

## **Gender Perspective on Impact of Disasters: A Study of Sarawal Rural Municipality, Nawalparasi West, Nepal**

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### **Abstract**

**Background:** Nepal is highly susceptible to various types of natural disasters, with approximately 90% of its population at risk of experiencing multiple hazards. The country ranks 30th in terms of flood risk, with hilly regions prone to landslides and lowland plains frequently affected by floods. Each year, disasters such as floods, landslides, fires, heat waves, cold waves, and epidemics cause significant loss of lives and livelihood assets. Given the critical role of gender in disaster vulnerability, it is essential to analyze gender-specific perspectives on disaster risk and resilience.

**Objective:** The study aims to explore gender roles and their associated vulnerabilities in disaster events. By examining the perceptions of males and females regarding different disaster-related variables, the research seeks to provide insights into gender-based differences in disaster preparedness, response, and resilience-building efforts.

**Methods:** A quantitative study was conducted in Sarawal Rural Municipality of Nawalparasi West, Nepal. A total of 428 respondents were selected through random sampling, comprising 311 males and 117 females. The study employed six major disaster variables as defined by the United Nations International Strategy for Disaster Reduction (UNISDR) to analyze gender perspectives critically. Statistical methods were used to assess the association between gender and disaster perception.

**Findings:** The study revealed a significant association between gender and disaster perceptions. Males and females demonstrated differing views on disaster risks, preparedness, and coping mechanisms. Understanding these gender-specific differences can help determine levels of vulnerability, identify associated risks, and enhance the coping capacities of different groups.

**Conclusion:** The findings emphasize the need to incorporate gender perspectives into disaster-related research and resilience-building initiatives. Addressing gender-based vulnerabilities can lead to more effective disaster preparedness and response strategies, ultimately improving community resilience.

**Novelty:** This study provides empirical evidence on the gendered dimensions of disaster perception in Nepal, highlighting the importance of integrating gender considerations into disaster risk management. By focusing on a rural municipality, the research offers localized insights that can inform policy and program development for gender-inclusive disaster resilience planning.

**Keywords:** Coping Capacity, Disaster, Gender, Vulnerability.

## **Introduction**

Disasters are serious life-threatening events that disturb the well-functioning of society causing human and material loss and the affected population requires external support to come to pre disaster state [\(UNISDR, 2009\)](#). The study on double disaster: disaster through a gender lens underscored that women and girls are vulnerable to disaster due to their limited access to resources and presence at the decision-making level however disaster-related policies lack the gender lens [\(Bradshaw & Fordham, 2015\)](#) thus disaster-related issues and their gender perspectives to be incorporated in policies. Studies pointed out that due to limited capacity women and girls are unable to cope with, resist, and recover from disastrous events, it is not because they are biologically women, but because poor women have triple roles being assigned by society such as reproductive, productive and community managing in these two of them are labor intensive and doesn't get enough benefits [\(Moser & Peake, 1994\)](#). It is also underlined that single woman-headed households are affected badly by disasters, it could be mainly due to having limited assets that could have been used for disaster preparedness and response efforts [\(DFID, 2004\)](#). Gender practitioners have pointed out that most of the studies and programs lack reflexivity which could be considered as a key ingredient of development [\(Kunz & Prügl, 2019\)](#). In many instances, due to social values and norms, women and girls are not taught to swim or climb trees which might be essential skills during floods or tsunamis and their clothing

may prevent them in emergency response therefore women are likely to die than men during disaster events [\(Oxfam, 2012\)](#). These assumptions have limited empirical evidence and there are limited sex-disaggregated data, and it is difficult to generalize female-headed households as are poorest of the poor. Disasters are by product of vulnerability and hazards, if people are having high vulnerability and occurrences of hazards are happening then there is a high possibility of people being affected particularly people who have undertaken limited preparedness and risk reduction measures [\(Chant, 2008\)](#). Gender ideologies and practices contribute to systematic differences in how risks are perceived [\(Gustafson, 1998\)](#).

Besides the vulnerability of females, it is also pointed out that males have risk-taking behaviors thus they usually face high levels of disaster incidents for example males accounted for 73 percent of road traffic deaths in 2002 [\(Waldron, McCloskey, & Earle, 2005\)](#). In some places such as Latin America, the traditional and cultural meaning of maleness is having riskier behaviors [\(Bradshaw, 2004\)](#). The study of UK and European flood fatalities also indicates that men show risk-taking behaviors [\(Jockman & Kalman, 2005\)](#). When it comes to Australian bushfires, men die due to protecting homes and other assets whereas female and child fatalities were reported while sheltering in the house or fleeing, which is usually time-consuming. Lack of access to information, education as well as engagement in preparedness activities causes fewer families to perceive risk and not be confident about when to act and how to act on various emergency warnings [\(Tylor & Fairbrother, 2013\)](#). Gender disaggregated data is largely missing thus it is difficult to come up with a complete picture of gender-based perception, preparedness, and response as well as fatalities. Many agencies working in this sector are not sensitive to these requirements. Unlike measuring the socio-economic impact of the disaster that has been experienced immediately after the event, it is important to assess secondary impacts such as intangible changes in well-being and time burden that has been considered by women and girls thus for gender perspective reconceptualization may be needed [\(Fordham & Bradshaw, 2013\)](#). Although there is limited data about social, emotional, and sexual violence among women and girls however it is pointed out that 30 percent of women suffer physical abuse during normal times [\(Ellsberg, Pena, Herrera, Liljestrand, & Winkvist, 2000\)](#). The experiences of women and men are very important for better planning and delivering services to both. Gender-sensitive approaches can unveil ground reality and address inequalities prevailing in society [\(Yumarni, Amaratunga, & Haigh, 2014\)](#).

Although natural disasters are gender neutral however impact are different as male and female have different level of exposure, vulnerability to natural hazards and role being assigned to them by the society. Gender inequalities may have gender differentiated impact of disasters and it will also have an impact in gender dynamics. It is believed that women are more likely die due to disaster than men however the study postulates that 70 percent flood related deaths among male in USA and Europe. It could be primarily due to having men in rescue professions. On the other hand, women's deaths during disasters in developing countries are comparatively high [\(Alvina Erman, 2022\)](#). The study on post-earthquake recovery underscores that gender sensitivity in post disaster recovery is unmindful due to male-controlled tradition, lack of

understanding, perception and exposure. The political instability and lack of capacity in terms of implementation policy arrangements also hinders in applying gender sensitive approaches. The study also revealed that there is no clear mechanism to involve female in disaster risk management planning and programming [\\_\(Pathranakul, 2018\)](#).

Nepal ranks 30<sup>th</sup> in terms of flood and 11<sup>th</sup> in terms of earthquake risks, around 90 percent population is at risk of death due to two or more types of disasters [\\_\(MoHA, 2018\)](#). Unstable geological structures, rapid urbanization, construction of infrastructure without an environmental impact assessment and over-exploitation of natural resources are underlying factors that aggravate disaster events in Nepal. Growing evidence of climate change has a direct impact on the occurrence of hydrological and meteorological events in the country [\\_\(Aryal, 2023\)](#). Nepal has been experiencing recurrent disasters such as floods, fires, landslides, heat waves, cold waves, avalanches, and epidemics every year [\\_\(KC, 2013\)](#). Lowland areas are vulnerable to floods mainly due to the disposition of silt, debris, and riverbeds are gradually rising, and river dams are not able to protect inhabitants from floodwater inundation. In 2008, the water level of the Koshi River had suddenly gone up resulting destruction of the embankment and affecting 65000 people and 700 hectares of fertile land in Nepal whereas 2.6 million people were impacted in India and Nepal. Likewise, Nepal witnessed the Koshi flood in 2011 which also destroyed the fertile land [\\_\(Kafle, Khanal, & Dahal, 2017\)](#). The study on gendered experience conducted among 22 earthquake survivor in depth case story highlights that woman had many difficulties in saving their and family lives mainly encountering difficulties on knowledge about earthquake and evacuation skills [\\_\(K.C & Hilhorst, 2022\)](#).

Nepal is experiencing recurrent disasters such as floods, landslides droughts, fires, and water inundation problems which have a significant impact on the loss of gross domestic product (GDP) [\\_\(KC, 2013\)](#). There was heavy rainfall from 26-28 September 2024 in Nepal that triggered floods and landslides. As of October 3, 2024, floods and landslides have claimed the lives of 236 people, leaving 19 missing and 165 injured. Among the deceased, 90 were women, 114 were men, and 32 were children. Altogether 2.5 million people were affected by floods and landslides; Nawalparasi West was one of the affected districts in Nepal [\\_\(NDRRMA, 2024\)](#). Sarawal Rural Municipality, particularly Wards 5, 6, and 7 of Nawalparasi West District, has experienced recurring water inundation issues almost every year. The problem arises due to inadequate drainage outlets for two major rivers, Khajura and Dhanewa, leading to frequent overflows that affect nearby villages and agricultural land. This flooding disproportionately impacts marginalized groups, including women, children, the elderly, and individuals with disabilities.

In this milieu, this study has been carried out to critically analyze disaster elements through a gender lens. It is expected that the findings would be key resources for designing and implementing various awareness creations as well as disaster preparedness and risk reduction initiatives at different levels.

## **Materials & Methods**

This study has been designed based on a postpositive worldview having a quantitative research design. This research philosophy applies to a deductive approach and believes that there is a single reality that needs to be further identified or obtained using various research approaches, instruments, and tools. The household-level survey was applied using a set of questionnaires. The draft questionnaires were reviewed by the research supervisor and co-supervisor to incorporate their technical inputs. Based on their feedback, necessary amendments were made, and the revised questionnaires were subsequently tested among community members representing three different educational backgrounds: illiterate, up to primary, and high school and above. Reflections from the respondents were carefully analyzed, leading to further refinement. The primary objective of this process was to ensure that the questionnaires effectively captured the intended information.

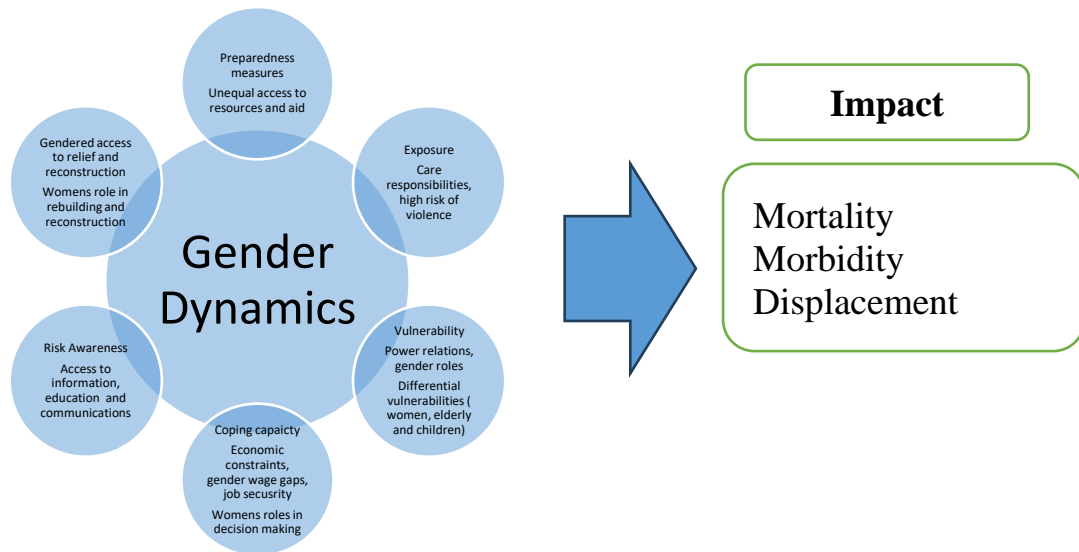
Given the vulnerability to floods and other hazards, 3 wards mainly 5, 6, and 7 of Sarawal Rural Municipality of Nawalparasi district were identified. Using the formula, of sampling technique  $n = \frac{N}{1 + N(e)^2}$  (Yamane, 1967), altogether 428 respondents, specifically 122, 158, and 148 from wards no 5, 6, and 7 respectively were selected using cluster random sampling. In which, 117 females and 311 males participated in this study. Six key variables were constructed according to the UNISDR definition of disaster. These six variables were formed in a statement and kept on a five-degree Likert scale from strongly agree to strongly disagree. The statements are outlined below:

- Sudden incidence of hazard events caused by either climate variability or change
- Loss of human lives and properties
- Obstruction on the well-functioning of society
- Reduction of the ability of affected communities to face hazards
- The affected community requires external support to come to the pre disaster stage
- Disaster causes displacement.

The study also applied a reliability test; while performing the Cronbach's Alpha test, obtaining a value of .725 signifies being reliable.

Reliability Statistics	
Cronbach's Alpha	N of Items
.725	6

Conceptual Framework: Adapted from Erman, A. et al, (2021)



## Results & Discussion

The perception and understanding of disasters were tested in six major parameters namely: disaster causes loss and damage of lives and properties, obstruction in functioning of society, the population affected by disaster does not have coping capacities, which requires external support to bring back to the pre-disaster stage and disasters cause displacement. These six conditions were hypothesized based on gender lens indicating that there is no association between male and female respondents on their perception of the impact of disaster. The gender perspective of disaster is elaborated below as per six key parameters:

### Climate change induced Hazard Events

The data presented in Table 1 shows survey responses on the perceived cause of climate change and disasters categorized by gender. Most of the respondents agreed (53.3%) or strongly agreed (41.4%) that Sudden incidence of hazard events caused by climate variability and change.

**Table 1: Climate change induced Hazard Events**

		Sex		Total
		Male	Female	
Sudden incidence of hazard events caused by climate variability and change	Disagree	0.3%	0.9%	0.5%
	Neutral	3.9%	7.7%	4.9%
	Agree	45.7%	73.5%	53.3%
	Strongly agree	50.2%	17.9%	41.4%
Total		100.0%	100.0%	100.0%
<b>Chi-Square Tests</b>				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	36.769	3	.000	

**Source:** Field Survey 2024



Notably, a higher proportion of males strongly agreed (50.2%) compared to females (17.9%), while more females agreed (73.5%) than males (45.7%). A smaller percentage remained neutral (4.9%), with more females (7.7%) than males (3.9%) in this category. Very few respondents disagreed, with only 0.5% overall, indicating strong overall acknowledgment of the issue, though with gender-based differences in intensity of agreement.

The Chi-Square test shows ( $\chi^2 = 36.769$ ,  $p = 0.000$ ) that the p-value is less than 0.05 significant level, which is statistically significant thus the null hypothesis is rejected means that there is a significant association between males and females in their perception of the causes of disasters.

### **Loss of human lives and properties**

Table 2 indicates survey responses on whether disasters cause loss of human properties and lives, by gender. The majority of respondents affirmed the impact, where 61.4% agreed and 20.6% strongly agreed. Males were more in agreement than females, where 65.0% agreed and 21.2% strongly agreed, compared to females, where 52.1% agreed and 18.8% strongly agreed.

**Table 2: Loss of human lives and properties**

		Sex		Total
		Male	Female	
Incidents are causing the loss of human lives and properties	Disagree	1.0%	2.6%	1.4%
	Neutral	12.9%	26.5%	16.6%
	Agree	65.0%	52.1%	61.4%
	Strongly agree	21.2%	18.8%	20.6%
Total		100.0%	100.0%	100.0%
<b>Chi-Square Tests</b>				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	13.592 <sup>a</sup>	3	.004	

**Source:** Field Survey 2024

A significant percentage of respondents were undecided (16.6%), with a significantly higher proportion of females (26.5%) than males (12.9%) being undecided. Less than a fifth (1.4%) disagreed, with more females (2.6%) than males (1.0%) disagreeing. The Pearson Chi-Square test statistic ( $\chi^2 = 13.592$ ,  $p = 0.004$ ) indicates a statistically significant association between males and females in their attitudes toward loss due to disasters. This means that even though men and women both confirm the serious consequences of such events, women tend to be somewhat more ambivalent or less committed in their responses. Women may not have enough exposure of affected areas and loss and damage made by the disasters compared to men.

### **Obstruction on the well-functioning of society**

Table 3 presents survey responses on whether climate change-induced disasters obstruct the well-functioning of society, categorized by gender. The majority of respondents acknowledged the impact, with 67.5% agreeing and 18.9% strongly agreeing. Males exhibited stronger agreement, with 66.2% agreeing and 22.2% strongly agreeing, compared to females, where

70.9% agreed but only 10.3% strongly agreed. This suggests that while both genders recognize the issue, males express stronger convictions regarding its severity.

**Table 3: Obstruction on the well-functioning of society**

		Sex		Total
		Male	Female	
Obstruction on well-functioning of society	Disagree	3.5%	5.1%	4.0%
	Neutral	8.0%	13.7%	9.6%
	Agree	66.2%	70.9%	67.5%
	Strongly agree	22.2%	10.3%	18.9%
Total		100.0%	100.0%	100.0%
<b>Chi-Square Tests</b>				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	10.034 <sup>a</sup>	3	.018	

**Source:** Field Survey 2024

A smaller proportion of respondents remained neutral (9.6%), with more females (13.7%) than males (8.0%) holding this stance. Meanwhile, a very small percentage disagreed, totaling 4.0%, again with a higher proportion of females (5.1%) than males (3.5%). The Pearson Chi-Square test result ( $\chi^2 = 10.034$ ,  $p = 0.018$ ) indicates a statistically significant relationship between gender and perceptions of climate change induced disaster impacts. This suggests that gender differences influence how individuals perceive societal disruptions caused by these environmental challenges.

The findings indicate that women exhibit lower confidence regarding the obstruction of a well-functioning society due to disasters, whereas men express greater certainty. This discrepancy may stem from the distinct societal roles traditionally assigned to men and women. Men often assume primary responsibility for the family as well as disaster responder, while women are more engaged in childcare and household duties. These role-based differences may limit individuals' perspectives, preventing them from fully perceiving the broader functionality of a society.

#### **Decreased Capacity of Affected Communities to Withstand Hazards**

Table 4 presents survey responses on whether climate change and disasters reduce the ability of affected communities to cope with hazards, by gender. The majority of respondents were aware of this problem, as 47.2% of them agreed and 34.6% strongly agreed. There are gender differences, though—while 49.5% of men agreed and 39.2% strongly agreed, the percentages were lower among women, with 41.0% agreeing and only 22.2% strongly agreeing.



**Table 4: Decreased Capacity of Affected Communities to Withstand Hazards**

		Sex		Total
		Male	Female	
Reduced ability of affected communities to face the hazards	Disagree	1.9%	7.7%	3.5%
	Neutral	9.3%	29.1%	14.7%
	Agree	49.5%	41.0%	47.2%
	Strongly agree	39.2%	22.2%	34.6%
Total		100.0%	100.0%	100.0%
<b>Chi-Square Tests</b>				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	38.961	3	.000	

**Source:** Field Survey 2024

A high proportion of respondents were undecided (14.7%), much higher than either females (29.1%) or males (9.3%). Further, a small proportion (3.5%) disagreed, with more females (7.7%) than males (1.9%) questioning the impact. The Pearson Chi-Square test statistic ( $\chi^2 = 38.961$ ,  $p = 0.000$ ) is significant at a high level, and it indicates that gender and perceptions of community resilience are associated differently with men and women, with women being more skeptical or uncertain.

One of the key elements of disaster is that it reduces the ability of affected communities to face hazards. The researcher examined the perception from a gender lens, and it was also found that there is a significant association between gender and their perception regarding the coping capacity of affected populations.

The findings highlight that women are generally undecided about the reduced ability of disaster-affected communities to withstand hazards. This uncertainty may primarily stem from limited access to information and communication, as a significant proportion of women are illiterate. Additionally, women often have a limited understanding of coping capacities, as disaster preparedness and response activities are predominantly undertaken by men.

#### **Affected Communities Require External Support for Recovery**

Table 5 indicates survey responses to the question of whether affected communities require external help to return to their previous condition, by gender. Most of the respondents asserted this requirement, with 50.2% agreeing and 36.7% strongly agreeing. Males were more so in agreement, with 52.7% agreeing and 37.6% strongly agreeing, compared to females, where 43.6% agreed and 34.2% strongly agreed.

**Table 5: Affected Communities Require External Support for Recovery**

		Sex		Total
		Male	Female	
The affected community requires external support to come to the earlier state	Strongly disagree	0.6%	0.9%	0.7%
	Disagree	1.6%	6.8%	3.0%
	Neutral	7.4%	14.5%	9.3%

	Agree	52.7%	43.6%	50.2%
	Strongly agree	37.6%	34.2%	36.7%
Total		100.0%	100.0%	100.0%
<b>Chi-Square Tests</b>				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	14.028 <sup>a</sup>	4	.007	

**Source:** Field Survey 2024

Fewer were neutral (9.3%), with more among females (14.5%) than among males (7.4%). A minority of the respondents disagreed (3.0%) or strongly disagreed (0.7%), with greater proportions of females (6.8% disagreed and 0.9% strongly disagreed) than males (1.6% disagreed and 0.6% strongly disagreed). The Pearson Chi-Square test ( $\chi^2 = 14.028$ ,  $p = 0.007$ ) indicates that gender and perceived need for external assistance are statistically associated. This indicates that both groups recognize the importance of external assistance but that slightly higher uncertainty or resistance is experienced by women. This may primarily be attributed to gender roles, which influence women's involvement in disaster preparedness and response. Limited access to information and communication, coupled with their predominant responsibilities as homemakers—such as preparing food, caring for children, and having minimal engagement in economic discussions—further contribute to this dynamic.

### Disaster Causes Displacement

Table 6 presents survey responses to whether disasters displace people, by gender. The responses present a mix of opinions but with a large proportion of respondents perceived the impact. Overall, 28.7% agreed and 27.8% strongly agreed, indicating that the majority believe disasters displace people. There is, nevertheless, a gender difference—while 30.9% of the men agreed and 32.5% strongly agreed, the corresponding figures for women were lower at 23.1% and 15.4%.

**Table 6: Disaster Causes Displacement**

		Sex		Total
		Male	Female	
Disaster causes displacement	Strongly disagree	0.6%		0.5%
	Disagree	3.5%	11.1%	5.6%
	Neutral	32.5%	50.4%	37.4%
	Agree	30.9%	23.1%	28.7%
	Strongly agree	32.5%	15.4%	27.8%
Total		100.0%	100.0%	100.0%
<b>Chi-Square Tests</b>				
	Value	df	Asymp. Sig. (2-sided)	
Pearson Chi-Square	27.506 <sup>a</sup>	4	.000	

**Source:** Field Survey 2024

Many respondents were undecided (37.4%), and a much greater majority of females (50.4%) than males (32.5%) were undecided. Whereas 5.6% of respondents disagreed, more females (11.1%) than males (3.5%) shared this opinion. Few (0.5%) strongly disagreed. The result of the Pearson Chi-Square test ( $\chi^2 = 27.506$ ,  $p = 0.000$ ) indicates a very significant association between gender and attitudes towards disaster-induced displacement. This shows that men are more confident regarding the displacement impacts of disasters, while women are less sure or doubtful about this issue.

Disasters are causing displacement in various forms, such as within and out of the country. Given the circumstances caused by the disasters, it was assessed whether there is an association between gender and their perception of this issue, the finding revealed that there is an association between respondents' gender and their perception of a disaster causing displacement. Despite the severe impact of disasters, people in this municipality tend to remain in their communities, where they have lived for an extended period. This strong attachment to their hometown may explain why a considerable proportion of respondents were undecided about relocation. Societal roles and traditions further reinforce this reluctance, as residents often feel uncomfortable moving to another village or city. Women, in particular, are more hesitant to leave their homes compared to men and may not perceive relocation as a viable option, even when flood-affected individuals are required to stay in higher ground areas or community shelters temporarily.

## **Conclusion**

The analysis of the survey responses sees a definite overall awareness of the catastrophic impacts of disasters and climate change, with the majority agreeing that such events impede social functioning, lower community resilience, and result in displacement, loss of life, and destruction of property. There are, however, major gender differences, with males being more strongly in agreement on these issues, but females showing more uncertainty, indicated through higher neutral and disagreement scores. Statistically significant Chi-Square test results indicate that gender is an essential element in determining disaster impact perceptions and recovery needs.

Gender roles are socially constructed norms that define the expectations and responsibilities of males and females, shaped by societal values. These roles dictate how individuals undertake their duties within society. As such, it is essential to examine how people perceive disasters from a gendered perspective. Understanding whether the affected population shares a similar viewpoint or holds distinct perceptions is critical, as this insight will inform disaster preparedness, risk awareness, reduction strategies, and response initiatives at federal, provincial, and local levels. The findings of this study reveal that males and females perceive disasters slightly differently, highlighting an association between gender perspectives and disaster impact.

Given the gendered differences in disaster perception and impact, it is vital to conduct targeted awareness sessions for women, children, the elderly, and individuals with disabilities regarding

climate change and climate-induced disasters. As heads of households or male figures often serve as the primary decision-makers, involving both males and females in these programs will help clarify their roles in preparing for, mitigating risks, and enhancing response capabilities. These sessions can also offer valuable insights into how disasters erode the coping capacities of affected communities and the measures necessary to build resilience.

Furthermore, identifying safe zones where affected populations can be evacuated and their livelihoods safeguarded until water levels subside is equally important. Establishing Local Disaster Risk Management Committees at the municipal, ward, and community levels, with active participation from women and people with disabilities, will ensure that their concerns are addressed. Safety measures should also include early warning systems in local languages to ensure that illiterate individuals can receive and act upon critical messages promptly.

Prior to the onset of the rainy season, it is crucial to repair irrigation systems, reinforce river embankments, and clear riverbeds to facilitate the smooth flow of water and minimize the potential for damage. The study found that male respondents tend to have a relatively better understanding of how disasters disrupt the functioning of society, while women perceive these impacts differently. Therefore, awareness programs should include both male and female participants from diverse backgrounds to ensure comprehensive understanding of disaster management cycle across communities.

#### **Novelty in this research**

Occurrences of disasters and their impact are studied in different ways, however, understanding disasters from gender perspectives is missing. Realizing the facts, this research has been conducted to assess the disaster from a gender perspective. Since the study findings proved that there is an association between males and females in their perception of disaster; this would pave the way for policymakers and DRR practitioners to include these issues for making the policies and interventions more inclusive.

**Conflict of Interest:** There is no conflict of interest.

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