

Civic Engagement, Attitude towards Gender Roles, and Public Leadership Behaviors: A Structural Equation Model on Disaster Resiliency among Barangay Responders

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ABSTRACT

The study employed SEM to examine the interconnections between civic participation, attitudes towards gender roles, public leadership behaviors, and the disaster resilience of 400 BDRRM responders. The findings indicated that the respondents exhibit a high level of civic engagement, especially in proactive attitudes and behaviors that foster disaster preparedness and community participation. Respondents exhibit moderate attitudes towards gender roles, supporting egalitarian principles while remaining influenced by traditional and culturally rooted perspectives. People rated public leadership behaviors highly, with ethical leadership and network governance being the most important areas. This means that in disaster situations, accountability, inclusiveness, and collaborative governance are very important. Disaster resilience is also high, with knowledge being the most important sign. Correlation and regression analyses demonstrated that both civic engagement and public leadership behaviors significantly affect disaster resilience; however, public leadership emerged as the most robust predictor across tested models ($\beta = 0.641, p < 0.001$), followed by civic engagement ($\beta = 0.124, p < 0.05$). Gender role attitudes do not directly exert a significant influence on resilience ($\beta = 0.012, p = 0.741$); however, they indirectly enhance resilience by fostering inclusiveness and responsiveness in disaster response. Model 3 provided the best fit among the tested models, indicating that leadership, civic participation, and gender inclusivity work together to increase people's resilience in disasters. These results show that communities need institutionalized leadership training, stronger civic engagement, and policies that account for gender to remain strong and adaptable.

Keywords: Public, Administration, Civic Engagement, Attitude Towards Gender Roles, Public Leadership Behavior, Disaster Resilience, Davao Region

INTRODUCTION

The Philippines' frequent natural disasters require Barangay Disaster Risk Reduction Management (BDRRM) responders to assist barangays in building resilience and preparedness measures (Rico, 2022). Even though Republic Act No. 10121 institutionalizes disaster risk reduction and management, many BDRRM responders still struggle with funding, training, community participation, and government coordination. Risk assessment, contingency planning, and early warning systems are hindered by these gaps, reducing the community's ability to prevent or mitigate disaster impacts (Merz, Kuhlicke, Kunz, Pittore, Babeyko, Bresch, Domeisen, Feser, Koszalka, Kreibich, Pantillon, Parolai, Pinto, Punge, Rivalta, Schröter, Strehlow, Weisse, Wurf). However, many organizations, programs, and initiatives prioritize post-disaster aid and recovery over proactive risk reduction (Mushtaha, Alaloul, Baarimah, Musarat, Alzubi, & Khan, 2024), limiting DRRM solutions' long-term success.

Local disaster management is hampered by political instability, frequent leadership changes, and uneven policy implementation, all of which undermine institutional continuity and community confidence. BDRRM responders require stronger institutional support, consistent policy enforcement, sustainable financing sources, and capacity-building programs. Equipping responders through training, inter-agency coordination, and community engagement improves disaster preparedness, community ownership, proactive resilience, and sustainable development, preparing local populations to withstand, respond to, and recover from natural hazards.

BDRRM responders are vital to global, national, and local resilience in the face of catastrophes. They collaborate with authorities, reduce national catastrophe risk, and prepare locally (Gaudiel, 2023). Barangays monitor community-based risk and encourage education, training, and awareness (Towards Sustainable Land Use, 2020). They boost infrastructure, early warning, disaster response, and sustainability. BDRRM responders promote preparation to speed community recovery and reduce disaster damage. A community's resilience is measured by its ability to prepare for, endure, adapt to, and recover from disasters. Protecting grassroots communities against dangers reduces social, economic, and environmental problems. Resilience reduces disaster risk. Understanding catastrophe resilience helps create successful policies, promotes community-based disaster risk management, and links local initiatives to global frameworks. Casic and Lagura (2025) emphasized that political values is the most significant direct influence to employee accountability in the local governance.

BDRRM responders are more resilient in the face of disasters through proactive civic engagement. Risk assessments, training, and simulations help communities and stakeholders meet local needs (Suharini, Asiah, and Kurniawan 2020). It improves collaboration among the government, NGOs, and the private sector in disaster response (Ardiansyah, Mirandah, Suyatno, Saputra, and Muazzinah, 2024). Advocacy helps local government incorporate disaster resilience, but incorporating people in decision-making generates responsibility and ownership (Government for Youth, Trust and Intergenerational Justice, 2020). Civic participation enables communities to collaborate, reducing damage from natural disasters and promoting sustainability (Das, Becker, & Doyle, 2024). The gender roles BDRRM responders see impact barangay disaster resilience (Galang, 2022). All sexes improve response systems (Allwood, 2020). Female leaders build communities, and gender-sensitive policies provide fair and effective disaster response (Asian Development Bank, 2024). Gender affects crisis work distribution. Gender equality encourages men and women to respond quickly and effectively, boosting resilience (UNODR, 2022).

Public leadership enhances the disaster resilience of BDRRM responders by improving preparedness, coordination, and community engagement. Effective leaders train disaster responders via proactive decision-making, accountability, and inclusivity (Truby, 2020). Leadership increases BDRRM team flexibility by mobilizing resources, building capability, and planning strategically (Truché, 2020). Strong leadership fosters a sustainable, disaster-resilient community by promoting resilience and collective action to mitigate risks, respond promptly, and recover effectively (Kunreuther, Botzen, Del Rio, Gregory, and Vogel, 2022). Inclusive and adaptable public leaders enhance resource efficiency and community resilience. Community-connected leaders who recognize the importance of gender, culture, and local expertise are better equipped to mitigate vulnerability and facilitate recovery (Terraza, Orlando, Lakovits, Janik, and Kalashyan, 2020). Disaster resilience—communities' capacity to prepare, react, and rebuild without long-term harm (changing 2023). Good governance, infrastructural resilience, and social capital all contribute to boosting resilience (Kalla & Metaxas, 2023). In vulnerable locations, the combination of ancient knowledge and new technology fosters resilience (Murdoch, 2022). Abanto and Acero (2025) find out that good governance is the most significant predictor to the service orientation in the government institution.

Civic Engagement, Attitude Towards Gender Roles, and Public Leadership Behavior are often studied independently without considering their overall influence on disaster resilience. Few integrative studies have examined how these three elements impact the preparation and responsiveness of BDRRM responders. Although natural disasters are becoming more prevalent in the Davao Region, little is known about the socio-behavioral factors that promote or hinder community-based disaster response. Current research primarily overlooks local government environmental and cultural factors that affect BDRRM success. Structural Equation Modeling (SEM) is underutilized, leaving a methodological gap in the information on interrelationships between disaster resilience system variables.

This research examines a causal model linking Civic Engagement, Attitude Towards Gender Roles, and Public Leadership Behavior to Disaster Resiliency. The study examines the Civic Engagement of Barangay Disaster Risk Reduction and Management Responders, focusing on Attitude and Behavioral Factors. Attitudes towards Gender roles are explored through the lenses of Egalitarian, Female, Marriage, Traditional, and Male perspectives. The study evaluates the Public Leadership Behavior of BDRRM respondents based on five leadership styles: Accountability Leadership, Lawfulness Leadership, Ethical Leadership, Political Loyalty Leadership, and Network Governance Leadership. It also evaluates Disaster Resiliency based on disaster

knowledge, preparedness plans, and action in emergency response. The project will examine the relationships between Civic Engagement, Attitude Towards Gender Role, Public Leadership, and Disaster Resiliency. Ultimately, the study identified the best-fit model of disaster resiliency using SEM.

At a 0.05 significance level, the following hypotheses were tested: Civic participation, gender role attitudes, and public leadership conduct do not correlate with disaster resiliency. It was also suggested that no external factor significantly impacts the resilience of Barangay disaster Risk Reduction Management responders. No model best depicts the disaster resiliency of BDRRM responders, the study found.

Civic engagement, the first exogenous variable, is crucial to disaster control strategies. This variable's markers are AF and BF. Attitude refers to people's thoughts and feelings toward community and disaster management. People believe disaster readiness is linked to social duty and collective efficacy (Clarito, 2025). The behavior component assesses how volunteers, education, and active engagement in disaster risk reduction activities apply these principles (Ganoë, Roslida, and Sihotang, 2023). Civic engagement improves disaster resilience and collaboration (Eriksen, Schipper, Scoville-Simonds, Vincent, Adam, Brooks, Harding, Khatri, Lenaerts, Liverman, Mills-Novoa, Mosberg, Movik, Muok, Nightingale, Ojha, Sygna, Taylor, Vogel, and West, 2021).

The second exogenous variable examines how societal gender roles affect men and women in disaster management. Egalitarianism, femininity, masculinity, marriage, and traditional gender roles are variables. Gender equality ensures women and men participate equally in disaster risk management (Erman, De Vries Robbe, Thies, Kabir, and Maruo, 2021). However, traditional gender norms limit women's engagement, assigning them to domestic tasks or caring for others, thereby affecting society's resilience (Hoffmann, 2021). Numerous gender role indices illustrate how social expectations shape men's and women's collaboration and contributions to disaster preparedness, response, and recovery (OECD, 2021).

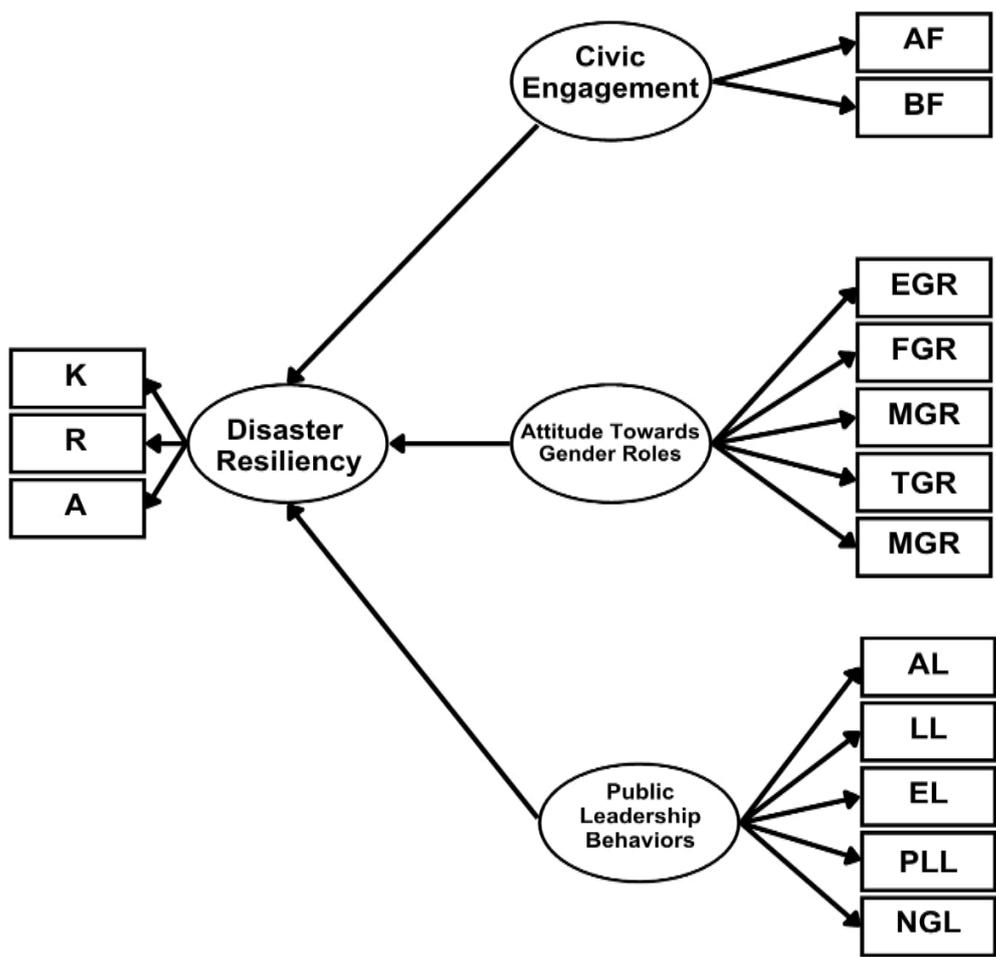


Figure 1. Hypothesized Model Showing the Direct Causal Relationship of

Civic Engagement, Attitude Towards Gender Roles, and Public Leadership Behavior on Disaster Resiliency

Legend:

Disaster Resiliency	Civic Engagement	Attitude Towards Gender Roles	Public Leadership Behavior
K – Knowledge Leadership R – Readiness Leadership A – Action Leadership	AF – Attitude Factor BF – Behavior Factor	EGR – Egalitarian Gender Roles FGR – Female Gender Roles MGR – Marriage Gender Roles	AL – Accountability LL – Lawfulness EL – Ethical
		GR – Traditional Gender Roles PLL – Political Loyalty	
		GR – Male Gender Roles Leadership	
		NGL – Network Governance Leadership	

Public leadership behavior is the third exogenous characteristic that strongly impacts crisis resilience and governance. Lawfulness leadership (LL) ensures legality; accountability leadership (AL) promotes transparency and efficiency. Ethical leadership (EL) promotes justice and integrity. Network Governance Leadership (NGL) encourages collaboration, whereas Political Loyalty Leadership (PLL) coordinates public interest. These boost the resilience of Barangay Disaster Risk Reduction Management (BDRRM) responders (Rafael-Vicente & D, 2024). Disaster resilience, the fourth latent endogenous variable, shows how well BDRRM responders prepare and respond to disasters. Knowledge, Readiness, and Action comprise this variable. Knowledge includes management, disaster risks, and effective responses. Contest planning, training, and resources help businesses and communities. García, Wishart, Ueda, Pisaniello, Tingey-Holyoak, and Lyon (2020) stress the significance of applying theoretical knowledge to real-world disaster response, resource allocation, and emergency operations.

This study applies Social Capital Theory, which emphasizes networks, trust, and social cohesiveness in community involvement, to project work, crisis response, and teamwork (Van Bakel & Horak, 2024). Strong social ties make people more resilient, improving neighborhood disaster preparedness and response (Interlocal adaptations to climate change in East and Southeast Asia, 2022). This study employs Gender Role Theory to investigate how society allocates disaster management activities and responsibilities, and how women perceive their involvement and decision-making, with the aim of promoting equitable and inclusive roles. Gender-sensitive disaster plans cater to the needs of everyone and enhance cooperation (Acanga, Matovu, Murale, and Arlikatti, 2025).

This study employs Transformational Leadership Theory (Burns, 1978) to demonstrate how leaders inspire, excite, and reflect to enhance the resilience, flexibility, and readiness of BDRRM responders. Transformational leaders foster diversity, innovation, and teamwork to build disaster-resilient organizations that enable effective response, recovery, risk reduction, coordination, decision-making, and involvement in line with Disaster Resilience Theory, which emphasizes communities' adaptability, response, and recovery after disasters. It builds resilience through public leadership, gender roles, and civic engagement (Velenturf, 2021). Civic involvement fosters cooperation, gender-sensitive strategies ensure inclusivity, and improved service leadership improves response. Together, these measures strengthen barangay disaster resilience.

Disaster readiness and response depend on citizen participation in government projects and community events. During natural disasters, strong civic networks enable communities to collaborate effectively and respond to emergencies. Trusting and participating in local decisions makes resource mobilization easier. Community resilience requires unity and a shared sense of responsibility (Boston et al., 2024).

Volunteers prepare for disasters. Engagement raises knowledge of risks, safety, disaster drills, and preparation. This precaution reduces fear and confusion. Community members may participate in safety initiatives and receive assistance (Dwivedi et al., 2021). Another advantage of local disaster response is good communication. Civically engaged communities share information quickly and reliably. Alerts, safety advice, and updates are sent swiftly via emergency communication networks (Gershaneck, 2020). Active community members can advise authorities on local needs to ensure an inclusive and personalized response (Marvin, 2024).

Civically engaged responders are key to BDRRM. Utilizing local government and stakeholder connections, they rapidly develop resources (Gomes, Osborne, & Guarnieri, 2020). Their empathy and coordination are enhanced by their knowledge of local terrain, social dynamics, and poverty. Civic participation prepares BDRM responders for local calamities. Disasters disrupt gender-based labor, decision-making, and access to resources. Men serve the community; women care for children, retirees, and the home (Khalfan, Lewis, Aguilar, Persson, Lawson, Dabi, Jayoussi, and Acharya, 2023). Although cultural, these roles restrict men and women from responding to emergencies together. These interactions may limit participation, thereby reducing the effectiveness and inclusivity of crisis management (D'Ignazio & Klein, 2020).

Despite limitations, men and women possess valuable healing talents and perspectives. Women may build practical initiatives by understanding local needs and weaknesses. Gendered preconceptions hinder leadership, strategic involvement, and support (Patel, 2025). Isolating crucial voices from decision-making and limiting their influence inhibits effective crisis response. Egalitarian and inclusive gender roles improve disaster management. Encouraging men and women to lead, develop, and interact equally provides a more comprehensive answer that meets society's requirements (Baubock & Orgad, 2020). Awareness and challenging of negative preconceptions may lead to stronger, more adaptive disaster management systems that prioritize talent over gender (Kachniewska & Para, 2023). Philippine disaster planning and implementation are still influenced by gender stereotypes, especially at the village level. Community planning and barangay disaster risk reduction and management council seminars excluded women. It may prevent men from seeking psychological care.

Local government agencies must resist these tendencies by offering gender-sensitive training, promoting equitable representation, and recognizing diverse contributions, from preparedness to recovery, to create a more inclusive system (Cuaton & Su, 2020). Public leadership fosters stakeholder participation and trust in local disaster response. Communities look to leaders for comfort and advice during disasters. Effective leaders coordinate and expedite intersectoral efforts (Boyce et al., 2020). In times of disaster, strong and empathetic leaders build trust and aid in recovery.

Leadership must be accountable, open, and participative to prepare for disasters and build community resilience. Leaders who uphold these values inspire trust among their constituents and foster a shared sense of accountability (Joseph, Awasthi, & Mulla, 2022). Being accountable ensures ethical decision-making and resource management. Open leadership and public communication facilitate the flow of accurate information (Wang et al., 2022).

Community participation in disaster preparedness and response makes them more relevant and inclusive (Black et al., 2022). In decentralized systems like the Philippines, barangay leaders must lead disaster response and preparedness. Local deficiencies can be identified, and aid can be mobilized quickly owing to their proximity to the community. This involves managing hazards and ensuring safety. Barangay leadership can enhance disaster management by making it more responsive, adaptable, and community-driven during climate-related disasters (Abenir, Manzanero, & Bollettino, 2022).

To improve disaster resilience, barangay officials must strengthen their leadership abilities. Training in risk management, crisis communication, and inclusive governance can help local leaders handle complicated disasters while maintaining community accountability (Tõnurist, 2020). Creating a leadership culture of service, equity, and cooperation will make disaster responses efficient, compassionate, and community-centered (Bozkurt et al., 2023).

Disaster resilience enables individuals, communities, organizations, and systems to prepare for, respond to, and recover from disasters (Tariq, Pathirage, & Fernando, 2021). Beyond immediate reaction, it builds resilience to future situations. The development of resilience requires proactive planning, risk reduction, and disaster preparation. Resilient communities recover from disasters and become stronger (Baluran, 2023).

Creating disaster resilience demands comprehensive, multi-sectoral efforts. Government, civic, economic, and community sectors must collaborate. Early warning systems, infrastructure, and disaster risk reduction education are crucial (Lahn & Shapland, 2022). Strong social cohesiveness and community networks increase resilience

because working communities help one another in times of need. Communities leading preparation and recovery produce sustainable solutions (Shirleyana, Hawken, Sunindijo, & Sanderson, 2023).

Due to frequent typhoons, earthquakes, volcanic eruptions, and floods, the Philippines needs disaster resilience (Rivera & Vega, 2025). Effective disaster risk reduction and management (DRRM) require decentralized barangay initiatives to adjust local plans to community vulnerabilities and capabilities. Local governments educate, prepare, and support communities before, during, and after disasters, and policy frameworks and development plans must include resilience principles to protect lives, livelihoods, infrastructure, and ecosystems (Ner, Okyere, Abunyewah, & Kita, 2022). Beyond hazard mitigation, disaster resilience requires addressing poverty, social inequality, and environmental degradation to protect vulnerable populations like women, children, the elderly, and people with disabilities (Joudyian, Soltani, Lohi, Shirazi, & Tahmasebi, 2025). Education, sustainable livelihoods, healthcare access, social protection, and environmental stewardship help communities adapt, recover, and continue operating during crises (Tan, 2023).

Resilient societies also foster social solidarity, community empowerment, and participatory government, enabling residents to participate in preparation, decision-making, and recovery actively. Climate adaptation, risk-informed urban planning, and ecosystem-based approaches strengthen adaptive capacity. At the same time, continuous training, simulation exercises, and inter-agency coordination keep local responders and communities proactive and effective in disaster management (Mahajan, 2022). Disaster-resistant societies can endure calamities and turn vulnerabilities into sustainable development opportunities, generating adaptable, inclusive, and empowered communities.

Civic participation, gender role perspectives, and Public Leadership Behavior improve public administration by making Barangay Disaster Risk Reduction Management (BDRRM) responders more resilient in the face of disasters. Leadership, social norms, and community participation strengthen BDRRM responders, improving local disaster preparation, response, and recovery, according to a study. Building resilient communities requires ethical, accountable, and collaborative public leadership, gender sensitivity and diversity, and active citizen engagement, according to the research. Responders' operational efficiency, community trust, cohesion, and resilience improve with a comprehensive, motivated organizational culture. Participation, gender equality, and job satisfaction lower disaster risks, increase organizational commitment, and build resilient governance structures. This research organizes public sector disaster management leadership, gender equity, and civic engagement to provide an evidence-based framework for local governments and disaster agencies to institutionalize inclusive and effective disaster management practices and build adaptive, resilient, and sustainable communities that can withstand and recover from hazards.

This research uses a structural equation model to explore how civic involvement, gender roles, and public leadership impact BDRRM responders' disaster preparedness. Crisis prevention, disaster drills, relief operations, and social network formation for cooperation and resource mobilization are civic engagement. Studying gender roles examines how social norms and cultural beliefs shape disaster preparedness, highlighting where inclusive efforts could reduce vulnerabilities. Ethics, transparency, accountability, and collaborative decision-making improve responder confidence, service delivery, community trust, and resilience. These qualities provide local preparedness, reactivity, and adaptability, improving barangay disaster management programs. This study emphasizes community participation, equitable gender roles, and decent working conditions in disaster resilience based on UN Sustainable Development Goal (SDG) 16, which promotes peaceful, inclusive, and accountable institutions, and SDG 11, which seeks to make human settlements inclusive, safe, resilient, and sustainable. Increased local governance, engagement, and catastrophe risk reduction make communities safer and promote sustainable development, enhancing social, institutional, and environmental resilience.

METHOD

This section describes the study's methodology, including respondent selection, instrument usage, and design and processes. It describes participant identification and screening, sample size considerations, and methods for validity, reliability, and ethical compliance. This section describes the structured instruments, data collection timeline, and analytical methods—including Structural Equation Modelling (SEM)—used to study civic

engagement, gender role attitudes, public leadership behavior, and disaster resilience among BDRRM responders in Region XI.

Research Respondent

This study includes 23,240 barangay respondents from 1,162 barangays in Davao del Norte, Davao del Sur, Davao de Oro, Davao Oriental, Davao Occidental, and the highly urbanized city of Davao. Based on their work, 80 respondents were selected from each province and the city. Region XI is a critical area for assessing disaster resilience and preparedness due to its exposure to typhoons, earthquakes, and floods. The researcher purposively selected 400 BDRRM respondents from Region XI barangays to ensure they have the necessary knowledge, training, and disaster experience for the study. The sampling was non-probability, yet 400 respondents met Cochran's criterion of 384 for a 95% confidence level and 5% margin of error, improving both dependability and accuracy. Although there was no stratification, the large sample included barangays with varying levels of catastrophe exposure, geographic conditions, and community capacity, thereby increasing the reliability of the results. This size enabled the research to analyze civic participation, gender roles, and Public Leadership Behavior, thereby making its results regarding the resilience of Region XI BDRRM responders more credible and applicable.

Equal regional participation was achieved by selecting Barangay Disaster Risk Reduction and Management (BDRRM) responders from all the provinces in Region XI. Participants must have at least 3 years of active experience in disaster preparedness, response, and management, with both men and women represented to achieve gender balance. Barangay records verified identity, role, and service period. The research excluded individuals who did not meet the criteria or had no records. Participants provided informed consent, were anonymous, and had the right to withdraw at any time.

Following structural equation modeling (SEM) criteria, data were collected from June to December 2025, yielding a large sample. The replies will be crucial to creating a structural equation model to examine civic participation, gender role views, public leadership, and disaster resilience. This research examined BDRRM responders to inform local disaster management strategies. Resilience planning, inclusive gender roles in disaster response, and front-line responder working conditions in community-based disaster risk reduction have improved.

This section presents the methodological foundation of the study, detailing the selection of research respondents, the instruments used, and the overall research design and procedures. It outlines how participants were identified and screened, the rationale behind the sample size, and the processes undertaken to ensure validity, reliability, and ethical compliance. By describing the structured instruments, data collection timeline, and analytical techniques—including Structural Equation Modeling (SEM)—this section provides a comprehensive overview of how the study was systematically conducted to examine civic engagement, gender role attitudes, public leadership behavior, and disaster resilience among BDRRM responders in Region XI.

MATERIALS AND INSTRUMENT

This research examined the impact of civic engagement, attitude towards gender roles, and public leadership behavior on disaster resilience among BDRRM responders, using a structured survey questionnaire. The instrument will have a framework and research-confirmed characteristics for reliability and content validity. According to Doolittle and Faul (2013), civic involvement indicators included attitude and conduct. Zeyneloğlu (2011) analyzed the Gender Role Beliefs Scale (GRBS) to evaluate traditional and egalitarian views on gender roles in disaster response. The Public Leadership Behavior Scales measured accountability, lawfulness, ethics, political loyalty, and network governance leadership, as noted by Tummers and Knies (2014). Disaster resilience was connected to the CBDRR framework components and adapted (Matsukawa, Nagamatsu, Ohtsuka, and Hayashi, 2023). Respondents will utilize a five-point Likert scale to capture their opinions, attitudes, and behaviors across the four primary dimensions: 5 (strongly agree), 4 (agree), 3 (moderately agree), 2 (disagree), and 1 (strongly disagree).

The questionnaire was carefully verified before use to guarantee validity and reliability. A panel of social science and disaster risk reduction experts will review the items' content, structure, and relevance to ensure they meet the study's goals and theory. To improve the instrument, a small number of non-samples 50 BDRRM respondents pilot-tested it, yielding Cronbach's Alpha values of .908 for Civic Engagement (14 items), .932 for Attitude Toward Gender Roles (38 items), .958 for Public Leadership Behavior (29 items), and .936 for Disaster Resilience (24 items). All coefficients were above 0.70, indicating that the instrument was reliable for primary survey administration.

This pilot phase evaluated the clarity, comprehensibility, and suitability of the items. Following feedback from pilot participants and expert reviewers, the questionnaire was revised to rephrase unclear items and modify the response options. These changes enhanced the instrument's internal consistency, thereby improving its ability to measure civic participation, gender role views, Public Leadership Behavior, and disaster resilience. The survey scores were interpreted as follows: The independent variables, Civic Engagement, Attitude Towards Gender Roles, Public Service Leadership, and Disaster Resiliency, ranged from 4.20 to 5.00, indicating an exceptionally high level and suggesting that these measurements were consistently evident. A range of 3.40 to 4.19 indicates a high level, suggesting that these measurements frequently materialized. A moderate level is indicated by a range of 2.60 to 3.39, signifying that the measurements are occasionally exhibited. A low level, defined as 1.80 to 2.59, indicated that the measurements were infrequently exhibited, whilst a very low level, spanning 1.00 to 1.79, indicated that the measures were never exhibited.

Design and Procedure

BDRRM responders' civic involvement, gender roles, public leadership, and disaster resilience were measured using structural equation modeling. Quantitative approaches objectively assess dependability and generalizability. SEM may examine complex relationships between observable and latent factors, thereby evaluating this research's theoretical approach.

Research variable correlations were examined using Structural Equation Modeling (SEM). This method enabled a thorough investigation of BDRRM responders' civic participation, gender role views, and the direct and indirect impacts of public sector leadership on disaster resilience. The model's validity was examined using the Chi-square (CMIN), Comparative Fit Index (CFI), Goodness-of-Fit Index (GFI), and Root Mean Square Error of Approximation (RMSEA). The model's fit to observed data was assessed using these metrics. Data were gathered before, during, and after the study. The University Multi-Disciplinary Ethics Review Committee (UMERC) authorized the study with the Certificate of Approval, UMERC Protocol No. UMERC-2025-343 and materials prior to distributing the survey instrument in order to ensure the ethical conduct of research involving human participants.

Local DRRM offices and barangay authorities coordinated informed consent and participant involvement after approval. During data collection, qualified BDRRM volunteers received questionnaires from July to August 2025. Participants enjoy privacy, anonymity, and the right to withdraw at any time. Encoding, cleaning, and analyzing data involved the use of descriptive statistics (mean and standard deviation), Pearson's Product-Moment Correlation to examine relationships, and Structural Equation Modeling (SEM) to evaluate model fit and structure.

RESULTS AND DISCUSSION

In this section, the results of the data collected and analyzed on civic engagement, attitudes towards gender roles, public leadership behavior, and disaster resilience are presented and discussed.

Civic Engagement

Table 1 shows BDRRM respondents' views on civic involvement. The 4.26 mean and 0.52 standard deviation are high. This suggests BDRRM respondents are very civically engaged. With a standard deviation of 0.54, the attitude factor had the highest mean of 4.31, indicating high levels. The behavior factor's lowest mean of 4.21 and standard deviation of 0.62 suggest high levels. The good attitude and behavior of BDRRM responders

demonstrate their appreciation for disaster preparedness and community engagement. They value reducing catastrophe risk and building community resilience. Goodwill towards volunteers, a feeling of duty, and a commitment to disaster relief helped them succeed. Their efforts include disaster preparedness, relief, information, and capacity-building.

The strong civic participation in attitudes suggests that proactive thinking and disaster risk management expertise are necessary for community disaster risk management (Nakano & Yamori, 2021). High civic engagement—both in attitudes and behaviors—indicates that proactive thinking, risk awareness, and community responsibility are essential for disaster management, with responders actively applying these principles to enhance preparedness and trust. Response behavior, especially in community-driven projects, improves catastrophe preparation and citizen-institutional confidence (Ryan, Johnston, Taylor, & McAndrew, 2020).

Table 1 Level of Civic Engagement of Barangay Responders

Indicators	SD	Mean	Descriptive Level
Attitude Factor	0.54	4.31	Very High
Behavior Factor	0.62	4.21	Very High
Overall	0.52	4.26	Very High

Positive attitudes and perseverance promote community resilience, according to these studies. BDRRM responders must be trained, value-driven, and engaged to build civic involvement. Improve community-based disaster risk reduction measures to maintain participation (Cvetković, 2024). Partnerships with local governments, NGOs, and others will increase BDRRM responders' civic involvement. Continuous training, reinforcement of DRRM values, simulations, and improved community-based policies and partnerships improve involvement, coordination, and resilience.

Attitude Toward Gender Roles

Table 2 shows respondents' attitudes toward gender roles. The mean is 2.67, and the standard deviation is 0.55, indicating reasonable values. Though BDRRM responders recognize gender roles in disasters, their views nonetheless reflect conventional attitudes and constraints that impede gender equality. Equal gender roles had the highest mean score of 4.23 and standard deviation of 0.57. This implies that most BDRRM responders support gender equality in disaster risk reduction and recognize that both can strengthen communities. Following that, conventional and feminine gender roles are minimal (3.23, 0.77, 0.79). Most respondents laud women for their caring and supporting roles, but some still maintain cultural norms that limit their leadership and decision-making.

Interestingly, male and marital gender roles are moderate to low, with averages of 2.69 and 2.59, and standard deviations of 1.00 and 0.88, respectively. Men have historically been guardians and providers, but disaster management is changing this. A poor view of marital gender roles may lead respondents to not fully associate catastrophe chores with their spouse's obligations, suggesting a split between personal and community engagement.

Table 2 Level of Attitude toward Gender Roles of Barangay Responders

Indicators	SD	Mean	Descriptive Level
Egalitarian Gender Roles	0.57	4.23	Very High
Female Gender Roles	0.79	3.22	Moderate
Marriage Gender Roles	0.88	2.59	Low
Traditional Gender Roles	0.77	3.23	Moderate

Male Gender Roles	1.00	2.69	Moderate
Overall	0.55	2.67	Moderate

Despite increased support for equality, BDRRM respondents hold conventional gender roles and marital attitudes. Given these perspectives, gender-sensitive training, inclusive participation, and addressing cultural myths that may hinder balanced gender engagement in disaster planning and response are essential (Arvind, 2020). BDRRM gender equality promotes male and female participation and disaster preparedness (Oktari et al., 2020). Gender-responsive policies, knowledge, and leadership, as well as the technical and representational representation of men and women, are needed for a resilient and equitable community (Barairo, 2024).

The mixed pattern supports the idea that cultural, societal, and institutional expectations progressively shift gender norms. Traditional beliefs persist, underscoring the need for gender-sensitive training and inclusive participation initiatives to dispel misunderstandings and encourage equitable DRRM engagement. Since equal participation improves preparedness and community outcomes, strengthening gender-responsive policies, increasing women in decision-making positions, and integrating continuous awareness programs may align community practices with resilience-building.

Public Leadership Behavior

Table 3 shows the public leadership of BDRRM responders. The mean is 4.01, and the SD is 0.57, suggesting high values. In their communities, BDRRM responders exemplify accountability, ethics, and collaborative governance. Ethical leadership has the highest mean score of 4.19, with a standard deviation of 0.62, followed by network governance leadership at 4.14, with a standard deviation of 0.66. These findings demonstrate that BDRRM responders value honesty, fairness, and transparency in decision-making and recognize the need for strong cooperation with other institutions, organizations, and community stakeholders for disaster risk management. BDRRM responders follow rules, standards, and procedures in accountability and lawfulness leadership, with mean values of 4.02 and 0.69 and 3.99 and 0.68, respectively. These results demonstrate their community-mindedness and dedication to legal and transparent catastrophe management.

Table 3 Level of Public Leadership Behavior of Barangay Responders

Indicators	SD	Mean	Descriptive Level
Accountability Leadership	0.69	4.02	High
Lawfulness Leadership	0.68	3.99	High
Ethical Leadership	0.62	4.19	High
Political Loyalty Leadership	0.89	3.72	High
Network Governance Leadership	0.66	4.14	High
Overall	0.57	4.01	High

Political loyalty leadership is the lowest-rated high-level trait, with a mean of 3.72 and an SD of 0.89. BDRRM respondents may value political institutions and leadership but prioritize community welfare and professional responsibilities above party affiliations, suggesting a more balanced leadership style (Lumabi et al., 2025). Ethics, accountability, and collaboration characterise BDRRM leaders (Ablang & Ocampo, 2025). Disaster preparation and response must be adequate, inclusive, and compatible with good governance (Acharya, Koedsin, & Techato, 2025). Emergency leadership and community resilience can be enhanced through leadership training, ethical education, and inter-agency coordination (Tabanao et al., 2025).

These results show that ethical, responsible, and collaborative leadership is essential to disaster governance, fostering public confidence, planning openly, and improving coordination for preparation and response. Good governance emphasizes inclusion, rule-following, and shared accountability to reduce catastrophe risks, which high public leaders demonstrate. In DRRM environments, leadership development programs, ethics-focused

training, and structured inter-agency coordination procedures should be institutionalized to promote emergency leadership and community resilience.

Disaster Resilience

Table 4 shows the BDRRM disaster responders' resilience. The mean is 4.16, and the SD is 0.57, suggesting high values. Responders must be resilient in knowledge, planning, and action to reduce catastrophe risk and safeguard communities. Knowledge was evaluated highest per-indicator, with a mean of 4.25 and an SD of 0.66. Disaster risk reduction ideas, tactics, and strategies help responders make informed emergency decisions. Mean scores of 4.12 and 0.62, and 4.09 and 0.65, suggest good crisis preparedness and skills among BDRRM responders. They exhibit dedication by organizing resources and responding to crises.

Technical expertise, practical training, and operational skills make BDRRM responders disaster-resilient. With knowledge, readiness, and action, they preserve lives, property, and community stability during catastrophes. This shows resiliency, but the translation of information into proactive, consistent activities needs development. Training, exercises, and simulations may improve readiness and response (Gundran et al., 2023). Collaboration with local governments, civil society, and community stakeholders may increase disaster resilience by increasing resource availability and support networks (Ma, Qirui, & Lv, 2023). Training equips disaster responders with information (Rosen et al., 2023).

Table 4 Level of Disaster Resilience of Barangay Disaster Risk Reduction Management Responders

Indicators	SD	Mean	Descriptive Level
Knowledge	0.66	4.25	Very High
Readiness	0.62	4.12	High
Action	0.65	4.09	High
Overall	0.57	4.16	High

Continuous practice, capacity-building, and community involvement help responders be flexible, proactive, and successful in risk reduction and crisis management. Combine technical knowledge with readiness and operational abilities to increase disaster resilience. Train, simulate, and collaborate with local governments and stakeholders to keep responders flexible, proactive, and successful in disaster management.

Relationship between Civic Engagement and Disaster Resilience

Table 5 shows how civic engagement affects BDRRM responders' resilience in the face of catastrophes. The hypothesis needed a p-value of 0.05 to prove a link. All p-values < 0.05 showed a significant correlation between civic participation and catastrophe resilience. Civically engaged BDRRM responders are more disaster-resistant. The findings show that civic involvement, attitude, and behavior affect catastrophe resilience. Attitude was positively associated with knowledge, readiness, action, and resilience (r = 0.381–0.430). Proactive thinking and civic responsibility help responders survive and respond to emergencies.

Table 5 Significance of the Relationship between Civic Engagement and Disaster Resilience of Barangay Disaster Risk Reduction Management Responders

Civic Engagement	Disaster Resilience			
	Knowledge	Readiness	Action	Overall
Attitude Factor	.381**	.382**	.393**	.430**

	.000	.000	.000	.000
Behavior Factor	.543**	.406**	.424**	.511**
	.000	.000	.000	.000
Overall	.513**	.435**	.451**	.521**
	.000	.000	.000	.000

Behavior was more strongly associated with values from 0.406 to 0.543. Responder exercises, relief operations, and community-driven activities boost catastrophe resilience more than mindset. Behavior and knowledge correlated most strongly at 0.543, indicating that hands-on participation directly enhances rescuers' understanding and application in catastrophe situations. This is consistent with research showing that experience learning and repeated simulated situations improve disaster skills. Permana, Said, Umar, and Ludhiana (2022) found that community responders who frequently engage in preparedness drills are more confident, make faster decisions, and coordinate better during disasters. According to Ryan, Johnston, Taylor, and McAndrew (2020), disaster-related behaviors such as training, drills, and community preparedness help responders apply theoretical knowledge in practice.

Civic participation and catastrophe resilience are substantially correlated ($r = 0.521, p < 0.05$), rejecting the null hypothesis. This substantial connection suggests civic participation is crucial to catastrophe resilience. Responders' readiness, response, and recovery resilience grow with thinking and action (Ganoë, Roslida, and Sihotang, 2023). Disasters require greater civic participation, including training, interactive community activities, and collaborations with local institutions (Eden, Chisom, & Adeniyi, 2024). Crisis responders may strengthen communities.

Civically engaged responders can utilize theoretical knowledge, make proactive judgements, and collaborate efficiently during crises. Active engagement builds accountability, community trust, and situational flexibility, all of which are essential for resilience in the face of catastrophe. Community participation should be prioritized in disaster management policy through training, exercises, community activities, and alliances with local institutions. Strengthening these activities helps responders improve their skills and fosters community resilience, helping communities recover from catastrophes.

Relationship between Attitude toward Gender Roles and Disaster Resilience

Table 6 indicates BDRRM responders' gender role attitudes and catastrophe resilience scores. Both variables were significantly connected in most indices (p -values < 0.05). This shows that the gender of BDRRM responders influences disaster resilience.

Table 6 Significance of the Relationship between Attitude toward Gender Roles and Disaster Resilience of Barangay Disaster Risk Reduction Management Responders

Attitude toward Gender Roles	Disaster Resilience			
	Knowledge	Readiness	Action	Overall
Egalitarian Gender Roles	.441**	.381**	.413**	.460**
	.000	.000	.000	.000
Female Gender Roles	.229**	.175**	.189**	.221**
	.000	.000	.000	.000
Marriage Gender Roles	.112*	.074	.061	.092
	.025	.142	.226	.067

Traditional Gender Roles	.152** .002	.195** .000	.190** .000	.199** .000
Male Gender Roles	.116* .020	.130** .009	.116* .020	.134** .007
Overall	.230** .000	.217** .000	.214** .000	.246** .000

Egalitarian gender norms were most strongly associated with catastrophe resilience (0.381–0.460). Disaster managers learn, plan, and act more effectively when they feel that men and women are equally competent (Janizadeh, Omidvari, Motlagh, & Jahangiri, 2023). These results emphasise inclusiveness and gender equality in disaster response and preparation. Milder but significant relationships were seen for female gender roles (0.175–0.229). Women's supportive and caring roles boost resilience, but they may limit their crisis leadership and decision-making (Azad & Pritchard, 2023). Traditional and masculine gender roles also had significant but small associations, showing that cultural expectations of men and women affect resilience, but are increasingly accepting of gender equality.

Most characteristics, except knowledge, showed no significant effect of marital gender roles on disaster resilience (p-values > 0.05). This shows that catastrophe obligations are more related to society and individual duties than to marital or spousal roles. The null hypothesis was rejected due to a correlation between gender role views and catastrophe resilience (r = 0.246, p < 0.05). Fair and inclusive gender roles strengthen BDRRM responses. This shows that inclusive treatments create a social context that influences behavior. It promotes inclusivity, credibility, and legitimacy in decision-making on catastrophes and resource management (Cuthbertson & Penney, 2023). Results emphasized gender equality and sensitivity in reducing catastrophe risk. Egalitarianism and the eradication of stereotypes help BDRRM responders maximize people's contributions, thereby improving community resilience and disaster preparedness.

These results show that inclusive gender views enable all responders to participate, thereby improving crisis management decision-making, credibility, and legitimacy. Gender equality helps men and women prepare, respond, and recover, strengthening communities. DRRM policies should incorporate gender sensitivity training, eradicate stereotypes, and promote fair leadership and operational roles to maximize human resources, improve coordination, and strengthen communities' disaster resilience.

Relationship between Public Leadership Behavior and Disaster Resilience

Table 7 shows public leadership and BDRRM responder disaster resilience. Overall, the 0.05 correlation was 0.721. Public leadership greatly affects catastrophe resilience. All public leadership behavior variables are linked to catastrophe resilience (p-values < 0.05). Network governance leadership was most strongly linked to resilience across all factors (0.625–0.713). Teamwork and linked decision-making improve BDRRM disaster responders' knowledge, preparedness, and response (Bearman, Hayes, & Thomason, 2023). Community resilience increases with stakeholder engagement and cooperative governance. Ethics, justice, and morality boost responder resilience (0.535–0.620) under ethical leadership. Ethics enhances disaster risk management by boosting trust, responsibility, and effectiveness (Bonfanti et al., 2023).

Table 7 Significance of the Relationship between Public Leadership Behavior and Disaster Resilience of Barangay Responders

Public Leadership Behavior	Disaster Resilience			
	Knowledge	Readiness	Action	Overall
Accountability Leadership	.472**	.449**	.525**	.538**

	.000	.000	.000	.000
Lawfulness Leadership	.497**	.484**	.497**	.550**
	.000	.000	.000	.000
Ethical Leadership	.535**	.548**	.584**	.620**
	.000	.000	.000	.000
Political Loyalty Leadership	.496**	.423**	.510**	.532**
	.000	.000	.000	.000
Network Governance Leadership	.640**	.625**	.653**	.713**
	.000	.000	.000	.000
Overall	.646**	.615**	.677**	.721**
	.000	.000	.000	.000

Lawfulness and political allegiance leadership were associated (0.423 to 0.550), although orderly and coordinated response processes, compliance with laws, political mandates, and institutional norms may also help with catastrophe resilience. Accounting leadership showed correlation values ranging from 0.449 to 0.538, supporting the premise that transparent, responsible, and accountable CEOs boost confidence and efficiency in the disaster response system. The data suggest that effective leadership enhances BDRRM disaster response resilience. Disaster responders are informed, equipped, and prepared by ethical, responsible, and legally committed leadership driven by connections (Thobaity, 2024). This indicates that disaster preparedness requires leadership and technical skills. Buildings that promote inclusive government, ethics, and inter-agency collaboration may benefit local communities.

These results show that leadership that directs, educates, and organizes responders is crucial to disaster resilience, assuring ethical, responsible, and collaborative DRRM operations. DRRM programs should emphasize ethical training, interagency collaboration, and collaborative governance to build leaders. Local governments and disaster agencies can improve responder performance, community preparedness, and disaster resilience by promoting transparent, accountable, and stakeholder-engaged public leadership.

Influence of Civic Engagement, Attitude toward Gender Roles, and Public Leadership Behavior on Disaster Resilience

Table 8 reveals how gender, civic involvement, and public leadership affect catastrophe resilience. Significant F-value of 149.222 and p-value of 0.000 for the regression model. Rejecting the null hypothesis. Predictor factors may explain Barangay Disaster Risk Reduction Management respondents' disaster resistance. The factors of civic participation, gender role attitudes, and Public Leadership Behavior explain 53.0% of the variance in catastrophe resilience, with an R^2 of 0.530.

This suggests that non-model factors account for 47.0% of the variance in catastrophe resilience. A beta of 0.641 gave public leadership the highest standardized coefficient of all predictor components. This suggests that public leaders' actions most affect catastrophe resilience. Leadership accountability, inclusivity, and responsiveness are essential for community planning, emergency response, and disaster recovery (Abenir, Manzanero, and Bollettino, 2022).

Table 8 Significance of the Influence of Civic Engagement, Attitude toward Gender Roles, and Public Leadership Behavior on Disaster Resilience of Barangay Disaster Risk Reduction Management Responders

Disaster Resilience					
(Variables)		<i>B</i>	β	<i>t</i>	<i>Sig.</i>
Constant		.932		5.221	.000
Civic Engagement		.134	.124	2.836	.005
Attitude toward Gender Roles		.013	.012	.330	.741
Public Leadership Behavior		.649	.641	14.079	.000
R	.728				
R ²	.530				
ΔR	.526				
F	149.222				
ρ	.000				

Civic participation was considerable but weaker, with a beta of 0.124. Disaster planning and response need community participation, cooperation, and teamwork. Civic engagement promotes community action and preparedness for disasters, even if leadership is more crucial. A likelihood of 0.741 and a beta of 0.012 showed no influence from gender role views. Gender role views may affect community dynamics, but they do not predict barangay disaster risk reduction management responders' disaster resilience (Mercado, 2024). Leadership is the most significant factor in civic involvement and leadership behaviors, which in turn affect catastrophe resilience. Despite their potential influence on interpersonal relationships, gender role beliefs are inconsistent predictors of behavior.

These findings show that leadership behaviors impact knowledge application, decision-making, and coordination, while civic involvement prepares communities for disasters. Without supporting institutional or leadership mechanisms, gender attitudes alone have no direct influence on resilience results. DRRM programs should promote civic involvement through community engagement, preparation campaigns, and participatory planning, and emphasize leadership development through ethics, accountability, and inter-agency coordination (Rodríguez-Lirios & Donato, 2023). Focusing on these areas will improve responders' effectiveness and community resilience in the face of disasters.

Goodness of Fit Measures of the Three Generated Models

Table 9 shows the three models' goodness-of-fit indices for statistical data representation. Assessments include GFI, CFI, NFI, TLI, RMSEA, and P-close. Fit criteria include a non-significant chi-square p-value more than 0.05, a CMIN/DF value between 0 and 2, GFI, CFI, NFI, and TLI values better than 0.95, an RMSEA value less than 0.05, and a P-close value greater than. These indices balance explanatory power with empirical sufficiency, making the model parsimonious and theoretically relevant.

Model 1 fits most indices badly. The 0.000 p-value implies a significant chi-square statistic and poor fit. GFI (0.759), CFI (0.790), NFI (0.774), and TLI (0.747) were below 0.95, whereas 10.201 CMIN/DF was above. The

model was poor with an RMSEA of 0.152 and P-close of 0.000. Poorly fitted models invalidate structural connection claims, even when statistically significant. Leadership behavior was predicted by Model 1 but not by the data structure.

Model 2 fits better than Model 1, but not well. Despite remaining below 0.95, the GFI (0.818), CFI (0.846), NFI (0.829), and TLI (0.808) values all increased. The CMIN/DF ratio of 7.995 was lower than that of Model 1 but still within the acceptable range. The RMSEA of 0.132 and P-close of 0.000 indicated a persistent mismatch. Civic engagement enhanced the model's explanation but not its structure. Progressive index improvements may be promising, but need modification to be empirically accepted.

Table 9 Summary of Goodness of Fit Measures of the Three Generated Models

Model	P-value (>0.05)	CMIN / DF (0<value<2)	GFI (>0.95)	CFI (>0.95)	NFI (>0.95)	TLI (>0.95)	RMSEA (<0.05)	P-close (>0.05)
1	.000	10.201	.759	.790	.774	.747	.152	.000
2	.000	7.995	.818	.846	.829	.808	.132	.000
3	.067	1.442	.984	.996	.986	.991	.033	.885

Legend: CMIN/DF – Chi Square/Degrees of Freedom NFI – Normed Fit Index
 GFI – Goodness of Fit Index TLI – Tucker-Lewis Index
 RMSEA – Root Mean Square of Error Approximation CFI – Comparative Fit Index

While Model 2 improved over Model 1, it still did not fit well. While below 0.95, the GFI (0.818), CFI (0.846), NFI (0.829), and TLI (0.808) values increased. Although lower than Model 1, the CMIN/DF ratio of 7.995 was within the acceptable range. However, the 0.132 RMSEA and 0.000 P-close indicated a persistent mismatch. Civic engagement enhanced the model's explanation but not its structure. Theoretically promising incremental index improvements need modification to gain empirical acceptability.

Model 3, however, fit all criteria and surpassed expectations. As intended in structural equation modeling, the model's non-significant chi-square value (0.067) indicated that it was not statistically different from the observed data. GFI (0.984), CFI (0.996), NFI (0.986), and TLI (0.991) are all above 0.95, indicating a strong comparative and incremental fit. The CMIN/DF ratio of 1.442 was ideal. Parsimony and close fit were supported by RMSEA of 0.033 and P-close of 0.885. This supports Hu and Bentler's (1999) assertion that fit indices should converge to improve models. Model 3 is the most frugal and theoretically sound, making it suitable for leadership, civic involvement, and resilience.

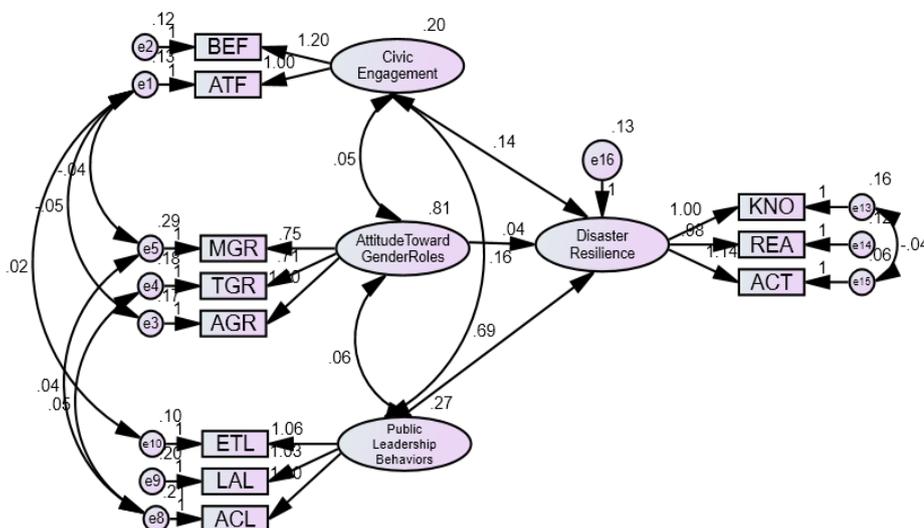


Figure 2: Best Fit Model in Standard Solution

Legend:

Disaster Resiliency

Civic Engagement

Attitude Towards Gender Roles

Public Leadership Behavior

KNO – Knowledge
 REA – Readiness
 ACT – Action

ATF – Attitude Factor
 BEF – Behavior Factor

TGR – Traditional Gender Roles
 MGR – Male Gender Roles

ACL – Accountability Leadership
 LAL – Lawfulness Leadership
 ETL – Ethical Leadership

These findings suggest that only a paradigm that integrates leadership, civic participation, and gender-inclusive behaviors can explain catastrophe resilience. The improvement from Models 1 to 3 underscores the need for many interacting predictors. Model 3's strong fit supports Hu and Bentler's (1999) claim that convergent fit indices indicate theoretical validity and empirical adequacy, showing that leadership, civic participation, and inclusive gender attitudes contribute to disaster resilience.

Regression Weights of the 3 Generated Models

Table 10 presents the regression weights for Civic Engagement, Gender Role Attitude, and Public Leadership Behavior. Individual, societal, and leadership qualities differ between models.

In Model 1, only Public Leadership Behavior predicted the endogenous construct with a beta coefficient of 0.805 and a p-value of 0.001. Leadership qualities such as accountability, inclusion, and responsiveness influence results, as evidenced by this strong association. It supports Abd Razak, Osman, and Mohd Nadzri (2025), who argue that public leadership motivates personnel, builds organizational commitment, and improves public sector service performance. Effective leaders build trust and responsibility for organizational resilience and sustainability (Kleynhans, Heyns, Stander, and De Beer, 2022).

Civic Engagement (standardized beta = -0.017, not significant) and Attitude towards Gender Roles (-0.006) did not affect the model. Leading actions explain most of the variance in the dependent variable. Wang, Hou, and Li (2022) found that leadership predicts organizational performance more than participation and context. Civic involvement required enabling institutions and supporting leadership, even when gender role ideas did not contribute, according to Otieno, Kathina, Gikonyo, Matindi, Nditi, and Kitili (2022).

Civic Engagement positively predicted Model 2 with a beta coefficient of 0.132 and p-value < 0.05. Lynggaard and Boje (2025) say civic engagement—through social networks, trust, and participation—improves collective action and social capital. Kirby (2025) says community involvement promotes resilience and adaptability, particularly in difficult situations. These findings demonstrate that civic involvement and leadership strengthen communities. Public Leadership Behavior was nevertheless important, with a beta coefficient of 0.732 and a probability value of less than 0.001, lower than Model 1. Leadership promotes organizational effectiveness, but new social or cultural variables may change its value, according to Jerab and Mabrouk (2023). Leadership requires organizational or community circumstances. Attitude towards Gender Roles did not influence with a beta of 0.006 and no statistical significance. This shows that gender role beliefs may impact, but assessing them may need institutions or societal changes. Sociocultural evolution, rather than institutional processes, shapes gender roles, according to Abdul Kadir (2023).

Three Model 3 predictors had positive coefficients, two of which were statistically significant. Civic Engagement contributed heavily with a beta coefficient of 0.140 and a likelihood below 0.05. Putnam (2000) found that civic engagement increases social capital and collective effectiveness, boosting organizational and community outcomes. Pasamonte (2025) found that public participation in governance frameworks boosts resilience and disaster response. Gender role attitude had a significant influence (beta coefficient = 0.040, probability value < 0.05). According to Amah and Ogah (2021), progressive gender role concepts increase collective decision-making and legitimacy by promoting equitable and inclusive communities. The emphasis on gender role views suggests that cultural and normative orientations, especially when paired with leadership and engagement techniques, affect business and community results.

The most significant predictor was public leadership behavior, with a standardized coefficient (beta) of 0.694 and a probability value of less than 0.001, though lower than in the prior models. Das (2024) says leadership improves governance and performance. Since impact sizes decrease across models, leadership is better explained

by civic and sociocultural factors. Model 3 suggests societal variables, civic involvement, and progressive gender roles boost leadership explanations. Collaboration and inclusivity boost institutional performance (Ketemaw, Ayenew, & Zewde, 2024). Though leadership is crucial, civic and attitudinal elements also determine success.

Table 10 Regression Weights of the 3 Generated Models

Model	Exogenous Variables to Endogenous Variables		
	Civic Engagement	Attitude toward Gender Roles	Public Leadership Behavior
1	-.017 ^{NS}	-.006 ^{NS}	.805***
2	.132*	.006 ^{NS}	.732***
3	.140*	.040*	.694***

* $p < 0.05$, ** $p < 0.01$, *** $p = 0.000$ NS-Not Significant

These findings show that civic involvement and gender-inclusive practices increase resilience to catastrophes more than leadership or technical ability alone. Civic involvement builds social capital and prepares people for leadership, while progressive gender views ensure fair participation and legitimacy in decision-making. Integrating ethical and responsible leadership, community participation via training and participatory activities, and gender-sensitive policies and practices should be DRRM programs' priorities. This comprehensive strategy improves responder performance, maximizes community resources, and builds resilient, inclusive, and adaptable disaster-resilient communities.

CONCLUSION AND RECOMMENDATION

Civic engagement, gender role views, and public leadership make Barangay Disaster Risk Reduction Management responders 53.0% resilient. The greatest predictor (beta = 0.641) was ethical, responsible, and collaborative public leadership in readiness, response, and recovery. Political engagement, catastrophe drills, and local institution cooperation boost resilience (beta = 0.124). As gender role ideas do not affect operational resilience, cultural perceptions affect inclusivity. Legitimacy, inclusion, and long-term flexibility need gender equality. The best-fit structural model (Model 3) showed leadership, civic engagement, and gender inclusion, with outstanding fit indices (Goodness-of-Fit Index = 0.984, Comparative Fit Index = 0.996, and Root Mean Square Error of Approximation = 0.033). SDG 11: Sustainable Cities and Communities and SDG 16: Peace, Justice, and Strong Institutions show that good governance, civic participation, and inclusive institutional practices reduce risks and protect lives and property, creating resilient communities.

To promote ethical and resilient governance, policy and practice should ensure that leadership development programs are open, inclusive, and evidence-based. Local governments should also require catastrophe drills, participatory planning, and community-based preparation programs to increase civic involvement. Gender-sensitive DRRM policies should eliminate cultural prejudices and provide equal responsibilities for men and women in decision-making, training, and response operations. Each agency should incorporate standardized simulations, interagency training procedures, and knowledge-sharing platforms into local DRRM plans and budget cycles to adapt to climate change.

Leadership was the strongest predictor of resilience; thus, local governments and institutions should foster strong, ethical, and accountable leadership. Leadership programs for community-centered disaster risk reduction should emphasize openness, inclusion, and evidence-based decision-making. Disaster drills, community-based preparation programs, and grassroots efforts to improve local cooperation and readiness should increase civic involvement. Even when gender roles have no direct influence, gender-responsive disaster management must break down cultural prejudices, encourage equitable participation, and guarantee that men and women participate effectively in disaster response and leadership. Simulations, inter-agency training, and knowledge-sharing platforms should be institutionalized to help responders adapt to climate change.

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