LOCATING THE GREAT CYCLONE OF 1970 AND SUBSEQUENT DISASTER RELIEF EFFORTS IN EAST PAKISTAN

By

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A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Geography—Master of Science

2022

ABSTRACT

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Darkness, water, wind, and tragedy. The Great Cyclone of 1970 swept into East Pakistan on the evening of November 12, its surging waters wiping out whole villages. The final death toll is still unknown. But for one of the first times in history, relief aid came pouring in from around the world. Several countries participated in short-term relief to provide food, water purification, and shelter to people within the hardest hit areas. Pakistan implemented an agricultural rehabilitation plan to provide food and agricultural aid to see the agrarian society through until the next harvest. Exactly where much of this aid went is not clear. Select aspects of the short- and medium-term aid effort that were connected to geographic locations were mapped. Maps were created from British and American accounts depicting national relief efforts and the international helicopter relief assistance. This paper also used post-cyclone surveys and aid reports to map the distribution of agricultural aid. It also discusses three of the factors that were considered when allocating the agricultural aid: season, manpower, and supplies and equipment. This paper also conducts content analysis of news coverage of the relief effort during this time using newspaper articles from the two largest international contributors: the United Kingdom and the United States. The purpose of this paper is to locate the cyclone and subsequent relief efforts in their geographic and historical context by mapping and analyzing the relief efforts and their contemporary perception.

ACKNOWLEDGMENTS

I would not have started, let alone finished, this project without the support of my advisor, Dr. Kyle Evered. Thank you, Kyle. You kept pushing me to find a topic in which I was interested. Your mentorship has challenged me to look at the human element that lies behind everything we do in Geography.

Thank you to my committee members, Dr. Soma Chaudhuri, Dr. Siddharth Chandra, and Dr. Ashton Shortridge. Thank you for your guidance, ideas, direction, and for sharing some of your vast knowledge.

Thank you to my fellow geography student Gabriela Shirkey for hosting the Supporting Women in Geography (SWIG) Writing Group when I first came to MSU. Being a part of the writing process with PhD students encouraged me to write at a higher level, and to help others on the same path.

Thank you to all the graduate students, faculty, and staff in the Geography Department. Getting to work alongside you, even remotely, was the highlight of my academic experience.

Thank you, Mom, Dad, sisters Lisa and Nicole, and Grandpa for supporting me through this process.

Thank you, Aunt Nita and Uncle Dave, for being my home-away-from-home during the school year.

Thank you, my MSU Graduate Intervarsity bible study friends. Spending time with you every Thursday refreshed my soul.

To everyone mentioned here, and everyone else who has helped along the way, please accept my heartfelt thanks. You are amazing.

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INTRODUCTION

The Great Cyclone of 1970, also commonly known as the Bhola Cyclone, has been the topic of discussion in different forums. The cyclone made landfall in present-day Bangladesh in November 1970. The high tide and cyclone storm surge pushed 1-6 meters of water onto the shores of many islands (Frank & Husain, 1971). At least 200,000 people died, and the cyclone is widely considered the deadliest cyclone in human history.

The historical and geographic context of the cyclone is discussed across multiple sources. Government reports, first-hand accounts, and news articles compose much of the literature written in the immediate aftermath. Encyclopedias and textbooks compiled the facts from those accounts into "worst disasters" lists and news articles. Academic articles span from shortly after the cyclone to the present day. Contemporary perceptions of the cyclone and relief effort are evident in newspaper articles published immediately after the cyclone. The articles describe East Pakistan, the cyclone, and the relief effort. Within these efforts are also observations on preventing another disaster of this magnitude. Later works compare the 1970 cyclone devastation with later cyclones whose response usually benefitted from the lessons learned in 1970. This chapter reviews select literature from each category, the importance of the event to the literature and the purpose behind the publications.

The Cyclone's Changing Names

First, it is important to understand the cyclone has had many names over the years. Cyclones do not casually stroll over and introduce themselves. They are created, run their course, and return to the water from whence they came. Humans name cyclones. Since 2004, storms in the Indian Ocean have been monitored and named when they meet the cyclone criteria (*Tropical*

Cyclone Naming, 2016). But prior to 2004, there was no standard naming conventions. Instead, different governments, journalists, and authors gave the same North Indian Ocean cyclones different names. The 1970 cyclone has several names: "The Great Cyclone of 1970", "The Great East Pakistan Cyclone of November 1970", "The East Bengal Cyclone of November, 1970", the "Ganges-Brahmaputra Delta Cyclone", and most recently "Cyclone Bhola", the "Bhola Cyclone", and "The Great Bhola Cyclone" (*Cyclone Shelters Save Lives, but More Needed*, 2008; *Remembering the Ganges-Brahmaputra Delta Cyclone Catastrophe (Picture of the Day) | Britannica Blog*, 2010; Emanuel, 2005; Leonard, 2007; Longshore, 2008; Malan, 2005; Reilly, 2009; Sommer & Mosley, 1972).

The wide assortment of names can make researching the cyclone difficult. Early sources and a dataset reference a "cyclone-driven tidal wave" and "Unknown Storm #15", dated November 7 or 12 cyclone depending if the source used the date of the cyclone's creation or landfall (*45th Anniversary of the Bhola Cyclone*, 2015; *Historical Tropical Cyclone Storm Tracks*, 2006; "Thousands of Pakistanis Are Killed by Tidal Wave," 1970). Literature published in 1970 until 2008 primarily used an assortment of "1970" names. The Encyclopedia Britannica was the only reference to use the "Ganges-Brahmaputra Delta Cyclone" name ("Ganges-Brahmaputra Delta Cyclone," 2020). One article written by a Bangladesh naval captain refers to the cyclone only by date (Shafiq-ur-Rahman, 1993). After 2008, the literature shifts and the name "Bhola Cyclone" becomes common. Why Bhola? Bhola is both the name of a large island and a town on the island that were hard hit by the cyclone. The town is cited in the New York Times a few days after the event from an account of a pilot, who reported "Nothing remains in Bhola. All is gone." ("Thousands of Pakistanis Are Killed by Tidal Wave," 1970). However, within that article, several places are listed as the most affected, and Bhola is not among them.

Many sources do not even mention the island of Bhola when discussing the cyclone. Others do so in a manner that gives no greater emphasis to Bhola than any other place. The commonly cited Cholera Research Laboratory (CRL) epidemiological surveys conducted in 1970 and 1971 show one graphic with the island of Bhola in the larger context of East Pakistan. However, the surveys focused on administrative units that encompassed several islands, and Bhola is not mentioned in the text (Sommer & Mosley, 1972). Barisal, the division Bhola fell within, is given greater precedence in other writings as both the larger administrative unit and as the first location mentioned where international aid came (Alam & Dominey-Howes, 2015; Longshore, 2008).

The name Bhola is not given prominence in most sources prior to 2008. The first use of the name "Bhola Cyclone" that I could find was in a 2005 article by the Milwaukee Journal Sentinel, a newspaper in Wisconsin. "Bhola" is repeated in a few news websites over the next couple years (Leonard, 2007; *The 10 Deadliest Storms in History*, 2008). Bhola appeared more prominently in literature after the 2009 book *Disaster and Human History: Case Studies in Nature, Society and Catastrophe*, the first readily available text with the Bhola name (Reilly, 2009). Unfortunately, none of the book's cited sources used the "Bhola" name. Perhaps the name seemed common enough by that time, thanks to the news websites, that an explanation did not seem necessary. Unfortunately, none of the news articles explain the reason for the name change. Where the name originated from remains uncertain and worth further study, but for now the Bhola name has become firmly entrenched in popular and academic literature. Since the origin of the "Bhola" name is unclear, I will refer to the cyclone as the "1970 cyclone", in keeping with the primary sources published shortly after the cyclone. Overall, knowing the different names is necessary to locate the literature published at various times in history.

Geography of Coastal Bangladesh

The cyclone made landfall it what was then known as East Pakistan. Now known as Bangladesh, the area is located at the northernmost point of the shallow Bay of Bengal. In the Bay of Bengal, and the larger Northern Indian Ocean, tropical cyclones are a common occurrence. The area has two cyclone seasons: April-June and October-November. Between the two seasons, the Bay of Bengal averages five cyclones a year (*1970- The Great Bhola Cyclone*, n.d.; *Indian Ocean*, 2021).

The 1970 cyclone struck the densely inhabited coastal region located between the Sundarbans, an expansive mangrove forest to the west, and the large city of Chittagong in the east. The coastal area and the Sundarbans are part of the largest river delta in the world, the Ganges-Brahmaputra Delta. Numerous rivers diverging from the combined Ganges, Brahmaputra, and Meghna rivers dissect the landscape. The land is often close to sea level, as sediments deposited in the delta create low islands known as chars. Chars are often longer than they are wide, with the rivers flowing along the long edges and the narrow end facing the sea. Smaller chars are between 0-5 meters in elevation, while some larger chars have elevations exceeding 15 meters (Longshore, 2008). Many chars are connected to the mainland by a system of bridges, dikes, and causeways.

This area had not always been so densely populated. According to one survey, many of the cultivated and inhabited islands had been mangrove forest a mere 60 years before the cyclone (Sommer & Mosley, 1972). But many people chose to farm the fertile coast. By 1970, between 1.3 and 3 million people lived along the coast. The large population in the vulnerable area, living close to sea level and with nowhere to go, would soon face the worst cyclone in decades.

Pre-Cyclone Instability

Unique political factors made East Pakistan even more vulnerable to cyclone damage. On August 15, 1947, after three centuries of ruling, the British relinquished control of India and created two new countries: India and Pakistan (*India Partition*, n.d.). After the Partition of India, peace between the two new countries did not last long and fighting broke out over which country should gain the province of Kashmir. Two decades later the Indo-Pakistan War of 1965 took place. But this was not the only strife arising from Partition. The new Pakistan was composed of two geographically distant sections. West Pakistan occupied the area currently known as Pakistan on the northwestern edge of India. East Pakistan, also known as East Bengal, occupied present-day Bangladesh on the eastern edge of India. Combined into one country because the majority of the population in each was Muslim, the two were socially and linguistically different and economically unequal (Biswas & Daly, 2020; Boissoneault, 2016). By the 1960's, West Pakistan was the home of the capital and the ruling elite. East Pakistan lacked political power yet powered the economy through raw material production.

This division also manifested in opposing political views, with the West Pakistani president advocating for a united Pakistan and the East Pakistani-led Awami League advocating for autonomy for East Pakistan. On December 7, 1970, 23 years after the creation of Pakistan, the first general elections of Pakistan were set to take place. The population of East Pakistan was estimated to be 65 million, larger than the West Pakistan population (Samad, 1971). Of the 313 seats up for election, over half were in East Pakistan (Moraes, 1971). A sweeping victory for East Pakistan's parties could mean gaining enough seats to take control of the Pakistani government. However, four weeks before election day and over 600 miles to the southeast of East Pakistan, an unnamed tropical storm formed (Longshore, 2008). In a matter of days, the

storm had moved to within four hundred miles of the coast of East Pakistan and become a cyclone.

Timeline of the Cyclone

There is no exact timeline of events either before or after the cyclone hit. Where the cyclone originated from is unclear. One source attributes the cyclone to a tropical depression that had downgraded from a tropical storm that originated in the Pacific Ocean and passed over Malaysia into the Bay of Bengal (Emanuel, 2005). Another source claimed the cyclone originated in the Intertropical Convergence Zone (ITCZ) within the Bay of Bengal (Longshore, 2008). Either way, what started as a tropical depression around November 8-9 intensified and headed toward East Pakistan. By November 11, the depression had turned into a cyclone. U.S. satellites tracked the storm, and both Pakistan and India were warned of the approaching cyclone (*Historical Tropical Cyclone Storm Tracks*, 2006; Reilly, 2009). Around 10pm local time on November 12, the unnamed Category 4-estimated cyclone made landfall in East Pakistan (Alam & Dominey-Howes, 2015; *Historical Tropical Cyclone Storm Tracks*, 2006). Coming at the same time as high tide and the night before the full moon, the combined high tide and storm surge pushed 1-6 meters of water onto the shores of many islands (Frank & Husain, 1971).

Official Bangladesh government figures reported 500,000 died in the cyclone (Shafiq-ur-Rahman, 1993). Other assessments vary between 200,000 and 550,000 (Frank & Husain, 1971). The fishing industry was greatly impacted, with 46,000 of 77,000 fishermen estimated dead, many survivors injured, and 65% of fishing fleet destroyed in a region where 80% of the protein comes from fish (*1970- The Great Bhola Cyclone*, n.d.). The cyclone also greatly impacted agriculture. Farmers lost between 470,000 and 2.8 million cattle (Samad, 1971). Floods covered

one million acres of fields, and the strong winds damaged even more. Much of the rice that was damaged was almost ready to be harvested. The severe damage and loss of life meant the area would need help for some time.

Post-Cyclone Instability

In the midst of the cyclone's aftermath, the December 7 general election of the Pakistan parliament was still held (Hossain, 2018). The East Pakistani-led Awami League, led by Sheikh Mujibur Rahman, earned the majority of the votes and the constitutional authority to form the central government (Biswas & Daly, 2020). But the current government opposed regional autonomy for East Pakistan, one of the goals of the Awami League, and suspended the National Assembly, preventing the changeover of power. 1971 was a pivotal year for East Pakistan. The Pakistani president Yahya Khan, who was also a general and the chief martial law administrator, declared martial law (Boissoneault, 2016). On March 7, Mujibur instituted a movement of civil disobedience. Several days of discussions and meeting between the two men ended well, until Mujibur was arrested on March 25. Operation Searchlight, the violent suppression of the East Pakistanis by the Pakistani military, began on March 26, 1971. What followed was both a civil war and a genocide.

An estimated 500,000 to three million East Pakistanis were killed in the genocide from March to December 1971. Around ten million are believed to have fled to India. The genocide was halted in December after West Pakistan launched a failed war on India and Indian troops took control of East Pakistan. Instead of being returned to Pakistan, East Pakistan became its own country and took the name Bangladesh. In 1974, Bangladesh joined the United Nations (*Milestones: 1969–1976 - Office of the Historian*, n.d.). Despite the efforts of aid workers, the

instability interrupted cyclone recovery. But in the months between the cyclone and the outbreak of hostilities, much relief work had been done.

Short-Term Relief Efforts

Throughout the post-cyclone period, aid had been provided by multiple countries to assist in recovery from the cyclone. Cyclone relief involved many nations and lasted for several months. The first phase of the relief effort provided short-term relief.
Assessments by first-hand and second-hand aid workers, journalists, and government officials guided short-term relief efforts. From 1970 to 1973, the findings of several surveys and commissions were published. The first to reach readers were news articles. The New York Times reported a "cyclone-driven" tidal wave on November 14, two days after the cyclone made landfall ("Thousands of Pakistanis Are Killed by Tidal Wave," 1970). The article wrote of the death and destruction pilots had observed, and of the medical support on the way. The intent of the story was to present the available facts to their readers and prepare for further developments.

The large international relief effort during the short-term phase included several nations. The United Kingdom, the United States, West Germany, France, and Saudi Arabia all contributed aircraft and personnel to operate in East Pakistan (Agency for International Development, 1972). Several other countries donated aid. The international efforts of the U.K. and the U.S. were largely guided by the respective governments, and recorded in government documents by various government agencies involved in the relief effort (Agency for International Development, 1972; *Relief Assistance for East Pakistan Cyclone Disaster, November, 1970 (1)*, 1970).

Medium-Term Relief Efforts

The medium-term relief efforts were intended to provide aid after the short-term phase until the major rice harvest in November/December 1971. Agricultural rehabilitation was an important part of the medium-term relief efforts, intended to provide relief after the short-term phase. Over 90% of the population lived in rural areas and was directly or indirectly involved in agriculture (I. Ahmed & Timmons, 1971). The Agricultural Rehabilitation Project by the Pakistan Department of Agriculture surveyed agricultural damage after the cyclone, and found almost 50% of the area's rice crop had been damaged (Samad, 1971). To speed recovery, the project provided seeds, fertilizer, and equipment to farmers throughout the cyclone area.

Another major concern was the cyclone's effect on public health. Sommer and Mosley's article on their public health surveys remains one of the most cited works on the cyclone (1972). The first survey in November 1970 determined most areas had drinkable water and there were no mass outbreaks of disease. The second survey involved ten two-man teams working over a three-week period in February and March 1971 to collect mortality data regarding age, gender, and location. Shelter, food relief, nutrition, fishing industry and agricultural data were also collected in the second survey. Sommer and Mosley's maps of mortality and inadequate shelter provided visual depictions of the extent of the damage, while the tables give district-specific estimates. The purpose of the publication was to provide more accurate estimates of what aid was needed and guide rebuilding after the cyclone.

Other medical assessments were also underway. *Disaster in Bangladesh* compiled the works of medical experts such as Sommer and Mosley into one location (Chen, 1973). Chapters about the cyclone, genocide, and civil war provided specific cases of the needs in Bangladesh. The book provided examples of the problems the cyclone created and the solutions underway,

with the cyclone as the first of several humanitarian crises in the early 1970s. A similar Health Services Reports article proposed the United Nations head an international disaster center (Kröger, 1973). Another report to the U.S. House of Representatives evaluated the effectiveness of U.S. aid after the cyclone (Comptroller General of the United States, 1972b). Both articles used the cyclone to call for reform and refinement in international aid.

Impact on Disaster Relief

The 1970 cyclone is widely believed to have triggered improvements in disaster response and cyclone warning. The cyclone is considered the catalyst to prevent a similar death toll in the future. Subsequent cyclones are viewed through the lens of not being as deadly as 1970 due to the construction of storm shelters and improvements in warning and evacuation (Reilly, 2009). The cyclone's high death toll and storm surge were often considered in assessments, as was the warning system. A catalogue of Bay of Bengal cyclones presented the 1970 cyclone's data compiled from numerous sources (Alam & Dominey-Howes, 2015). The 1970 cyclone is given special emphasis alongside the 1991 (later called Gorky) and 2007 (Sidr) cyclones. The comparison highlights the similarities in storm surge, arriving at high tide, and the differences in death toll and cost of damage. The death toll dropped over time, despite the population doubling from 1970 to 2007, due to improved satellite technology and forecasting, warning systems, evacuations, and community action (Chowdhury et al., 1993). A review of the multinational relief effort following the 1991 cyclone highlighted the lower death toll, despite a similar storm surge and wind speed to the deadlier 1970 cyclone (Shafiq-ur-Rahman, 1993). The lower death toll in a more powerful storm showed the effectiveness of the new warning system, the Cyclone Preparedness Program, and storm shelters (Chowdhury et al., 1993). Part of this preparation was

to build artificial hills, known as killas, to protect people and livestock (Chowdhury et al., 1993). In this context, the 1970 cyclone was contrast with later storms to show that proper disaster planning could mitigate loss in future disasters.

Accurately predicting the severity of cyclones was another concern. An overview of the geomorphology of the Ganges-Brahmaputra delta used the 1970 cyclone as an example of the effects of the area's unique geomorphology on the severity of cyclones (Kuehl et al., 2005). A model developed to simulate cyclone storm surge in the Bay of Bengal used the 1970 cyclone and its unpredicted storm surge as an example of how powerful and pervasive the storm surge can be (Johns & Anwar Ali, 1980).

Politics and Disaster Response

The cyclone is commonly considered to have had an impact on the December 1970 election giving power of the government to the East Pakistani Awami League (Biswas & Daly, 2020). Later Associated Press broadcasts from December 3 had videos to show the destruction as well as the slowly unfolding political drama (*Roving Report Pakistan | AP Archive*, 1970). Broadcast days before the election, the video sought to provide an overall picture of the cyclone's impact on the people's condition: destroyed homes, death, migration, and isolation from aid. The British aid effort was highlighted, and other nations were credited with providing aid. In contrast, Pakistan was mentioned as being incapable of distributing international aid. Subsequent coverage of the Awami League rally in Dhaka, possibly the November 23 rally, mentioned the opposition leaders readily used the cyclone to their advantage (Biswas & Daly, 2020). At the time, there had been discussion of delaying the election, and an interview of Mujibur further highlighted the political tension. Recent work sought to establish whether the

cyclone was responsible for the creation of Bangladesh through the election, genocide, and civil war. Instead of relying on the cyclone as the pivotal event, researchers assumed the West Pakistani government would have refused to accept the results of an election that would have strongly benefitted the Awami League, leading to conflict and potentially independence. They concluded the political shift was already underway, and while the cyclone may have influenced the margin of victory, the shift in power would have occurred without the cyclone.

Another article looked at the political impact of the cyclone in terms of nationalist politics and a "subsistence crisis contract" (Hossain, 2018). Here, the cyclone served as a catalyst to make disaster response an international issue, solidifying the expectation the government was responsible to see to the well-being of the people in such disasters. Hossain pointed to strong Bangladesh government responses to subsequent cyclones, born out the cyclone and the creation in 1972 of Mujibur's Cyclone Preparedness Programme. The impact of the cyclone on global humanitarian relief efforts is also explored. The NGOs Médecins Sans Frontières (also known as Doctors Without Borders) and the current Building Resources Across Communities (BRAC) based in Bangladesh owe their origins to the work of people influenced by the poor response to the cyclone. The article attributes strong disaster responses to the government's realization that a weak response puts the legitimacy of the government at risk. Thus, the 1970 cyclone was tied to the idea that cyclones are a risk to the population that the government must help alleviate, while also establishing a broader global network of governmental and non-governmental organizations skilled in disaster response.

Conclusion

Many types of literature have been written about the 1970 cyclone. Assessments from shortly after November 12 provided the first comprehensive information of the scale of the disaster. Damage, population, mortality, shelter, and aid were all concerns of the international community. The international aid effort was especially concerned by the cyclone, leading to aid-specific calls for better understanding and more coordinated efforts to deal with future disasters. Although some of the information was consolidated, much was still spread across several sources. Books consolidated the information from the early sources, placing the 1970 cyclone in the classroom as well as in context with other natural disasters. The idea of natural disasters as tragedies were also carried through from the earliest news articles, amplified in the books presenting several disastrous events, and have carried through most sources. Newer journal articles have carried on assessing the cyclone with the benefit of hindsight. The cyclone is considered alongside the broader issues of climate change, political upheaval, disaster response, and social and governmental responsibility. These studies have yielded improvements in the cyclone warning system and the construction of cyclone shelters to better prepare Bangladesh for future cyclones. But at the time pre- and post-cyclone instability threatened the relief effort. The region's geography and instability, paired with a powerful cyclone, created a unique environment into which countries from around the world poured relief aid.

CHAPTER 1: MAPPING SHORT-TERM RELIEF EFFORTS

"It was quickly realized that the most urgent need was for assistance in overcoming the formidable problems of distributing relief within the affected area." D.K.A. Reynolds (1970b).

After the cyclone, there was a great need for aid. Over 70 countries provided short-term relief aid to East Pakistan in the months following the cyclone (Agency for International Development, 1972). The primary purpose of the short-term relief was to provide the essentials to keep people alive: food, water, and medical aid. These supplies were provided by several different actors. The first foreign aid arrived four days after the cyclone (*Relief Assistance for East Pakistan Cyclone Disaster, November, 1970 (1)*, 1970). Governments provided military task forces to distribute aid. NGOs sent aid to government and private programs. Many organizations and individuals donated money and supplies. The supplies arrived by plane, helicopter, truck, train, and boat from several nations. With so many countries involved, there was a need for central organization. Pakistan oversaw the entire effort. The short-term relief was short-lived, lasting only two months. This chapter locates national and international relief contributions during the short-term relief period by mapping locations in international relief effort literature.

Methods: Mapping Zones

To create maps of the international effort, this chapter relies primarily on government documents and government aid organization reports. I used geographic information system software to create maps. QGIS is an open-source GIS software capable of creating, importing, and modifying map data. Using the government reports, I compiled locations mentioned in

reports of each country. There was no preexisting map available of the map zones, and the descriptions provided guidance but not exact coordinates. The zones depicted in the maps are approximations using the locations mentioned in the reports, as well as descriptions of each zone's extent.

In East Pakistan, as in Bangladesh today, multiple levels of administrative units (i.e., districts, sub-districts, thanas, and cities) used the same name. For example, in Figure 2.1, the city of Barisal was inside Barisal Sadar Thana. The thana was inside the Barisal sub-district, sometimes represented in maps as Bakerganj. The Barisal/Bakerganj sub-district was inside the district of Barisal. Several other place names were also repeated across multiple administrative levels. To alleviate confusion, place names next to a circle or dot indicate a city, and place name without a circle or inside a shape on the map refer to thanas.

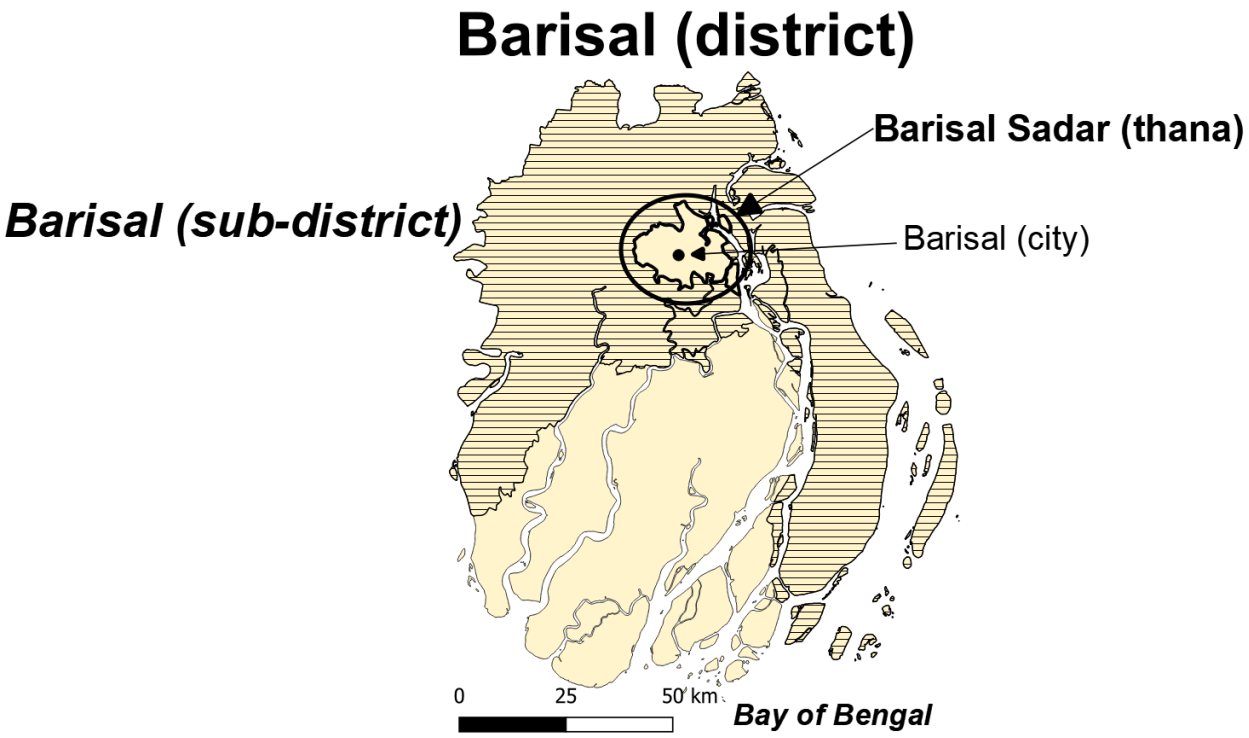

Figure 1.1: Map of Barisal administrative levels with similar names. In East Pakistan, it was common for multiple administrative levels to share the same name. The city of Barisal resides in the thana of Barisal Sadar (also known as Kotwali). The thana lies inside the Barisal sub-district that makes up the northern half of the district named Barisal.

To represent damage caused by the cyclone, I created two areas: the core and peripheral cyclone areas. The core area is the hardest hit area, where damage from storm surge and wind occurred. I created this area using post-cyclone mortality estimates (Sommer & Mosley, 1972). First, I adjusted the available information, so it was at the same administrative unit scale. In the initial survey (Figure 1.2), mortality was estimated at the union level, a smaller administrative unit than the thana. The map shows a concentrated core cyclone area, where mortality rates from the storm surge ranged between 0-9% and over 20%. However, the survey only published data for the larger thana level. Therefore, the maps I created show a wider core cyclone area than the

more detailed survey map. The peripheral area experienced extensive agricultural damage due to high winds, but little loss of life. The agricultural surveys by the Agricultural Rehabilitation Project provided data to create the peripheral area. Both the core and peripheral areas experienced severe damage from the cyclone and received substantial amounts of aid during the relief effort.

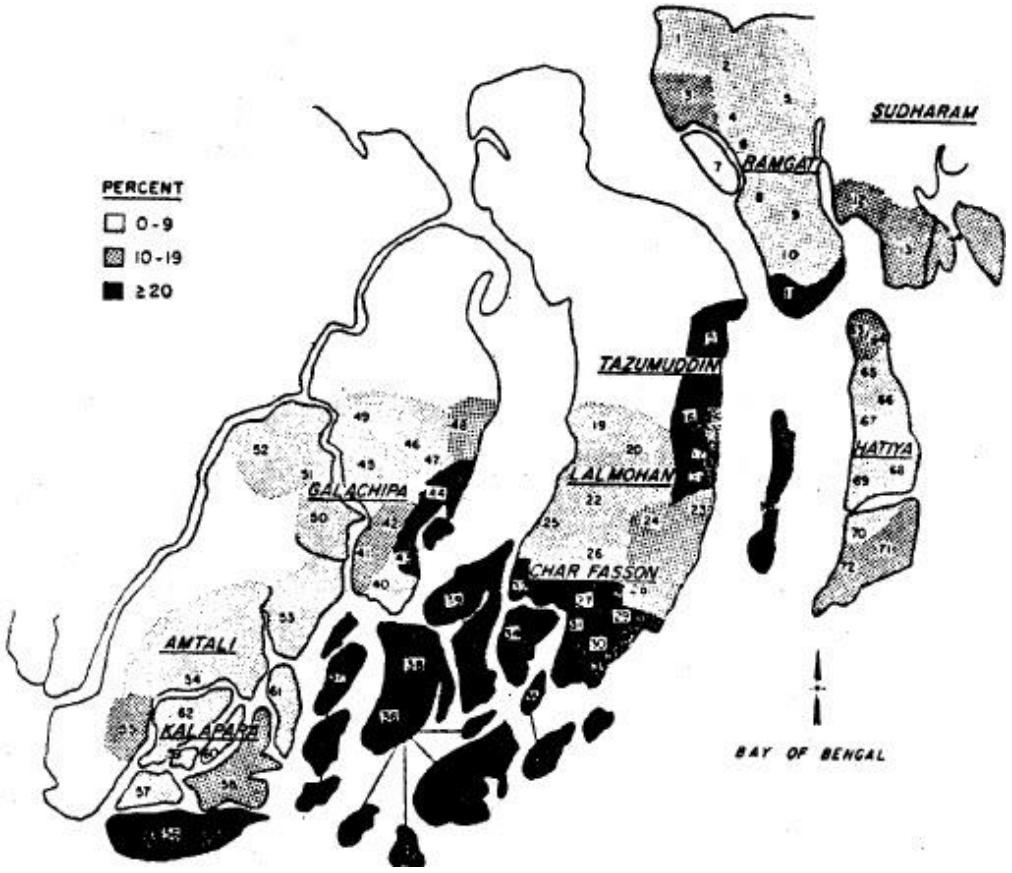

Figure 1.2: Estimated mortality from the 1970 cyclone by union in the nine most affected thanas of coastal Bangladesh. The survey in February and March 1971 surveyed 3,000 families representing 1.4% of the population before the cyclone. The highest mortality rates were believed to indicate the path of the storm surge. Source: Sommer & Mosley, 1972, p. 7.

Pakistan Relief Effort

There were several different components to Pakistan's post-cyclone relief effort. Pakistan headed the effort with the Central Coordinating Committee under the Economic Coordination and External Assistance Department, based in Islamabad in West Pakistan and led by the Pakistan High Commission (*Relief Assistance for East Pakistan Cyclone Disaster, November, 1970 (3)*, 1970). In East Pakistan, the Office of Relief Commission (ORC) oversaw food distribution during short- and medium-term operations (Agency for International Development, 1972). Subordinate relief commissioners coordinated aid in each affected district (Comptroller General of the United States, 1972a). The Government of East Pakistan (GOEP) divided the disaster area into four sections. Each had a divisional commissioner who planned and coordinated relief efforts in their section.

Within and around the disaster area the ORC operated four major operations centers, which oversaw several smaller local operations centers. The ORC also operated seven supply depots that received supplies from distribution centers in Dhaka and redistributed goods to 425 local distribution centers (Agency for International Development, 1972). The major centers were located outside of the hardest hit cyclone area, represented in Figure 1.3 as the High Mortality and Agricultural Damage area. This was because these centers served as staging points for aid and communication. The local distribution and operations centers would have been located further inside the cyclone impacted area to provide direction and aid.

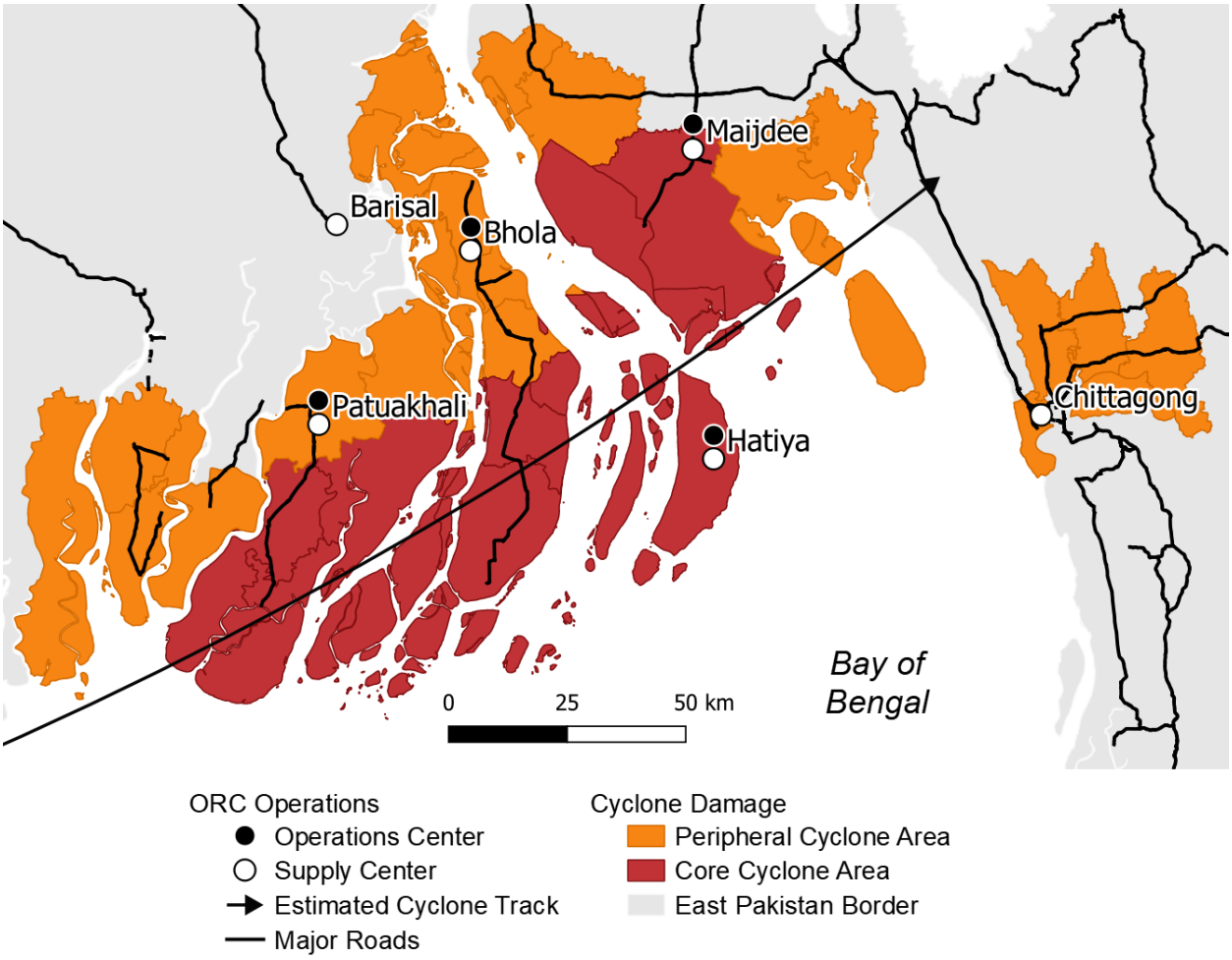

Figure 1.3: Map of Pakistan Office of Relief Commission (ORC) approximate distribution of four major operations centers and seven supply centers. The operations centers oversaw nineteen zone headquarters located near Bhola, Noakhali (Maijdee), and Patuakhali. The supply centers received and redistributed supplies to 425 distribution centers throughout the area. Two supply centers were located at Bhola. (Agency for International Development, 1972).

Figure 1.3 displays the approximate locations of the major Office of Relief Commission centers. From the map, it is apparent the major operations centers and supply depots were in populated areas that intersected major roads. The centers at Hatiya are the only ones located well inside the cyclone impacted area. The others are in the peripheral area, where agricultural

damage was prevalent due to high winds, but high mortality was not. Communications and transportation would have been less disrupted further from the core area that experienced the highest storm surge, prompting planners to establish major centers in areas that were not in desperate need.

The ORC controlled grain from the port to the local supply depots that provided food within the cyclone area. The food was then sold to local shops, which sold or distributed the food (Comptroller General of the United States, 1972b). The U.S. and other countries also followed a system of donating the food to the GOP, who then gave away or resold the grain through the ORC. Through the supply centers and shops, the ORC successfully provided almost 40,000 tons of food to the cyclone area.

The Pakistan Army was also active throughout the cyclone area and is mentioned working alongside British and American personnel. The British and American sources did not provide detailed estimates of the extent of Pakistan's military involvement, and it appeared to the British that the Pakistan Army was operating separate from the ORC (Cox, 1970; Sargeant, 1970b). Due to a lack of location data, I mapped only the ORC facilities.

Within other countries, aid from smaller organizations was often coordinated by committees. These committees contained members of several organizations and coordinated the types of supplies and logistics. The committees sometimes coordinated with a nation's embassy in Pakistan or the government relief effort at home. Some countries operated task forces in East Pakistan during the short-term relief phase. Both the U.K. and the U.S. deployed task forces to East Pakistan from mid-November until December 1970. West Germany, France, and Saudi Arabia also contributed helicopters during the short-term phase, while others, including Singapore and Belgian military personnel, started aid operations in the area in December (Cox,

1970). Only the locations of the initial international aid efforts were available and depicted in the maps because Pakistan assigned zones to the task forces operating in East Pakistan. The disaster area was divided into four zones between the nations that provided helicopters (Comptroller General of the United States, 1972a). The United Kingdom, United States, and West Germany were each responsible for one zone. Pakistan, France, and Saudi Arabia were jointly responsible for the fourth zone.

British Relief Effort

For the international relief efforts, the largest zone was the southern British zone. This zone included the hardest hit area. Both the British government and non-governmental organizations (NGOs) were actively involved in the cyclone relief effort. The East Pakistan Relief Unit (EPRU) was the central British relief coordinator. Located within the Foreign and Commonwealth Office (FCO), part of the Ministry for Overseas Development, the EPRU oversaw the government and NGO efforts (*East Pakistan Cyclone Disaster British Relief Assistance*, 1970). The government's military operation was known as Operation Burlap, and took place from November 20 – December 11, 1970 (Sargeant, 1970c). The operation included 6 ships, 10 helicopters, planes, 100 boats, four landing craft, and over 500 servicemembers from the Royal Marines, the Royal Navy, the Royal Air Force, and the Royal Fleet Auxiliary (Sargeant, 1970c). Operating out of the main base in Patuakhali, the British helicopter zone included Bhola Island, the coast of Tazumuddin, Burhanuddin, and Galachipa, as well as boat bases in Amtali, Bauphal, Kala Para, and Rangabali (Figure 2.3) (Agency for International Development, 1972; Cox, 1970).

Several British NGOs were also involved in the relief effort. The British Disaster Emergency Committee (DEC) represented the NGOs providing aid, and included the British Red Cross, Oxfam, Christian Aid, Save the Children Fund, and War on Want. The DEC also led a public campaign for donations in Britain (Foreign Staff, 1970).

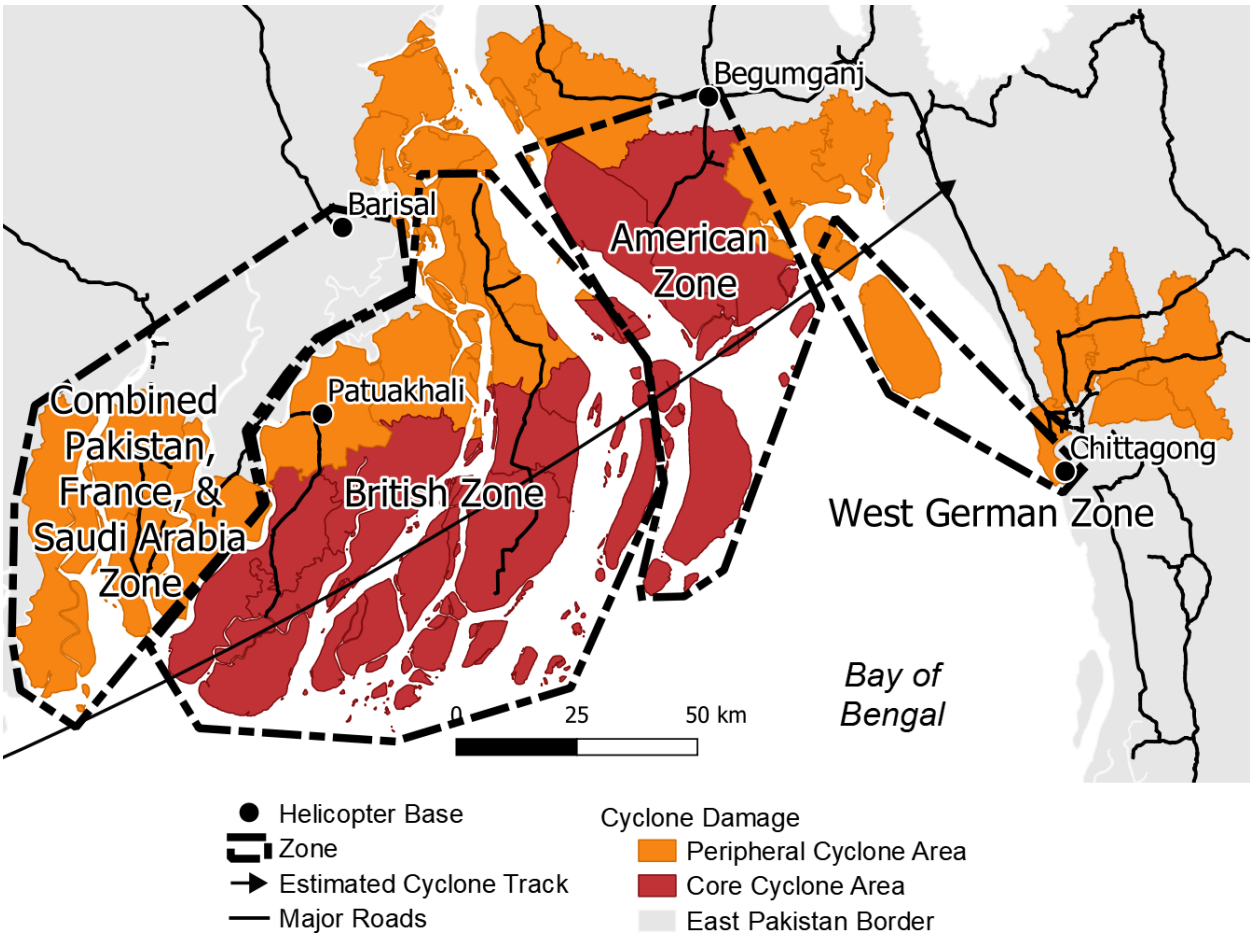

Figure 1.4: Map of estimated extent of four zones of helicopter aid and the helicopter bases. (Agency for International Development, 1972; Cox, 1970; Sargeant, 1970c).

The British government also brought in supplies from around the world. Flights from the U.K. and Singapore and a ship diverted from Kolkata carried medical supplies, nurses, and water

purifying tablets. The British government assumed all responsibility in transporting relief supplies to EP from British NGOs. Charter flights from the U.K. and Singapore and boat transportation ferried in members and supplies from around the world. Through these channels, by November 24 the first relief workers arrived in southern Patuakhali.

The highly equipped and mobile task force of Operation Burlap provided its own communications and transportation in the least accessible area. In this area communications had not yet been established and travel by road was considered impossible, so the British task force ships made both access and communication possible (Sutherland, 1970). One ship also had the capability to find safe passages through the many channels that were clogged with debris and shifted by the storm surge (Reynolds, 1970a). Royal Engineers and Royal Marines repaired damaged and destroyed infrastructure, including bridges, buildings, and wells (Reynolds, 1970b). Aid flowed to the British zone from Dacca by river boat, ocean-going boat from the main supply base in Chittagong, (East Pakistan Relief Unit, 1970; Sargeant, 1970b).

Money was also an issue the British government became involved in. On behalf of the NGO relief organizations and the servicemembers, the British attempted to negotiate the rupee-pound exchange rate. Unlike many countries, Pakistan at the time had two different exchange rates: an official exchange rate for government interactions and a tourist rate for travelers. The two rates were part of a special program subject to guidance by the World Bank. But what many relief organizations saw was that the official exchange rate of 11 rupees to one pound was eclipsed by the 20 rupee to the pound tourist rate (Sargeant, 1970a). Since relief money from organizations was exchanged at the official rate, it had half the buying power of tourist money. However, the EPRU found that exchanging all the relief money at the tourist rate would be financially difficult for the GOP, and it was no surprise when Pakistan refused. Until the tourist

rate was extended to all relief aid late in December, aid workers were encouraged to carry money themselves to exchange at the tourist rate (Douglas-Home, 1970c; Siddiqui, 1970b).

The relationship between Pakistan and the U.K., despite the cyclone cooperation, remained tense. While Pakistan was still a member of the Commonwealth, cracks in the arrangement showed. Some within Pakistan viewed the benefits of being in the Commonwealth were "out-weighed" by negative aspects (N. Ahmed, 1971). And others viewed negative British press reports concerning the Pakistan Government's cyclone relief effort as a British attempt to reassert control over Pakistan (Siddiqui, 1970a).

For their part, the British were concerned by Pakistan's slow response. While telephone lines were out of service, the British observed it still took many hours for Pakistani officials to visit the cyclone area. Possibly due to an internal power struggle with General Tikka Khan, the GOP president had seemed more concerned after the July-September floods in East Pakistan than during cyclone relief. The president's appearance of being less concerned with the latest crisis and a seemingly slow Pakistan response concerned the British observers.

The election of 1970 was also a concern after the cyclone. The election had already been delayed due to heavy rains in October, and rescheduled for December (Agency for International Development, 1972). On November 22, the Chief Election Commissioner, Mr. Justic Abdus Sattar, implied elections would continue as scheduled except in cyclone area but would finish before the National Assembly. The British considered this implied the GOP was concerned that ballot boxes from earlier collections would be tampered with before polling concluded across the country if the elections were changed or further staggered. Rising political tension before the election prompted Operation Burlap planners to only run the operation for three weeks.

Balancing public relations was another concern of the government. On November 24, the FCO reported some Pakistanis had staged a demonstration outside the High Commission in London protesting the GOP's "handling of [the] situation" (Douglas-Home, 1970a). The FCO also reported some of the Pakistan newspapers were expressing criticism. The Pakistan Observer was critical of the GOP's handling of the crisis. The Pakistan Times published an article where observers saw goods piled-up at airports in West and East Pakistan ("Co-ordination Lacking: CARE Stops Its Supplies," 1970). In light of this criticism, the British sought to avoid criticizing the GOP relief efforts, to not use the term "British relief area", and to obtain positive reports on GOP efforts for public relations (Douglas-Home, 1970b).

Some expected the reporting of criticism against GOP to die down after British ships arrived. But when the reports of British efforts began to die down a few days later, the criticism of a lack of timely assistance from the GOP and Pakistani armed forces remained, especially around the deployment of GOP helicopters. British observers also noted the East-West divide. "Officials here in the West Wing have shown us very clearly their attitude to their Bengali compatriots by acting with a notable lack of urgency." wrote Richard E. Escritt of the British High Commission in Rawalpindi, West Pakistan (Escritt, 1970).

By November 27, the British were concerned that Pakistan would not remain unified. On the same day, the short-term relief phase was believed to be nearly complete. By the next day, they were slowing medical aid, except water purification, awaiting the Pakistan Minister of Health's determination of need in the cyclone area following reports that medical concerns were not as prominent as previously believed.

Volunteer groups would remain after the military withdrawal, but the withdrawal would affect volunteer relief organizations using RAF flights from Singapore and other transportation.

However, the sentiment “If we leave soon, we shall do so with the maximum credit” prevailed, and Operation Burlap ended on December 11, 1970 (Sargeant, 1970b).

American Relief Effort

The American aid effort occurred at the same time in a different corner of the disaster area. Like the British effort, the American effort took multiple forms. Shortly after the cyclone, when the scope of the disaster was still becoming known, the U.S. expressed condolences and support for Pakistan. A telegram on November 15 expressed personal sentiments from President Nixon to President Yahya regarding the cyclone (*Telegram 187199 From the Department of State to the Embassy in Pakistan*, 1970). Pakistan officially requested the assistance of both helicopters and boats in the relief effort from the U.S. Then, from November 18 to December 18, American helicopters operated in the disaster area. Over 80 personnel and 10 helicopters comprised the local American effort operating in the U.S. zone (Agency for International Development, 1972).

The U.S. zone included islands in the northeast sector of the disaster area. The helicopters operated out of Begumganj Airbase in Noakhali, flying aid to islands in the Bay of Bengal, including the major islands of North and South Hatiya, as seen in Figure 2.3. The zone also included the smaller islands to the east, between the islands of Hatiya and Sandwip, with an estimated population of 450,000 people pre-cyclone (Comptroller General of the United States, 1972a). After the cyclone, the area was largely inaccessible, requiring aid to be transported by helicopter (*Relief Assistance for East Pakistan Cyclone Disaster, November, 1970 (1)*, 1970).

Normally USAID would have headed the disaster relief effort, but in this case multiple groups were created. The Interdepartmental Working Group on East Pakistan Disaster Relief

included representatives from USAID, the State and Defense Departments, and other agencies. This group coordinated operations between the member groups. Within this group, a special USAID group called East Pakistan Disaster Action Group was also created to manage the USAID response (Comptroller General of the United States, 1972a). In West Pakistan, the American Ambassador to Pakistan also created an interagency task force. The task force's role was to manage political relations as well as foreign relations. It also was responsible for communication and transportation for the U.S. aid effort, and coordination with other donors such as the British. Overall, the groups worked together and successfully provided a large amount of aid.

American aid took many routes to East Pakistan. Like the British, the U.S. charted commercial flights into the country to deliver supplies. Initial emergency supplies included: biscuits, bottled water, blankets, tents, and 250,000 Pakistan rupees. Later emergency shipments included vegetable seeds for medium-term recovery. Helicopters were airlifted from the continental U.S., as this was deemed faster than reassigning helicopters operating in Vietnam.

The emergency supplies, along with the commercial airlift and American helicopter operation, totaled $2.2 million USD. In the U.S. calculations, transportation and personnel costs for the task force are included in the donation total. $1.5 million of the donation was transportation. A later grant to the GOP of $1 million USD provided funds for transporting supplies by boat within East Pakistan (Comptroller General of the United States, 1972a). The U.S. also provided over $11 million dollars of food aid and food transportation. By September 30, 1971, U.S. cyclone relief aid totaled $38.9 million dollars.

The U.S. noticed similar issues in the aid effort as the British had. During the short-term phase, U.S. teams of the East Pakistan-based Cholera Research Laboratory conducted surveys in

the disaster area. Transported by U.S. Army helicopters, these teams found there were few disease outbreaks or freshwater shortages, and the overall need for medical aid was remarkably low. The need for medical aid was so low that more international medical aid was not needed. Relief then had to be redirected from field hospitals and medical teams to other relief efforts. And despite the backlog of relief supplies at central facilities such as Dhaka, most air drops were small. This was due to a shortage of personnel and storage at distribution sites in the cyclone area. There were not enough personnel to distribute supplies quickly, and the sites lacked storage facilities to store large shipments of relief supplies. Despite these difficulties, U.S. observers did feel the GOP distributed supplies fairly.

Except for the emergency supplies in the earliest shipments, the bulk of U.S. food aid did not arrive for months. This was because the U.S. food aid was not intended to be consumed right away, but to replace Pakistan's depleted food stocks. With foreign food aid earmarked for Pakistan, Pakistan was free to release grain, stored before the cyclone, to cyclone victims. The U.S. food relief went towards replenishing Pakistan's food stores. This system of assurance meant the U.S. still counted its food aid as short-term disaster aid even though the food arrived after the short-term phase was complete.

Documents covering the U.S. relief in 1970 and U.S.-Pakistan relations in 1971 displayed a warm relationship between President Nixon and President Yahya (Bass, 2013). Nixon urged swift aid to Pakistan (*Telegram 187199 From the Department of State to the Embassy in Pakistan*, 1970). But a few years before, relations between the two countries had become frosty over the subject of aid. When Pakistan's request for additional military aid was denied by the Kennedy administration, it instead pursued a non-aggression pact with China (Williams, 2012). In the Cold War balancing act, the U.S., under President Johnson, threatened to withhold aid, as

a non-aligned Pakistan could threaten U.S. interests. At the time, U.S. aid totaled $400 million a year. The aid programs stalled under increasing political tensions. By 1970 the aid relationship had returned to friendlier terms that enabled an American military task force to deliver aid after the cyclone, and official documents focused on the cooperation between the two nations.

West German Zone and Combined Zone

There was little information available concerning the last two zones aided by helicopters from West Germany, France, Saudi Arabia and Pakistan. West Germany provided six helicopters that were based at the port of Chittagong and delivered aid to the island of Sandwip, east of the American zone. The three-nation helicopter force operated out of Barisal and covered the western portion of the disaster zone, but locations detailing the exact extent of this "western" zone were not available (Agency for International Development, 1972). Saudi Arabia and France both provided two helicopters, and Pakistan four helicopters. Both zones are approximated on the maps. Both zones appear to have encompassed significant portions of the aid area that would have been difficult to transport supplies to by land or boat.

Conclusion

This chapter mapped the highest level of relief aid. The operations and supply depots were established where communication and transportation had not been disrupted and served as central nodes for several smaller centers. The helicopters were primarily stationed outside of the hardest hit area where aircraft maintenance and fuel were easier to access. The British task force's large naval presence enabled its helicopters to operate further in the cyclone area. Thirty-two helicopters delivered aid to the disaster area during the short-term phase. But aid delivered

by helicopter was only a small portion of the total aid (Agency for International Development, 1972). Over 80% of the relief aid was delivered by boat. This chapter represents the first level of the national and international aid effort during the short-term phase. These locations were supported by British and American government and aid documents. Aid reports from Pakistan and other participating countries may expand the understanding of the extent of the cyclone relief efforts. Understanding the complex interconnection between national and international relief efforts is necessary to understand the Great Cyclone of 1970, and this chapter begins to bridge that knowledge gap by locating both national and international relief contributions during the short-term relief period.

CHAPTER 2: MAPPING MEDIUM-TERM DISASTER RECOVERY IN THE AGRICULTURAL SECTOR

The cyclone of 1970 damaged over 1 million acres of rice, almost 50% of the cyclone area's rice crop (Samad, 1971). When the cyclone struck, the most important rice crop of the year was most vulnerable, and experts feared famine. However, the famine did not appear (Bose, 1972). Vast quantities of imported food helped meet immediate needs, but that was not the only form of post-cyclone food aid. There was also an effort to enable farmers to produce their own food. This effort was directed by the Agricultural Rehabilitation Project, an outreach of the Directorate of Agriculture (Samad, 1971). Using location data identified in the Agricultural Rehabilitation Project Report, this chapter locates national agricultural relief efforts during the medium-term relief period, expanding the understanding of this often-overlooked period of the national relief effort.

The goal of the project was to enable farmers to grow produce for local consumption. These efforts enabled farmers to grow rice in the traditional off-season, as well as quick-growing vegetable seeds. These crops were meant to see farmers through until the next year's rice harvest. But the supplies were not evenly distributed. Three factors shaped the aid distribution: season, manpower, and supplies and equipment. The coming dry season would require irrigation or lands with low salinity. Manpower, normally not an important factor in the densely populated region, was most impacted in the hardest hit areas by the high mortality rate from the deadly storm surge. Supplies and equipment would have to be transported to the area, and consisted mostly of seed, fertilizer, plows, and plow animals. Each of these factors was considered within the broader scope of agriculture in East Pakistan.

Attributes of Agrarian Society in East Pakistan

The delta created a fertile landscape with new lands being created each year that could be farmed. Farms were often 20 to 25 acres of land due to the less dense population (Samad, 1971). Traditional homesteads involved digging channels, digging freshwater tanks, and planting trees around the houses to provide food and serve as a windbreak. Traditional crops were grown around the homestead throughout the year, with salt-resistant crops grown in the dry season. The primary crop grown in East Pakistan was paddy rice. In East Pakistan then, as in Bangladesh today, the warm subtropical climate meant crops could be grown year-round. For the primary crop, rice, there were three distinct seasons: Aus (summer), Aman (winter), and Boro (spring) (Hussain, 1964). Aman rice is sown in seed beds from May-June, transplanted during the period from July-August, and harvested between November and January. This season is ideal for rice because the monsoon rains from June to October irrigate the rich soil of the delta, lowering salinity and providing fresh water for paddies without the need for water pumps. Due to the ideal conditions, in 1969 76% of the rice crop in the cyclone area was grown during the Aman season (Samad, 1971). The other 24% was grown during the summer Aus season. Boro rice, with a season running from October to April, was not traditionally grown in the coastal area. Encroaching sea water increased soil salinity near the coast during the March-May dry season. The lack of rainfall during the dry season meant the rice would need irrigation. However, this area lacked the water pumps needed to move fresh water into the paddies. Overall, the Aman season was the ideal growing season in the cyclone-impacted area, but it was also the season the cyclone made landfall.

Post-Cyclone Surveys

The primary sources of cyclone area relief efforts come from two programs. The Department of Agriculture of Pakistan commissioned the Agricultural Rehabilitation Project Report. The report provided agricultural damage estimates and an account of the governmental actions undertaken to provide farmers the equipment and supplies needed to restore agriculture to the devastated area (Samad, 1971). The two surveys conducted by the Epidemiology Division (Pakistan-SEATO) of the Cholera Research Laboratory (CRL) provided estimates of mortality, damage, and how much agricultural equipment was needed to restore production (Sommer & Mosley, 1972).

Agricultural rehabilitation was important because agriculture was the primary livelihood in the Ganges Delta. The traditional agricultural cycle meant the cyclone struck during the crucial Aman season. The Agricultural Rehabilitation Project's survey found over 1 million acres of rice were destroyed by the cyclone (Samad, 1971). This was almost 50% of the cyclone impacted area's rice crop.

The damage caused by the storm varied. Although storm surge is responsible for high mortality cyclones in South Asia, wind can be dangerous for vegetation (Seo & Bakkensen, 2017). The cyclone's strong winds caused extensive damage to unprotected crops. Windbreaks such as trees and embankments sheltered some rice paddies and resulted in less damage. Greater damage was observed where the paddies were exposed to the high winds. This damage was attributed to heat created by the cyclone's winds (Samad, 1971). The storm's timing and immense damage meant the bulk of the damaged fields were also meant to be the bulk of the harvest for the entire year. Replacing such a large crop would be impossible, but perhaps some food could be grown to minimize the ill effects of such a disaster. The recovery focus of the

Agricultural Rehabilitation Project was to enable farmers to produce a spring (Boro) rice crop and winter/spring vegetables, melons, spices, millet, and pulses. Seeds and supplies from USAID and a multitude of other sources were distributed by the project.

Other crops were also damaged. Vegetables, betel leaf, sugarcane, kheshari, banana, coconut, betelnut, and other trees had been blown over or burned by the wind. Unlike rice, trees could take one to two years to recover and produce fruit. So instead of focusing on longer-term produce like trees, the project focused on introducing quick-growing vegetables. Over half the land replanted through the project was not replanted with rice, but with other crops (Samad, 1971). Detailed location allotments of vegetable seed and other inputs was not available, so I focused on the rice seed distribution.

Methods: Recreating 1970 Maps

To locate the cyclone and relief effort during the medium-term relief efforts, I created maps of agricultural inputs and damage. To analyze the project's perceptions of the relief effort, I then compared the stated objectives of the relief program with the spatial extent of aid. I used the open-source GIS software QGIS to display and create maps. The initial map base layer was the GADM 2018 Bangladesh shapefile dataset in the WGS84 datum (*Bangladesh: GADM Data (Version 3.6) Datasets*, 2018). This dataset consisted of administrative levels 0-4, with 0 being the largest and 4 the smallest administrative units. Level-0 represented the country-level shapefile. Levels 1-4 of Bangladesh's administrative units are the division, district, upazilla, and union. However, since the cyclone occurred the administrative units have changed. To effectively map the cyclone data, I needed to recreate a map with administrative units as they existed in 1970. Some of the place names are the same as those from Chapter 1. However, in the

previous chapter, I primarily referenced cities, and represented them with circle symbols. In this chapter, I primarily reference the larger Level 3 administrative unit called the thana, represented by a polygon. The approximate locations of agricultural rehabilitation camps are represented by stars and diamonds located in the geographic center of each thana.

Early 1970s maps of West and East Pakistan show the coastal area at the time of the cyclone consisted of five districts (*Pakistan*, 1971; Islam & Miah, 1974). By 2018, each of those districts had been further sub-divided into 2-4 districts. Using the map and the level-2 layer, I merged and renamed the 2018 districts to recreate the 1970 districts. Level-2 district consolidation included: Pirojpur, Jhalokati, Barisal, and Bhola consolidated into Barisal/Bakerganj District; Barguna and Patuakhali consolidated into Patuakhali District; Satkhira, Bagerhat, and Khulna consolidated into Khulna District; Lakshmipur, Noakhali, and Feni consolidated into Noakhali District; and Chittagong and Cox's Bazaar consolidated into Chittagong District.

The level-3 layer had changed as well. Here individual upazillas had also been subdivided into smaller upazillas. The "upazilla" was renamed to its 1970 title "thana". Subdivided upazillas were reconsolidated into the 1970 thanas. This provided a 1970 level-3 dataset in the hardest hit cyclone area that both surveys had mapped.

For consistency, I adjusted place names on the maps and throughout the paper to the 2018 English spelling of the 1970 place name. This process resulted in a serviceable map of 1970 districts and thanas for the hardest hit area.

Next, I applied the data collected by the post-cyclone surveys to the map. After adjusting names and areas, I inputted various tables from the agricultural report and epidemiological survey into the software for the affected area. In the case of Patuakhali District, only six of the

eleven thanas had individual Aman crop damage totals. The remaining five thanas had been summed together. Across all five 50% of the Aman crop had been damaged. Since this was the hardest hit district, the unnamed thanas were located next to one another, had similar river access, and were adjacent to the most damaged thanas, I assumed the 50% damage was evenly distributed across those thanas. The tables' information is depicted in the maps in the next section of the paper.

Rice Rehabilitation: Season

The project first considered the impact salinity could have on a Boro rice crop. Aus rice could not be sown until spring and would not be ready for harvest until at least July (Hussain, 1964). Boro could be planted immediately and ready for harvest by March or April if the area were properly irrigated. After determining the salinity could damage the crop before harvest in areas that were more likely to experience higher salinity (i.e., closer to the ocean), the Boro rice allotment was directed to hard hit areas that also had sufficient fresh water. Map 1 details the damage and aid given after the storm. Much of the Aman rice crop in the impacted area was damaged by the storm. The cyclone's storm surge submerged fields, destroying what had been harvested and damaging the rice that was still growing. Apart from the storm surge, much of the crop further inland was also damaged by high winds. The susceptibility of rice to high winds depends on the stage of the crop. Rice in the area was in the booting stage, the stage when the above-ground portion of the plants has grown to full height, the root network begins to expand, and the plants are preparing to flower (Morris, 1980; Samad, 1971). While it would seem much of the damage in the worst-hit area was caused by the storm surge, less damage was observed

where the storm surge had submerged the rice paddy, as the water caused some damage but protected the rice from the wind. In unprotected areas the rice was damaged by the wind.

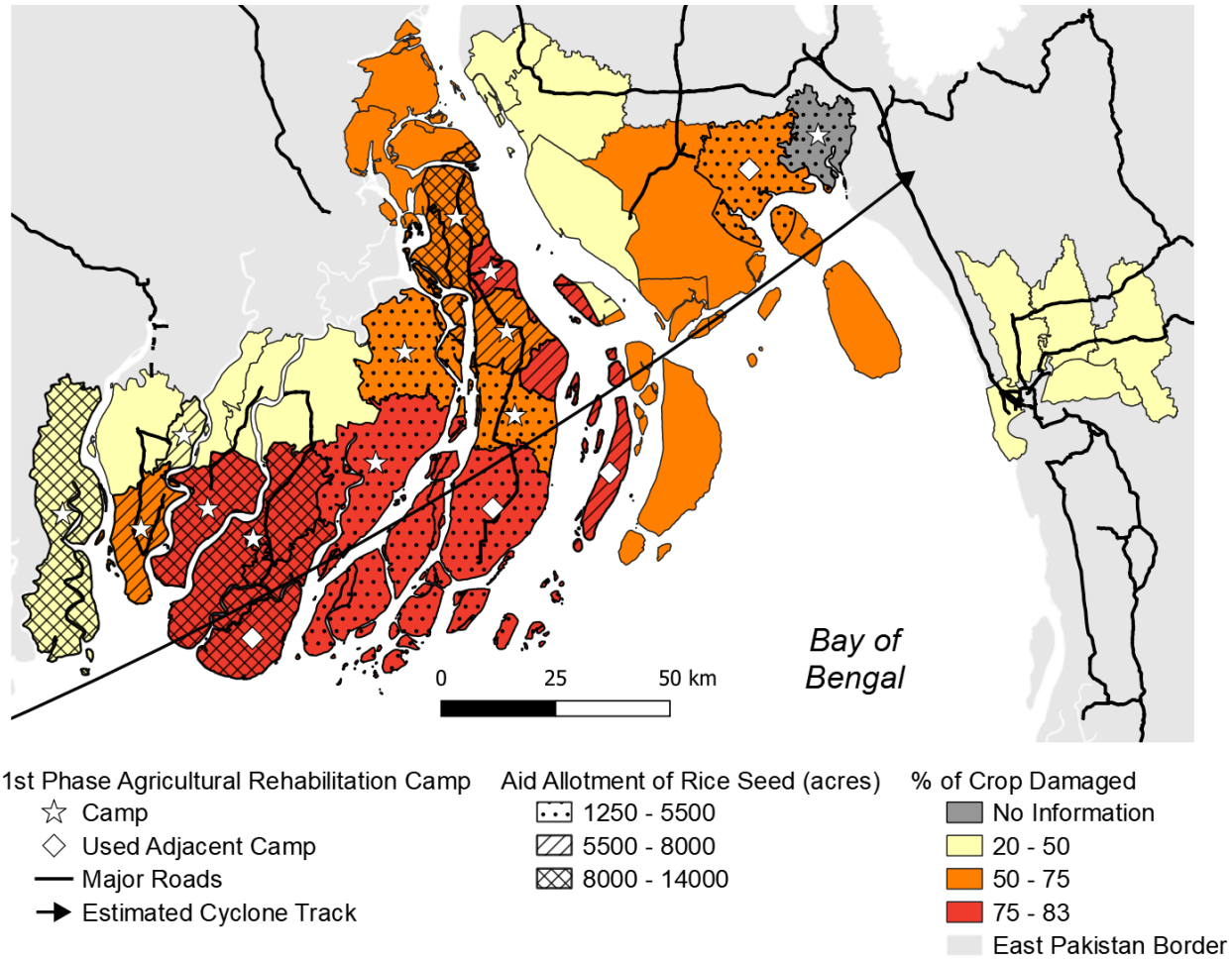

Figure 2.1: Rice crop damage and first phase aid allotments. The greatest rice crop damage occurred in the southwest sector of the cyclone area, yet much of the aid went to less-damaged areas further from the coast due to seasonal, manpower, and equipment concerns (Samad, 1971).

In Figure 1, it is clear that much of the aid went to areas with less ocean front and more river access, in keeping with the principle to avoid growing a crop that could be damaged before harvest.

Rice Rehabilitation: Manpower

The second factor was the high mortality rate of the hardest hit area. The concern was that survivors would still be recovering from the shock and initial effects of the cyclone in areas where the storm surge had caused more deaths. The project planned to instead focus on providing agricultural aid where the population had been less affected by the storm surge.

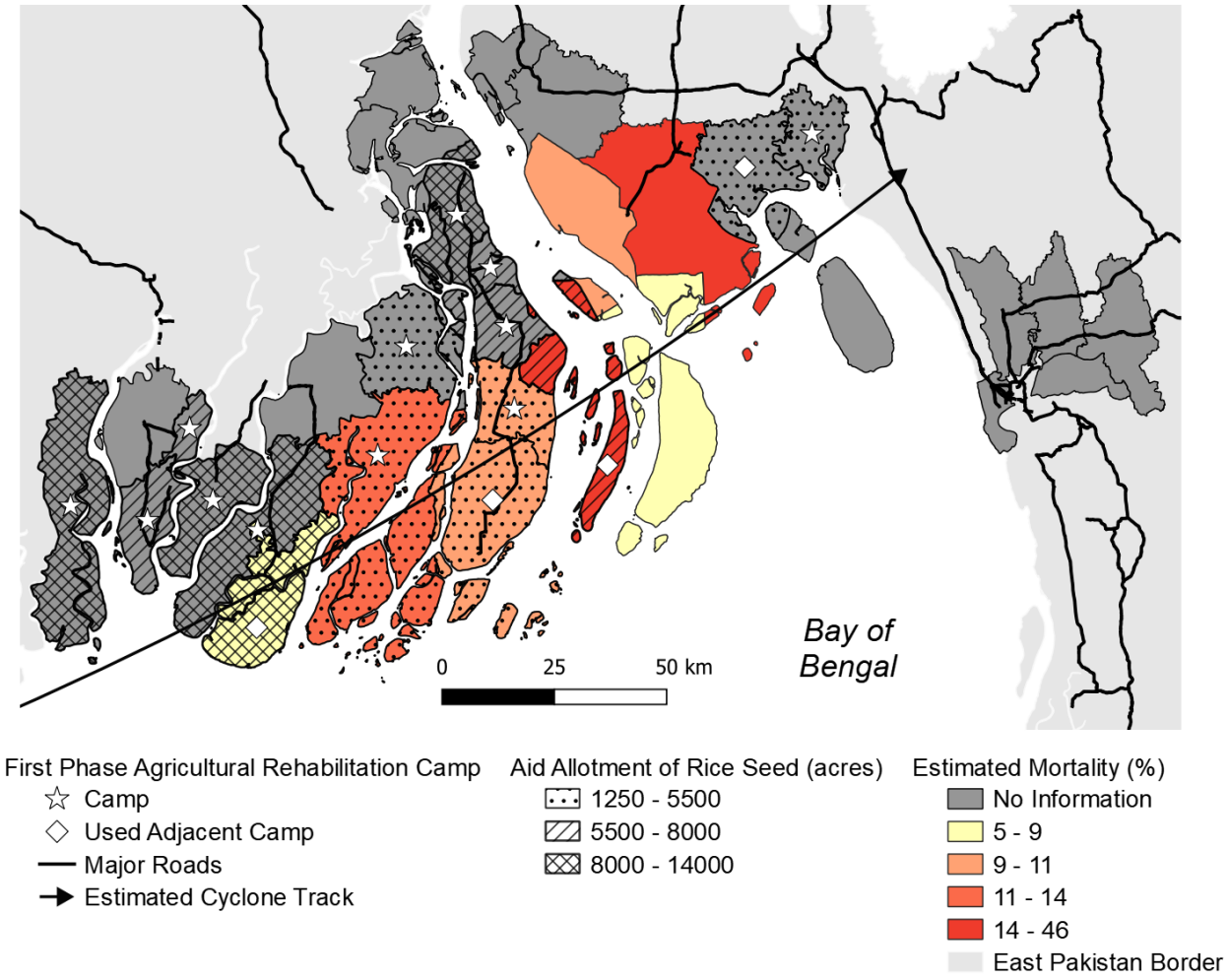

Figure 2.2: Cyclone mortality estimates and first phase aid allotments. The highest mortality rates in the center of the cyclone-affected area received some agricultural aid, but manpower and salinity considerations pushed aid to outlying thanas (Samad, 1971; Sommer & Mosley, 1972).

Figure 2 shows the mortality rate caused by the cyclone, primarily by the storm surge, as estimated by the CRL surveys (Sommer & Mosley, 1972). The rice seed was distributed west and north of the high mortality area. This indicates the project did prioritize agricultural aid away from areas that experienced the greatest manpower impact.

Rice Rehabilitation: Supplies and Equipment

The distribution of agricultural rehabilitation resources was the responsibility of the Department of Agriculture. The distribution included seeds, fertilizer, plows, animals for pulling, tractors, other farm implements, and cash loans. Camps located at major towns and villages throughout the area served as distribution points. Figure 1 shows the thana distribution of the camps, with the symbol located in the center of each thana. This does not represent the camp's actual location, but it is apparent in Figure 1 that coastal thanas to the southwest did not have their own camps. Instead, those farmers were permitted to travel to a designated adjacent thana's camp for supplies.

The area's traditional Aman crop was irrigated by the plentiful rainfall of the monsoon season, and powered water pumps were not needed for irrigation. But irrigation would be needed during the dry season. Locations under consideration were limited to those with available fresh water for the duration of the Boro season, and pumps were procured. Although by 1971 there would eventually be enough power pumps in the cyclone area to irrigate over 700,000 acres without interfering with subsequent Aman crops, money and time constraints meant only 50,000 acres of rice could be planted in the first phase of the plan.

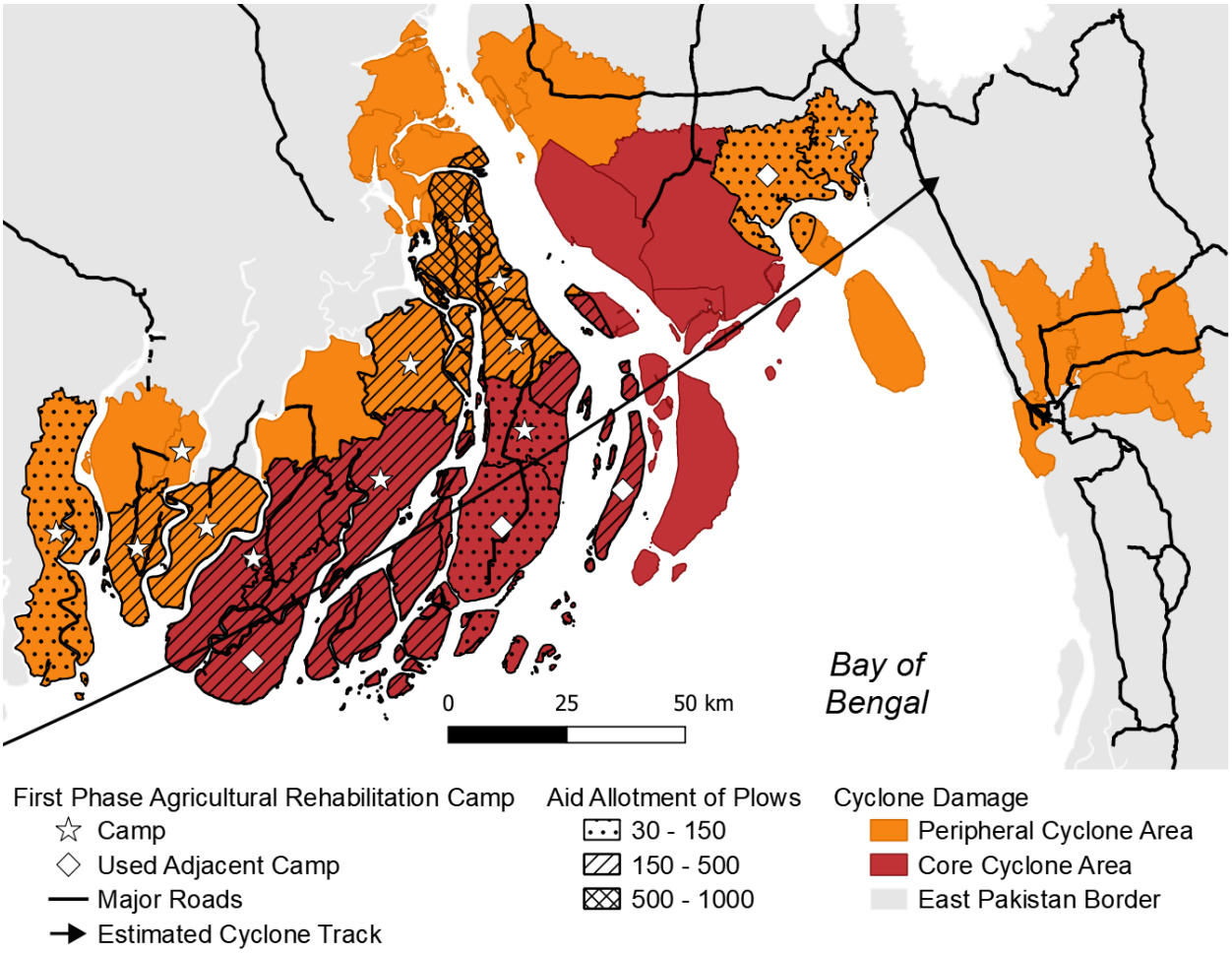

Figure 2.3: Plow distribution throughout the cyclone area. Plows were distributed throughout the core and peripheral area. Many were distributed outside of the storm surge area, represented by the area of high mortality and agricultural damage, where equipment would have been more greatly damaged.

The camps also distributed plows and plow animals. Many farmers relied on plow animals that had been swept away and drowned in the storm surge. The surge also swept away or destroyed farm equipment such as plows. Farming in the storm surge affected area, represented in the maps as the High Mortality and Agricultural Damage area, would require replacing a lot of animals and equipment. But equipment still existed where there had only been wind damage.

With these factors in mind, initial replanting efforts focused on areas outside of the area that had both the most storm surge crop damage and equipment loss. Even the plow animal allotments went to the agricultural damaged area. This was because the plow animals living there had not recovered from the previous season's work. In this case, the plows and plow animals were not meant to replace lost animals and equipment, but to supplement areas that still had equipment and animals.

Issues During the First Phase

The project experienced both a lack of issues in some areas, and unexpected issues in others. Some relief workers feared the storm surge would have raised salinity in the area, making water undrinkable and preventing cultivation. But, due to the heavy rainfall from the recently ended monsoon season, the salinity level of the ocean at the delta's mouth was probably lower than usual. Since the storm surge waters were less salty than usual, salinity levels were low in most areas and were not a factor in immediate agricultural relief. However, water still needed time to drain from areas enclosed by embankments, delaying planting in waterlogged fields.

The unique aspects of agricultural rehabilitation meant the project also ran into unique problems. Animals in one area were distributed to farmers one at a time instead of in the pairs needed for plowing. The project also pushed increase cultivation in the area by mechanizing agriculture within the cyclone-affected area. But mechanization required time to train operators, delaying plowing with power tillers. Shortage of pesticides in some areas, potato blight, operators fleeing the area, fuel and spare parts shortages from the government crackdown and civil war in March and April of 1971 all interrupted recovery.

The civil war and genocide disrupted both the Agricultural Rehabilitation Project and the CRL teams, forcing the CRL teams to leave the area. The Agricultural Rehabilitation Project Report, published in 1972, revealed the project's second phase was poised to provide widespread assistance to the hardest hit areas, but due to the crisis had been interrupted and remained incomplete. Information from the first phase was also incomplete as hostilities broke out before the harvests were complete.

Additional Mapping Difficulties

One issue with mapping the Aman crop damage was that the Directorate of Agriculture provided two different tables with different figures for Aman damage in acres. For this paper, I chose the table used in the text to represent damage in the maps. That table provided a bigger affected area than the table in the appendix and encompassed the agricultural camp locations.

The area depicted in the Aman agricultural damage maps represents only two thirds of the total affected area. Additional damage in the eastern and westernmost districts was included in the damage total, but the places surveyed were not named. Out of the total 2.4 million acres of affected Aman, over 500,000 additional acres in the west and almost 300,000 in the east were damaged, or 34% of the damaged area (Samad, 1971). Accurate names and figures of these additional thanas would increase understanding of how widespread cyclone wind damage was. However, since only 5% of the rice within these areas was damaged, aid was not distributed there. That these little damaged outlying areas did not receive aid further supports the project's priority to provide aid to the most affected areas.

Next Steps for Further Study

An elevation dataset paired with the 1970 water level measurements would enable an estimate of where the storm surge occurred. A more accurate representation of camp locations would also help determine the proximity of the camps to the hardest hit regions that had to travel to other camps. Adding detailed transportation networks would also help visualize the difficulty of transporting agricultural supplies across the area.

One important note is each survey relied on statistical information derived from a small sample. The slow transportation and utter devastation of the area made collecting data unfeasible. Exact numbers of supplies distributed by each camp were also unavailable. The sheer amount of work associated with distributing supplies is credited for preventing camp workers from keeping records of how many supplies went to each area, let alone each farmer.

Conclusion

Agricultural rehabilitation across the cyclone-impacted area was necessary given the large population that depended on agriculture for their livelihoods. The Agricultural Rehabilitation Project adhered to the three factors of the season limitations, manpower, and supplies and equipment in distributing agricultural aid. Due to these constraints, the medium-term relief effort was centered on areas severely impacted by the cyclone, with special considerations shaped by the perception of conditions in the core cyclone area. The long-term effects of the project are difficult to determine due to its interruption, and because the 1960s and 1970s were a time of other agricultural improvements that created greater food security (Jabbar, 1985). However, this project serves as an example for how post-disaster aid can rebuild an agricultural society.

CHAPTER 3: CONTENT ANALYSIS OF POST-CYCLONE NEWS ARTICLES

The Great Cyclone of 1970 and the complex multinational aid effort was one of the common news stories during its time. Countries at odds with one another were offering aid. Much of the credit for the post-cyclone aid effort went to the U.K. and the U.S. Both countries' governments were heavily involved, as were several non-governmental aid organizations. Therefore, it is important to understand the perceptions that these countries had of East Pakistan. In this chapter, I analyzed the content of two major newspapers providing news coverage of the event to locate the cyclone and relief effort within the context of contemporary perceptions surrounding East Pakistan.

Methods: News Article Content Analysis

The New York Times, abbreviated to NYT, and the Guardian, abbreviated to GUA, both provided English-language news coverage that would have been accessible to the public of both countries. These newspapers also had reporters stationed in West and East Pakistan. For this paper, I only included articles between November 13, 1970, and March 25, 1971. All the articles were published after the November 12 cyclone and before the March 26 government crackdown and mentioned Pakistan and the cyclone. There are articles after the March 26 government crackdown, and the following civil war and genocide, which cover the cyclone. However, as millions of refugees fled East Pakistan into neighboring India, much of the aid focus shifted to alleviating the refugee crisis. Celebrity aid such as the George Harrison concert for Bangla Desh also came later during the refugee crisis and was not a factor in the short- and medium-term relief efforts or articles. To avoid using articles influenced more strongly by other events, I chose to only include articles published from November 13, 1970, to March 26, 1971.

In this 132-day period, there were 63 articles published that pertained directly to the cyclone: 28 from the Guardian and 35 from the New York Times. This is approximately one article every two days, with most clustered in the three weeks immediately following the cyclone.

For content analysis, I used the open-source software Voyant for keyword analysis. The keywords assisted in identifying topics of interest that spanned the entire body of articles. I then coded the articles using the open-source software QDA Miner Lite. The number of occurrences of each topic in the tables represent the number of articles that discussed each topic. To cite various news articles used in content analysis, I used a table format and citation format used in a content analysis by Joel Gruley (2009). The citation format uses (Author, Newspaper, Month/Day/Year) instead of the standard citation. By showing the newspaper and full date, this method aids in comparing the ideas expressed across each newspaper over time.

I coded the articles to identify three major topics: descriptions of East Pakistan, the cyclone impact, and the relief effort. East Pakistan would have been an unfamiliar place to many readers, so the geography, people, history of neglect and the election in December 1970 were frequent topics. The cyclone impact was commonly measured in terms of the death toll and aspects of destruction. The relief effort, which was the main subject in many articles, covered the efforts of various countries and non-governmental organizations as well as concerns and criticisms at the handling of the crisis. The many topics created a unique picture of how the authors viewed East Pakistan at the time.

Article Overview

When the article was published influenced the article's topic. The majority of the news articles were published during the short-term relief efforts of November and December. Therefore, most of the relief effort discussion centered around short-term relief. There is some coverage of medium-term efforts from January to March 1971, centered on housing, food, and agricultural relief. This period also included longer discussions on long-term relief plans, the World Bank and the international community's role in providing long-term relief by construction projects that could lessen the damage caused by future cyclones.

Table 3.1: Number of news articles published in the months following the cyclone.

Month of publication	NYT	GUA	Total
November[a]	25	18	43
December	5	7	12
January	4	2	6
February	0	1	1
March[b]	1	0	1
Total	35	28	63

Note: Most news articles were published shortly after the cyclone, during the short-term relief phase from November to December 1970.

[a] Articles from November 13-31, 1970.

[b] Articles from March 1-25, 1971.

The first major topic was centered around describing East Pakistan. Both this region of the world and the catastrophic nature of the cyclone were foreign to many readers. One American I spoke with said the news coverage of the cyclone was the first time they had heard about East Pakistan. To make the event more understandable to the reader, 41% of the articles described aspects of the landscape of East Pakistan. Some descriptions created an image of a flat, low-lying, featureless plain (Disaster in Bengal, NYT, 1970). Other descriptions tie the

geography to the cyclone: a perfectly flat landscape with dikes, “frequently hit by storms, with heavy death tolls” (Pakistan Death Toll, NYT, 11/17/70). Still other descriptions incorporate negative aspects of the human situation into the geography, creating a place of despair: “a tragedy which continues decade after decade in the mud flats of the Delta” (Preston, GUA, 11/30/70).

Over 40% of articles mention the people of East Pakistan. One article quoted a Bengali who lived in the cyclone area, who referred to his fellow islanders as “prosperous fishermen and paddy farmers” before the cyclone (The Survivor, NYT, 11/18/70). Some referred to farmers, peasants, and fishermen (Foreign Staff, GUA, 11/19/70; Pakistan Death Toll, NYT, 11/17/70). But most references spoke of the people as the victims of the cyclone: desperate, “reduced to scrabbling in the contaminated river waters for rotting rice” or living in “rural squalor” (The Survivors, NYT, 11/18/70; Preston, GUA, 11/30/70). The lack of descriptions of the people and culture in context created a perception of helpless people trapped in “one of the poorest, saddest, most deserving countries in the world, a proliferating nonnation in an Asian limbo” (Preston, GUA, 11/30/70).

The overwhelmingly negative portrayal of the East Pakistan geography and conditions of the people’s lives was concerning. The prevalence of such ideas across both newspapers implied they were both concerned with conditions and the people. However, if this was the only time their readers heard about East Pakistan, it risked creating a false impression of the lives of the people there. While people such as one Bengali man see themselves as prosperous, outsiders who have only read coverage of the cyclone would create an entirely negative mental image of the region due to the negative geographic descriptions. Multiple people I spoke with, who had only heard of Bangladesh or East Pakistan in the context of a disaster, automatically used words such

as “poor” when discussing the people. They had no reference for understanding how the region perceived itself. News coverage of disasters is necessary, but negative descriptions can easily create an image of a poor, miserable, sad place that doesn’t exist except in the mind of the reader.

Relief Efforts Concerns and Criticism

The most prevalent topic across both newspapers was the relief effort. Even though I only search for articles that mentioned Pakistan and the cyclone, every article referenced the relief effort. Which aspects of the relief effort were discussed varied. Both newspapers reported on the Pakistan relief effort and on concerns or criticisms of the relief effort in 50% or more of the articles.

Table 3.2: Percentage of articles published by each newspaper that discussed the two most common topics.

Topic	NYT	GUA	Total
Pakistan relief effort	63%	68%	65%
Relief effort concern/criticism	66%	50%	59%

Note: The most common topics discussed within the relief effort across both newspapers. The percentage of each newspaper’s articles gives an indication of the prevalence each topic. Both newspapers reported on the Pakistan relief effort and concern and criticism in 50% or more of the articles.

The Pakistan relief effort code usually referenced the Pakistan government’s handling of the cyclone. Given the event occurred in East Pakistan, that Pakistan assumed overall responsibility for the relief effort, and that the Pakistan government was held responsible for the relief effort, it was not surprising that many news articles included Pakistan’s effort in some way.

The coverage of concerns and criticism was more varied. Studying the cyclone is impossible without coming across some form of criticism. Relief response concerns and criticism took many forms and shifted over time. Concerns and criticism of the relief effort were often mentioned together. In this paper I analyzed the form concerns and criticism took in each newspaper, and how they changed over time.

The Guardian Concerns and Criticism

The first concern in the Guardian came on November 16, four days after the cyclone. A reporter learned that the Meteorological Department in East Pakistan had not broadcast a cyclone warning as it normally did (Ghauri, GUA, 11/16/70). A few days later, an entire article was written criticizing different aspects of the response: a lack of a central authority to organize the relief effort; failure by the United Nations to create such an organization; unneeded items being collected; aid being bought elsewhere and flown into East Pakistan when it could be bought there (Lake, GUA, 11/19/70). Other concerns and criticism centered around the lack of helicopters in the cyclone area (Foreign Staff, GUA, 11/19/70). Next, criticism was aimed at countries and NGOs that were sending unneeded medical aid, cluttering up airports and wasting valuable space (Foreign Staff, GUA, 11/21/70).

The first mention of criticism directed at the Pakistan government is a report of a Pakistan government official denying claims of the government's response being slow (Page, GUA, 11/23/70). A few days later, GUA reported the Pakistani newspapers criticized the British press for allegedly intentionally stirred up anger at the Pakistani government following the cyclone (Siddiqui, GUA, 11/26/70). The next day an article reported Sheik Mujibur Rahman had weighed in with his own criticism of Pakistan politicians who supported delaying the elections or

who did not visit the cyclone area (Ghauri, GUA, 11/27/70). He also criticized the government for not issuing a cyclone warning, for not getting aid quickly to survivors, for not attempting to collect accurate mortality numbers, and claimed the government had "grossly played down" the severity of the disaster by releasing "absurdly low casualty figures."

The comments from inside and outside Pakistan helped fuel another aspect of the disaster: protestations by the Pakistani government against the accusations (Preston, GUA, 11/28/70). Over the next three days, the Guardian ran two articles reporting Pakistani President Yahya Khan's response to the criticism. Yahya defended the Pakistan government and claimed the criticism he faced was "belligerent" and "hostile" (Preston, GUA, 11/28, 11/30/70).

By the end of November, another article concluded that while inevitable mistakes had happened, the relief effort was going well (Preston, GUA, 11/30/70). Criticism shifted towards other aspect of the relief effort. One article criticized the British task force for setting a too-early withdrawal date for what appeared to be political reasons (Keatley, GUA, 12/5/70). The actions of the press also became a target of criticism. The British and Pakistani press were also condemned for reporting outbreaks that didn't happen, and the Pakistani press for repeating British stories rather than reporting their own (Preston, GUA, 12/12/70). Relief efforts were also perceived to be "hampering" other projects. This perception drew criticism that although relief efforts helped some, the efforts impeded flood control projects that stood to help everyone. The aid was also seen as too pointed at cyclone victims, disregarding others suffering in East Pakistan.

The last two articles in the Guardian expressed concerns with money. The relief money was exchanged at the official rate of eleven rupees per pound, while tourists could exchange their money at the tourist rate of twenty rupees per pound. NGOs were concerned that donors would

be less generous if it were known the relief money was being exchanged at the government rate, with its purchasing power only half that of a tourist (Thomas, GUA, 12/15/70). Aside from the exchange rate, no further concerns or criticism were directed toward the Pakistani government after mid-December.

Overall, the Guardian's concerns and criticism pointed at multiple actors. While the Guardian reported criticisms against the Pakistan Government, its reporters issued very few criticisms of the government themselves. More criticism was aimed at the international community, and even its own country's efforts.

The New York Times Concerns and Criticism

Concerns and criticism published in the New York Times followed a different arc than the Guardian. The NYT articles first expressed concern at the lack of communication across the cyclone area (NYT, 11/15/70). The first criticism came from survivors, who complained that no relief had arrived, and no government officials had visited the island of Manpura (The Survivors, NYT, 11/18/70). Concerns of disease rose, followed by the fear that survivors would die of starvation if helicopters were not available to deliver aid (Disease Increases, NYT, 11/18/70; Copter Shortage, NYT, 11/19/70)

Transportation restrictions were also a concern. The large area impacted by the cyclone and the large population were considered too big a job for the few helicopters in the area, even as high seas and swift currents prevented boat travel (NYT, 11/20/70; Schanberg, NYT, 11/21/70). Like the GUA, the NYT also noted the lack of a cyclone warning and safe buildings for people to shelter in (Disaster, NYT, 11/22/70).

In the NYT articles, the criticism of the Pakistan government continued to grow. One article reported that the government had made "less than a total effort" to assist survivors (Schanberg, NYT, 11/23/70). The criticism shifted to the geographic and cultural divide. The article reported East Pakistani claims that a callous West Pakistan government was not providing aid for the cyclone-impacted people of East Pakistan and would instead leave that job to the international community. On the other side the Pakistan government claimed it could not fly in helicopters from West Pakistan because India would not allow them to land and refuel in Indian territory.

Articles continued to report criticism of the Pakistan government from East Pakistan (East Pakistani, NYT, 11/24/70). The reported criticism also became directed at President Yahya Khan: criticizing his first trip to the cyclone area as both too brief and too late, demanding his resignation, and staging nonviolent demonstrations (Yahya Directing, NYT, 11/25/70; Schanberg, NYT, 11/26/70).

The first entirely critical article was published on November 26. Some criticism was aimed at the international relief effort. The American helicopter assistance was called a "pitifully small fleet" while the extensive British relief efforts were reduced to "World War II landing craft" (Pakistan's, NYT, 11/26/70). The rest was aimed at the Pakistan local and national government efforts. The point of this article was to appeal for aid donations on Thanksgiving Day. The negative portrayal of every element of the relief effort may have been targeted to elicit more generous donations.

The Pakistan government continued to defend itself against accusations of negligence (Schanberg, NYT, 11/28/70). Transporting supplies to survivors continued to be a concern, mixed in more frequently with criticism of the government (People, NYT, 11/29/70). Another

article expressed concerns that some prosperous countries would not care enough to respond or would consider the disaster a common occurrence and not appreciate the magnitude (Halloran, NYT, 11/30/70). It also expressed concerns that the relief operations by NGOs and governments had gotten off to a slow start. The article shifted to criticize the slow reaction by the Pakistan government to inspect the disaster area or request aid from the U.S. Then it criticized the UN for not previously creating an organization to coordinate international disaster response. The article also pointed to a lack of disaster relief readiness by "advanced nations," despite urging by the UN to plan. Concerns about the exchange rate also appeared in the NYT (Hamilton, 12/15/70).

Finally, the last article before the outbreak of war blamed the continuing deterioration in the relationship between East and West Pakistan for interrupting aid and reconstruction in the cyclone area (Durdin, NYT, 3/12/71).

Several articles criticized the Pakistan government's response. However, these two newspapers took two different approaches to criticism. The tone of the news articles in the NYT shifted after November 26. Before then, most criticism was reported as said by someone else. Through the end of November and in the articles in the following months, criticism became more incorporated into an article's narrative, an accepted fact of the event. By contrast, in the GUA more criticism was leveled at the international effort, and most criticism at the Pakistan government was reported from another source in November.

These newspapers, and coverage of most disastrous events, often point out concerns and criticism with the management of the event. This coverage can serve several purposes. News sources can talk to people who have no other means to voice concerns, then share those concerns with their readers. News can also reveal flaws or shortcomings in governments, such as the lack of an international disaster relief organization. News stories can also bring a disaster into a home

on the far side of the world, eliciting compassion and aid. Criticism can also be directed towards the news. In a disaster, criticism will come. Keeping such criticism well-researched and timely can aid in shoring up the gaps in relief efforts.

Additional Relief Effort Topics

Table 3.3: Percentage of articles published by each newspaper discussing other relief effort topics.

Topic	NYT	GUA	Total
NGOs[a]	37%	75%	54%
American effort	60%	18%	41%
Aid Appeal/Offer	43%	36%	40%
British effort	31%	46%	38%

Note: NGOs were discussed in more GUA articles than NYT. Each newspaper favored its own countries efforts in its reporting. Appeals or offers of aid were slightly more common in the NYT and occurred across several months.

[a] Included all non-governmental and private organization efforts to provide cyclone relief.

Other topics frequently discussed included: NGOs, the American and British relief efforts, and appeals or offers of aid. The frequency of each topic varies (Figure 3.3). As might be expected, the British GUA published a higher percentage of articles containing references to the British relief effort, while the American NYT published more containing references to the American relief effort. The GUA also published a greater number of articles referring to the efforts of non-governmental and private organizations, possibly due to the close ties between the British government's relief effort and the non-governmental Disaster Emergency Committee, representing five major NGOs. Appeals or offers of aid also occurred in over a third of the

articles. These other topics created the full picture of the cyclone relief effort and highlighted differences in the priorities of each newspaper.

Conclusion

The cyclone occurred in a unique time and was surrounded by strong perceptions. News coverage by two different newspapers revealed similar topics with different emphasis. Both newspapers reported criticism in most articles. The GUA directed more attention to the international effort. The NYT directed more attention to both national and international efforts. Due to this and increased reporting on their own countries' contribution to the aid effort, neither newspaper's articles appeared representative of the entire scope of the disaster or the relief effort. Each did contain important pieces to understanding the events and sentiments of the time. The NYT's and GUA's tendency to report on their respective countries' relief effort could mean meaningful contributions by other countries were not mentioned in reporting. Publications from West Germany, France, Saudi Arabia, Singapore, China, Russia, and others may reveal more details about each country's involvement. Just as information surrounding each country's involvement was limited, the period of the articles was limited. Most articles were published early in the relief effort, emphasizing the short-term relief. There was little coverage of medium-term relief that occurred from January to March.

News sources are also uniquely positioned to influence public perception of the relief efforts. They can provide a voice to the people recovering from a disaster. News can also critique the efforts of governments and NGOs. News articles can also critique other news articles and point out shortcomings that occurred before a disaster. This coverage can reveal flaws that should be fixed for future relief efforts. However, like the strong language negatively portraying

East Pakistan, news articles can also incorporate claims as fact, influencing readers and relief efforts.

The strong language used in articles to describe East Pakistan created a negative portrayal of the region. It is important to understand that disasters such as the 1970 cyclone are tied to the time and place they occur. It is also important to understand the sources can cover different elements of the disaster, while not covering other elements. Comparing the two newspapers revealed similar and differing trends that shaped the relief effort in the months following the cyclone, and that continue to shape our understanding of the cyclone.

CONCLUSION

When I first read about the Great Cyclone of 1970, I felt much of the focus on the cyclone was on the destruction it caused, and less on the extensive international relief effort that came afterward. To gain a wider understanding of the cyclone that rose above the level of destruction, I chose to study the historical context surrounding the cyclone and the relief effort that came after. The purpose of this paper was to locate the cyclone and subsequent relief efforts in their geographic and historical context by mapping and analyzing the relief efforts and their contemporary perception. To do this, I created maps from national and international relief documents and analyzed the sentiments from relief documents and newspaper articles. The geographic locations present across the literature made mapping elements of the cyclone possible. Surveys and government documents offer information from shortly after the cyclone. British and American government documents provided locations and background for their respective task forces. The helicopter zones, alluded to in the literature, were mapped according to the locations described, revealing the British and American task forces were responsible for helicopter operations in the hardest hit cyclone area. West Germany, Pakistan, France, and Saudi Arabia provided necessary helicopter assistance to other impacted communities to the east and west. The map created from the literature showed every zone of the cyclone area had helicopter support, indicating relief aid was provided to every corner of the cyclone area.

The medium-term relief agricultural effort was outlined in the Agricultural Rehabilitation Report. Seasonal, manpower, and supplies and equipment constraints were applied to the project, influencing the distribution of aid. These constraints caused the first phase of agricultural aid to be delivered outside of the hardest hit cyclone area. Maps of the distribution of rice seed and plows depict how the project stayed within its constraints to deliver aid to areas with greater

access to fresh water and less affected by the storm surge. Staying within the constraints supported the project's goal to begin replacing the lost rice while also supporting people impacted by the cyclone.

Finally, this paper conducted content analysis of the major topics presented in articles by two major newspapers: the Guardian and The New York Times. Most articles were published in the two months immediately following the cyclone, and primarily covered short-term relief. The topic of concern and criticism of the relief effort echoed loudly across the two newspapers. Negative descriptions of the geography and people also contributed to creating a poor place in need of rescue. These sentiments shaped the relief effort and continue to influence the dialogue surrounding the cyclone. Such sentiments can create a false narrative of a place while they elicit greater generosity from donors.

Greater understanding of the complexities surrounding the relief effort following the Great Cyclone of 1970 add depth to the historical event. But it is even more important to remember the cyclone area was a complex place of history and culture that guided every aspect of the relief effort. Understanding necessary elements of this complexity is a vital component in successful disaster relief efforts.

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