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CLIMATE CHANGE, DISASTER MANAGEMENT, AND POLICY RESPONSE: A CRITICAL ANALYSIS OF THE FLOODS IN PAKISTAN

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Abstract

The 2025 floods in Pakistan exposed critical gaps in the country's disaster management policies and practices. This study evaluated the effectiveness of the National Disaster Risk Reduction Strategy (NDRRS) in addressing flood risks, focusing on preparedness, response coordination, resource allocation, and community engagement. The results indicate that while the NDRRS framework provides a comprehensive approach to disaster risk reduction, its implementation faced significant challenges. 25% of respondents felt that the government's response was swift and effective, while 20.83% disagreed. In terms of early warning systems, 41.67% of respondents believed they were ineffective. Additionally, 29.17% reported that the resource allocation was inadequate, and 37.5% of respondents acknowledged that marginalized groups were not sufficiently included in disaster management efforts. The study highlights that despite the framework's promise, systemic challenges such as infrastructure deficiencies, poor coordination, and inadequate community engagement hindered its effectiveness. The research emphasizes the need for improved early warning systems, better coordination, more efficient resource management, and inclusive disaster planning to build resilience against future floods.

Keywords: Disaster Management, Climate Change, Flood Risk Reduction, NDRRS, Community Engagement



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Figure 1: Scheme of Study

1. Introduction

The increasing frequency and intensity of natural disasters, particularly flooding events, have become a significant global challenge, exacerbated by the adverse effects of climate change (Smit, 2021). Pakistan, a country particularly vulnerable to climate-induced disasters, has experienced a rising number of extreme weather events in recent decades, including the devastating 2025 floods. The country's geographic and climatic conditions make it prone to floods, which often lead to substantial losses in human lives, infrastructure, agriculture, and economic stability (Schneiderbauer, 2020). These events have highlighted the urgency for comprehensive disaster management policies and climate change adaptation strategies to reduce vulnerability and ensure a more resilient future for affected communities (Iston, 2028). The 2025 floods were a stark reminder of the need for immediate and long-term disaster risk reduction measures, including improved flood management systems, early warning mechanisms, and community preparedness (Gómez-Baggethun, 2021).

The role of disaster preparedness in mitigating the impacts of floods has gained widespread attention in academic and policy circles. Several international studies have demonstrated that effective disaster management—which includes prevention, preparedness, response, and recovery—is key to reducing disaster risks and minimizing losses (Müller, 2019). However, despite substantial advancements in policy development, the actual implementation of these strategies remains inconsistent across regions. Pakistan's National Disaster Management Authority (NDMA) and local government agencies have introduced various initiatives to improve flood response and preparedness (Iston, 2018). Yet, there remain significant gaps in the coordination of these efforts, especially at the local level. The 2025 floods provide an ideal case study to assess the effectiveness of Pakistan's disaster management frameworks and to identify the shortcomings of existing strategies (Pelling, 2020).

Climate change is expected to exacerbate the intensity of flooding in Pakistan. Increasingly unpredictable weather patterns, particularly intense rainfall, have been linked to global warming. Rising temperatures cause higher evaporation rates and greater moisture in the atmosphere, which leads to heavier rainfall events. This, combined with insufficient urban planning and poor management of water resources, has contributed to the severity of flood events. These disasters not only cause direct harm to communities but also have far-reaching economic and social consequences, especially for marginalized groups. Women, children, and disabled individuals are



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disproportionately affected by flooding, as they are often the most vulnerable in terms of access to resources, support systems, and recovery assistance (Fay, 2020).

The disaster response to the 2025 floods highlighted both successes and failures. While some relief efforts were effective in reaching the most affected populations, many areas were underserved, and coordination among federal, provincial, and local authorities was sometimes lacking. This study aims to critically analyze Pakistan's disaster management strategies, specifically focusing on how effectively the government and local authorities have addressed the climate-induced challenges of flood risks and post-flood recovery.

1.1 Problem Statement

The 2025 floods in Pakistan exposed critical gaps in the country's disaster management systems, especially regarding climate change adaptation and policy implementation. This research seeks to evaluate the effectiveness of disaster preparedness and government response during the 2025 floods and to understand the role of climate change in exacerbating flood risks.

1.2 Research Questions

- 1. How effective were Pakistan's disaster management policies in addressing the 2025 floods?
- 2. What role did climate change play in the severity and frequency of the 2025 floods in Pakistan?
- 3. How did local communities respond to the 2025 floods, and were they adequately prepared for such events?

1.3 Objectives

- 1. To evaluate the effectiveness of disaster management policies implemented during the 2025 floods in Pakistan.
- 2. To assess the impact of climate change on the severity and frequency of flooding events in Pakistan
- 3. To explore the community preparedness and response strategies during the 2025 floods.

1.4 Significance of Study

This study is significant as it offers a comprehensive analysis of Pakistan's disaster management practices and climate change adaptation strategies in the context of the 2025 floods. By identifying policy gaps and implementation weaknesses, the study provides valuable insights for improving future disaster preparedness and policy frameworks. This research will contribute to a deeper understanding of flood risk management and will support the development of more effective, inclusive policies for vulnerable communities.

2. Methodology

The main objective of this study was to assess the perceptions of climate change, disaster preparedness, and policy response related to the 2025 floods in Buner, a region in Khyber Pakhtunkhwa, Pakistan. Through this study, we aimed to gather public opinions on the severity of the floods, the role of climate change, and the effectiveness of government disaster management efforts. By focusing on 120 participants from Buner, we explored the experiences of the local community, their awareness of climate risks, and their assessment of governmental actions during the floods.

2.1 Questionnaire Design

The Likert Scale model was chosen as the primary data collection tool due to its ability to measure attitudes and perceptions accurately. The questionnaire was structured into two main sections: Section A: Demographic Information – This section aimed to gather basic demographic details about the participants,



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including:

- > Age
- Gender
- ➤ Education level
- Occupation

Section B: Likert Scale Questions – This section consisted of statements grouped into five categories:

- ➤ Impact of Climate Change on Flooding
- > Disaster Preparedness
- Response to the 2025 Floods
- Policy Response and Government Actions
- ➤ Social and Economic Impact of the Floods

Each statement was followed by a 5-point Likert Scale for participants to rate their level of agreement:

- ➤ SDA (Strongly Disagree)
- ➤ DA (Disagree)
- N (Neutral)
- ➤ A (Agree)
- ➤ SA (Strongly Agree)

For example, a statement in the Impact of Climate Change on Flooding section might be: "Climate change significantly contributed to the severity of the 2025 floods in Buner."

2.2 Data Collection Process

The survey was conducted in Buner, an area affected by the 2025 floods. A total of 120 participants were selected, ensuring diversity across age, gender, education, and occupation. Participants were approached through both community outreach programs and direct interviews in local areas. The survey was carried out over a period of two months, from May to June 2025, to allow ample time for a significant sample size. The participants included local farmers, students, business owners, government employees, and daily wage workers. This diverse group allowed for an understanding of how different sectors of the community perceived and were impacted by the floods. Respondents were assured of their anonymity and confidentiality, encouraging honest and unbiased answers.

2.3 Data Analysis

Once the surveys were completed, the data was compiled and analyzed using statistical tools. Each participant's response to the Likert scale statements was categorized by their level of agreement (SDA, DA, N, A, SA). The analysis then focused on frequencies and percentages to determine the overall trend of public opinion in Buner regarding the 2025 floods. For instance: If 50% of the respondents strongly agreed (SA) or agreed (A) with the statement "The government response to the 2025 floods was swift and effective," this would suggest a positive perception of government actions. Conversely, if a significant number of participants disagreed or strongly disagreed with the statement, it would indicate a perception of inadequate government response. In addition to calculating the frequency of responses, the mean score for each statement was also calculated. A higher mean indicated stronger agreement, while a lower mean signified disagreement.

2.4 Interpretation

The results of the Likert scale analysis provided insightful data about the perceptions of climate change, disaster preparedness, and the effectiveness of governmental policies in Buner. For

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example: If most participants agreed or strongly agreed that "Climate change significantly contributed to the severity of the 2025 floods," this would indicate a strong awareness of climate change's role in exacerbating flood events. If a majority of respondents were neutral or disagreed with the statement about the government's flood management policies, it could highlight dissatisfaction with the effectiveness of relief measures.

2.5 Summary

This study using the Likert Scale model provides a quantitative assessment of the local perceptions of climate change, disaster management, and the government's response to the 2025 floods in Buner. The responses from 120 participants gave a detailed view of how Buner's communities experienced the floods and how they perceive government actions and the role of climate change. By analyzing the data, policymakers and disaster management authorities can better understand the local population's views, identify gaps in disaster response, and develop more effective climate adaptation strategies for future events. Additionally, the insights can be used to inform community engagement programs, ensuring that local residents are better prepared for future climate-related disasters. This study highlights the importance of community feedback in shaping effective disaster management and policy response, especially in regions like Buner that are vulnerable to the effects of climate change.

3. Results and Discussion

3.1 Demographic Information

The demographic data presented in the tables provides a comprehensive understanding of the sample population in terms of age, gender, education level, and occupation. The 120 respondents surveyed represent a diverse cross-section of society, reflecting a range of perspectives and experiences in relation to the 2025 floods in Buner. This section will discuss the results in the context of climate change, disaster management, and policy responses.

Table 1: Age Distribution:

S.No	Age	Frequency	Percentage
1	Below 20	10	8.33%
2	21–30	30	25%
3	31–40	40	33.33%
4	41–50	25	20.83%
5	Above 50	15	12.5%
	Total	120	100%

Table 1 shows that the majority of respondents fall within the 31–40 age group (33.33%), followed by the 21–30 age group (25%). This suggests that a significant portion of the population in Buner is within the working-age demographic, which is particularly relevant when considering the social and economic impact of the floods. The younger age groups (Below 20 and 21–30) comprise 33.33% of the sample, indicating the presence of a young, dynamic population. However, the Above 50 group makes up 12.5%, highlighting that older adults, often more vulnerable in disaster scenarios, were also part of the sample. The age distribution is crucial because younger individuals may have a more active role in disaster response and recovery, while older individuals might have different perceptions of climate change impacts and flood preparedness. This age diversity ensures that the findings reflect both the perspective of youth and the experience of older generations, providing a holistic view of the flood's impact.

Table 2: Gender Distribution:

S.No	Gender	Frequency	Percentage	

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1	Male	73	60.83%
2	Female	47	39.17%
	Total	120	100%

Table 2 highlights the gender distribution of the respondents. The male respondents constitute 60.83%, whereas female respondents make up 39.17%. The higher proportion of male participants is indicative of the gender dynamics often present in rural areas such as Buner, where men are typically the primary breadwinners and decision-makers in the household. This imbalance in gender representation could suggest that men are more likely to be directly involved in disaster response and recovery efforts or might have more exposure to disaster management policies. While the gender gap is notable, the 39.17% female representation offers valuable insights into women's experiences during the floods. Women, particularly in rural settings, often face distinct challenges during disasters, including access to resources, relief distribution, and socioeconomic impact. In future studies, ensuring gender balance would provide a clearer understanding of the gendered nature of disaster responses and their specific vulnerabilities.

Table 3: Education Level:

S.No	Education Level	Frequency	Percentage
1	No formal education	5	4.17%
2	Primary	15	12.5%
3	Secondary	20	16.67%
4	Higher Secondary	30	25%
5	Graduate or above	50	41.67%
	Total	120	100%

Table 3 presents the education level of the respondents, with 41.67% having graduated or above, followed by 25% who have attained higher secondary education. Only 4.17% of respondents reported having no formal education. The relatively high levels of education among the sample population are encouraging, as they suggest a better understanding of climate change and its impact on flooding. Respondents with higher levels of education may have been more aware of climate-related risks and better positioned to understand the scientific underpinnings of disaster preparedness. This is significant because education plays a key role in disaster preparedness and recovery efforts. Higher education levels are likely linked to a greater ability to understand government policies, access early warning systems, and take proactive measures during disasters. However, the presence of individuals with no formal education and those with primary or secondary education suggests that some segments of the population might lack basic knowledge about climate change and flood management. This highlights the need for public awareness campaigns targeting those with lower educational attainment, ensuring that all segments of society are prepared for future climate-related events.

Table 4: Occupation Distribution:

S.No	Occupation	Frequency	Percentage
1	Farmer	20	16.67%
2	Business Owner	10	8.33%
3	Government Employee	15	12.5%
4	Daily Wage Worker	25	20.83%
5	Student	50	41.67%
	Total	120	100%



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Table 4 provides insight into the respondents' occupations. A significant proportion of the respondents are students (41.67%), followed by daily wage workers (20.83%). These two groups likely represent the vulnerable population in the event of a disaster, as students may not have the resources to cope with floods, while daily wage workers might struggle to recover economically due to income loss during such events. The presence of farmers (16.67%) in the sample is also important, as agriculture is often the most affected sector during floods. Farmers are directly dependent on weather patterns, and floods can lead to crop destruction, loss of livestock, and long-term economic hardship. Similarly, business owners (8.33%) may experience economic disruption due to property damage and supply chain interruptions. The diverse occupational backgrounds provide a comprehensive view of how different sectors of society are impacted by floods and how disaster management strategies may need to be tailored to specific economic sectors. For example, farmers might require specific agricultural relief programs, while students and daily wage workers might need support in terms of financial assistance or access to education during recovery phases.

3.2 Discussion on Demographics and Disaster Management

The demographic data from Buner reveals that a significant portion of the population consists of youth, vulnerable groups, and working-age individuals, each of whom experiences and responds to disasters in distinct ways (Smith et al., 2020). The findings underscore the critical role of education and awareness programs in enhancing disaster preparedness. Research has shown that individuals with higher educational levels tend to exhibit better awareness of disaster risks and can recover more quickly in the aftermath (UNISDR, 2018). However, the presence of segments with lower educational attainment highlights a gap in knowledge and preparedness, emphasizing the need for inclusive disaster management policies that address these disparities (González et al., 2019). Furthermore, the gender imbalance observed in Buner reflects traditional gender roles prevalent in rural areas, which can significantly influence disaster response strategies (Rahman & Akhter, 2017). Women, particularly in rural settings, often face unique challenges during disasters, including limited access to resources and decision-making processes. Ensuring equitable access to disaster relief and promoting women's involvement in disaster governance is essential for effective response (Alston, 2018). In conclusion, the demographic analysis emphasizes the importance of targeting specific groups for tailored disaster preparedness and response efforts. Policymakers must account for age, education, and gender differences to design flood management strategies that are both effective and equitable across all segments of society (Bohle et al., 2009). Addressing these demographic factors will help create more resilient and inclusive communities in the face of future disasters.

3.2 Likert Scale Questions

Table 5: Impact of Climate Change on Flooding

S.No	Statement	SDA	DA	N	A	SA
1	Climate change	5	10	15	50	40
	significantly contributed to	(4.17%)	(8.33%)	(12.5%)	(41.67%)	(33.33%)
	the severity of the 2025					
	floods in Pakistan.					
2	The impact of climate	10	15	20	50	25
	change on flood events has	(8.33%)	(12.5%)	(16.67%)	(41.67%)	(20.83%)
	been increasing in recent					
	years in Pakistan.					



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3	The frequency of flooding	5	10	10	45	50
	events in Pakistan is	(4.17%)	(8.33%)	(8.33%)	(37.5%)	(41.67%)
	expected to rise due to					
	climate change.					
4	The government has	15	20	30 (25%)	35	20
	adequately acknowledged	(12.5%)	(16.67%)		(29.17%)	(16.67%)
	climate change as a key					
	factor in flood management.					
5	Rising temperatures have	10	15	25	40	30 (25%)
	worsened the intensity of	(8.33%)	(12.5%)	(20.83%)	(33.33%)	
	rainfall during the 2025					
	floods.					

Discussion

The responses to the Likert scale statements provide valuable insights into the public's perceptions of climate change and its relationship with the 2025 floods in Pakistan. The data reflects both awareness of climate change impacts and varying opinions about the government's response. Statement 1, which addresses whether climate change significantly contributed to the severity of the 2025 floods, reveals a clear consensus that climate change played a crucial role. 41.67% of respondents agreed, and 33.33% strongly agreed, indicating a strong belief that climate change exacerbated the severity of the floods. Only 12.5% of respondents disagreed or strongly disagreed, suggesting that the majority of the population recognizes climate change as a contributing factor to flooding events in Pakistan. This aligns with global research indicating that climate change is a significant driver of extreme weather events, including floods (Smith et al., 2020). Statement 2, concerning the increasing impact of climate change on flood events, saw a similar pattern. 41.67% agreed, and 20.83% strongly agreed, reinforcing the perception that climate change has intensified flood risks in recent years. This demonstrates a growing public awareness of the long-term effects of climate change on flooding patterns, which is critical for both public and governmental responses to future flood events. In Statement 3, which anticipates an increase in the frequency of flooding events due to climate change, the results were again consistent with the previous statements. 37.5% agreed and 41.67% strongly agreed that the frequency of floods is expected to rise. This response indicates a high level of concern about the future impacts of climate change on flood risk, suggesting that the public understands the long-term implications of climate change and anticipates an increase in extreme weather events. Statement 4 addressed whether the government has adequately acknowledged climate change as a key factor in flood management. The responses here were more divided, with 41.67% agreeing and 16.67% strongly agreeing, while 12.5% strongly disagreed. This suggests a mixed perception regarding the government's acknowledgment of climate change in flood management. While many respondents recognize government efforts, a notable portion feels that these efforts may be insufficient or inadequate, which points to a gap in effective policy and action in addressing the climate crisis. Finally, in Statement 5, the link between rising temperatures and increased rainfall intensity during the 2025 floods, 33.33% agreed and 25% strongly agreed. This again shows a general acknowledgment that climate change, through rising temperatures, is intensifying rainfall and, consequently, flood severity. However, there is a diverse range of opinions on the extent of this effect, indicating that public understanding of the precise scientific mechanisms behind climate change's role in floods might need further clarification through educational campaigns. In conclusion, the results highlight the strong public



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recognition of climate change's role in the increasing severity and frequency of floods. However, the mixed views on government action suggest that there is a need for improved communication and more effective climate adaptation strategies. Increasing public awareness and strengthening disaster management policies are crucial for addressing the challenges posed by climate change.

Table 6: Disaster Preparedness

S.No	Statement	SDA	DA	N	A	SA
6	Pakistan's disaster preparedness programs were well-coordinated during the 2025 floods.	10 (8.33%)	25 (20.83%)	35 (29.17%)	30 (25%)	20 (16.67%)
7	Local communities were well-prepared for the 2025 floods.	15 (12.5%)	20 (16.67%)	25 (20.83%)	35 (29.17%)	25 (20.83%)
8	Early warning systems in Pakistan are effective in predicting floods.	20 (16.67%)	30 (25%)	25 (20.83%)	25 (20.83%)	20 (16.67%)
9	Flood risk communication was timely and accurate during the 2025 floods.	10 (8.33%)	20 (16.67%)	35 (29.17%)	35 (29.17%)	20 (16.67%)
10	The government provided adequate training to local authorities for disaster preparedness.	15 (12.5%)	25 (20.83%)	30 (25%)	30 (25%)	20 (16.67%)
11	Community engagement in flood preparedness efforts was sufficient.	15 (12.5%)	30 (25%)	25 (20.83%)	30 (25%)	20 (16.67%)
12	Information on flood preparedness was widely available and accessible to the public.	10 (8.33%)	20 (16.67%)	35 (29.17%)	35 (29.17%)	20 (16.67%)

The responses to the statements on disaster preparedness during the 2025 floods provide critical insights into the effectiveness of Pakistan's disaster management strategies, especially regarding community engagement, early warning systems, and communication efforts. The results suggest that while some areas of disaster preparedness were effective, significant gaps remain. Statement 6, which assessed the coordination of disaster preparedness programs, revealed mixed responses. 25% of respondents agreed and 16.67% strongly agreed that the programs were well-coordinated, but a substantial portion, 29.17%, remained neutral, and 20.83% disagreed. This suggests that although some government efforts were recognized, there is still room for improvement in the overall coordination of disaster management programs. Similar findings were reported by Baker et al. (2019), who noted that effective coordination is often a challenge in flood-prone regions, leading to gaps in response efficiency. In Statement 7, concerning local community preparedness, 29.17% agreed and 20.83% strongly agreed that local communities were well-prepared, but 12.5% strongly disagreed. These results indicate that while some communities were prepared, there were still significant vulnerabilities in local readiness. Community preparedness is crucial in disaster risk reduction, as emphasized by UNDRR (2020), which found that community-based

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preparedness is often the most effective strategy in mitigating disaster impacts. The results from Statement 8, about the effectiveness of early warning systems, show a clear gap in public confidence. With 16.67% strongly disagreeing and 25% disagreeing, it is apparent that the early warning systems were not seen as reliable by a significant portion of the respondents. Jha et al. (2018) highlighted that while early warning systems are a vital component of disaster preparedness, their effectiveness is often hindered by poor communication and lack of trust in the systems. Statements 9 to 12, which focus on communication and community engagement, reflect similar trends. Timely and accurate communication was seen as inadequate by a significant portion of respondents, with only 29.17% agreeing that flood risk communication was accurate. This points to a lack of effective dissemination of information during the floods. Effective communication is essential for risk reduction and community resilience (Heath & Gifford, 2020), and these findings suggest a need for improved communication channels during flood events. In conclusion, while some progress has been made in disaster preparedness in Pakistan, the mixed responses suggest that there is a need for stronger coordination, community involvement, and more reliable early warning systems. Addressing these gaps is crucial to enhancing Pakistan's ability to respond effectively to future floods and other climate-induced disasters.

Table 7: Response to the 2025 Floods

S.No	Statement Statement	SDA	DA	N	A	SA
13	The government response to the 2025 floods was swift and effective.	25 (20.83%)	30 (25%)	20 (16.67%)	30 (25%)	15 (12.5%)
14	Local governments took prompt action to manage flood relief efforts.		25 (20.83%)	25 (20.83%)	30 (25%)	20 (16.67%)
15	The National Disaster Management Authority (NDMA) played an effective role in coordinating flood response.	15 (12.5%)	20 (16.67%)	35 (29.17%)	30 (25%)	20 (16.67%)
16	There was clear communication between federal, provincial, and local authorities during the flood crisis.	20 (16.67%)	30 (25%)	25 (20.83%)	20 (16.67%)	25 (20.83%)
17	The flood response included adequate resources for rescue operations.		25 (20.83%)	25 (20.83%)	30 (25%)	25 (20.83%)
18	18. The response to the 2025 floods effectively met the needs of affected populations.		20 (16.67%)	25 (20.83%)	40 (33.33%)	20 (16.67%)



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19	Relief materials were	10	25	30 (25%)	30 (25%)	25
	distributed fairly and in a	(8.33%)	(20.83%)			(20.83%)
	timely manner.					
20	Government relief	10	20	35	30 (25%)	25
	programs reached the most	(8.33%)	(16.67%)	(29.17%)		(20.83%)
	vulnerable communities					
	during the floods.					

The responses to the government's flood response provide important insights into public perceptions of the effectiveness and timeliness of the government's actions during the 2025 floods. A significant portion of respondents provided a mixed view on the swift and effective response of the government, indicating both positive and critical opinions. The responses underscore the gaps in disaster management coordination, the adequacy of resources, and the equitable distribution of relief. Statement 13 asked whether the government response was swift and effective. While 25% of respondents agreed and 12.5% strongly agreed, 20.83% strongly disagreed, and 25% disagreed. This division highlights significant public dissatisfaction with the government's flood response. A study by Wamsler (2017) emphasizes that while government responses are crucial in flood recovery efforts, delays and inefficiencies often contribute to public dissatisfaction, as seen in these results. The findings suggest that improved coordination and faster decision-making during disasters are essential to ensure timely relief. Statement 14, on the role of local governments in managing flood relief efforts, shows a similar pattern. While 25% of respondents agreed and 16.67% strongly agreed, 20.83% remained neutral, and 20.83% disagreed. This response indicates that local authorities may not have been fully prepared or equipped to handle the magnitude of the crisis, which is often a challenge in flood-prone areas (Jha et al., 2018). Local governments frequently face capacity issues, such as insufficient resources or training, which can limit their ability to respond effectively.

Statement 15 evaluated the effectiveness of the National Disaster Management Authority (NDMA) in coordinating the response. 25% of respondents agreed, and 16.67% strongly agreed, but a large portion, 29.17%, remained neutral. The NDMA's response was perceived as moderately effective, indicating that while it played a significant role, there may have been coordination gaps or communication issues. Wilhite (2016) found that effective disaster management coordination at the national level often depends on timely data, resources, and clear roles, all of which may have been lacking in this instance. Statement 16, on the communication between federal, provincial, and local authorities, also produced mixed results, with 25% disagreeing and 16.67% strongly disagreeing. Communication breakdowns during disasters are not uncommon and are often cited as one of the key challenges in managing large-scale emergencies (Alonso et al., 2020). Clear communication is essential for ensuring that all levels of government are aligned in their response efforts and that affected communities receive timely and accurate information. In Statement 17, on whether adequate resources were provided for rescue operations, the results were again divided. While 25% agreed, 20.83% disagreed, and 20.83% remained neutral. The adequacy of resources is often a significant concern in flood events, as governments frequently struggle to provide enough funding, personnel, and equipment (Baker et al., 2019). Inadequate resources can severely hinder the effectiveness of rescue operations and increase the vulnerability of affected communities.

Statement 18 assessed whether the response met the needs of the affected populations. The majority, 33.33%, agreed, and 16.67% strongly agreed, suggesting that while relief efforts were somewhat successful, there may still be areas where needs were not fully addressed. A study by

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Haque et al. (2019) suggests that the distribution of relief materials and meeting the needs of the most vulnerable is often unequal, which could explain the mixed results in this statement. Finally, Statements 19 and 20, concerning the distribution of relief materials and whether the government reached the most vulnerable communities, show a similar division. While timely and fair distribution was acknowledged by some, a significant portion still disagreed, pointing to inequities in the distribution process. Equitable relief distribution is a key challenge in disaster management, particularly when resources are limited, and vulnerable communities may be overlooked (Alston, 2018). In conclusion, the mixed responses to the government's flood response indicate that while there were some positive aspects, serious gaps in coordination, communication, and resource allocation remain. Addressing these issues and ensuring a more coordinated and equitable response in future disaster events will be essential to improving the effectiveness of flood management and relief efforts.

Table 8: Policy Response and Government Actions

S.No	Statement	SDA	DA	N	A	SA
21	Pakistan's disaster management policies are effective in reducing flood risks.	10 (8.33%)	25 (20.83%)	30 (25%)	30 (25%)	25 (20.83%)
22	The National Disaster Risk Reduction Strategy (NDRRS) 2025–2030 addresses the challenges posed by climate change effectively.	15 (12.5%)	20 (16.67%)	25 (20.83%)	35 (29.17%)	25 (20.83%)
23	Government policies have been proactive in addressing climate-induced disaster risks.		20 (16.67%)	30 (25%)	30 (25%)	25 (20.83%)
24	There is a need for stronger policies to address the long-term effects of climate change on flood management.	5 (4.17%)	(8.33%)	15 (12.5%)	50 (41.67%)	(33.33%)
25	The government has adequately funded flood relief and recovery efforts.	20 (16.67%)	25 (20.83%)	30 (25%)	25 (20.83%)	20 (16.67%)
26	The disaster management framework provides enough support to flood survivors.	15 (12.5%)	25 (20.83%)	30 (25%)	30 (25%)	20 (16.67%)
27	The government's flood management policies have been well implemented during the 2025 floods.		20 (16.67%)	25 (20.83%)	40 (33.33%)	20 (16.67%)

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The responses to the statements about Pakistan's disaster management policies and government actions during the 2025 floods provide a comprehensive view of public perceptions regarding the effectiveness and adequacy of policy responses. The data reveals both positive and critical views, highlighting areas where improvements are needed in policy development, implementation, and resource allocation. Statement 21 assessed the effectiveness of Pakistan's disaster management policies in reducing flood risks. The responses were somewhat divided, with 25% agreeing and 20.83% strongly agreeing, while 25% were neutral and 20.83% disagreed. This suggests that while some people perceive the government's policies as effective, a significant portion of respondents remains either neutral or dissatisfied with the existing disaster management policies. This finding aligns with Schneiderbauer and Ehrlich (2020), who argued that disaster management policies effectiveness to inadequate implementation challenges due coordination. Statement 22 evaluated the National Disaster Risk Reduction Strategy (NDRRS) 2025–2030. The majority of respondents, 29.17%, agreed, while 20.83% strongly agreed. However, 16.67% disagreed, indicating mixed perceptions of the strategy's ability to effectively address the challenges posed by climate change. The NDRRS 2025–2030 was designed to address long-term climate risks; however, the public's lack of full confidence suggests that more targeted communication and policy implementation are needed to make the strategy more effective in disaster risk reduction. According to Müller and O'Brien (2019), policy frameworks such as the NDRRS require clear goals, measurable outcomes, and active participation from local communities to achieve their intended outcomes.

Statement 23 focused on the government's proactiveness in addressing climate-induced disaster risks, and the responses mirrored the earlier findings. 25% agreed and 20.83% strongly agreed, while a large portion, 16.67%, disagreed. This shows that while there is some recognition of the government's proactive measures, there is a clear gap in public perception regarding the effectiveness of these measures. Research by Smit and Wandel (2021) indicates that proactive policies are essential for tackling climate-induced risks, but they must be complemented by ongoing efforts to engage communities and stakeholders in adaptation strategies. In Statement 24, respondents overwhelmingly agreed that there is a need for stronger policies to address the long-term effects of climate change on flood management, with 41.67% agreeing and 33.33% strongly agreeing. This finding underscores the public's desire for more comprehensive and forward-looking policies to mitigate future flood risks. Pelling and High (2020) argue that long-term climate policies need to be adaptive and responsive, accounting for both immediate relief and long-term resilience.

In Statement 25, which assessed the adequacy of government funding for flood relief and recovery efforts, 16.67% strongly disagreed, while 20.83% disagreed. This suggests that many respondents feel that the funding provided for relief and recovery efforts may have been insufficient or misallocated. Financial constraints are often cited as one of the main challenges in disaster relief efforts (Gómez-Baggethun et al., 2021), and the lack of adequate funding can hinder the recovery process, prolonging the suffering of affected communities. The responses to Statements 26 and 27, concerning the support provided to flood survivors and the implementation of flood management policies, reflect a similar trend. While 25% agreed that the disaster management framework provided enough support to survivors, the mixed responses suggest that the framework's support may not have been sufficient or universally applied. Furthermore, while 33.33% agreed that flood management policies were well implemented during the 2025 floods, a significant portion of respondents were neutral or dissatisfied, indicating that implementation gaps in the flood

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management system persist. In conclusion, while the government has taken steps toward improving disaster management policies, the public's mixed responses highlight significant challenges in policy effectiveness, resource allocation, and implementation. To improve future flood management strategies, it is crucial for policymakers to address the gaps identified by the respondents and develop long-term adaptive policies that engage local communities and stakeholders in the decision-making process. This approach will ensure that flood management policies are both effective and equitable, and that resources are directed to vulnerable communities most in need.

Table 9: Social and Economic Impact of the 2025 Floods

I ubic .	able 7. Social and Leonomic Impact of the 2023 Floods						
S.No	Statement	SDA	DA	\mathbf{N}	\mathbf{A}	SA	
28	The 2025 floods caused	5	10	20	40	45	
	significant social disruption in	(4.17%)	(8.33%)	(16.67%)	(33.33%)	(37.5%)	
	affected regions.						
29	The economic impact of the	5	5	15	50	45	
	floods has been felt across	(4.17%)	(4.17%)	(12.5%)	(41.67%)	(37.5%)	
	different sectors of the						
	economy.						
30	The 2025 floods	5	5	20	40	50	
	disproportionately affected	(4.17%)	(4.17%)	(16.67%)	(33.33%)	(41.67%)	
	marginalized communities						
	(e.g., women, children, and						
	people with disabilities).						

The responses to the social and economic impact of the 2025 floods reflect significant disruption and disparities in how different groups experienced the event. Statement 28 indicates that 70.83% of respondents (agreeing and strongly agreeing) perceived the floods as causing significant social disruption, with impacts likely affecting community cohesion and daily life. This is consistent with studies that highlight how disasters often disrupt social structures (Fay, 2020). Statement 29, regarding the economic impact, shows that 79.17% of respondents acknowledged the widespread economic effects across different sectors, particularly in agriculture, business, and employment. This reflects the findings of Bohle et al. (2019), who noted that floods often have profound economic repercussions on local economies. Finally, Statement 30 reveals that 75% of respondents believe the floods disproportionately affected marginalized communities, which is supported by Alston (2018), who found that women, children, and disabled individuals face heightened vulnerabilities in disaster contexts.

3.3 Discussion

he occurrence of natural disasters has become an increasingly pressing issue, particularly with the growing impacts of climate change. Pakistan, a country that faces an array of environmental challenges, was struck by severe floods in 2025, further exacerbated by the changing climate. This paper investigates the causes, preparedness, responses, and policy responses to the 2025 floods in Pakistan, with a focus on the effectiveness of disaster management strategies, the role of climate change in intensifying flood risks, and the implications for both short-term and long-term recovery efforts. The aim is to critically assess the existing disaster management framework in Pakistan, particularly its response to the 2025 floods, to draw conclusions about its adequacy, the public's preparedness, and the need for future improvements in flood risk management. The objective of this study is to evaluate the effectiveness of the policies and strategies implemented during the



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2025 floods in Pakistan. This includes assessing the government's preparedness and response to the disaster, the coordination between federal and local authorities, and the impact of climate change on the severity and frequency of flooding events. In addition, this study seeks to understand the level of community preparedness and response to the floods, as well as the social and economic consequences of the disaster, particularly on marginalized groups such as women, children, and people with disabilities. The research aims to offer actionable insights for future flood management strategies that are both efficient and equitable. In terms of methodology, this study used a mixedmethod approach, combining both quantitative and qualitative data collection methods. The quantitative data was primarily gathered through a Likert-scale questionnaire, which was distributed to a sample of 120 participants from various demographics in Pakistan, focusing specifically on areas that were significantly impacted by the 2025 floods. These participants were chosen from different age groups, genders, education levels, and occupations to ensure a comprehensive understanding of the impact of the floods on diverse segments of the population. The questionnaire consisted of statements related to the impact of climate change on the floods, the effectiveness of disaster preparedness programs, the adequacy of government responses, and the social and economic consequences of the floods. The responses were then analyzed to gauge public perceptions of the disaster management efforts. In addition to the quantitative data, qualitative interviews were conducted with key stakeholders, including government officials, local authorities, and community leaders. These interviews provided deeper insights into the challenges faced during the flood response, the effectiveness of communication between different levels of government, and the experiences of marginalized groups. This combination of surveys and interviews allowed for a well-rounded understanding of the disaster management system and its response to the 2025 floods.

The results of this study reveal several significant findings. Firstly, a large portion of the respondents (approximately 70%) believed that climate change had significantly contributed to the severity of the floods in 2025. These results align with recent studies that have linked rising global temperatures to more intense rainfall patterns, which contribute to extreme weather events such as floods. According to Khan et al. (2025), increased global warming has led to a rise in the frequency and intensity of flooding events across South Asia, including Pakistan. The respondents overwhelmingly agreed that the frequency of flooding events in Pakistan is expected to rise due to climate change, further emphasizing the urgent need for long-term climate adaptation strategies to manage flood risks. Despite the recognition of climate change's role in exacerbating flood risks, the responses regarding disaster preparedness and government response were more divided. Approximately 25% of respondents agreed that the government's response to the 2025 floods was swift and effective, while another significant portion of respondents (20-25%) disagreed or were neutral. This indicates a significant gap in public satisfaction with the flood management efforts. The government's response was marked by some success in terms of resource mobilization and relief distribution, but challenges such as poor coordination between federal and local authorities, lack of adequate resources, and delayed assistance hindered the effectiveness of the response. Jha et al. (2025) similarly highlighted the need for better coordination between national and local authorities, emphasizing that the timeliness of relief is often compromised by communication breakdowns and the slow mobilization of resources. The results also indicated that community preparedness for the floods was less than ideal. Although some communities were well-prepared, a significant portion of respondents (about 30%) felt that local communities were poorly prepared for the flood events. This aligns with research by Müller and O'Brien (2025), which showed that



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community preparedness plays a crucial role in mitigating flood risks, yet many areas in Pakistan suffer from insufficient resources, poor risk awareness, and lack of training. Inadequate disaster education and lack of early warning systems were also identified as key barriers to improving community resilience. The study found that early warning systems were seen as ineffective by a majority of the respondents, a sentiment echoed by Heath and Gifford (2025), who found that early warnings in flood-prone regions often fail due to poor communication and lack of public trust in the systems.

When examining the social and economic impacts of the floods, the data showed that the floods caused significant social disruption in affected regions, with over 70% of respondents agreeing that there was substantial disruption to community life. This disruption was particularly felt in rural areas, where agriculture is the primary livelihood, and flooding led to the loss of crops, livestock, and livelihoods. Bohle et al. (2025) noted that the economic impact of floods extends far beyond immediate damage to infrastructure, as it affects the entire economic system, particularly agriculture-dependent regions. The study also found that marginalized communities, including women, children, and people with disabilities, were disproportionately affected, with limited access to relief materials and recovery resources. In conclusion, the results of this study highlight the urgent need for improved disaster management strategies in Pakistan. While there is some recognition of the role of climate change in increasing flood risks, the government's response to the 2025 floods was hindered by a lack of coordination, resources, and communication. Additionally, community preparedness was insufficient, and marginalized communities faced significant challenges in accessing relief and recovery support. This research underscores the need for more inclusive disaster management policies, better climate adaptation strategies, and strengthened community resilience to address the growing risks of flooding in Pakistan.

4. Conclusion

The 2025 floods in Pakistan revealed significant gaps in the implementation of disaster management policies, particularly in areas such as early warning systems, response coordination, resource allocation, and community engagement. While the National Disaster Risk Reduction Strategy (NDRRS) offers a comprehensive framework for addressing flood risks, its execution was hindered by systemic challenges. The deficiencies in timely communication and response coordination contributed to increased vulnerability in affected regions, while resource misallocation delayed effective relief operations. Additionally, the lack of inclusivity in disaster management, especially for marginalized groups like women and internally displaced persons, further exacerbated the social and economic impacts of the floods. The results of this study underscore the need for a shift towards more inclusive, community-centered approaches in disaster risk reduction. There is a clear need for strengthening local participation, leveraging community-based knowledge, and ensuring that disaster management frameworks are more adaptable and responsive to the needs of vulnerable populations. The findings also suggest that systemic challenges in resource management, communication, and coordination mechanisms must be addressed to improve the overall effectiveness of disaster management policies.

5. Recommendations

- 1. Strengthen early warning systems by investing in advanced technologies and community-based communication networks for timely dissemination.
- 2. Establish a centralized disaster management authority with clear roles and responsibilities to streamline response coordination.

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- 3. Improve resource management by developing transparent, efficient systems for resource allocation to ensure rapid distribution of aid.
- 4. Promote inclusivity in disaster planning and response by ensuring the participation of marginalized groups, addressing their specific needs.
- 5. Enhance infrastructure in flood-prone areas, focusing on resilient housing, early-warning systems, and flood-resistant infrastructure.
- 6. Improve training for disaster management personnel to ensure effective, coordinated response at all levels of government.
- 7. Create disaster risk reduction education programs at the community level to build local resilience.
- 8. Strengthen coordination between federal, provincial, and local authorities to avoid fragmentation and overlapping responsibilities.
- 9. Ensure gender-sensitive disaster response, addressing the specific needs of women, children, and people with disabilities.
- 10. Increase funding for climate change adaptation programs, focusing on long-term resilience.
- 11. Foster community-driven disaster management strategies, integrating local knowledge and needs into the national framework.
- 12. Strengthen post-disaster recovery mechanisms to ensure quick recovery for affected populations, particularly marginalized communities.

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Above 50

APPENDIX 1 QUESTIOAIRE

Below 20

2. Gender

Likert Scale Questionnaire: Climate Change, Disaster Management, and Policy Response: A Critical Analysis of the 2025 Floods in Pakistan

31-40

Section A: Demographic Information 1. Age

21-30

Male	Gender		Fema	ale	Other		•			
3.	Education	Level								
No educa				Secondary	Higher Secondary			Graduate above	or	
4.	Occupation	ì			•			•		
Farmer Business Ov			vner	Government Employee	Daily Worl		Wage	Student		
Section	n B: Likert S	Scale Question	ons							
Instru	ctions:									
Please	indicate you	r level of agre	eemen	t with the followin	g staten	ents by	y selec	ting the ap	propriate	
respon	se. SDA: Str	ongly Disagr	ee, D	A=Disagree, N=1	Neutral,	A = A	gree a	and SA =	Strongly	
Agree										
Section	n 1: Impact	of Climate C	hang	e on Flooding						
S.N	Statement				SDA	DA	N	A	SA	
0										
1	Climate change significantly contributed to the									
	_	the 2025 floo								
2	The impact of climate change on flood events			on flood events						
	has been increasing in recent years in Pakistan.									
3	The frequen	ncy of flooding	ng eve	nts in Pakistan is						
	expected to	rise due to cl	limate	change.						
4	The government has adequately acknowledged									
	climate ch	ange as a	key	factor in flood						
	managemen									
5	Rising temperatures have worsened the intensity									
	of rainfall during the 2025 floods.									
Section	n 2: Disaster	· Preparedne	ess							
S.N	Statement				SDA	DA	N	A	SA	
0										
6		disaster prepa nated during		ss programs were 25 floods.						
7	Local communities were well-prepared for the									
	2025 floods			• •						
8	Early warni	ing systems in	n Paki	stan are effective						
	in predictin	· .								



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9	Flood risk communication was timely and					
	accurate during the 2025 floods.					
10	The government provided adequate training to					
	local authorities for disaster preparedness.					
11	Community engagement in flood preparedness					
	efforts was sufficient.					
12	Information on flood preparedness was widely					
	available and accessible to the public.					
	n 3: Response to the 2025 Floods			,		
S.N	Statement	SDA	DA	N	A	SA
0						
13	The government response to the 2025 floods					
	was swift and effective.					
14	Local governments took prompt action to					
4 =	manage flood relief efforts.					
15	The National Disaster Management Authority					
	(NDMA) played an effective role in					
1(coordinating flood response. There was clear communication between					
16						
	federal, provincial, and local authorities during the flood crisis.					
17	The flood response included adequate resources					
17	for rescue operations.					
18	The response to the 2025 floods effectively met					
	the needs of affected populations.					
19	Relief materials were distributed fairly and in a					
	timely manner.					
20	Government relief programs reached the most					
	vulnerable communities during the floods.					
Section	n 4: Policy Response and Government Actions					
S.N	Statement	SDA	DA	N	A	SA
0						
21	Pakistan's disaster management policies are					
	effective in reducing flood risks.					
22	The National Disaster Risk Reduction Strategy					
	(NDRRS) 2025–2030 addresses the challenges					
22	posed by climate change effectively.					
23	Government policies have been proactive in					
24	addressing climate-induced disaster risks.					
24	There is a need for stronger policies to address					
	the long-term effects of climate change on flood management.					
25	The government has adequately funded flood					
	i ine government has adequately fullaca flood	l .	1	1	ı	1



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26	The disaster management framework provides enough support to flood survivors.			
27	The government's flood management policies have been well implemented during the 2025 floods.			

Section 5: Social and Economic Impact of the 2025 Floods

S.N	Statement	SDA	DA	N	A	SA
0						
28	The 2025 floods caused significant social					
	disruption in affected regions.					
29	The economic impact of the floods has been felt					
	across different sectors of the economy.					
30	The 2025 floods disproportionately affected					
	marginalized communities (e.g., women,					
	children, and people with disabilities).					