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INSTITUTIONAL LEARNING TO MANAGE THE NATURAL DISASTERS IN PAKISTAN AND INDIA

Author 1:	DR. KIRAN SAMI, Professor and former Chairperson, Department of Political Science, University of Sindh. Pakistan, Email: kiran.sami@usindh.edu.pk
Corresponding & Author 2:	DR. BISHARAT ALI LANJWANI, Assistant Professor, Department of Political Science, University of Sindh, Pakistan Email: bisharat.lanjwani@usindh.edu.pk
Author 3:	MR. ABDUL GHAFFAR JAMALI, Education Activist and Freelancer, Private Tutor, Pakistan Email: ghaffarjami.b@gmail.com

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Abstract

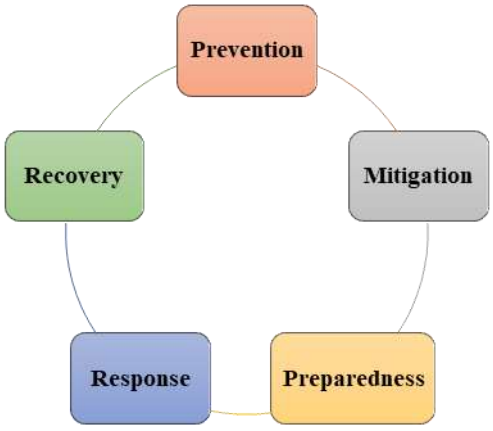
This paper seeks to review, compare, and descriptively analyze the institutionalization and organization of the Disaster Management System (DMS) in Pakistan and India. This article aims to study the effectiveness and efficacy of the DMS in both countries by looking at the situation through depoliticized prisms. Through the comparative method documentary analysis, the paper identifies the common links between strengths and weaknesses in both countries and suggests recommendations for improving the available mechanisms to dissuade the effects of natural disasters across borders. The introduction describes DMS in Pakistan and India by reporting the risk profiles of both countries followed by the organization and institutionalization at different tiers of the government. The available precedents show signs of cooperation in minimizing the damage caused by post-natural disasters in Pakistan and India. The results reveal that there have been difficult phases where both countries helped each other in calamities. After the Gujrat earthquake in 2001, the Pakistani military provided significant aid to India which facilitated the first recent conversation between the two nations since a military coup in Pakistan two years prior. This support by Pakistan led to the Agra Summit five months between the two archrivals and later when a powerful earthquake struck both India and Pakistan in October 2005, efforts were made by the Indian side to provide relief and rescues. These results suggest possible actionable policy recommendations for both countries to minimize the effects of natural disasters and seek cooperation at the institutional level.

Keywords: Disaster, Management, Framework, Mitigation, Cooperation.

Introduction

A disaster is a sudden event that causes widespread loss of life and property, significantly disrupting a community's or society's daily functioning. (UNDRR) These "disasters can be natural or man-made," Singh, V. P. (1996), and the severity of the damage depends on the characteristics of the affected population and their environment. The United Nations defines a disaster as "a severe disruption to the functioning of a community or society at any scale due to the interaction of exposure, vulnerability, and capacity in the face of hazardous events. This disruption can result in human, material, economic, and environmental impacts." (UNDRR). According to the International Federation of Red Cross (IFRC), "a disaster occurs when a threat affects vulnerable people. It results from a combination of vulnerability and the failure to reduce the potential negative consequences of disaster risk". (www.ifrc.org). There are many types of disasters, such as natural disasters, which include earthquakes, landslides, tsunamis, volcanic activity, avalanches, floods, droughts, forest fires, and disease outbreaks. Some are man-made disasters, which result from human activities and often occur in or near human settlements. These include environmental degradation, pollution, industrial, technical, and transport accidents, and complex emergencies. Some "disasters result from multiple hazards or a complex combination of natural and man-made causes. These include food insecurity, epidemics, armed conflict, and population displacement." Shaluf, I. (2007). "Managing disasters systematically is known as disaster management, which involves rapidly preparing for and responding to disasters to minimize damage." Nikbakhsh, E., & Farahani, R. Z. (2011) This process includes strategically managing resources and handling disaster prevention, preparedness, response, and recovery responsibilities. Disaster management addresses disasters' human, material, economic, and environmental impacts. It focuses on managing events that significantly impact a community. Effective disaster management requires a combination of efforts by individuals, households, organizations, and various levels of government. The primary goal of disaster management is to prevent disasters or, when that is not possible, to reduce their harmful effects. (Tulane University, 2021). The five steps of disaster management are prevention, mitigation, preparedness, response, and recovery. Prevention focuses on stopping hazards from occurring, whether they are natural, technological, or man-made. Mitigation aims to reduce the impact of disasters and emergencies on life and property, thereby minimizing damage. Coppola, D. (2006). Preparedness involves proactive measures that contribute to disaster risk reduction and ensure an effective response to potential hazards. Houston, J. B., et al. (2019).

Fig 1. The five-step cycle of disaster management



Research Objective

1. To conduct a comprehensive analysis of the institutional frameworks of disaster management in India and Pakistan.
2. To find gaps and challenges within these frameworks, specifically focusing on disaster preparedness and response capabilities, the objective of this research is to evaluate the effectiveness of inter-country cooperation, assess the adequacy of training programs for disaster management personnel, and explore

the impact of education and awareness initiatives on disaster risk reduction.

Research Questions

1. What are the key components of the disaster management frameworks in India and Pakistan?
2. How effectively do these frameworks enable both countries to respond to and manage disasters?
3. What challenges do India and Pakistan face in their disaster management efforts?

Problem Statement

India and Pakistan have developed National Disaster Management Authority (NDMA) institutions over the years functioning as the apex organization responsible for framing policies, plans, and disaster mitigation and management guidelines. The establishment of these mechanisms has been effective in the past two decades but the uphill task of increased risk of natural disasters and the challenges followed by always remains there. Despite political strains and historical enmities, there have been cases of helping each other during and after natural catastrophes. These instances exemplify the urge and need for shared humanity and resilience of both the nations in Pakistan and India as such unwanted natural events are likely to emerge in the future so the potential for collaborative efforts in mitigating the impacts of these disasters is inevitable. For example, the opening of the Line of Control (LoC) from five crossing points in the aftermath of the 2005 earthquake in Kashmir, which affected both the Indian and Pakistani sides, prompted both governments to facilitate the exchange of relief materials across the line. They permitted the unhindered passage of humanitarian aid across borders, showcasing a positive indication and willingness to collaborate amid mutual adversity. Reciprocally, in the wake of the 2010 floods in Pakistan, the Indian side offered financial assistance and relief materials for the affected communities in Pakistan. This gesture was reciprocated in 2014 when floods devastated parts of Indian-administered Jammu and Kashmir, and Pakistan extended an offer of aid and support.

Significance of the Study

This study explores the substantial untapped potential for forging a powerful partnership in disaster mitigation efforts between India and Pakistan. Both countries can benefit from sharing best practices, proficiency, and resources to use their disaster response competencies. Pakistan and India must prioritize building political trust by opening permanent communication channels for fostering collaboration at multiple levels for effectively managing natural disasters. With the support of modern technology, including artificial intelligence, satellite imagery, and data sharing, preparedness and early warning systems can be improved. This study investigates topics like early warning systems, search and rescue operations, and community-based responses, and awareness about disaster management would help the common people. This capacity building will surely foster mutual collaboration and will reach at public level to learn from each other's experiences and expertise. This cutting-edge system will effectively facilitate real-time data sharing and communication between India and Pakistan. This paper suggests that artificial intelligence, satellite data, meteorological information, and ground-level observations, will seamlessly share scientific data to significantly improve preparedness and reduce response time.

Research Methodology

The study uses a comparative research design to assess disaster management strategies in India and Pakistan. This is a research methodology that involves comparing any two things, such as policies, decisions, scientific discoveries, and social behaviors. Comparative research design is an interdisciplinary approach used in fields like social sciences, health sciences, and humanities for conducting research. Mello, P. A. (2021). This paper has adopted a qualitative research approach with

secondary data using existing literature, government reports, policy documents, and case studies on disaster management in both countries. Data from national sectors, including international bodies such as the United Nations, have also been collected and analyzed. The research focuses on post-2005 data and disasters, as new disaster management authorities are established in both countries over the same period. This period marks important developments and major disaster research efforts in India and Pakistan, providing a comprehensive view of their disaster response practices.

Literature Review

India and Pakistan are affected by natural and man-made disasters; both countries face significant risks from various disasters, including floods, earthquakes, droughts, and terrorism, but they have limited resources. This literature review draws critical insights from multiple studies and reports on disaster management in Pakistan and India, highlighting challenges, improvements, and actions. In the literature review, thirteen different papers from India and Pakistan have been analyzed. Azhar (2022) discusses the evolution of disaster management in Pakistan and writes that despite disaster prevention efforts, problems persist in the country, including overlapping responsibilities and conflicting programs that affect citizens through disasters. He discussed ensuring good and better service during natural disasters and making communication systems effective. Khan et al. (2022) presented an analysis of natural and human disasters in Pakistan from 2013 to 2019 and discussed changes and improvements in how they are dealt with disasters. This research has emphasized the importance of continuing economic practices and increasing capital in these areas to improve disaster preparedness and resilience. Cheema (2021) presents an analysis of disaster management and planning in Pakistan in his research, while he describes his analysis of the 2005 earthquake as a post-disaster response in the country while disaster management has been reformed. It has provided various suggestions and recommendations to mitigate the effects of climate change and protect the country from disasters. Rana et al. (2021), while describing their analysis of urban flooding in Pakistan, stressed that the disaster management cycle needs to be explored, and disaster data should be updated. Understand climate change adaptation. They recommended that in this way, major disasters can be avoided. Shakeri et al. (2021) makes a comparative analysis of disaster management systems in India and Nigeria. The study highlights that India's disaster management is more effective due to its improved legal and institutional framework, community participation, and communication mechanisms. However, both countries struggle to mobilize and manage the disaster management fund due to a lack of transparency, especially at the state and local levels. The study shows that the two countries mainly focus on natural disasters. Fayyaz & Bussell (2017) highlight that while natural hazards cannot be eliminated, they can be mitigated through effective disaster risk management and strategies that involve multi-sectoral efforts to build social resilience. Thattai et al. (2017) focus on India's natural disaster management, particularly floods and storms. Their study emphasizes the importance of early warning systems and community-based approaches to enhance preparedness and response. Research shows that while significant progress has been made, ongoing efforts are needed to improve infrastructure and community awareness to deal with such disasters effectively (Ahmed et al, 2020). Malik, M., & Cruickshank (2016) identify critical challenges in disaster management, such as lack of construction methodology, awareness, and historical seismic data. Ahmed (2013) critically reviewed the Pakistan Disaster Management Act 2010 (PNDMA 2010). The Act primarily focuses on building institutions and

developing action plans but lacks explicit provisions for disaster risk reduction. Ahmed suggests that the Act is reactive rather than proactive, highlighting the need for revision to include proactive measures to reduce disaster risk. Kaur (2006) highlights several administrative challenges that have historically affected India's Disaster Management efforts, such as poor communication at the local level, lack of early warning systems, and inadequate training for respondents. These problems have contributed to past slow and unsuccessful responses to disasters. However, establishing disaster management authorities at the state and district levels aims to bridge these gaps by providing better communication and monitoring. Moreover, a document published by the Government of India named "Disaster Management in India: A Status Report" (www.undp.org) provides a comparative perspective, highlighting India's approach to disaster management. This report can serve as a benchmark for India, outlining successful initiatives, including a solid institutional framework, a comprehensive disaster preparedness plan, and proactive mitigation measures. Similarly, The Government of Pakistan's National Disaster Risk Management Framework (2007) outlines the country's basic disaster management measures. It stresses the need for an integrated approach to disaster preparedness, response, mitigation, and recovery. (https://ndrmf.pk/) The framework advocates the establishment of robust institutional mechanisms to effectively manage emergencies, emphasizing the importance of integrating Disaster Risk Reduction (DRR) into national development policies. The literature review highlights many challenges and ongoing reforms in India and Pakistan's disaster management landscape.

Disaster Scenarios in India and Pakistan

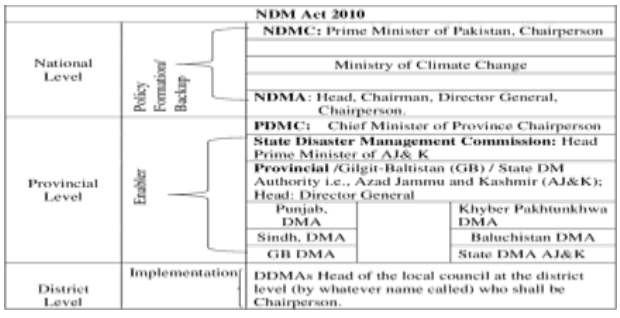
Pakistan and India frequently face natural calamities and disasters. Both countries are traditionally affected by natural disasters due to their unique geographical situation, which influences their weather patterns, and experience frequent floods, droughts, cyclones, earthquakes, landslides, and epidemics. Heavy rains, hurricanes, and diseases are common in both countries. Despite these challenges, Pakistan and India have consistently relied on their internal resources to manage and respond to these disasters.

Framework of Disaster Management in Pakistan

In 2006, Pakistan introduced the National Disaster Risk Management Framework (NDRMF) (phkh.nhsrc.pk) to improve the country's disaster management system. The institute was created in consultation with national-level experts and government officials, including people from the provincial and local levels. Plans are also made to sensitize citizens to community mobilization and promote disaster management activities in schools and colleges. The responsibilities of this institution include four main areas: disaster prevention and mitigation, another is disaster preparedness, the third is disaster response, and the fourth primary responsibility is post-disaster rehabilitation and recovery (NDRMF 2006). The institute was created after the devastating 2005 earthquakes in Azad Jammu and Kashmir and Khyber Pakhtunkhwa. It also aims to mitigate the effects of future disasters and develop a comprehensive system for rehabilitating disaster-affected citizens. (NDRMF 2006), The government issued the National Disaster Management Ordinance in 2006. It established the National Disaster Management Commission (NDMC) and the National Disaster Management Authority, after which the National Disaster Management Authority (NDMA) is working at the national level, while the Provincial Disaster Management Authorities (PDMA) is working at the provincial level. Earlier, the country had the Calamity Act of 1958, (https://pdma.punjab.gov.pk) but the 2005 earthquake made it necessary to formulate a

strong policy and institutional framework to mitigate the effects of disasters. As a result, the government issued an ordinance in 2006 to create a comprehensive system to protect the country from catastrophe, through which work began on a comprehensive system to reduce disasters. According to this Act (National Disaster Management Ordinance 2006), institutions have been established to deal with disasters at the country's central, provincial, and district levels. Its headquarters is in Islamabad, the highest policy and decision-making body for disaster and risk management. This agency was initially established under the Ministry of National Disaster Management but was later renamed the Ministry of Climate Change (MoCC) in 2012. Similarly, a Provincial Disaster Management Commission (PDMC) and a Provincial Disaster Management Authority (PDMA) have been established in each province of the country, with their headquarters in their provincial capitals, to implement the practical policies of the NDMA. After this, District Disaster Management Authorities (DDMAs) are established at the local level in each district, which manage disaster risks in their respective districts. Overall, this time, a systematic framework for disaster reduction and recovery has been developed, which is a safe and flexible framework that includes the capacity to work at all levels of management and all levels of the community. This framework focuses on local-level risk assessment and community-based preparedness activities, disaster management and primary recovery efforts, coordination, and resource mobilization.

Fig. 2. Institutional Framework of NDMA Pakistan

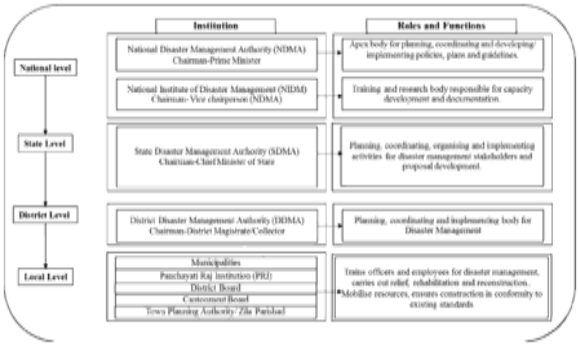


Farmwork Of Disaster Management in India:

The National Disaster Management Authority is the apex body in India, responsible for dealing with disaster situations and formulating policies. The agency was implemented by the Government of India in 2005. (http://www.ndma.gov.in/). The responsibilities of the agency include planning disaster management, reducing the risk of any disaster and taking appropriate measures to always deal with any disaster, considering the risk and severity of its consequences, being prepared and assessing the severity of the effects of any disaster and take appropriate measures for prevention, relief, rehabilitation, and reconstruction. This body formulates policies to deal with disasters, approves the national plan, and instructs various ministries or departments of the country to coordinate their development plans and measures to prevent or reduce the effects of disasters. This organization was designed to deal with significant disasters in the country and aid other affected countries. The organization also conducts several training courses at the national level, in which government officials, institutions, and community members are invited to prepare for reduction and response during a crisis or disaster and train others. The agency works under the Ministry of Home Affairs, while the National Disaster Management Authority in Pakistan works under the Ministry of Climate Change. The head of the institution is the Prime Minister of India, and there are nine other members, but after 2020, they have become four members. The member secretary can also act as the vice-chairperson if needed. (www.ndma.gov.in). Apart from this, the Special Secretaries/Additional Secretaries of the Ministries/Departments of Health, Water, Resources, Environment and Forest, Agriculture, Railways, Atomic Energy, Defense, Chemicals, Science and Technology, Telecommunication, Urban Employment, and Poverty Alleviation will also be included. This

organization works with provincial governments to deal with disasters, relief, and rehabilitation. Disaster management authorities have been established in the provinces under the Chief Minister; apart from this, at the district level, the District Magistrate and the Deputy Commissioner are carrying out their existing responsibilities related to response and relief, while at the village level, elected representatives, government officials including doctors/paramedical staff of primary health centers, primary school Teachers etc are involved in case of emergency. This institution is responsible for setting policies, plans, and guidelines for management in disaster situations so that disasters can be diagnosed promptly and the response to them can be minimized.

Fig. 3. Institutional framework of disaster management in India Madan, A., & Routray, J. K. (2015).



Major Disasters Occurring in Pakistan

Pakistan is prone to many natural disasters, the country is prone to floods, earthquakes, cyclones, and droughts. Sometimes there is a lot of famine in this country and sometimes there is a heavy monsoon.

Flood: Pakistan has frequent floods, and the country's history is full of floods, the floods that occurred after 2005 were discussed here, including the 2007 floods that hit Khyber Pakhtunkhwa, Sindh, and the coastal area of Balochistan, these areas of the country were badly affected by the monsoon rains, that results over 100,000 people were displaced, and more than 800 villages were submerged. (Relief Web) However, the International Federation of Red Cross and Red Crescent Societies estimates that approximately 300 lives were lost across the country, and 550,000 people were displaced. Pakistan was then hit in 2010 when massive floods caused by record-breaking rains affected Sindh, Balochistan, and Khyber Pakhtunkhwa. This was one of the worst floods in Pakistan's history, affecting 20 million people according to reports from the National and Provincial Disaster Management Authority. The death toll was reported to be 1,781, with 2,966 people injured. Over 1.3 million people were rescued, while more than 1.89 million homes were destroyed across the country. Cross, S. R. (2010), the number of people affected by floods is higher than the 2005 Kashmir-Khyber Pakhtunkhawa earthquake combined. (www. mowr.gov.pk). To add to the wounds of the 2010 floods, monsoon-induced floods in Sindh in 2011 killed at least 361 people and affected an estimated 5.3 million. Provincial Disaster Management Authority Sindh (2011). Monsoon rains in 2012 resulted in floods in Khyber Pakhtunkhwa, Southern Punjab, and Northern Sindh, "and affected a total population of about 4.85 million (0.887 million in Punjab, 3.174 million in Sindh, & 0.788 million in Balochistan provinces, affecting 14,159 villages, claiming about 571 lives, damaging 636,438 houses & cropped area of about 1.172 million acres." Ministry of Water and Power (2012). In 2020, Karachi experienced the heaviest single-day rainfall in its history when 231 mm of rain fell in just 12 hours (Pakistan Meteorological Department (2020). Rainwater and runoff from drains flooded most of the main roads and streets in residential areas, adversely affecting people's lives. In 2022, floods affected most of Pakistan. Sindh and Balochistan were the most affected. The 2022 flood was the most devastating in Pakistan's history after the 2010 flood, affecting nearly 33 million people, causing $14.8 billion in damages, and resulting in 1,739 deaths. According to the report, over 1,000 people lost their lives in Sindh, and 800,000

were displaced. Additionally, 45% of schools in Sindh were destroyed, impacting more than 2.3 million students, and there was significant nutritional loss as well. UNICEF (2023).

Earthquake: Pakistan's land lies on the Indo-Australian plate, which is prone to earthquakes, the largest earthquake in Pakistan in recent decades was the Azad Kashmir and Balakot earthquake of 2005, which recorded a magnitude of 7.6, and about 86,000 people were killed by this earthquake, while more than 70,000 people were injured. The city of Balakot was destroyed by this earthquake, while Muzaffarabad was also badly damaged. Relief Web (2006). In 2008, a magnitude 6.5 earthquake struck Ziarat in Balochistan, killing 160 people and injuring nearly 200 BBC (2008). In 2013, two earthquakes occurred in the Awaran region of Balochistan, with magnitudes of 7.2 and 6.8, killing 399 people and injuring 599. (Provincial Disaster Management Authority). In 2015, a magnitude 7.5 earthquake was recorded in Badakashan, due to which 248 people were killed while 1665 were injured, and damaged 25,367 houses. In 2019, an earthquake of magnitude 5.6 occurred in Mirpur, Azad Kashmir, killing 40 people and injuring 852 people. NDMA (2019). Similarly, the earthquake in Balochistan in 2021 had a magnitude of 5.9 killing 20 people and injuring many people. Francis, E (2021).

Cyclone: In 2007, Cyclone Gonu hit southwest Pakistan, bringing heavy rains and strong winds to Gwadar, damaging dozens of boats and school buildings, nearly 250,000 people were displaced in the districts of Gwadar and Kech in Balochistan province, and 11,000 livestock were killed. (PDMA Balochistan). In the same year, Yemyin, a powerful cyclone that developed over the Bay of Bengal, hit Pakistan, killing 730 people in Karachi, Ormara, and Pisni, and affecting the lives of 2 million people in Pakistan. Cyclone. (Centre for Research on the Epidemiology of Disasters.) In 2010, Cyclone Phet brought heavy rains along the Makran coast, which damaged 10,000 houses, Phet killed at least 16 people in Pakistan, and damages were estimated at Rs 7 billion (US $ 81 million). NASA (2010).

Major Disasters Occurred in India

Natural disasters are a common occurrence in India, often resulting in significant loss of life and property. Climate change has led to extreme weather events such as heavy rainfall, droughts, earthquakes, landslides, and tsunamis, which have repeatedly devastated the country. This section discusses some major incidents in India since 2005.

Earthquakes While no significant earthquakes occurred in our study area during the period under review, a major earthquake and tsunami struck in 2004, resulting in nearly 10,000 deaths, with 5,640 people reported missing, and thousands displaced. (The Indian Express, 2019).

***Floods*:** Floods due to monsoons are common in India. Every year, heavy rains lead to flooding. Notable examples include the 2015 Gujarat flood, which resulted in at least 72 deaths (Firstpost, 2015). In Bihar, the 2017 flood claimed over 250 lives, displaced approximately 850,000 people, and caused the death of 152 animals (Khalid, S. 2017). Similarly, the 2018 Kerala floods led to over 489 deaths, with 15 people reported missing. The World Bank estimated the total economic loss at $3.4 billion, while the UN estimated the recovery cost at $3.7 billion, with 1.1 million people temporarily displaced (Rajiv Gandhi Institute of Development Studies, 2018). In Hyderabad, the 2020 floods caused 33 deaths and displaced around 40,000 families, resulting in property damage worth 6.7 billion (Rangari, V.A., Bhatt, C.M., & Uma Mahesh, N.V., 2021). In 2021, Uttarakhand faced multiple weather-related disasters, including floods, landslides, and avalanches, leading to approximately 300 deaths, 66 missing persons, and over 100 injuries (Singh, R., Aryan, V., & Joshi, M., 2022).

Cyclones: A large part of India's coastline is vulnerable to tropical cyclones, especially in

the Indian Ocean and the Bay of Bengal. These cyclones bring heavy rains, storms, and strong winds, making relief efforts challenging. Cyclones peak between May and November, with an average of eight cyclones per year, reaching speeds of 63 km/h (India Bloom News Service). In 2019, Cyclone Fani affected 24 districts across the states of Odisha, West Bengal, and Andhra Pradesh, impacting 28 million people according to a UNICEF report (UNICEF, 2019). Cyclone Amphan in May 2020 caused widespread damage in India and Bangladesh, resulting in at least 77 deaths in India and displacing 4.9 million people. It was the most powerful cyclone since the 1999 Odisha Cyclone and the most expensive cyclone recorded in India and the northern Indian Ocean (Relief Web). After the Super Cyclone Amphan, Cyclone Nisarga struck in May 2020, causing significant destruction (National Disaster Response Force, 2020).

***Fires*:** The 2020 Assam Gas and Oil Spill, also known as the Baghjan Gas Leak, was a natural gas explosion at the Baghjan Oil Field of Oil India Limited in Tinsukia district, Assam. The fire, which started on May 27, 2020, was controlled on November 15, 159 days later, making it India's longest-burning oil well (Gogoi, S., Barua, B., & Chetiya, A., 2022; Dutta, Y., & Kalita, S., 2024). Additionally, a fire in Delhi, the national capital of India, resulted in 24 deaths. Delhi Fire Services (DFS).

Conclusion

Owing to their geographical closeness and shared climatic conditions, both Pakistan and India are situated in a region that is acutely vulnerable to natural calamities. The northern region of Pakistan and some areas of India are situated in seismically active areas, resulting in frequent earthquakes and massive landslides caused by heavy monsoon rains. In India, the frequency of cyclones along its eastern coast and yearly floods during the monsoon season are the big challenges, followed by the earthquakes in the Himalayan region. Both countries have witnessed high damages caused by climate change, increasing day by day. This shared susceptibility to natural disasters highlights the need for a robust institutional framework for coordinated efforts to mitigate and respond to the effects of natural calamities. As past natural disaster occurrences suggest, both Pakistan and India, by adopting these policy suggestions, can improve their disaster mitigation efficiencies and can foster a spirit of cooperation resulting in mutual benefits for communities living in disaster-prone areas across the borders in both countries. These joint efforts will help create an environment for developing disaster resilience strategies. They will also aid in reducing the impacts of natural disasters and strengthening the political trust between the two countries. The mutual vulnerabilities to natural disasters provide an opportunity for India and Pakistan to cooperate, despite historical and current political challenges. By drawing on shared experiences across borders, a successful framework for collaboration can be improved. The available platform of SAARC institutions can be instrumental in devising an institutional response to reduce the impact of future disasters. Fostering a culture of cooperation and solidarity will ultimately benefit not only the people of India and Pakistan but also the broader South Asian region.

Recommendations

1. *Establish a Joint Early Warning System*

It's significant to create a jointly run early warning system for disasters such as cyclones, floods, and earthquakes. Getting benefits from satellite data, real-time monitoring, and predictive models, India and Pakistan have timely alerts for better readiness to face the challenge of natural disasters.

2. Develop a Cross-Border Disaster Management Framework

Better institutionalization of the bilateral agreement for natural disasters is the need of time. This will speed up the response and better coordination. The creation of a joint task force responsible for executing rapid response

initiatives, sharing resources, and engaging in coordinated relief efforts, will help the affected people across the borders whenever natural disasters occur.

3. ***Promote Knowledge and Technology Sharing***

Foster collaboration in research and development related to disaster-resilient technologies, infrastructure, and planning. Both countries should exchange best practices in climate-adaptive agriculture, urban planning, and resilient construction, utilizing their shared experiences in managing similar disaster risks.

4. ***Enhance Regional Data Sharing and Forecasting***

Strengthen the sharing of meteorological, geological, and hydrological data to improve disaster forecasting and risk assessments. This would facilitate more accurate predictions of extreme weather events and better disaster preparedness, particularly for flood-prone areas along shared river systems like the Indus.

5. ***Build Capacity through Joint Training and Simulation Exercises***: Conduct joint training programs, simulation drills, and workshops for disaster response teams, NGOs, and local governments. By training personnel in both countries to work together, India and Pakistan can improve coordination and enhance their capabilities to manage disaster situations more effectively.

References

Ahmed, M., Minhas, S., & Hussain, T. (2020). Environmental journalists' perspective on the coverage of environmental issues in media of Pakistan. Journal of Peace, Development, and Communication, 4(2), 419-432.

Ahmed, Z. (2013). Disaster risks and disaster management policies and practices in Pakistan: A critical analysis of Disaster Management Act 2010 of Pakistan. International Journal of Disaster Risk Reduction, 4, 15-20. https://doi.org/10.1016/j.ijdrr.2013.02.003.

BBC. (2008, October 29). *Scores dead after Pakistan quake.* Retrieved from http://news.bbc.co.uk/2/hi/south_asia/7696639.stm

Centre for Research on the Epidemiology of Disasters. (n.d.). EM-DAT: The Emergency Events Database. Université catholique de Louvain. Retrieved from https://www.emdat.be/

Cheema, A. R. (2021). Disaster management in Pakistan. In The role of mosque in building resilient communities: Widening development agendas (pp. 51-93). Singapore: Springer.

Coppola, D. (2006). Introduction to international disaster management. Elsevier.

Cross, S. R. (2010). Pakistan Floods: The Deluge of Disaster-Facts & Figures as of 15 September 2010. Singapore Red Cross Society, 15.

Dutta, U., & Kalita, S. (2024). An Analytical Case Study of the Oil Well Blowout at Baghjan Oil Field, Assam: a Human and Environmental Perspective.

Firstpost. (2015, August 5). Gujarat floods: 72 people dead, over 81,000 cattle perished due to heavy rains. Retrieved August 23, 2015, from https://www.firstpost.com/india/gujarat-floods-72-people-dead-over-81000-cattle-perished-due-to-heavy-rains-2380592.html

Francis, E. (2021, October 7). Pakistan earthquake kills 20 people, injures hundreds. The Washington Post. https://www.washingtonpost.com/world/2021/10/07/pakistan-earthquake-balochistan-harnai/

Gogoi, S., Baruah, B., & Chetia, A. (2022, December). Baghjan Fire: A Case Study of the '2020 Assam Gas and Oil Leak'at Baghjan Oil Field, Tinsukia, Assam. In 5th World Congress on Disaster Management: Volume II (pp. 483-497). Routledge.

Government of Pakistan, Ministry of Water Resources. (2010). Annual flood report of FFC. Retrieved July 11, 2024, from https://mowr.gov.pk/SiteImage/Misc/files/2010%20Annual%20Flood%20Report%20of%20FFC.pdf.

Government of Pakistan. (2007). National Disaster Risk Management Framework

Pakistan. Islamabad: National Disaster Management Authority.

Houston, J. B., Schraedley, M. K., Worley, M. E., Reed, K., & Saidi, J. (2019). Disaster journalism: fostering citizen and community disaster mitigation, preparedness, response, recovery, and resilience across the disaster cycle. Disasters, 43(3), 591-611.

https://www.undp.org/india/publications/disaster-management-india-status-report

India Blooms News Service. (2010, April 16). Storm toll: 125; PM sanctions ex-gratia. Archived from the original on April 18, 2010. Retrieved from http://www.indiablooms.com/NewsDetailsPage/newsDetails160410i.php

International Federation of Red Cross and Red Crescent Societies (IFRC). (n.d.). What is a disaster? Retrieved August 31, 2024, from https://www.ifrc.org/what-disaster

International Federation of Red Cross and Red Crescent Societies. (n.d.). What is a disaster? Retrieved August 03, 2024, from https://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-disaster/.

International Federation of Red Cross and Red Crescent Societies. (2007, June 29). Pakistan: Cyclone Yemyin/floods emergency appeal No. MDRPK001. ReliefWeb. https://reliefweb.int/report/pakistan/pakistan-cyclone-yemyinfloods-emergency-appeal-no-mdrpk001

Kaur, J. (2006). Administrative issues involved in disaster management in India. International Review of Psychiatry, 18(6), 553-557. https://doi.org/10.1080/09540260601037857.

Khalid, S. (2017, August 21). India's Bihar state reels under unprecedented flooding. Al Jazeera. Retrieved from https://www.aljazeera.com/news/2017/8/21/indias-bihar-state-reels-under-unprecedented-flooding

Khan, I., Ali, A., Waqas, T., Ullah, S., Ullah, S., Shah, A. A., & Imran, S. (2022). Investing in disaster relief and recovery: A reactive approach of disaster management in Pakistan. International Journal of Disaster Risk Reduction, 75, 102975. https://doi.org/10.1016/j.ijdrr.2022.102975.

Madan, A., & Routray, J. K. (2015). Institutional framework for preparedness and response of disaster management institutions from national to local level in India with focus on Delhi. International Journal of Disaster Risk Reduction, 14, 545–555. doi:10.1016/j.ijdrr.2015.10.004

Malik, M., & Cruickshank, H. (2016, June). Disaster management in Pakistan. Proceedings of the Institution of Civil Engineers - Municipal Engineer, 169(2), 85-99. Thomas Telford Ltd.

Mello, P. A. (2021). Qualitative comparative analysis: An introduction to research design and application. Georgetown University Press.

Ministry of Home Affairs, India. (n.d.). Disaster management in India - A status report.

Ministry of Water and Power, Government of Pakistan. (2012). Annual flood report 2012. Islamabad: Author. https://ffc.gov.pk/wp-content/uploads/2020/06/Annual-Flood-Report-2012.pdf

NASA. (2010, June 6). Tropical Cyclone Phet. Retrieved from https://earthobservatory.nasa.gov/images/44210/tropical-cyclone-phet#:~:text=By%20the%20time%20the%20storm,the%20storm%20is%20near%20Karachi

National Disaster Management Authority. (2019, September 26). NDMA situation report No. 04 - Mirpur earthquake 2019 (dated September 26, 2019 @ 1530 hours) [PDF].

National Disaster Response Force. (2020). Cyclone Nisarga 2020. Retrieved from https://www.ndrf.gov.in/operations/cyclone-nisarga-2020

Nikbakhsh, E., & Farahani, R. Z. (2011). 15 Humanitarian Logistics Planning. Logistics operations and management: Concepts and models, 291.

Pakistan Meteorological Department. (2020). Monsoon rainfall report 2020.

https://cdpc.pmd.gov.pk/Monsoon%202020%20Rainfall%20Report.pdf

Provincial Disaster Management Authority Sindh. (2011, September 28). *Situation report*. http://www.pdma.pk/siterip/2809sitrep.pdf

Provincial Disaster Management Authority. (n.d.). Earthquake Awaran 2013. Retrieved from https://www.pdma.gob.pk/disaster-and-climities/earthquake-awaran-2013

Rajiv Gandhi Institute of Development Studies. (2018). Kerala flood 2018: The disaster of the century. Retrieved from https://sdma.kerala.gov.in/wp-content/uploads/2020/08/Rajeev-Gandhi-Centre-Kerala-flood-2018-The-disaster-of-the-century.pdf

Rana, I. A., Asim, M., Aslam, A. B., & Jamshed, A. (2021). Disaster management cycle and its application for flood risk reduction in urban areas of Pakistan. Urban Climate, 38, 100893.

Rangari, V. A., Bhatt, C. M., & Umamahesh, N. V. (2021). Rapid assessment of the October 2020 Hyderabad urban flood and risk analysis using geospatial data. Current Science, 120(12), 1840-1847.

Relief Web. (2006). The Kashmir earthquake of October 8, 2005: Impacts in Pakistan. Retrieved from https://reliefweb.int/report/pakistan/kashmir-earthquake-october-8-2005-impacts-pakistan

Shakeri, E., Vizvari, B., & Nazerian, R. (2021). Comparative analysis of disaster management between India and Nigeria. International Journal of Disaster Risk Reduction, 63, 102448. https://doi.org/10.1016/j.ijdrr.2021.102448.

Shaluf, I. (2007). An overview of disasters. Disaster Prevention and Management: An International Journal, 16(5), 687-703.

Singh, R., Aryan, V., & Joshi, M. (2022). Understanding the flash flood event of 7th February 2021 in Rishi Ganga basin, Central Himalaya using remote sensing technique. Remote Sensing Applications: Society and Environment, 26, 100744.

Singh, V. P. (1996). Disasters: Natural or Man-made. In Hydrology of Disasters (pp. 1-18). Dordrecht: Springer Netherlands.

Thattai, D. V., Sathyanathan, R., Dinesh, R., & Kumar, L. H. (2017, July). Natural disaster management in India with a focus on floods and cyclones. IOP Conference Series: Earth and Environmental Science, 80(1), 012054. IOP Publishing. https://doi.org/10.1088/1755-1315/80/1/012054.

The Indian Express. (2019, November 20). December 26, 2004 tsunami: 12 years on. Retrieved from https://indianexpress.com/article/india/december-26-2004-tsunami-india-thailand-indonesia-srilanka-natural-disaster-earthquake-12-years-on-4445361/

Tulane University School of Public Health and Tropical Medicine. (2021, September 3). What is disaster management? Retrieved August 31, 2024, from https://publichealth.tulane.edu/blog/what-is-disaster-management/

UNICEF. (2019, May 19). Cyclone Fani situation report #2. Retrieved from https://www.unicef.org/media/82111/file/India-Cyclone-Fani-SitRep-12-May-2019.pdf

UNICEF. (2023, August 25). Devastating floods in Pakistan. Retrieved from https://www.unicef.org/emergencies/devastating-floods-pakistan-2022#:~:text=What%20happened?%20The%202022%20floods%20submerged%20one,on%20contaminated%20water%20from%20ponds%20and%20wells.

United Nations Office for Disaster Risk Reduction (UNDRR). (n.d.). Disaster. Retrieved August 31, 2024, from http://www.undrr.org/terminology/disaster

United Nations Office for Disaster Risk Reduction. (n.d.). Disaster. Retrieved August 02, 2024, from https://www.undrr.org/terminology/disaster.