Bhola Cyclone, 1970

On the evening of November 12, 1970, a Severe Cyclonic Storm, equivalent to a Category 3 hurricane, made landfall on the southwest coast of East Pakistan (present day Bangladesh). The cyclone's destructive path swept over coastal areas of the Sundarbans to 60 miles (95 km) north of Chittagong, passing directly over the islands of Manpura and Bhola. The storm, known by a multitude of names including The Killer Cyclone of 1970, unleashed torrential downpours and unrelenting winds. The precipitation and winds, combined with a high tide and relatively flat topography, resulted in 33 feet (10 m) storm surges that claimed the lives of anywhere from 300,000-600,000 people in the densely populated region (Smillie 2009; Penna & Rivers 2013). The massive death toll results in the Bhola Cyclone ranking as the deadliest tropical cyclone in recorded history.

Preparation and Mitigation

The Bhola Cyclone began as a tropical depression from remnants of Cyclone Naru in the middle of the Bay of Bengal on November 8. The depression quickly gained energy from the Bay waters to become a cyclone the following day (Karmakar et al. 1998; Smillie 2009). Prior to modern predictive equipment, little was known about cyclones ahead of landfall, and most warnings were developed utilizing skills of indigenous peoples living in the area. Fisherfolk also played a crucial role in this system by alerting coastal villages of impending storms when they would moor. This system was greatly hampered by restrictions in both time and location as most warnings merely were spread by word-of-mouth.

A reliance on personal observations and word-of-mouth to predict the cyclone gave little warning to populations in (present day) Bangladesh prior to landfall, although prior warning was

received from the United States who had captured remotely sensed satellite imagery of the storm's formation (Penna & Rivers 2013). Despite being present for decades, radio was a fairly new technology to the Bengali people and much of the populace did not trust weather reporting due to grossly inaccurate reporting of the era (Frank & Husain 1971). An additional warning sign of the impending disaster came from witness testimony of the crew of the M. V. Mahajagmitra, which was enveloped by the cyclone. The ship reported the intense storm at midnight on November 12 and then went silent. All 50 crew members were lost at sea (Karmakar et al. 1998).

Historical land use patterns also increased levels of risk and vulnerability. The delta of Bangladesh was formed by sediments from the Himalaya Mountain range, creating fertile low-lying farmlands that incentivized individuals to settle there for agriculture as well as fishing (Penna & Rivers 2013). Soils and coastal areas were also made unstable due to loss of mangroves during the colonial era. This loss of binding vegetation increased erosion, although there were active reforesting programs aimed at reducing erosion (Tatham et al. 2009). Finally, annual monsoons unleash copious volumes of precipitation that further erode riverbanks and encroach upon human settlements, leading to enhanced vulnerability to precipitation events—especially mega-disasters such as the Bhola Cyclone.

Impact, Response, and Aid

In the wake of the storm, 300,000 people were confirmed dead, although the actual number of fatalities is much higher considering a lack of vital records, proper death recording, and the thousands of bodies that were washed to sea and/or unrecovered. Coastal islands such as Bhola had most of their population completely wiped out. Massive amounts of farm animals also perished in the storm, totaling up to 280,000 livestock and 500,000 poultry (Frank & Husain

1971). Coastal areas were inundated with saline water causing the degradation of soils and the destruction of crops. Economic damages associated with crop loss totaled $63 million USD (Frank & Husain 1971), while freshwater wells were contaminated with salt water and many buildings were washed away, fashioning a context rife with starvation, dehydration, and disease. These secondary health impacts made the post-disaster scenario as deadly as the initial disaster itself (Penna & Rivers 2013).

The Bhola Cyclone hit coastal areas the hardest. Many of the char lands were no more than 20 ft (6 m) in elevation, which were easily surpassed the 20-33 ft (6-10 m) storm surges (Penna & Rivers 2013). Fisherfolk, who reside near the coast, were the hardest hit demographic. The loss of fisherfolk resulted in a huge economic lossses in the fishing industry at large and local economies at a smaller scale, not to mention the decrease in protein intake that ensued in already malnourished populations who needed the calories provided by fisherfolk (Frank & Husain 1971).

Following the cyclone, a young oil baron by the name of Fazle Abed witnessed the grave inhumanities and jumped into action. Abed was living in a Shell Oil compound in Chittagong, where he opened up his house to 50 relief workers. Five days after landfall, Abed and others went to the island of Manpura where they observed the mass destruction that the cyclone had left behind. Only 1/3 of the population of Manpura had survived the cycone, and human and animal carcasses were scattered about. After visiting Manpura, Abed and Father Richard William Timm, Marty Candy, Vikarul Chowdhury, and Akbar Kabir formed the Heartland Emergency Lifesaving Project (HELP), which over time evolved into the versatile, life-sustaining nonprofit known today as Building Resources Across Communities, or BRAC (Smillie 2009). BRAC

remains the largest nonprofit in Bangladesh and is one of the largest and most comprehensive nonprofits in the world.

British troops were deployed to affected regions. However, they were not cleared to provide aid until a Pakistani official arrived on scene. While the British had materials on-site (e.g., bags of rice, boats, motors, and tents), they ended up digging latrine pits and tanning until the official arrived. Meanwhile, locals looked on at the soldiers with no assistance. Days later, the official arrived and relief aid was finally allocated to affected populations (ThamesTv 2009).

Prior to the storm, political tensions were palatable between Bangladesh (i.e. East Pakistan) and Pakistan. These tensions were further strained in the aftermath of the cyclone. The border to Pakistan was completely closed within two days of the cyclone making landfall, and Pakistan's inability to show interest in aiding their noncontiguous state sparked discontent among local governments and the Bengali masses, which resulted in sweeping political changes in their first ever democratic election. Thus, during the first national elections the following month, the people of Bangladesh made their voices heard by electing all but two seats allotted to them from the Awami League. The results gave Sheikh Mujibur Rahman’s party political dominance (Siddiqi 2004; Umar 2006; Smillie 2009).

The takeover of the Awami League, a Bengali Nationalist and pro-independence party in Pakistan’s parliament, became a catalyst for events to come. East Pakistan was never truly part of Pakistan. When the British finally relinquished control of India and the surrounding territories in mid-20th century, they split territories based the dominant religion of each area. This resulted in a piece of the Indian subcontinent, present day Bangladesh, becoming part of Pakistan despite being separated by the country’s adversary of India (Umar 2006). From the outset they were divided by ethnicity, geography, and especially language.

Conflict erupted along the border as Bengalis were enraged by then Pakistani President Yahya Khan's invasion. In March 1971, Bangladesh officially announced secession and publicly released their Declaration of Independence (Siddiqi 2004). Beginning March 25th, 1971, Khan initiated a series of attacks on villages and civilian targets in Bangladesh with the objective of curbing the actions of local militias operating under the banner of the Bengali Nationalist Movement. Within 24 hours of the beginning of Operation Searchlight, Bangladesh officially declared war on Pakistan.

Plagued by intense guerrilla warfare by local militias and a lack of supplies, Operation Searchlight was an abject failure. However, Bengalis were galvanized against Pakistan and the number of active militias grew rapidly. Overwhelmed, the Pakistani military eventually retreated towards the border and began a widespread bombing campaign of Dhaka. With the city in ruins, the Pakistani military pushed back into Bangladesh making it all the way to the coast with the order to slaughter as many Bengalis in Dhaka as possible. Villages were burned, buildings were destroyed, and scholars working in the country who had gathered in Dhaka were rounded up and shot outside of a brick-making factory (Payne 1973). Itching to seek revenge on Pakistan for the last war a mere six years earlier, India jumped into the fray on the side of Bangladesh. The war lasted to the end of the year; however, a second war between the three countries began soon afterwards accompanied by smaller border skirmishes in the interim. Peace between Bangladesh, Pakistan, and India would not be achieved until late 1979. The result, which was initiated by the Bhola Cyclone, was the formation of the independent state of Bangladesh.

Recovery and Reconstruction

Recovery and reconstruction are critical for the mitigation of future disasters but, due to civil strife, such processes were stymied and took much longer than was expected. BRAC, at that time HELP, was very active with recovery and reconstruction on the island of Manpura by providing clothing, food, blankets, pond desalination technology, crop seeds, agricultural tools, and support groups. BRAC has done further work in Bangladesh in terms of disaster recovery and reconstruction, and their methods are lauded because they target long-term developmental projects rather than immediate efforts to provide aid (Smillie 2009). There is evidence that reconstruction activities, both from BRAC and other organizations, has led to greater mitigation and resilience from future disasters. Many cyclones following the Bhola Cyclone have been more powerful, but less deadly. This is due to better weather reporting, warning systems, communication media, and structural mitigation measures.

The construction of embankments along rivers has been essential for the prevention of flooding in many coastal areas, but sometimes these embankments fail because people decide to reside near them as regular weather events and storm surges are less impactful in such areas (Tatham et al. 2009). While embankments slow erosion and keep water out of low lying areas, when large flooding or storm surges occur the areas are inundated. Thus, this practice of risk transference leads to lower vulnerability in normal times at the risk of disaster, drownings, disease, crop failure, and livelihood disruption in larger scale events, which, unfortunately, are common in Bangladesh.

A successful reconstruction element was the large-scale construction of cyclone shelters from 1970-1991, which can cumulatively house approximately 350,000 people (Tatham et al. 2009). However, there are many improvements that can still be implemented since the shelters are sometimes unable to accommodate the affected populations of the regions they serve, not to

mention that the structures are sometimes vulnerable themselves and often lack proper amenities for women as well as water storage capabilities (Tatham et al. 2009).

Infrastructure is essential for mitigation, but civil engineering can only do so much. Following the Bhola Cyclone and many others throughout recent history, there has been a call for the development of education, communication systems, local economies, social capital, and community capacity. More recently, there has been the establishment of disaster management programs with educational outreach components, which conduct research and dissemination knowledge on disasters and their effects (Tatham et al. 2009). Nearly all international aid in Bangladesh is performed by nonprofit institutions. Due to the Bangladesh's past ties with the UK and NATO partner, United States, much of the success of Bangladesh can be attributed to World Bank initiatives and direct donations to BRAC and the Global Disaster Preparedness Center (Global Disaster Preparedness Center 2017).

Conclusion

The 1970 Bhola Cyclone is the most devastating weather event in recorded history. It created a realization of the need for comprehensive disaster mitigation plans including emergency drills, real-time forecasting, and local training of the public. Immediate response to the disaster was poor, but there is evidence that reconstruction has reduced both mortality and destruction in the region from more recent storms such as Cyclones Sidr and Gorky. Furthermore, the Bhola Cyclone triggered an independence movement that resulted in the formation of Bangladesh, one of the world's newest political states. The Bhola Cyclone both provides an excellent case study of what not to do in the case of a major disaster as well as how

efforts to mitigate disasters have proven effective. Thus, the Bhola Cylcone serves as a focal point of many studies on disaster preparedness and mitigation.

Further Reading:

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