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2022 Floods in Balochistan and the Socio-Economic Context of the Region

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Abstract: *Pakistan has been hit hard by floods in recent decades. Heavy floods are becoming increasingly common in Pakistan as a result of glaciers melting and exceptional rainfall during monsoon seasons (Hussain et al. 2020). Because it relies on agricultural production, floods pose the greatest threat to the agricultural sector. More than twenty big floods have occurred in Pakistan since its independence, according to a study by the Federal Flood Commission (Tariq and Van De Giesen 2012). The researcher counted five in Pakistan's first decade, five in the 1970s, four in the 1980s, four in the 1990s, and two in the 2010s. More than 500,000 square kilometers of land were damaged by these floods, 12,000 people were killed, and an annual economic loss of 39 billion dollars was incurred. Of all the economic sectors, the one that has been most hit hard is agriculture, which provides the majority of Pakistanis with their daily sustenance. Pakistan has never had a flood as destructive as the one that occurred in 2010. Information gathered by the NDMA indicates that both public and private infrastructure, including roads, railways, bridges, schools, and crops covering millions of acres, were devastated (Mahmood and Hassan 2022). 728,193 dwellings were damaged, more than 2000 people were killed, and there was an economic loss of almost 578 billion USD.*

Key Words: NDMA Natural Catastrophe, Marginalized Communities, Environmental Vulnerabilities, Adaption, Resilience, Socio-economic Factors, Megafloods

Introduction

Natural disasters result in loss of life and damage to infrastructure and property all around the world. More than half of the approximately 0.4 million casualties caused by natural catastrophes between 1997 and 2010 were due to floods (Asgharpour & Ajdari, 2011). Extreme hydro-meteorological disasters, such as floods, slow down development, destroy agricultural land, and affect people's lives and production (Zhang et al., 2002). More than a hundred medium and large metropolitan centers have been impacted by floods in the last thirty years (Bloschl et al., 2008).

Both "flood impacts" and "flood consequences" may be found in scientific literature to explain the wide-ranging effects of floods on humans, their possessions, and the natural environment (Ali, 2007). Though the words are typically used negatively in literature, these outcomes can have both good and bad impacts. Researchers have used the phrases "damages" and "losses" interchangeably. Negative effects on individuals, structures, and social processes as well as on infrastructure, services, and the environment are what constitute damage. According to their severity and the socio-physical and economic development of the community, floods have a range of features and effects. This development is closely tied to damage. Flood damage varies from location to location due to differences in flood depth, length, duration, and speed that occur throughout time and space.

According to Lehner et al., (2006) and Fewtrell and Kay, (2008), devastating floods can cause environmental damage, economic losses, and human losses. While Vinet (2008) classified flood damages into direct and indirect damages, secondary economic damage, and intangible damage based on

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socioeconomic and environmental factors, Parker, (2000) classified flood losses into tangible direct losses, tangible indirect losses, and intangible losses respectively. The extent of the flood and the community's socioeconomic status determine both the direct and indirect losses caused by flooding, as noted by Jonkman et al., (2008).

According to Ibarra et al., (2012), flash floods resulted in 34 deaths in the UK in 1952, 400 in Barcelona in 1962, 72 in Italian Piedmont in 1968, and 69 in 1994. Over 70,000 people were forced from their homes in 1993 when the Mississippi River overflowed its banks, resulting in a ten billion dollar economic damage (Aleotti, 2004). The Yangtze River flooded in 1998, causing about $3 billion in damage and 2600 deaths. The Huaihe River flooded in 1997. The same year, a devastating flood ravaged Dhaka, Bangladesh, and the surrounding regions, causing 4.6 million people to lose their homes or have them seriously damaged. The economic damage was 10 million US dollars. In 1999 and 2002, a severe flood struck southern France, incurring economic losses of about 100 million US dollars and 36 and 24 human fatalities, respectively (Vinet, 2008).

According to Kortny and Kichigina, (2006), the Angara Basin flood of 2001 was responsible for the submersion of 150 human settlements, both large and small. The flood impacted 0.45 million people and caused an economic loss of over 200 million US dollars. Approximately five million people were impacted and one thousand lives were lost in the 2005 devastating flood that hit Mumbai (Wheater, 2006). A total of 132 structures, including homes, businesses, and institutions, were destroyed in the 2008 North Dakota flood, which caused an estimated economic loss of $2.9 million (Cummings et al., 2012). The biggest flood in Pakistan's history occurred in 2010, killing 1,885 people and causing tens of billions of dollars in economic damage.

Floods in Pakistan

Pakistan has witnessed floods almost every year in recent years. Damage to infrastructure, loss of life, and land are all consequences of floods. Flooding has occurred in Pakistan as a result of ineffective water policy and insufficient management of water resources (Arslan et al., 2016). Based on reports, Pakistan is rated sixth among South Asian nations affected by floods. Pakistan is no stranger to floods. Between 1947 and 2015, Pakistan saw 23 of the worst floods in the world. (the 2015 FFC). During 36 hours, floods of varying intensities swept through Gilgit-Baltistan, FATA, Azad Jammu and Kashmir, Khyber Pakhtunkhwa, Punjab, Sindh, and Balochistan. Megafloods in Pakistan in 2010 were among the most devastating river floods that the contemporary era has seen. Between 1947 and 2015, Pakistan suffered a financial loss of US$38.165 billion due to 23 major flood disasters. Over 12,000 people were killed, and 616,598 km2 of land was inundated, as seen in Table 1. Roughly 0.715% of Pakistanis are affected by floods annually, and by 2030, that number is projected to rise to over 2.7 million. (The study conducted by Khan and colleagues in 2016).

2022 Floods in Baluchistan and the Socio-Economic Context of the Region

The 2022 floods in Baluchistan, Pakistan, were a huge natural catastrophe with widespread impacts on the region's communities, economies, and environment. Sumptuous monsoon rains in 2022 set off the devastating Baluchistan floods that displaced countless people and devastated major swaths of the province. Over 360,000 people were impacted by the floods, and 238 people were confirmed dead and 106 injured, according to the National Disaster Management Authority (NDMA). The flooding occurred in at least 34 regions. The floods caused the destruction of homes, infrastructure, and agricultural land, which led to substantial economic losses and humanitarian issues. In addition, the floods worsened the region's pre-existing socio-economic vulnerabilities, interrupted transportation networks, and restricted access to key services.

Heavy monsoon rainfall in 2022, which was above average and caused flash and riverine flooding throughout the province (NDMA 2022) was the primary cause of the floods in Baluchistan. The intensity of the monsoon rains and their impacts on Baluchistan is thought to have been exacerbated by climate change, which is defined by rising temperatures and changing precipitation patterns. Soil erosion has worsened due to deforestation, land degradation, and unsustainable land-use practices, which have also

diminished the region's inherent ability to absorb and hold rainfall, making flooding more likely. The flooding was worsened and efforts to control and respond to it were impeded by insufficient infrastructure, such as badly built embankments and drainage systems.

Communities, livelihoods, and ecosystems in Baluchistan were all negatively impacted by the 2022 floods, which also had major socioeconomic and environmental impacts. Thousands of families have been forced to flee their homes and are now in desperate need of emergency shelter and assistance due to the destruction of infrastructure. Food security and rural livelihoods were further threatened by the floods' significant damage to agricultural land and animals. Exacerbating humanitarian crises and impeding rescue and recovery operations, transportation network disruptions cut off access to vital services including healthcare, education, and clean water.

With an area of around 347,190 square kilometers and a wide variety of physical and environmental elements, Baluchistan is the biggest province in Pakistan (UNDP 2023). Arid and semiarid climates, with very little rainfall and extremely hot and dry weather (especially in the southwest), define this province. The majority of Baluchistan's inhabitants live off the land, tending to crops and animals or even going on nomadic journeys. Numerous ethnic groups inhabit the province, each having its own unique history, culture, and socioeconomic dynamics; they include the Baloch, the Pashtuns, and the Brahuis.

Despite having abundant mineral, oil, and gas reserves, Baluchistan is struggling economically and socially due to issues including unemployment, underdevelopment, and poverty (UNDP 2023). Human growth is impeded and socioeconomic disparities are intensified due to limited access to healthcare, education, and basic services in the area. Baluchistan's vulnerability to environmental hazards and disasters is further exacerbated by continuous political tensions, ethnic disputes, and security worries that have hampered economic progress and social cohesiveness.

Baluchistan's Marginalized Communities' Flood Exposure Weaknesses

The marginalized communities in Baluchistan, Pakistan, are particularly vulnerable to flooding, which can destroy homes and livelihoods and make already precarious socioeconomic situations much worse. Flooding is a major problem for marginalized communities in Baluchistan since many of these locations are situated in floodplains, along rivers, or on the coast. Their vulnerability is increased by their geographical remoteness and restricted access to transportation networks, which make it even more difficult for them to evacuate and reach rescue services during floods. Furthermore, the region's natural resilience to floods is diminished due to environmental degradation, which includes deforestation, soil erosion, and land degradation (Ahmed, 2013). As a result, marginalized communities feel these impacts even more acutely.

Compared to the general population, marginalized communities in Baluchistan suffer from greater poverty, unemployment, and inaccessibility to essential amenities (UNDP 2023). They are more vulnerable to flood-related damages and health concerns because of limited economic possibilities and poor infrastructure, including housing and sanitary services. (Ajibade et al., 2013) found that the vulnerability of particular populations to flood is exacerbated by social inequality and discriminatory actions that marginalize them.

The government's capability to respond to floods and offer prompt relief and support to impacted communities is hindered by insufficient institutional capacity and governance structures in Baluchistan. Allocating funding for flood mitigation and preparedness and coordinating disaster management operations are both made more difficult by a lack of resources, corruption, and political instability. Further, marginalized communities are less likely to have access to flood resilience resources and information due to a lack of community involvement and participation in decision-making processes.

Slow and poor government response to Baluchistan flooding, especially in reaching marginalized communities, has been criticized. There have been delays, inefficiencies, and mismanagement in the delivery of help and the coordination of relief activities, even though the National Disaster Management Authority (NDMA) and provincial disaster management bodies were established. The government's inability to react quickly due to a lack of resources and manpower makes things worse for impacted communities, making it take longer for them to recover (Choudhury et al., 2019).

Slow and unequal rehabilitation and reconstruction of flood-affected districts in Baluchistan has occurred, with marginalized communities being overlooked in the recovery attempts. Sustainable development and long-term rehabilitation projects face bureaucratic roadblocks, inadequate financing, and poor planning. Another issue is that marginalized communities' socioeconomic demands and goals are frequently disregarded when the government prioritizes infrastructure repair, which in turn perpetuates cycles of poverty and vulnerability.

Addressing the risks of flood-affected communities in Baluchistan has shown potential via efforts to build community resilience and empower marginalized groups (Springer, 2023). Involving local stakeholders and institutions, community-based disaster risk reduction (CBDRR) programs have successfully increased awareness, strengthened capacity, and put into place long-term adaptation strategies. Forestmüller, Jamali, and Nogales (2019) found that flood response and recovery activities might be more successful and equitable if participatory techniques prioritized the participation of marginalized voices in decision-making and resource allocation.

Vulnerabilities of Marginalized Communities in Baluchistan to Flooding

According to Springer (2023), the 2022 floods in Baluchistan, Pakistan, caused substantial short-term and long-term impacts on marginalized communities, exacerbated preexisting vulnerabilities, and uprooted livelihoods. Tragically, many marginalized communities in Baluchistan were forced to flee their homes and lost their lives in the devastating floods of 2022. At least 238 individuals lost their lives and more than 360,000 were impacted by the floods, as stated by the National Disaster Management Authority (NDMA) in 2022. The calamity had a disproportionate impact on marginalized communities, especially those living in flood-prone areas and informal settlements, who were already in a precarious position. Due to the short amount of time that families had to evacuate before the floods began, many ended up taking refuge in makeshift relief camps or with relatives who were willing to let them stay.

Homes, infrastructure, and vital services were severely damaged by the floods, making the living conditions of marginalized communities in Baluchistan even worse. Damage to homes, roads, and communication networks made it difficult to provide emergency aid and relief supplies to those in need. The destruction of houses and loss of assets had a disproportionate impact on marginalized communities, further exacerbating their socio-economic vulnerability. These communities frequently lived in poorly constructed buildings and informal settlements.

Marginalized communities in Baluchistan are suffering from severe food, water, and medical supply shortages as a result of the floods. In particular, women and children were more likely to contract water-related illnesses including cholera and diarrhea due to a lack of access to clean water and sanitary facilities (Zahid, 2018). Health hazards and mortality rates among flood-affected communities were worsened by poor healthcare infrastructure and emergency response services, which stressed the capacity of local health institutions.

The marginalized communities in Baluchistan suffered long-term economic impacts as a result of the 2022 floods, which disrupted their livelihoods and income-generating activities. Marginalized communities lost access to their primary means of income and nourishment when farms and crops were damaged, cattle were swept away, and small enterprises were forced to close (NDMA 2022). Mbow et al. (2020) found that vulnerable communities saw their poverty and food insecurity worsen as a result of the loss of assets and productive assets. This, in turn, exacerbated socio-economic inequities and made it harder to recover and build resilience in the long run.

In Baluchistan, the floods exacerbated the deterioration of natural resources and ecosystems by causing significant environmental damage and disturbances. The region's ecological resilience and integrity were undermined by soil erosion, sedimentation, and water source pollution, which in turn impacted water quality, ecosystem services, and biodiversity.

Marginalized communities, which depend on natural resources for their survival, are at greater risk of environmental deterioration and resource depletion, which weakens their resilience to future catastrophes and climate change impacts. Psychological trauma and social displacement are two examples

of the long-term impacts of the floods on marginalized communities in Baluchistan. Mental health problems, stress, and social isolation were among the long-term effects of people's experiences with the disaster's devastating effects on their homes, families, and communities. The floods further stigmatized and marginalized marginalized groups, who were already experiencing social marginalization and discrimination.

Socio-economic, environmental, and health consequences of the floods for marginalized populations Because of the flooding, many marginalized people had to leave their houses and find refuge in makeshift communities or informal settlements (Ahmed et al. 2020). For communities reliant on agriculture, livestock raising, and informal work, displacement undermines livelihoods and economic activity in particular. Poverty and food insecurity among marginalized communities are exacerbated by the loss of assets and productive resources, which makes it harder for them to recover and build resilience.

Floods significantly damage infrastructure, including housing, transportation networks, and public utilities, exacerbate socioeconomic disparities, and obstruct development initiatives (Brooks et al., 2005). The destruction happens most often in marginalized communities, which are generally located in locations with poor infrastructure and are thus more likely to experience hazards. As a result, these communities face difficulties such as housing instability, limited economic prospects, and loss of access to services. Parthasarathy (2018) argues that floods' economic losses worsen poverty and socioeconomic inequities, leading to a vicious cycle of marginalization and vulnerability.

Ecosystem health and functioning are impacted by floods' substantial environmental repercussions, such as soil erosion, sedimentation, and water source pollution (UNDP 2023). Many marginalized communities depend on natural resources for their livelihoods and food security. As a result, they are more likely to suffer from environmental degradation and the loss of ecosystem services including biodiversity, rich soil, and clean water. The vulnerability of marginalized groups to upcoming calamities and the impacts of climate change is further exacerbated by the destruction of natural habitats and resource depletion.

In ecosystems that are already at risk, such as coastal regions, marshes, and forests, flooding makes the problem worse. Loss of access to fuelwood, biodiversity loss, and increased vulnerability to landslides and soil erosion are just a few of how marginalized communities rely on forest resources for fuel, food, and livelihoods. Deforestation and land degradation disproportionately impact these communities. The vulnerability of marginalized groups to environmental risks and climate change impacts is further exacerbated by the loss of forest cover and degradation of ecosystems.

Particularly among marginalized people living in overcrowded and filthy settings, floods raise the danger of waterborne infections and public health issues. When sewage, chemicals, and pathogens contaminate water supplies, it can cause diarrhea, cholera, and other water-related disorders. Vulnerable communities are particularly in danger (Ahmed et al., 2020). The health impacts of floods on marginalized communities are worsened by limited access to healthcare facilities and poor sanitary infrastructure, leading to higher rates of morbidity and mortality.

Stress, anxiety, and trauma among people and communities are some of the severe psychological and social impacts of floods on marginalized groups (UNDP 2022).

Depression and post-traumatic stress disorder are among the mental health issues that can develop as a result of the devastating effects of losing one's home, means of support, and loved ones. The psychological impacts of floods, which can worsen existing social tensions and disparities, are especially harmful to marginalized groups that already experience social marginalization and discrimination.

Adaptation and Resilience Strategies for Marginalized Communities

Community-based adaptation (CBA) techniques enable marginalized communities to find and apply context-specific solutions to climate-related hazards. Assuring cultural sensitivity, social inclusion, and environmental sustainability via the use of local knowledge, participation, and decision-making processes are the tenets of CBA activities. Examples of CBA include ecosystem-based adaptation methods, participatory community assessments, and climate-smart agriculture, which increase adaptive capacity to cope with the impacts of climate change.

To lessen the vulnerability of marginalized communities to hazards associated with climate change, ecosystem-based adaptation (EbA) initiatives utilize ecosystems' inherent resilience and services. Reforestation, wetland restoration, and coastal management are examples of EbA interventions that can improve ecosystem services and functions, which in turn can increase community adaptive capacity and resilience. Contributing to long-term resilience-building initiatives, EbA techniques also foster social cohesiveness, sustainable livelihoods, and ecological stewardship among marginalized groups. Enhanced resilience in marginalized communities confronting climate-related dangers can be achieved through social protection and safety nets. Reduced dependence on negative coping mechanisms and increased adaptive capacity can be achieved when disadvantaged households get financial support and resources through social insurance schemes, food assistance, and cash transfers in the event of climate shocks and stresses. In addition, social protection programs help marginalized groups build resilience and promote long-term development by reducing poverty, ensuring food security, and increasing social inclusion.

Critical measures for bolstering resilience in marginalized communities confronting climate-related dangers include early warning systems (EWS) and disaster preparedness exercises. Early Warning Systems (EWS) alert communities to potential dangers in a timely and accurate manner, allowing them to take preventative actions, such as evacuating to safer areas, to safeguard lives and livelihoods. Empowering marginalized groups to cope with climate extremes and adapt to changing conditions, community-based disaster preparedness includes training, exercises, and capacity-building activities. This strengthens local resilience and response capacities.

Providing timely and reliable information about approaching threats, early warning systems (EWS) are vital in minimizing the vulnerability of marginalized people to flood hazards. To decrease casualties and property damage, EWS empowers communities to adopt preventative actions including evacuation, relocating, and safeguarding assets. According to studies, marginalized communities' flood preparedness and response may be considerably enhanced by well-designed EWS, efficient communication channels, and community participation. Key adaptation techniques to reduce flood impacts on marginalized communities include investments in infrastructure renovations and flood barriers. Levees, embankments, and floodwalls are examples of structural interventions that protect people and their livelihoods against flooding, erosion, and property damage. In addition to structural defenses, non-structural interventions like green infrastructure, zoning restrictions, and land-use planning improve ecosystem services and promote sustainable flood risk management (Abbas et al. 2016). However, factors like design, upkeep, and community approval determine how effective infrastructure-based adaptation methods are.

Especially for marginalized groups, nature-based solutions (NBS) provide long-term, affordable methods of reducing flood risk. To improve flood protection and community well-being, NBS such as afforestation, riverbank stabilization, and wetland restoration use ecosystem services and resilience.

Studies have shown that NBS is successful in reducing flood impacts, improving water quality, and increasing biodiversity, all while bringing marginalized communities socioeconomic advantages like job development, tourism, and cultural preservation. Community-based adaptation (CBA) initiatives give marginalized communities the ability to find and apply context-specific solutions to flood threats. Adaptation methods that are culturally appropriate, socially inclusive, and ecologically sustainable are prioritized by CBA programs, which also emphasize local knowledge, involvement, and decision-making processes (Williams & Huq, 2018). Participatory vulnerability assessments, community-based early warning systems, and livelihood diversification are examples of CBA measures that have been found to improve flood resilience and adaptive capability.

According to research by Resurrección et al. (2019), well-designed EWS may considerably lessen flood impacts on marginalized people by sending out early warnings and facilitating preparatory measures. An early warning system for floods and cyclones, for instance, boosted community resilience and cut mortality rates by 75% in Bangladesh, according to research. Similar to this, research conducted in Vietnam showed that an EWS for flash floods and landslides decreased economic losses and improved community security.

Various factors, including design, upkeep, and community approval, affect how successful infrastructure-based adaptation methods are. Arnall, 2014) notes that structural modifications might offer short-term flood protection but also carry the risk of causing environmental damage and social

displacement as unforeseen effects. For instance, relocating vulnerable populations or making flood risks worse downstream might result from building flood barriers in metropolitan areas. Upgrades to infrastructure in flood risk management must, therefore, take social, environmental, and economic factors into account. In particular, for marginalized communities, nature-based solutions are beneficial in lowering flood impacts and enhancing community resilience. For example, according to research conducted in Indonesia, mangrove restoration had a 90% reduction in flood damages as well as several other advantages, such as carbon sequestration and improved fisheries (Bassi et al., 2014). The restoration of wetlands and natural drainage systems enhanced water quality and decreased flood risks, which benefited local communities, according to research conducted in India.

Conclusion

Adaptation measures are durable and relevant to the location, CBA efforts prioritize local knowledge, involvement, and ownership. For instance, Smith, Brown, and Dugar (2017) discovered that community-based early warning systems enhanced disaster preparedness among vulnerable communities and decreased flood impacts. Similarly, Ethiopian research has shown that community-based adaptation strategies, including water and soil conservation, improved agricultural output and flood resilience

References

Abbas, A., Amjath-Babu, T. S., Kächele, H., Usman, M., & Müller, K. (2016). An overview of flood mitigation strategy and research support in South Asia: implications for sustainable flood risk management. *International Journal of Sustainable Development and World Ecology*, *23*(1), 98–111. https://doi.org/10.1080/13504509.2015.1111954

Ahmed, A., Mohammad, N., & Wadood, A. (2020). Balochistan: Overview of its Geo-economic and Socio-economic Perspectives. *Review of Applied Management and Social Sciences*, *3*(2), 235–246. https://doi.org/10.47067/ramss.v3i2.58

Ahmed, T., Zounemat-Kermani, M., & Scholz, M. (2020). Climate change, water quality and water-related challenges: A review with focus on Pakistan. *International Journal of Environmental Research and Public Health*, *17*(22), 8518. https://doi.org/10.3390/ijerph17228518

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: IJDRR*, *4*, 15–20. https://doi.org/10.1016/j.ijdrr.2013.03.003

Ajibade, I., McBean, G., & Bezner-Kerr, R. (2013). Urban flooding in Lagos, Nigeria: Patterns of vulnerability and resilience among women. *Global Environmental Change: Human and Policy Dimensions*, *23*(6), 1714–1725. https://doi.org/10.1016/j.gloenvcha.2013.08.009

Aleotti, P. (2004). A warning system for rainfall-induced shallow failures. Engineering Geology, 73(3), 247-265.

Ali, A. M. S. (2004). flood event in South-western Bangladesh: a study of its nature, causes, human perception and adjustments to a new hazard. *Natural Hazards*, *40*, 89–111.

Arnall, A. (2014). A climate of control: flooding, displacement and planned resettlement in the L ower Z ambezi R iver valley, M ozambique. *The Geographical Journal*, *180*(2), 141–150. https://doi.org/10.1111/geoj.12036

Arslan, M., Ullah, I., BAQIR, M., & Shahid, N. (2016). Evolution of flood management policies of Pakistan and causes of flooding in year 2010. *Bulletin of Environmental Studies*, *1*(1), 29-35. https://oaji.net/articles/2016/3875-1472490295.pdf

Asgharpour, S. E., & Ajdari, B. (2011). A case study on seasonal floods in Iran, watershed of ghotour Chai basin. *Procedia, Social and Behavioral Sciences*, *19*, 556–566. https://doi.org/10.1016/j.sbspro.2011.05.169

Bassi, N., Kumar, M. D., Sharma, A., & Pardha-Saradhi, P. (2014). Status of wetlands in India: A review of extent, ecosystem benefits, threats and management strategies. *Journal of Hydrology. Regional Studies*, *2*, 1–19. https://doi.org/10.1016/j.ejrh.2014.07.001

Bloschl, G., Reszler, C., & Komma, J. (2008). A spatially distributed flash flood forecasting model. *Environmental Modelling & Software: With Environment Data News*, *23*(4), 464–478. https://doi.org/10.1016/j.envsoft.2007.06.010

Brooks, N., Neil Adger, W., & Mick Kelly, P. (2005). The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation. *Global Environmental Change: Human and Policy Dimensions*, *15*(2), 151–163. https://doi.org/10.1016/j.gloenvcha.2004.12.006

Choudhury, M., Uddin, M. S., & Haque, C. E. (2019). "Nature brings us extreme events, some people cause us prolonged sufferings": The role of good governance in building community resilience to natural disasters in Bangladesh. *Journal of Environmental Planning and Management*, *62*(10), 1761-1781. https://doi.org/10.1080/09640568.2018.1513833

Cummings, C. A., Todhunter, P. E., & Rundquist, B. C. (2012). Using the Hazus-MH flood model to evaluate community relocation as a flood mitigation response to terminal lake flooding: The case of Minnewaukan, North Dakota, USA. *Applied Geography (Sevenoaks, England)*, *32*(2), 889–895. https://doi.org/10.1016/j.apgeog.2011.08.016

Springer, A. (2023). The Pakistani Floods of 2022: How Vulnerability is Amplified by Climate Change and Political Policy. *Indian Ocean World Centre Working Paper Series*.

Vinet, F. (2008). Geographical analysis of damage due to flash floods in southern France: The cases of 12–13 November 1999 and 8–9 September 2002. *Applied Geography (Sevenoaks, England)*, *28*(4), 323–336. https://doi.org/10.1016/j.apgeog.2008.02.007

Wheater, H. S. (2006). Flood hazard and management: a UK perspective. *Philosophical Transactions. Series A, Mathematical, Physical, and Engineering Sciences*, *364*(1845), 2135–2145. https://doi.org/10.1098/rsta.2006.1817

Williams, M. S. (2000). *Voice, trust, and memory: Marginalized groups and the failings of liberal representation*. Princeton University Press.

Zahid, J. (2018). *Impact of clean drinking water and sanitation on water borne diseases in Pakistan.* Sustainable Development Policy Institute. https://www.jstor.org/stable/resrep17223

Zhang, J., Zhou, C., Xu, K., & Watanabe, M. (2002). Flood disaster monitoring and evaluation in China. *Environmental Hazards*, *4*(2), 33–43. https://doi.org/10.3763/ehaz.2002.0404