

# Influence of Education on Public Perceptions of Climate Change and Disaster Risk Management Policy and Plan Formulation

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## Abstract

Climate change and climate-induced disasters pose significant threats to the socio-economic well-being of communities, contributing to over 65% of disaster-related deaths annually in Nepal. Policies and plans serve as vital instruments for setting long-term vision, defining goals, designing interventions, and guiding implementation across multiple governance levels. Equally important is understanding how local communities perceive these policies and plans, as such perceptions influence ownership, effectiveness, and successful implementation. Sarawal Rural Municipality in Nawalparasi West District of Lumbini Province in Nepal is highly vulnerable to floods, drought, fires, cold waves, and heat waves each year. Floodwater inundation is a major hazard, and each year approximately 40 percent of paddy fields are destroyed due to inundation. However, this year it was affected by drought, thus climate variability and change are major concerns for them. This study examines the role of the educational level of community people in shaping community perceptions of climate risk management and disaster risk management plans and policies formulation in Sarawal Rural Municipality. Employing a quantitative research design, a total of 428 households were selected using systematic random sampling. Community perceptions were assessed through five statements measured on a five-point Likert scale, focusing on climate and disaster risk management (CRM/DRM) policies and plans. The findings indicate that educational background does not solely influence community perceptions of CRM/DRM policies and plans; rather, lived experiences play a crucial role in shaping these perceptions. The study highlights that well-designed policies and plans remain critical instruments for building community resilience and facilitating effective climate and disaster risk management, regardless of educational differences.

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## **Introduction**

The global surface temperature during 2011-2020 was about 1.1°C higher than pre-industrial levels (1850–1900), primarily due to human activities (IPCC, 2023). The IPCC report (2023) warns that global warming is likely to reach 1.5°C in the early 2030s without deep and rapid reductions in greenhouse gas (GHG) emissions. Most of the countries in the globe are suffering from increasing global temperature; some countries are more vulnerable than others (Oh-Seng et al., 2025). Situated in a climate-sensitive ecological zone, Nepal has been experiencing increasing climate variability and climate-induced disasters, which have significantly affected agriculture, health, and drinking water and sanitation systems (Aryal, 2023). Himalaya regions are affected due to limited snowfall and rapid melting of snow, resulting in floods and landslides in the high Himalaya and midhill regions, whereas the southern parts of the country are affected by water inundations, and most riverbeds are raised due to silt and boulders brought by the river (Aryal et al., 2025).

Nepal remains vulnerable to multiple recurrent disasters, including hydro-meteorological and geological; almost 90 percent of the population is at risk of death due to two or more than two types of disasters (MOHA, 2018). Despite a negligible amount of GHG emissions, Nepal has been facing tremendous challenges posed by climate change, and acute hazards such as extreme weather events are expected to increase (MoFE, 2019). Climate change exacerbates the situation, and around 65 percent of disaster-related deaths are from climate-induced disasters. In 2017, around 2.08 percent of GDP was lost due to climate-induced disasters, mainly flooding in the southern parts of the country (MOFE, 2021).

The 1994 UN World Conference on Natural Disaster Reduction marked a paradigm shift by endorsing the Yokohama Strategy, emphasizing prevention, preparedness, and mitigation, integrating disaster risk reduction into development planning, and strengthening institutional capacity and community-based approaches to reduce vulnerability (UNDRR, 1994). The Hyogo Framework for Action (2005-2015) marked a major shift in disaster risk reduction by establishing five priorities focused on governance, risk assessment, early warning, knowledge, preparedness, and resilience, with strong emphasis on local capacity building (UNISDR, 2007). The Sendai Framework for Disaster Risk Reduction (2015–2030) provides the latest global roadmap, emphasizing risk understanding, governance, investment in resilience, preparedness, and the principle of “Build Back Better” to reduce future risks while strengthening recovery, livelihoods, infrastructure, and institutions. (UNISDR, 2015) and the 2030 Agenda for Sustainable Development Goals (SDGs), and the Paris Agreement represent landmark shifts in global efforts to reduce climate and disaster-related risks. Building resilience to external shocks, including climate-induced disasters, requires integrated policy planning (Capano & Woo, 2017). The policies and plans

need to be robust and resilient, in which community engagement and ownership play a crucial role in periodic review and in maintaining flexibility in response to emerging situations. Appropriate policy governance helps enhance and strengthen institutional capacity and contributes to integrated policy planning processes (IPCC, 2022).

Drawing on policy review and field-based evidence, the study highlights the gap between the recognized importance of community-led initiatives and their limited institutionalization within national disaster policies (Pandey, 2019). Recent flood disasters in Nepal are driven by increasing population vulnerability combined with changing climatic conditions, while existing flood disaster governance and risk assessment remain limited (Pandey, 2025; Pandey & Niraula, 2024). Flood risk studies note that community vulnerability is rising and highlight the need for improved early warning systems, clearer institutional roles, and strengthened risk assessment to enhance flood governance (Delalay et al., 2018; Pandey et al., 2023 ; Pandey & Basnet, 2023). While the National Disaster Risk Reduction and Management Act (NDRRMA, 2017) marks a significant shift toward a comprehensive disaster management cycle, persistent overlap of policies, limited local-level focus, and an emphasis on preparedness and response over mitigation and rehabilitation continue to challenge effective implementation (Nepal et al., 2018). Studies note that there are context-specific gaps in preparedness and the importance of understanding public perceptions in developing countries to design policies that are both publicly supported and practically implementable (Vignola et al., 2013).

Until the enactment of the NDRRMA, disaster management in Nepal was governed by the Natural Calamity Act 1982, which primarily emphasized response and lagged in addressing local capacity strengthening and community resilience building (MoHA, 2018; Pandey, 2019). Realizing rapidly changing dynamics of disasters and commitments made at global forums, the government of Nepal endorsed the NDRRMA (2017), which is further operationalized through the National Disaster Risk Reduction Strategic Plan of Action (2018-2030). The Act provisioned six layers of institutions (Federal Council, Federal Executive Committee, Federal Authority, Provincial Executive Committee, District Committee and Local Committee) and the disaster risk reduction and management authority as the secretariat for coordinating disaster-related matters (MoLJPA, 2017). In addition, the government has also endorsed a Climate Change Policy 2019 along with several sector-specific guidelines. Collectively, these policies emphasize strengthening community resilience while simultaneously enhancing adaptive capacity and reducing GHG emissions.

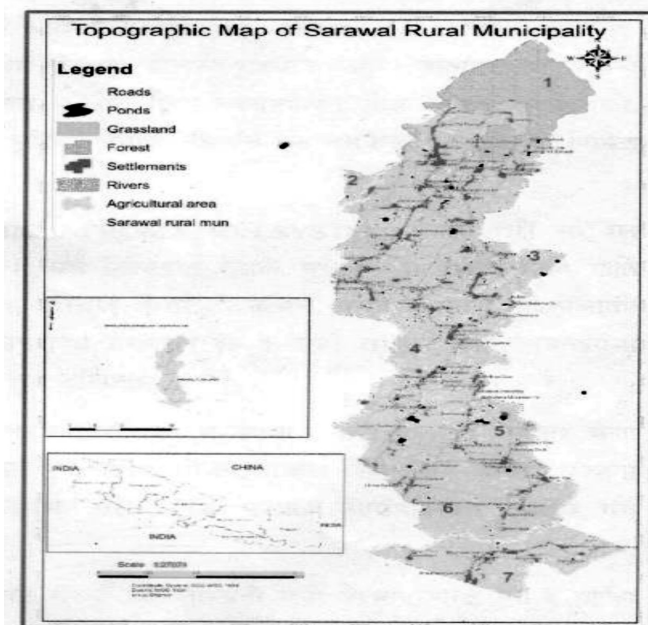
Since Nepal adopted a federal republic system with three tiers of government, effective disaster and climate risk management requires that policies and plans be implemented down to the local levels and primarily at the community level. However, achieving overarching policy goals requires an understanding of how they are perceived and internalized at the community level. In this context, two critical questions emerge: (i) To what extent are community members aware of existing disaster risk reduction and climate change-related policies and plans? and (ii) How does educational attainment

influence community perceptions of climate risk management and disaster risk management policies and plans in achieving resilience, adaptation, and emission reduction goals?

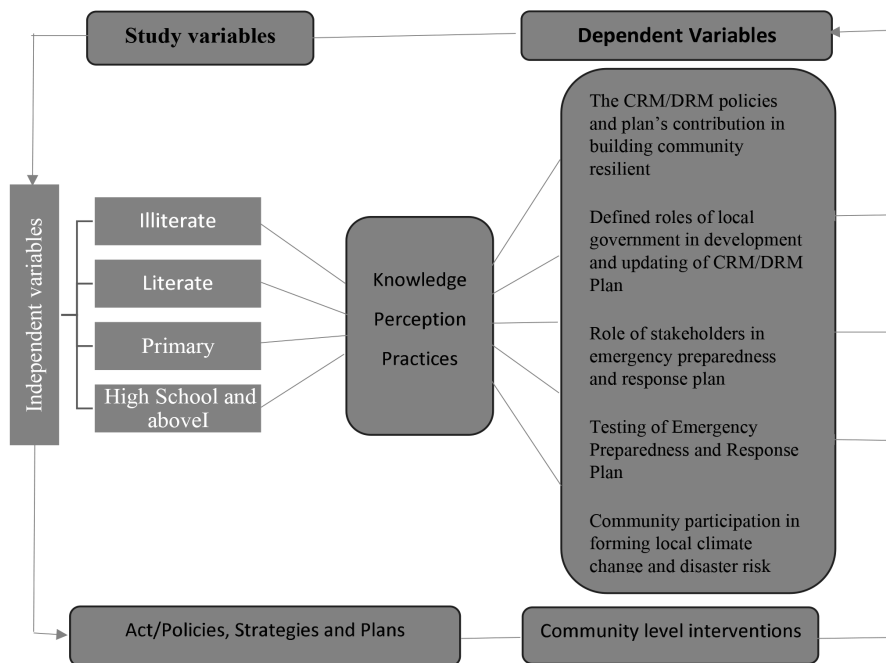
The main objective of this study is to examine the role of educational attainment in shaping community perceptions of climate and disaster risk management plans and policies formulation in Sarawal Rural Municipality, Nawalparasi West District, Nepal.

## Methodology

This study was conducted in Wards 5, 6, and 7 of Sarawal Rural Municipality, Nawalparasi West. These wards frequently encounter climate-induced disasters such as flooding and water inundations, which have been major problems for the communities residing in these locations. The Gandak irrigation canal and the two major rivers (Jharai and Dhanewa) pose significant flood and inundation risks in the area. These wards have a combined population of 17037.5835 with an average household size of 4.83 persons, resulting in an estimated 3527.45 households (GoA, 2021). A quantitative research design was adopted, and a total of 428 households (122 from Ward 5, 158 from Ward 6, and 148 from Ward 7) were selected using systematic random sampling. The sample size was determined using the finite population formula  $n = \frac{N}{1 + N(e)^2}$  (Yamane, 1967) and an additional 19% of the total sample was incorporated to minimize response error. Data were collected through a structured household survey questionnaire. Ethical considerations were strictly followed, including obtaining informed consent from all respondents and ensuring appropriate citation and acknowledgment of researchers and published sources.



### Conceptual Framework:



**Figure 1:** Conceptual Framework

The conceptual framework illustrates the relationship between the level of education and key dimensions of climate and disaster risk management (CRM/DRM). The level of education of respondents has been classified as illiterate, literate, primary, and high school and above. These are treated as independent variables, while five CRM/DRM-related statements constitute the dependent variables. Perception, knowledge, and practices act as intervening variables linking education with CRM/DRM outcomes. It is assumed that the level of education plays a critical role in shaping individuals' knowledge and perceptions of climate change and climate-induced disasters. Against this background, the study hypothesizes that there is an association between respondents' level of education and their perceptions of various statements related to the formulation of climate and disaster risk management plans and policies. These relationships operate within the broader context of government acts, policies, and community-level interventions, which influence both processes and outcomes. The framework demonstrates potential interlinkages and recognizes that educational attainment may or may not significantly affect the dependent variables.

### Findings

Five statements related to the formulation of climate risk management (CRM) and disaster risk management (DRM) plans and policies were analyzed according to the

educational attainment of respondents. Four levels of education were considered: illiterate, literate/informal education, primary education, and high school and above. Each statement was assessed using a five-point Likert scale to capture variations in perceptions among community members with differing educational backgrounds.

- 1. CRM/DRM policy and plan’s contribution in building resilience:** Table 1 illustrates respondents’ perceptions of whether CRM/DRM policies and plans help make communities more resilient, categorized by four levels of educational attainment using a five-point Likert scale.

**Table 1: The CRM/DRM policies and plan help in making the community more resilient**

Education qualification of respondent	The CRM/DRM policies and plan help in making the community more resilient					Total
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Illiterate	0.7%	0.7%	5.6%	36.4%	56.6%	100.0%
Literate (informal education)			13.4%	71.4%	15.2%	100.0%
Primary (1-8)		0.9%	6.1%	65.2%	27.8%	100.0%
High school (9-12) and above		1.7%	10.3%	58.6%	29.3%	100.0%
Total	0.2%	0.7%	8.4%	56.3%	34.3%	100.0%
<b>Chi-Square Tests</b>						
		Value	df	Asymp. Sig. (2-sided)		
Pearson Chi-Square		60.199 <sup>a</sup>	12	.000		
Likelihood Ratio		61.574	12	.000		
Linear-by-Linear Association		11.588	1	.001		
N of Valid Cases		428				

**Source:** Field Survey, 2024

The results indicate an overall positive perception of CRM/DRM policies and plans in enhancing community resilience across all educational groups. A large majority of respondents either agreed or strongly agreed with the statement, with particularly strong endorsement among illiterate respondents, where over half strongly agreed and more than one-third agreed. Similarly, respondents with informal literacy and primary education largely expressed agreement, although these groups showed a slightly higher proportion of neutral responses compared to the illiterate group. Among respondents with high school education and above, agreement remained dominant, but neutrality was comparatively higher, suggesting a more measured or critical assessment among those with higher educational attainment.

The chi-square test results confirm a statistically significant association between educational qualification and perceptions of CRM/DRM policy effectiveness in building community resilience ( $\chi^2 = 60.199$ ,  $df = 12$ ,  $p < 0.001$ ). The null hypothesis was rejected, indicating that the level of education is significantly associated with individuals’ perceptions of policies and plans. The significant linear-by-linear association further suggests a systematic variation in perceptions across educational levels. While support for CRM/DRM policies is strong overall, the pattern indicates that increasing educational attainment is associated with more nuanced responses, reflected in higher neutral proportions. This implies that, alongside education, experiential factors and contextual understanding may shape how different groups interpret the effectiveness of resilience-oriented policies and plans.

**2. Role of local government in development and updating of CRM/DRM Plan:**

Table 2 explains the perceived role of local government and ward-level authorities in preparing and updating plans, analyzed across four educational categories using a five-point Likert scale.

**Table 2: Local government should coordinate with the ward-level authority and community while preparing and updating the plan**

Education qualification of respondent	Local government should coordinate with ward level authority and community while preparing and updating the plan					Total
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Illiterate	0.7%	0.7%	16.1%	55.2%	27.3%	100.0%
Literate (informal education)		0.9%	23.2%	61.6%	14.3%	100.0%
Primary (1-8)		2.6%	20.0%	57.4%	20.0%	100.0%
High school (9-12) and above		5.2%	19.0%	44.8%	31.0%	100.0%
Total	0.2%	1.9%	19.4%	56.1%	22.4%	100.0%
<b>Chi-Square Tests</b>						
	Value		df		Asymp. Sig. (2-sided)	
Pearson Chi-Square	18.009 <sup>a</sup>		12		.115	
Likelihood Ratio	17.811		12		.122	
Linear-by-Linear Association	.780		1		.377	
N of Valid Cases	428					
a. 8 cells (40.0%) have expected count less than 5. The minimum expected count is .14.						

Source: Field Survey, 2024

The findings show broad support for the view that local governments should coordinate with ward-level authorities and communities when preparing and updating plans, regardless of educational background. Overall, more than three-quarters of respondents agreed or strongly agreed with this statement. Illiterate respondents expressed

particularly strong agreement, with over half agreeing and more than one-quarter strongly agreeing. Respondents with informal education, primary, and higher education levels also demonstrated majority agreement, although these groups exhibited relatively higher neutral responses, indicating cautious endorsement rather than strong conviction.

The chi-square analysis indicates that the association between educational qualification and perceptions of the need for coordination is not statistically significant ( $\chi^2 = 18.009$ ,  $df = 12$ ,  $p = 0.115$ ). The null hypothesis fails to reject, which means there is no association between the level of education and their perception about local authority should coordinate with concerned stakeholders while preparing policies and plans.

The non-significant linear-by-linear association further suggests the absence of a clear trend across educational levels. This implies that the expectation for participatory and coordinated planning is widely shared across the community, transcending educational differences. However, the presence of several cells with low expected counts suggests that these results should be interpreted with caution, and future studies with larger subgroup samples may help clarify subtle variations in perception.

**3. Emergency Preparedness and Response Plan:** Table 3 illustrates respondents’ perceptions regarding the need to clearly define the roles and responsibilities of each actor in emergency preparedness and response plans.

**Table 3: The roles and responsibilities of each actor should be defined in the emergency preparedness and response plan**

Education qualification of respondent	The roles and responsibilities of each actor should be defined in the emergency preparedness and response plan				Total
	Disagree	Neutral	Agree	Strongly agree	
Illiterate	4.2%	9.1%	52.4%	34.3%	100.0%
Literate (informal education)	0.9%	12.5%	75.9%	10.7%	100.0%
Primary (1-8)	7.0%	14.8%	61.7%	16.5%	100.0%
High school (9-12) and above	1.7%	19.0%	63.8%	15.5%	100.0%
Total	3.7%	12.9%	62.6%	20.8%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	35.207 <sup>a</sup>	9	.000
Likelihood Ratio	34.965	9	.000
Linear-by-Linear Association	9.371	1	.002
N of Valid Cases	428		

a. 3 cells (18.8%) have expected count less than 5. The minimum expected count is 2.17.

**Source:** Field Survey, 2024

The results demonstrate strong consensus across all educational groups on the importance of clearly defining roles and responsibilities within emergency preparedness and response plans. Overall, more than four-fifths of respondents agreed or strongly agreed with the statement, underscoring widespread recognition of coordination and clarity as essential components of effective emergency management. Illiterate respondents showed particularly strong endorsement, with a high proportion expressing agreement or strong agreement. Respondents with informal, primary, and higher education similarly reported majority agreement, although neutral responses increased with educational attainment, suggesting a more reflective or critical appraisal among more educated groups.

The chi-square test indicates a statistically significant association between educational qualification and perceptions regarding role clarity in emergency planning ( $\chi^2 = 35.207$ ,  $df = 9$ ,  $p < 0.001$ ). The null hypothesis was rejected, indicating that the level of education is significantly associated with individuals' perceptions of policies and plans. The significant linear-by-linear association further suggests a systematic variation in responses across educational levels. While agreement remains consistently high, the distribution of responses indicates that educational background influences the intensity of agreement rather than overall support. These findings imply that, alongside experiential knowledge, education shapes how strongly individuals articulate the need for clearly delineated institutional roles in emergency preparedness and response frameworks.

**4. Testing of Emergency Preparedness and Response Plan:** Table 4 illustrates respondents' perceptions regarding the need for regular simulation and drill exercises, assessed using a five-point Likert scale across four educational levels.

**Table 4: Simulation and drill exercises are to be organized regularly**

Education qualification of respondent	Simulation and drill exercises are to be organized regularly.					Total
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Illiterate	1.4%	5.6%	7.7%	53.8%	31.5%	100.0%
Literate (informal education)		0.9%	12.5%	51.8%	34.8%	100.0%
Primary (1-8)	0.9%	5.2%	10.4%	45.2%	38.3%	100.0%
High school (9-12) and above		5.2%	12.1%	39.7%	43.1%	100.0%
Total	0.7%	4.2%	10.3%	49.1%	35.7%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.939 <sup>a</sup>	12	.451
Likelihood Ratio	14.287	12	.283
Linear-by-Linear Association	.793	1	.373
N of Valid Cases	428		

a. 7 cells (35.0%) have expected count less than 5. The minimum expected count is .41.

*Source: Field Survey, 2024*

The findings indicate strong overall support for the regular organization of simulation and drill exercises across all educational categories. Nearly 85% of respondents either agreed or strongly agreed with the statement, highlighting broad recognition of drills and simulations as essential components of preparedness. Illiterate respondents showed particularly high levels of agreement, with more than half agreeing and nearly one-third strongly agreeing. Respondents with informal, primary, and higher education levels similarly expressed majority agreement, although comparatively higher neutral responses were observed among those with higher educational attainment, suggesting more cautious or conditional endorsement.

The chi-square analysis shows no statistically significant association between educational qualification and perceptions regarding the need for regular simulation and drill exercises ( $\chi^2 = 11.939$ ,  $df = 12$ ,  $p = 0.451$ ). The null hypothesis fails to reject, which means there is no association between the independent and dependent variables. The non-significant linear-by-linear association further confirms the absence of a systematic trend across educational levels. These results suggest that support for regular drills is widely shared within the community, largely independent of educational background. However, the presence of several cells with low expected counts warrants cautious interpretation, indicating the need for further investigation with larger subgroup samples to capture more nuanced differences.

**5. Encourage community participation in local climate change and disaster risk management policies:** Table 5 illustrates community members’ perceptions of whether climate and disaster risk management policies encourage community participation in reducing the adverse impacts of climate change.

**Table 5: Local climate change and disaster policies encourage community participation to reduce the adverse impacts of climate change**

Education qualification of the respondent	Local climate change and disaster policies encourage community participation to reduce the adverse impacts of climate change					Total
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Illiterate	3.5%	1.4%	4.9%	45.5%	44.8%	100.0%
Literate (informal education)		1.8%	15.2%	67.9%	15.2%	100.0%
Primary (1-8)	2.6%	0.9%	13.0%	60.9%	22.6%	100.0%
High school (9-12) and above	1.7%		6.9%	55.2%	36.2%	100.0%
Total	2.1%	1.2%	10.0%	56.8%	29.9%	100.0%

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.866 <sup>a</sup>	12	.000
Likelihood Ratio	44.722	12	.000
Linear-by-Linear Association	1.340	1	.247
N of Valid Cases	428		

a. 8 cells (40.0%) have expected count less than 5. The minimum expected count is .68.

**Source:** Field Survey, 2024

The analysis reveals strong overall agreement that local climate change and disaster policies encourage community participation to reduce the adverse impacts of climate change. Across the full sample, 86.7% of respondents agree or strongly agree, indicating broad recognition of participatory approaches as central to effective climate and disaster risk governance at the local level. Only a small proportion expresses disagreement, underscoring general confidence in local policy frameworks.

Disaggregated by education level, illiterate respondents demonstrate particularly strong endorsement, with over 90% agreeing or strongly agreeing. This suggests that community participation is not perceived as a technical or abstract policy concept but as a practical mechanism through which communities engage in adaptation and risk reduction. Respondents with primary education and secondary education and above also report high levels of agreement, reinforcing the idea that participatory climate and disaster policies resonate across educational backgrounds. In contrast, respondents with informal education show a comparatively higher level of neutrality, which may reflect uneven exposure to policy processes or limited opportunities for meaningful engagement rather than skepticism toward participation itself.

The Pearson chi-square test confirms a statistically significant association between education level and perceptions of participatory climate and disaster policies ( $\chi^2 = 40.866$ ,  $df = 12$ ,  $p < 0.001$ ). The null hypothesis was rejected, indicating that the level of education is significantly associated with individuals’ perceptions of encouraging community participation in the development of policies and plans. While the linear-by-linear association is not significant, indicating no simple directional trend with increasing education, the results nonetheless suggest that educational background shapes how individuals experience and interpret participatory policy processes. Although some cells have low expected counts, the strength and consistency of agreement across groups support the robustness of the overall pattern.

**6. Role of Educational attainment in shaping public perceptions on climate and disaster risk management related policies and plans:** Table 6 illustrates the means of five different statements designed around climate and disaster risk management related policies and plans.

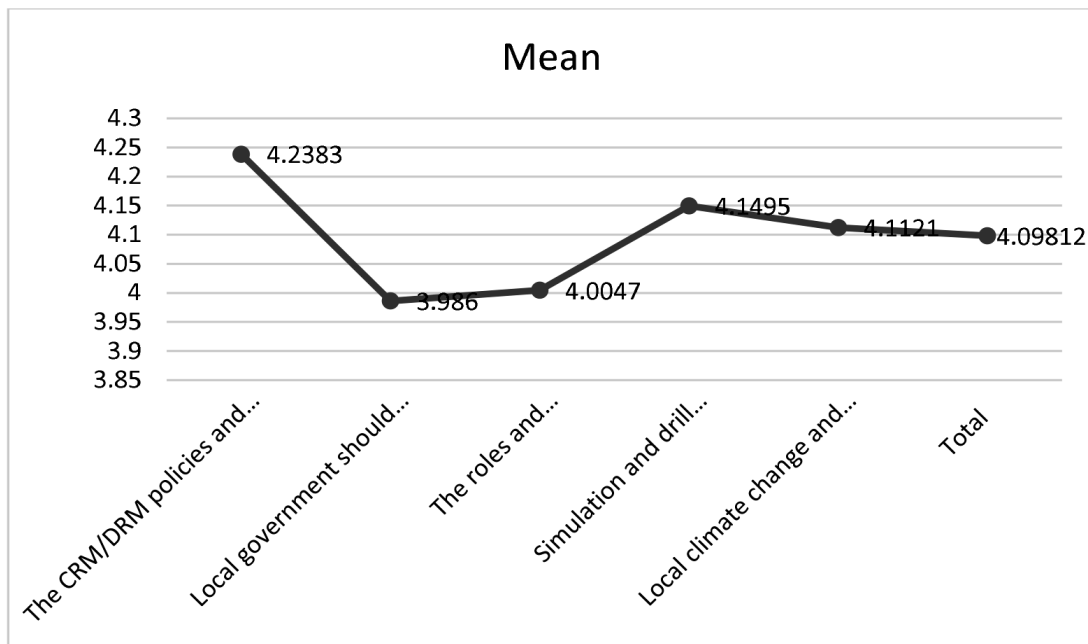
**Table 6: Mean perceptions on climate and disaster risk management policies and plans**

Descriptive Statistics		
	N	Mean
The CRM/DRM policies and plan help in making the community more resilient	428	4.2383
Local government should coordinate with ward level authority and community while preparing and updating the plan	428	3.9860
The roles and responsibilities of each actor should be defined in the emergency preparedness and response plan	428	4.0047
Simulation and drill exercises are to be organized regularly.	428	4.1495
Local climate change and disaster policies encourage community participation to reduce the adverse impacts of climate change	428	4.1121

**Source:** *Field Survey, 2024*

Figure 2 explains the perceptions of community people around whether climate and disaster policies encourage community participation to reduce the adverse impact of climate-induced disasters.

**Figure 2: Mean perceptions on climate and disaster risk management-related policies and plans**



Descriptive statistics further reinforce these findings. The mean score for the statement on participatory climate and disaster policies (M = 4.11) is consistently high and comparable to other preparedness indicators, such as regular simulation and drills (M = 4.15), community resilience through CRM/DRM plans (M = 4.24), defined roles and responsibilities (M = 4.00), and coordination between local government, wards, and communities (M = 3.99). Together, these results suggest that respondents view community participation as an integral component of a broader preparedness and governance ecosystem, rather than as an isolated policy goal.

**Discussion**

This study examined how educational attainment shapes community perceptions of climate risk management (CRM) and disaster risk management (DRM) policies and plans. Overall, the findings reveal strong community-level endorsement of CRM/DRM frameworks across all educational groups, while also highlighting nuanced differences in how respondents with varying educational backgrounds interpret policy effectiveness, participation, and preparedness mechanisms. These results contribute to the growing body of literature emphasizing the combined role of education, lived experience, and institutional trust in shaping public perceptions of climate and disaster governance.

Across all educational categories, respondents expressed overwhelmingly positive perceptions regarding the contribution of CRM/DRM policies and plans to build community resilience. The statistically significant association between educational attainment and perceptions of resilience-building effectiveness suggests that education influences not whether individuals support CRM/DRM initiatives, but how critically they assess them. Respondents with lower levels of formal education, particularly illiterate respondents, reported stronger agreement, while those with higher educational attainment demonstrated higher levels of neutrality. Similar patterns have been observed in other disaster-prone contexts, where communities with limited formal education but high exposure to climate-induced hazards often assess policies based on tangible outcomes and lived experiences rather than abstract policy criteria (Shaw, 2014; Aryal et al., 2025). In contrast, more educated respondents may apply analytical or comparative benchmarks, depending on their access to community capital and encounters with disasters, leading to more cautious or conditional evaluations of policy effectiveness (Niraula et al., 2026).

The findings related to coordination between local governments, ward-level authorities, and communities indicate broad consensus across educational groups. The absence of a statistically significant association suggests that participatory and coordinated planning is a shared normative expectation rather than an education-dependent perception. The social perceptions of community members can play an important role in shaping their understanding of climate change and disasters, rather than education alone serving as the determining variable. The perception of natural disasters could be considered as a social construct and subjective (Bempah & Øyhus, 2017). This aligns with decentralization and local governance literature, which emphasizes that inclusive planning processes are widely valued in disaster risk reduction, regardless of socio-demographic characteristics (UNDRR, 2019; Bulkeley & Betsill, 2013). In the Nepali context, where local governments are constitutionally mandated to engage communities in planning processes, such consensus may reflect both policy awareness and practical experience with local governance structures. However, higher neutral responses among more educated groups may indicate concerns about the quality or consistency of coordination rather than its importance per se or elites whose local political economy is strong.

Strong agreement across educational levels regarding the need to clearly define roles and responsibilities in emergency preparedness and response plans further underscores widespread recognition of institutional clarity as a cornerstone of effective disaster risk reduction and management. The statistically significant association between education and perception intensity suggests that educational attainment shapes the degree of emphasis placed on role clarity. While all groups support this principle, respondents with higher levels of education may better appreciate the operational and institutional

consequences of overlapping mandates and coordination failures. Existing research consistently identifies unclear institutional roles as a major barrier to effective disaster response, particularly in multi-actor governance systems (Comfort et al., 2011; Kapucu & Pu, 2011). The findings therefore reinforce the importance of strengthening role delineation within CRM/DRM frameworks to enhance trust and operational efficiency.

Perceptions regarding the regular organization of simulation and drill exercises were uniformly positive across all educational groups, with no statistically significant association observed. This indicates that preparedness drills are perceived as universally beneficial, irrespective of educational background. Such findings are consistent with disaster preparedness literature, which demonstrates that drills and simulations enhance risk awareness, response confidence, and collective efficacy across diverse socio-demographic groups (Paton & Johnston, 2017). The slightly higher neutrality among more educated respondents may reflect concerns related to implementation quality, frequency, or inclusiveness rather than opposition to drills themselves. Respondents with higher levels of education may have better access to resources, live in less vulnerable areas, and have lower exposure to disasters. Nevertheless, the consensus highlights the central role of experiential learning in disaster preparedness, particularly in hazard-prone rural settings.

The analysis of perceptions regarding participatory climate and disaster policies reveals both strong overall agreement and a statistically significant association with educational attainment. High levels of endorsement among illiterate and formally educated respondents suggest that community participation is widely understood as a practical and empowering mechanism for reducing climate-related risks. This finding aligns with participatory governance and community-based adaptation literature, which emphasizes that inclusive policies enhance local ownership, legitimacy, and adaptive capacity (Ravazzoli et al., 2025; Ribot, 2014). The comparatively higher neutrality among respondents with informal education may indicate uneven access to participatory platforms or limited exposure to formal policy processes, highlighting the need for targeted engagement strategies to ensure inclusivity across all social groups.

Descriptive statistics further reinforce these patterns, with high mean scores across all five CRM/DRM policy statements. The consistently strong mean values suggest that respondents perceive CRM/DRM policies as an interconnected governance ecosystem encompassing resilience building, coordination, preparedness, role clarity, and participation. Importantly, community participation emerges not as an isolated objective but as an integral component embedded within broader preparedness and governance frameworks. This holistic perception echoes contemporary disaster risk reduction paradigms, such as the Sendai Framework, which emphasize integrated, people-centered, and multi-level approaches to managing climate and disaster risks (UNDRR, 2015).

## Conclusion

This study examined the role of educational attainment in shaping community perceptions of climate change and climate-induced disaster risk management policies and plans in Sarawal Rural Municipality, Nawalparasi West District, Nepal. Of the five statements analyzed, three were statistically significant, leading to the rejection of the null hypotheses and indicating a significant association between the independent and dependent variables. In contrast, two statements were statistically non-significant, demonstrating no association between the variables. The findings demonstrate that communities across diverse educational backgrounds share broadly similar perceptions regarding the importance and effectiveness of climate risk management (CRM) and disaster risk management (DRM) policies and plans. Contrary to assumptions that educational level significantly determines understanding and acceptance of policy instruments, the results indicate that educational attainment does not substantially influence community perceptions of CRM/DRM policies.

The results indicate that perceptions of DRM/CRM policies and plans are shaped not only by educational attainment but also by practical, lived experiences. Respondents with higher education tended to provide more measured responses, frequently selecting neutral or agreeing, suggesting a more critical evaluation of policy effectiveness. This pattern underscores that educational level alone does not determine perception; rather, experiential knowledge and day-to-day interactions with disaster and climate risk management practices play a significant role in shaping how individuals assess the relevance and impact of these policies.

The consistently high levels of agreement across preparedness indicators, including institutional coordination, defined roles and responsibilities, regular simulation and drill exercises, and participatory climate and disaster policies, suggest that community members value practical, experience-based approaches to risk reduction. This reflects the growing influence of Nepal's decentralized governance framework, where local governments, ward structures, and community institutions play a central role in disaster preparedness and response. The findings further underscore that community engagement is shaped not only by formal education but also by lived experience with climate-induced hazards, social learning, and collective action.

Overall, the study contributes to the growing body of evidence that effective climate and disaster risk governance depends less on educational differentiation and more on inclusive, participatory, and well-coordinated institutional arrangements. Strengthening locally embedded CRM/DRM processes can foster ownership, trust, and sustainability, ultimately supporting resilient communities in Nepal's hazard-prone and climate-vulnerable contexts.

## Recommendations

1. **Promote Inclusive Community Participation:** Local governments and DRM/CRM authorities should actively involve community members in planning, updating, and implementing policies, valuing both lived experiences and formal education to enhance relevance and acceptance.
2. **Institutionalize Practical Preparedness Measures:** Regular simulations, drills, and clearly defined roles and responsibilities should be implemented to strengthen community readiness, reinforce experiential learning, and build confidence in emergency response systems.
3. **Strengthen Local Governance and Knowledge Integration:** Decentralized governance structures, including ward-level authorities, should be empowered to coordinate effectively with communities, while policymakers systematically integrate community experiences into CRM/DRM policy design to ensure practical, context-specific, and sustainable interventions.
4. **Provision of DRM/CRM Learning Platform:** CRM/DRM-related training should be systematically integrated into both formal and informal education systems. While the findings show that individuals without formal education have developed meaningful perceptions regarding policy and plan formulation, community participation, and preparedness practices, strengthening formal education through structured courses and awareness sessions is equally critical to deepen understanding and foster informed, consistent, and evidence-based perceptions of DRM/CRM policies and plans.

## References

- Ansell, C., & Gash, A. (2008). Collaborative Governance in Theory and Practice. *Journal of Public Administration Research and Theory*, 18(4), 343-571. doi:<https://doi.org/10.1093/jopart/mum032>
- Aryal, P. (2023). Occurrence of Disaster Events and their Impact in Nepal: Role of Government and Civil Society Organizations to Reduce the Disaster Risks. *Nepal Journal of Multidisciplinary Research (NJMR)*, 6(1), 88-101. doi:<https://doi.org/10.3126/njmr.v6i1.54355>
- Aryal, P., Gangal, M., & Karki, T. B. (2025). Exploring the Role of Education (Formal and Informal Learning) in Shaping Climate Change and Disaster Awareness in Sarawal Rural Municipality, Nepal. *International Journal of Atharva*, 3(1), 26-43. doi: <https://doi.org/10.3126/ija.v3i1.76710>
- Aryal, P., Gangal, M., & Karki, T. B. (2025). Exploring the Role of Education (Formal and Informal Learning) in Shaping Climate Change and Disaster Awareness in Sarawal Rural Municipality, Nepal. *International Journal of Atharva*, 3(1), 26-43. doi:<https://doi.org/10.3126/ija.v2i2.69822>

- Ayers, J., & Forsyth, T. (2009). Community Based Adaptation to Climate Change. *Environment: Science Policy for Sustainable Development*, 22-31. doi:<http://dx.doi.org/10.3200/ENV.51.4.22-31>
- Bempah, S. A., & Øyhus, A. O. (2017). The role of social perception in disaster risk reduction: Beliefs, perception, and attitudes regarding flood disasters in communities along the Volta River, Ghana. *International Journal of Disaster Risk Reduction*, 23, 104-108. doi:<https://doi.org/10.1016/j.ijdr.2017.04.009>
- Bulkeley, H., & Betsill, M. M. (2013). Revisiting the urban politics of climate change. *Environmental Politics*, 22(1), 136-154. doi:<https://doi.org/10.1080/09644016.2013.755797>
- Capano, G., & Woo, J. J. (2017). Resilience and robustness in policy design: a critical appraisal. *Policy Science*. doi:DOI 10.1007/s11077-016-9273-x
- Comfort, L. K., Boin, A., & Demchak, C. C. (2011). *Designing Resilience Preparing for Extreme Events*. University of Pittsburgh Press.
- Delalay, M., Ziegler, A. D., Shrestha, M. S., Wasson, R. J., Sudmeier-Rieux, K., McAdoo, B. G., & Kochhar, I. (2018). Towards improved flood disaster governance in Nepal: a case study in Sindhupalchok District. *International Journal of Disaster Risk Reduction*. doi:<https://doi.org/10.1016/j.ijdr.2018.05.025>
- GoA. (2021). *Census Report 2021*. Kathmandu, Nepal: Government of Nepal. National Office for the Prime Minister and Council of Ministers, National Statistics Office. doi:<https://nsonepal.gov.np/>
- IPCC. (2022). *Climate Change 2022: Impacts, Adaptation and Vulnerability*. World Meteorological Organization and United Nations Environmental Programme .
- IPCC. (2023). *A Report of the Intergovernmental Panel on Climate Change*. IPCC. Geneva, Switzerland : WMO & UNEP. doi:doi: 10.59327/IPCC/AR6-9789291691647.
- IPCC. (2023). *Climate Change: Synthesis Report, Summary for Policy Makers*. Geneva, Switzerland: WMO & UNEP. doi:doi: 10.59327/IPCC/AR6-9789291691647.001
- Kapucu, N., & Pu, V. G. (2011). Collaborative Decision-Making in Emergency and Disaster Management. *International Journal of Public Administration* , 34(6), 366-375. doi:<https://doi.org/10.1080/01900692.2011.561477>
- MoFE. (2019). *Nepal Climate Change Policy*. Kathmandu Nepal: Ministry of Forests and Environment.
- MOFE. (2021). *National Framework on Climate Change Induced Loss and Damage (L&D)*. Kathmandu, Nepal: Ministry of Forests and Environment .
- MOHA. (2018). *Disaster Risk Reduction National Strategic Plan of Action 2018-2030*. Kathmandu, Nepal: MOHA.
- MoHA. (2018). *Nepal Disaster Risk Reduction National Strategic Plan of Action 2018-2030*. Kathmandu, Nepal: MoHA. Retrieved from <https://www.moha.gov.np/>

- MoLJPA. (2017). *Disaster Risk Reduction and Management Act*. Kathmandu, Nepal: Government of Nepal.
- MoLJPA. (2017). *Nepal Disaster Risk Reduction and Management Act*. Kathmandu, Nepal: Ministry of Home Affairs .
- Nepal, P., Khanal, N. R., & Sharma, B. P. (2018). Policies and institutions for disaster risk management in Nepal: A review. *The Geographical Journal of Nepal*, 2, 1-24. doi:<https://doi.org/10.3126/gjn.v11i0.19546>
- Niraula, P., Pandey, C. L., & Pariyar, R. K. (2026). Community resilience to multi-hazard risks: Insights from Narayani Basin, Nepal. *Progress in Disaster Science* , 29. doi:<https://doi.org/10.1016/j.pdisas.2026.100523>
- Oh-Seng, a. R., Klöck, C., & Deenapanray, P. (2025). Conceptualising a Governance Framework for Climate Change Adaptation and Disaster Risk Reduction in Small Island Developing States Through a Systematic Review. *Sustainability*, 17(9965). doi:<https://doi.org/10.3390/su17229965>
- Pandey, C. L. (2019). Making communities disaster resilient: Challenges and prospects for community engagement in Nepal. *Disaster Prevention and Management: An International Journal*, 28(1), 106-118. doi:<https://doi.org/10.1108/DPM-05-2018-0156>
- Pandey, C. L. (2019). Making communities disaster resilient: Challenges and prospects for community engagement in Nepal. *Disaster Prevention and Management: An International Journal*, 28(1), 106-118. doi:<https://doi.org/10.1108/DPM-05-2018-0156>
- Pandey, C. L. (2025). Climate Change, Floods, and Community Resilience: A Study of the Kamala River Basin, Nepal. *Journal of Flood Risk Management*, 18, 1-11. doi:<https://doi.org/10.1111/jfr3.70069>
- Pandey, C. L., & Basnet, A. (2023). Challenges and Prospects of Flood Early Warning Systems: A Study of Narayani Basin. *Asian Journal of Water, Environment and Pollution*, 20(1). doi:<https://doi.org/10.3233/AJW230004>
- Pandey, C. L., & Niraula, P. (2024). Climate Change-induced Livelihood Insecurity in Narayani-Gandak Basin of Nepal. *Bharatpur Pragya: Journal of Multidisciplinary Studies*, 2(1), 16-32. doi:<https://doi.org/10.3126/bpjms.v2i01.65869>
- Pandey, C. L., Joseph, J., Deshar, R., & Niraula, P. (2023). Transboundary flood resilience: Insights from Narayani and Mahakali Basins. *International Journal of Disaster Risk Reduction*, 86. doi:<https://doi.org/10.1016/j.ijdr.2023.103535>
- Paton, D., & Johnston, D. (2017). *Disaster resilience: An integrated approach* (Second ed.). Charles C. Thomas Publisher Ltd.
- Peters, B. G. (2021). *Advanced Introduction to Public Policy*. (Second, Ed.) Edward Elgar.

- Ribot, J. (2014). Cause and response: vulnerability and climate in the Anthropocene. *The Journal of Peasant Studies* , 41(5), 667-705. doi:<https://doi.org/10.1080/03066150.2014.894911>
- Shaw, R. (2014). *Disaster Recovery: Used or Misused Development Opportunity*. Kyoto, Japan: Springer. doi:DOI 10.1007/978-4-431-54255-1
- UNDRR. (1994). *Report of the World Conference on Natural Disaster Reduction*. UNDRR.
- UNDRR. (2019). *Global Assessment Report on Disaster Risk Reduction*. UNDRR. Retrieved from <https://www.undrr.org/gar>
- UNISDR. (2007). *Hyogo Framework for Action 2005-2015*. Geneva, Switzerland: UNISDR.
- UNISDR. (2015). *Sendai Framework for Disaster Risk Reduction 2015-2030*. Geneva, Switzerland : The United Nations Office for Disaster Risk Reduction.
- Vignola, R., Klinsky, S., Tam, J., & McDaniels, T. (2013). Public perception, knowledge and policy support for mitigation and adaption to Climate Change in Costa Rica: Comparisons with North American and European studies. *Mitigation Adaptation Strategy Global Change*, 18, 303-323. doi:DOI 10.1007/s11027-012-9364-8
- Yamane, T. (1967). *Statistics: An introductory analysis (2nd ed.)*. New York: Harper & Row.