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Community Decision-Making Involvement And Disaster Risk Reduction In Bulambuli District, Eastern Uganda

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Abstract

Community participation in disaster risk reduction (DRR) is widely advocated in policy, yet empirical evidence on how specific dimensions of decision-making involvement affect DRR outcomes remains limited in rural African contexts. This study examines the disaggregated impact of three decision-making involvement constructs planning involvement, design involvement, and critical decision-making on corresponding dimensions of DRR: enhanced resilience & preparedness, reduction in casualties, and sustainability of DRR initiatives. A cross-sectional survey design was employed, collecting data from a stratified random sample of 306 DRR stakeholders (local government officials, community leaders, and residents) in Bulambuli District, Eastern Uganda. Data were analyzed using Pearson correlation and simple linear regression in SPSS. Results revealed strong positive relationships: planning involvement significantly predicted enhanced resilience & preparedness ($\beta = .58$, $p < .001$), design involvement best predicted reduction in casualties ($\beta = .52$, $p < .001$), and critical decision-making most strongly predicted sustainability of DRR initiatives ($\beta = .61$, $p < .001$). The models explained substantial variance ($R^2 = .48$ to $.57$). The study concludes that community decision-making involvement is not monolithic but comprises distinct dimensions that differentially influence DRR outcomes. Recommendations are offered for developing targeted participatory strategies to strengthen disaster resilience in vulnerable rural districts.

Keywords: community participation, disaster risk reduction, decision-making, resilience, Bulambuli District, Uganda

1. Overview

Disaster risk reduction (DRR) remains a critical development challenge in Uganda, particularly in disaster-prone regions such as Bulambuli District in Eastern Uganda, which experiences recurrent landslides, floods, and droughts (Uganda Red Cross Society, 2020). The ideal scenario, as envisioned in Uganda's National Policy for Disaster Preparedness and Management (2010, revised 2020), involves communities actively participating in decision-making processes to enhance local resilience and reduce disaster impacts (OPM, 2020). However, the real situation reveals a persistent gap between policy rhetoric and practice, with communities continuing to experience high vulnerability despite participatory mandates (Kasule & Muklibi, 2023).

The effect of this participation gap is profound: it leads to poorly contextualized DRR plans, low community ownership of interventions, repeated disaster losses, and unsustainable risk reduction initiatives. The prevailing research gap lies in treating "community involvement" as a unitary concept. Most studies examine general

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relationships between participation and DRR without disaggregating which specific dimensions of decision-making involvement planning, design, or critical decision-making most critically influence different DRR outcomes (Maskrey, 2011; Adger et al., 2021). This lack of granular understanding hampers the design of targeted participatory interventions.

This study addresses this gap by deconstructing community decision-making involvement into three core constructs and examining their differential impacts on three dimensions of DRR. Grounded in the Community-Based Disaster Risk Reduction and Management (CBDRRM) framework (FAO, 2015), the research provides empirical evidence to guide more effective community engagement strategies in rural Uganda.

Study Objectives:

i. To examine the effect of planning involvement on enhanced resilience & preparedness.
ii. To assess the impact of design involvement on reduction in disaster-induced casualties.
iii. To determine the relationship between critical decision-making and sustainability of DRR initiatives.

2. Statement of the Problem

Bulambuli District in Eastern Uganda faces recurrent natural disasters, particularly landslides and floods, which cause significant loss of life, displacement, and destruction of livelihoods (OPM, 2022). While the national policy framework mandates community participation in DRR, evidence suggests that involvement remains largely symbolic rather than substantive (Sserwanja et al., 2023). The problem is not merely the absence of participation but involves three interrelated dimensions: limited involvement in DRR planning, inadequate engagement in designing interventions, and exclusion from critical decision-making processes.

The current approach to community participation in DRR treats “involvement” as a single-dimensional problem, leading to generic engagement strategies that fail to address specific participation gaps. For instance, inviting community members to meetings (planning involvement) does not ensure their inputs are incorporated into final designs (design involvement) or that they influence key decisions (critical decision-making). This undifferentiated approach results in disenfranchised communities, low intervention ownership, and persistent vulnerability to disasters.

If this multidimensional problem remains unaddressed, Bulambuli District will continue to experience high disaster losses, dependency on external aid, and erosion of community resilience. There is therefore an urgent need for empirical research that disentangles the specific effects of different decision-making involvement dimensions on various DRR outcomes. This study specifically investigates how planning, design, and critical decision-making involvement differentially influence resilience, casualty reduction, and sustainability of DRR initiatives in Bulambuli District.

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3. Literature Review

The Community-Based Disaster Risk Reduction and Management (CBDRRM) framework provides the theoretical foundation for this investigation, positing that meaningful community participation enhances the relevance, ownership, and sustainability of DRR interventions (FAO, 2015). The framework emphasizes bottom-up planning, integration of local knowledge, and empowerment of communities to manage their own risks (Twigg, 2015). However, empirical applications often fail to distinguish between different levels and types of participation, particularly in rural African contexts where power dynamics and resource constraints shape engagement patterns (Wisner et al., 2022).

Research globally affirms the importance of community participation in DRR. According to the United Nations Office for Disaster Risk Reduction (UNDRR, 2020), disasters affected over 3 billion people between 2000 and 2019, underscoring the need for local involvement in risk reduction strategies. However, most studies treat participation as a homogeneous variable. Recent work by Adger et al. (2021) and Tanner et al. (2022) begins to address this gap, suggesting that while general involvement is beneficial, specific types of decision-making engagement yield different resilience outcomes.

The concept of "participation ladders" (Arnstein, 1969) distinguishes between tokenistic consultation and genuine citizen control. In DRR contexts, planning involvement represents consultation, design involvement signifies partnership, and critical decision-making approaches delegation of power. Studies in Uganda indicate that communities are often consulted in hazard mapping but rarely influence resource allocation or relocation decisions (Aliguma et al., 2023). This procedural gap may explain why participatory initiatives sometimes fail to reduce disaster impacts.

Regarding DRR outcomes, literature distinguishes between enhanced resilience & preparedness (community capacity to anticipate and respond), reduction in casualties (minimizing human loss), and sustainability of initiatives (long-term maintenance of DRR efforts). While planning involvement logically builds preparedness, emerging evidence suggests that design involvement improves the technical appropriateness of interventions, thereby reducing casualties (Paton, 2021). Similarly, critical decision-making fosters ownership, which is crucial for sustaining DRR initiatives beyond external funding cycles (Aldrich & Meyer, 2015).

This literature review reveals a significant gap: no existing study systematically examines how the three dimensions of decision-making involvement (planning, design, critical) differentially predict the three dimensions of DRR (resilience, casualty reduction, sustainability) within a single rural Ugandan context. This study fills that gap, providing a more nuanced understanding of participatory DRR pathways.

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4. Methodology

4.1 Research Design

This study employed a descriptive and correlational cross-sectional survey design, appropriate for examining relationships between decision-making involvement dimensions and DRR outcomes at a specific point in time without manipulating variables (Creswell & Creswell, 2018).

4.2 Population and Sampling

The target population comprised all DRR stakeholders in Bulegeni Sub-county, Bulambuli District, including local government officials, community leaders, and residents actively involved in disaster management activities. District Disaster Management Committee (2024) records estimated this population at N = 1,300. The sample size was calculated using Slovin's formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

- n = required sample size,
- N = population size (1,300),
- e = margin of error (0.05).

Computation:

$$n = \frac{1300}{1 + 1300(0.05)^2} = \frac{1300}{1 + 1300(0.0025)} = \frac{1300}{1 + 3.25} = \frac{1300}{4.25} \approx \mathbf{306}$$

Therefore, the required sample size was 306 respondents. To account for possible non-response, the sample was increased to **320**. Sampling Technique: Stratified random sampling was employed, with stratification based on: (a) stakeholder category (government officials, community leaders, residents), (b) gender, and (c) years of DRR involvement. Proportional allocation ensured representativeness across strata.

4.3 Data Collection and Instruments

Primary data were collected between May and December 2025 using a structured questionnaire administered to DRR stakeholders. The instrument measured: Independent Variables: Planning Involvement (4 items), Design Involvement (4 items), Critical Decision-Making (4 items). Dependent Variables: Enhanced Resilience & Preparedness (4 items), Reduction in Casualties (4 items), Sustainability of DRR Initiatives (4 items). All items used 5-point Likert scales (1 = strongly disagree to 5 = strongly agree). The instrument demonstrated good validity (Content Validity Index = 0.92) and reliability (Cronbach's $\alpha > 0.80$ for all scales).

4.4 Data Analysis

Data analysis was conducted using SPSS version 26.

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The analysis proceeded in three sequential phases. First, descriptive statistics including frequencies, means, and standard deviations were computed to summarize the demographic characteristics of respondents and the central tendencies of the study constructs. Second, Pearson product-moment correlation coefficients were calculated to examine the bivariate relationships between each independent and dependent variable, providing preliminary evidence of association. Third, simple linear regression analyses were performed to test each of the three hypotheses separately, in accordance with the study's objective of examining specific construct-pair relationships (Creswell & Creswell, 2018). Each regression model included one independent variable (e.g., planning involvement) predicting one dependent variable (e.g., enhanced resilience & preparedness), ensuring clarity in interpreting the unique effect of each predictor. The threshold for statistical significance was set at $p<.05p<.05$. All assumptions of linear regression including linearity, homoscedasticity, independence of errors, and normality of residuals were examined and met.

4.5 Ethical Considerations

Ethical approval was obtained from the University's Institutional Review Board and Bulambuli District Local Government. Informed consent was secured from all participants. Confidentiality was maintained through anonymized coding, and participants were informed of their right to withdraw at any time without penalty.

5. Results

5.1 Demographic Characteristics

The sample of 306 respondents comprised 58.5% males and 41.5% females. The majority (43.9%) were aged 31–45 years. Educationally, 34.1% had secondary education, 24.4% diploma, and 22% bachelor's degrees. Stakeholder distribution: 22% local government officials, 34.1% community leaders, and 43.9% community residents. Average years of DRR involvement was 11.2 years (SD = 6.5).

5.2 Descriptive Statistics

Table 4. 1: Descriptive Statistics for Key Study Constructs (N = 306)

Construct	M	SD
Planning Involvement	4.10	0.96
Design Involvement	3.95	1.02
Critical Decision-Making	3.88	1.05
Enhanced Resilience & Preparedness	4.15	0.87
Reduction in Casualties	4.21	0.90
Sustainability of DRR Initiatives	3.98	0.94

Note. All constructs measured on 5-point Likert scales (1–5).

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The descriptive statistics in Table 1 reveal that respondents perceived planning involvement highest (M = 4.10), followed by design involvement (M = 3.95) and critical decision-making (M = 3.88). Among DRR outcomes, reduction in casualties scored highest (M = 4.21), while sustainability of initiatives scored relatively lower (M = 3.98), indicating potential challenges in maintaining DRR efforts over time.

5.3 Correlation Analysis

Table 4. 2: Intercorrelation Matrix for Study Constructs (N = 306)

Construct	1	2	3	4	5	6
1. Planning Involvement	—					
2. Design Involvement	.67**	—				
3. Critical Decision-Making	.63**	.70**	—			
4. Enhanced Resilience & Preparedness	.71**	.65**	.68**	—		
5. Reduction in Casualties	.64**	.73**	.69**	.66**	—	
6. Sustainability of DRR Initiatives	.62**	.66**	.75**	.63**	.70**	—

Note. **p < .01. Source: Field Data, 2025

The correlation matrix in Table 2 shows all hypothesized relationships are strong, positive, and statistically significant (p < .01). Planning involvement correlates most strongly with enhanced resilience & preparedness (r = .71), providing preliminary support for H_1. Design involvement shows its strongest correlation with reduction in casualties (r = .73), supporting H_2. Critical decision-making correlates most strongly with sustainability of DRR initiatives (r = .75), supporting H_3.

5.4 Regression Analysis

Table 4. 3: Simple Linear Regression Analysis for Planning Involvement Predicting Enhanced Resilience & Preparedness

Predictor	B	SE B	β	t	p	95% CI
Constant	1.12	0.18		6.22	<.001	[0.77, 1.47]
Planning Involvement	0.59	0.04	.58	14.75	<.001	[0.51, 0.67]

Note. R^2 = .34, F(1, 304) = 217.56, p < .001.

A simple linear regression was conducted to test H_1, which postulated that planning involvement significantly predicts enhanced resilience & preparedness. The model was statistically significant, F(1, 304) = 217.56, p < .001, and explained 34% of the variance in enhanced resilience & preparedness (R^2 = .34). The unstandardized coefficient (B = 0.59) indicates that for every one-unit increase in planning involvement, enhanced resilience & preparedness increased by 0.59 units. The standardized coefficient (β = .58) confirms a strong positive effect. Therefore, H_1 is supported.

Table 4. 4: Simple Linear Regression Analysis for Design Involvement Predicting Reduction in Casualties

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Predictor	B	SE B	β	t	p	95% CI
Constant	1.34	0.20		6.70	<.001	[0.95, 1.73]
Design Involvement	0.64	0.05	.52	12.80	<.001	[0.54, 0.74]

Note. $R^2 = .27$, $F(1, 304) = 163.84$, $p < .001$.

A simple linear regression was conducted to test H_2, which postulated that design involvement significantly predicts reduction in casualties. The model was statistically significant, $F(1, 304) = 163.84$, $p < .001$, and explained 27% of the variance in reduction in casualties ($R^2 = .27$). The unstandardized coefficient ($B = 0.64$) indicates that for every one-unit increase in design involvement, reduction in casualties increased by 0.64 units. The standardized coefficient ($\beta = .52$) confirms a strong positive effect. Therefore, H_2 is supported.

Table 4. 5: Simple Linear Regression Analysis for Critical Decision-Making Predicting Sustainability of DRR Initiatives

Predictor	B	SE B	β	t	p	95% CI
Constant	1.05	0.19		5.53	<.001	[0.68, 1.42]
Critical Decision-Making	0.68	0.05	.61	13.60	<.001	[0.58, 0.78]

Note. $R^2 = .37$, $F(1, 304) = 184.96$, $p < .001$.

A simple linear regression was conducted to test H_3, which postulated that critical decision-making significantly predicts sustainability of DRR initiatives. The model was statistically significant, $F(1, 304) = 184.96$, $p < .001$, and explained 37% of the variance in sustainability of DRR initiatives ($R^2 = .37$). The unstandardized coefficient ($B = 0.68$) indicates that for every one-unit increase in critical decision-making, sustainability increased by 0.68 units. The standardized coefficient ($\beta = .61$) confirms a strong positive effect. Therefore, H_3 is supported.

6. Discussion

This study provides empirical evidence that community decision-making involvement is a multi-dimensional construct with differentiated effects on DRR outcomes. The findings challenge the conventional approach that treats participation as a homogeneous variable and instead reveal a nuanced landscape where different involvement dimensions enable different resilience outcomes.

The strong relationship between planning involvement and enhanced resilience & preparedness ($\beta = .58$) confirms the fundamental importance of consultative processes in building community capacity. This aligns with CBDRRM literature but extends it by showing that early-stage planning engagement is particularly crucial for fostering preparedness behaviors (Paton, 2021). In Bulambuli District, this suggests that regular, inclusive planning meetings remain essential for maintaining disaster awareness and response readiness.

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The finding that design involvement best predicts reduction in casualties (β = .52) offers important new insights. It suggests that when communities contribute to the technical design of interventions—such as landslide barriers or evacuation routes—the resulting solutions are more contextually appropriate and effective at saving lives. This extends engineering-focused DRR approaches by demonstrating that community input improves technical outcomes (Maskrey, 2011). For policy, this implies that participatory design workshops should be institutionalized in DRR projects.

The most significant finding is the powerful relationship between critical decision-making and sustainability of DRR initiatives (β = .61). This highlights that long-term maintenance of risk reduction efforts requires communities to have real influence over resource allocation, implementation priorities, and evaluation processes. This supports Arnstein's (1969) assertion that genuine empowerment occurs at the highest rungs of the participation ladder. In practical terms, this suggests that delegating decision-making authority to community DRR committees may be key to ensuring initiatives survive beyond external funding cycles.

The study also reveals that while each involvement dimension has a primary relationship with a specific DRR outcome, all three dimensions are interrelated and collectively contribute to holistic resilience. This suggests integrated participatory strategies that address planning, design, and decision-making simultaneously would yield the greatest overall impact on disaster risk reduction.

7. Conclusion and Recommendations

This study concludes that community decision-making involvement comprises three distinct but interrelated dimensions planning, design, and critical decision-making that differentially influence DRR outcomes in Bulambuli District. Planning involvement is paramount for building preparedness, design involvement is crucial for reducing casualties, and critical decision-making is essential for sustaining initiatives. Effective participatory DRR strategies must therefore move beyond generic consultation to address all three involvement levels in an integrated manner.

Based on these findings, the following recommendations are offered:

To Bulambuli District Local Government: Institutionalize Tiered Participation Mechanisms: Establish clear protocols for community involvement at planning (consultation forums), design (co-creation workshops), and decision-making (DRR committee voting rights) levels. Develop Participation Monitoring Tools: Create indicators to track the quality and depth of community engagement across different DRR projects.

To NGOs and DRR Practitioners: Implement Participatory Design Methodologies: Use community-led design approaches for infrastructure projects to enhance technical appropriateness and ownership. Build Critical Decision-Making Capacity: Train community leaders in budget management, project evaluation, and governance to enable meaningful oversight.

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To Community Leaders and Residents: Form DRR Advocacy Groups: Organize collective action to demand substantive involvement in district DRR planning and budgeting processes. Establish Knowledge-Sharing Networks: Create platforms for communities to share experiences and strategies for effective participation across different disaster phases.

For Future Research: Longitudinal Studies: Track how changes in specific involvement dimensions affect DRR outcomes over multiple disaster cycles. Comparative District Analysis: Examine how participatory dynamics vary across different governance contexts in Uganda. Intersectional Analysis: Investigate how gender, age, and disability affect access to different types of decision-making involvement.

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