How Climate Shocks Produce Armed Rebellion: The 1970 Bhola Cyclone and the Birth of Bangladesh

Sultan Mehmood
The New Economic School

Ahmed Mushfiq Mobarak*
Yale University

June 11, 2026

Abstract

Why do climate shocks produce conflict (Hsiang et al., 2013)? We study the 1970 Bhola cyclone in East Pakistan, one of the deadliest natural disasters in recorded history, which killed an estimated 350,000 people. Using satellite imagery, archival records, electoral returns, and insurgent biographies, we show that cyclone exposure amplified pre-existing separatist sentiment at the ballot box and increased citizens' subsequent participation in guerrilla warfare against the state. Our estimates imply that exposure to the cyclone's devastation induced an additional 48,613 insurgents to join the guerrilla war effort. Effects are larger in areas with pre-existing political and economic grievances and weaker relief provision. Our analysis reveals the step-by-step mechanisms through which environmental shocks can produce conflict: they shift voting behavior, expose state indifference, and convert grievance into armed mobilization.

Keywords: political revolutions, natural disasters, East Pakistan, Bangladesh
JEL Codes: Q54, N45, D74, D72

"Sometimes it takes a natural disaster to reveal a social disaster."

Wallis (2005)

.

*We thank seminar participants at UC Berkeley, Yale School of Management, Bangladesh Institute of Development Studies (BIDS), IBA-Karachi, LUMS Pakistan, University of Notre Dame, Harvard/MIT/Brown South Asia seminar, BYU, London School of Economics, NYU, Oxford Centre for Islamic Studies, Shanker Satyanath, Saumitra Jha, Clare Balboni, Rinchan Mirza, David Engerman, Lars Lefgren, Asif Dowla, Ben Polak, and especially discussants at seminars: Martha Chen, Feyaad Allie (Harvard), Adeel Malik (Oxford), Ashutosh Varshney (Brown) for their comments and feedback. Georgii Marinichev and Aleksandra Vasileva provided excellent research assistance. We thank the Satelitte Services Group in NOAA's National Center for Environmental Information, and Ali Bakhtawar for facilitating access to NOAA's ITOS-1 satellite images. We are grateful to Muhammad Asiful Basar for sharing archive materials. Contact: smehmood@nes.ru and ahmed.mobarak@yale.edu.

1 Introduction

Scholarship in archaeology, geography, political science, psychology, and economics has linked climatic shocks to political instability, state failure, and conflict. The literature has documented correlations between environmental stress and large-scale societal transformations, ranging from the collapse of ancient civilizations to modern episodes of state breakdown and civil conflict.[1] Hsiang et al. (2013)'s influential meta-analysis documents the impressive statistical regularity with which weather aberrations increase the risk of political instability. Historians have even connected prolonged periods of extreme climate with the collapse of major human civilizations (Haug et al., 2003; Diamond, 2011; Buckley et al., 2010). While that body of research is of impressive scope, the precise mechanisms connecting climate to conflict often remain unclear. This study documents the precise causal channels linking a climate shock to conflict for a historically important case. We show that one of the deadliest natural disasters in recorded history – the 1970 Bhola Cyclone in the Bay of Bengal – along with the Pakistan government's apparent indifference to citizen suffering, interacted with entrenched political and economic grievances to trigger mass political mobilization followed by a civil war. This gave birth to the eighth most populous nation in the world, Bangladesh.

Events that precipitated the creation of Bangladesh – including the role played by the 1970 Bhola cyclone – have been chronicled in many excellent historical accounts (e.g., Baxter, 1997; Bass, 2013; Rohde, 2014; Carney and Miklian, 2022). We take a complementary empirical approach, using large-sample statistical methods and data to identify how differential exposure to the cyclone across different electoral constituencies within the province of East Pakistan led to different degrees of political mobilization, and how that variation affected the propensity of each constituency's residents to take up arms and engage in guerrilla warfare against the Pakistan military. This analysis was only possible because NASA's ITOS-1 mission (NASA Space Science Data Coordinated Archive, 1970) captured crucial imagery of the Bhola cyclone during its brief operational window before a tape recorder malfunction. We gained access to the historical satellite images from NASA, and then used algorithms recently developed and validated in the atmospheric science literature (Hu et al., 2023) to reconstruct granular variation in cyclone intensity felt across all electoral constituencies in East Pakistan in November 1970. We also digitize electoral records from the pivotal December 1970 Pakistan general elections and historical military archives identifying the birthplaces of "*freedom fighters*" who joined the March–December 1971 Bangladesh War of Independence (The Ministry of Liberation War Affairs, 2024a). We connect both datasets to the November 1970 cyclone exposure at the electoral constituency level. The cyclone coincidentally made

[1] Miguel et al. (2004); Middleton (2012); Homer-Dixon (1994); Burke et al. (2015); Carleton et al. (2016).

landfall only 4 weeks before the first democratic elections held in Pakistan in over 15 years, so the state's indifference to the death and destruction was salient to East Pakistanis when they went to the polls.

Voting records from the 1954 election allow us to report a difference-in-differences (event study) specification that tracks how exposure to the November 1970 cyclone *shifted* votes between 1954 and December 1970 towards the Bengali party running on a separatist platform, the Awami League. We find that the cyclone shifted voting in favor of the separatist party by an additional 4 percentage points in the December 1970 (post-cyclone) election, relative to voting behavior in 1954. But separatist sentiments were already very popular in East Pakistan in 1970, and the Awami League (AL) won 74.5 percent of the votes in the average district. Our estimates imply that cyclone intensity changed the election outcome in 6 constituencies. We therefore interpret the voting results as evidence that the cyclone shifted electoral support toward the Awami League, but not necessarily that it was pivotal to the party's overall victory. That counterfactual is difficult to establish: East Pakistanis outside the cyclone's path also responded to the disaster, while our estimates identify only the marginal effect of greater cyclone intensity.

However, we also estimate that cyclone intensity – as experienced on November 12, 1970 – induced an additional 48,613 insurgents to take up arms, relative to a counterfactual in which wind speeds remained at their November 7, 1970 level and no cyclone formed. This surge in freedom fighters engaging in guerrilla warfare, following the government's inadequate response to the cyclone's devastation in their districts of birth, may have been pivotal in sustaining the war effort for nine months, from March to December 1971, when the Indian army intervened and quickly overwhelmed the Pakistan military. While we cannot observe the counterfactual world without the 1970 Bhola cyclone, our reading of the history of separatist movements, insurgencies, and conflicts suggests that the cyclone and this surge may very well have been critical.

A recent dataset identifies 145 episodes of major political upheavals worldwide in the 20th century, only 27 of which produced new sovereign states (Grinin et al., 2022). Separatist movements often involve two elements, both of which were observed in East Pakistan. A typical first step involves voting, referenda, or political rallies that give disparate separatist sentiments a unified voice and bring them to the attention of national leaders.[2] That voting is often followed by some form of armed conflict, as incumbent leadership reacts with violence

[2]For example, over 90% of Croatians voted to secede from Yugoslavia in a 1991 referendum, which led to a declaration of independence (The New York Times, 1991). And garnering such widespread support may be a prerequisite: Ukraine's 1917 declaration of independence after the Russian Revolution, which was not preceded by any such unifying plebiscite, struggled to gain traction due to internal divisions and competing factions (Hunczak, 1977).

when faced with the threat of losing territory.[3] Many such armed conflicts *fail* to achieve their separatist objective, such as the Tamil Eelam's fate in the decades-long Sri Lankan civil war, or Biafra's failure to secede from Nigeria in 1967. In both those cases, secessionist groups faced strong state resistance and were ultimately overwhelmed by the state's military power. States are difficult to overpower militarily because they retain a monopoly on violence. In the case of East Pakistan, we show that the government's negligent response in the aftermath of the 1970 Bhola cyclone helped garner wider support for secessionist sentiments expressed at the polls, and encouraged citizens to subsequently take up arms against the government. The case we statistically analyze therefore sheds light on a fundamental question about how separatist groups sometimes manage to mobilize enough support and engender enough passion for the cause among their members, such that individuals willingly bear arms and put themselves in mortal danger in defense of that cause.[4]

Although our broad contribution is to the literature on climate and conflict by outlining the specific causal channels and mechanisms by which a separatist movement transformed into a full-scale conflict, our analysis also informs a specific historical debate about the role of the Bhola Cyclone in Bangladesh's independence. Many observers and actors present at that moment, as well as historians writing much later, have described the Pakistani state's failure to deliver cyclone relief as a moment of disillusionment that fueled separatist mobilization (Griffel, 2015; The Pakistan Observer, 1970; Chen, 2024; Kissinger, 1970).[5] But other scholars downplay the cyclone's significance, portraying it as merely reinforcing (rather than transforming) preexisting political divides (Raghavan, 2013; Biswas and Daly, 2021; Sobhan, 2007). An architect of the 1966 proposal for East Pakistan's provincial autonomy places less emphasis on this event, arguing, *"the cyclone merely dramatised the argument and reaffirmed [voters'] conviction"* (Sobhan, 2007, p. 285).

[3]Croatia's independence ultimately required armed conflict after negotiations with Belgrade failed. Irish independence from Britain in 1921 required extensive guerrilla warfare, two full years after Sinn Fein's victory at the polls (Hopkinson, 2002). Algeria achieved independence from France in 1962 after a brutal eight-year war that required sustained armed resistance fueled by mass mobilization (Horne, 2006). A famine fueled insurgency participation during the 1918 Finnish civil war (Meriläinen et al., 2023).

[4]The literature primarily draws on historical narratives and formal models to explain the mechanics of revolutions (Malik, 2018; Tilly, 1978; Acemoglu et al., 2015; Akerlof, 2016), while we take a complementary statistical approach. Our work also relates to the large literature on nation-building and state formation (Michalopoulos and Papaioannou, 2016; Giuliano and Nunn, 2021; Jha and Wilkinson, 2023; Chiovelli et al., 2023; Besley and Persson, 2009; Cantoni et al., 2017; Nunn, 2020; Rohner and Zhuravskaya, 2024; Beath et al., 2025).

[5]The US Consul General in East Pakistan in 1970 argued that the cyclone escalated regional discontent into a decisive push for secession (Bass, 2013; Blood, 2002). The USAID Mission Director Eric Griffel called the cyclone *"the real reason for the final break"* (Bass, 2013, p.23). The main headline in the largest-circulation newspaper in East Pakistan explicitly mentions the cyclone's devastation in announcing election results (see Figure A2), which suggests that these connections were in people's minds at the time (The Daily Ittefaq, 1971).

After statistically connecting cyclone exposure to voting and conflict, we explore mechanisms to understand why voters and insurgents reacted so strongly to the cyclone. Using World Bank reports from 1970 and 1972 on cyclone relief distribution (World Bank Report, 1970, 1972), we show that the Pakistan government's inadequate response played an important role. Cyclone-affected constituencies that received no state relief exhibited the highest levels of political mobilization and violence, even relative to more severely affected areas where some relief was distributed. This interpretation builds on Besley and Burgess (2002), in which disaster response reveals information about political leaders, and relates to evidence that political responses to natural disasters depend on government relief and performance (Healy and Malhotra, 2009; Lazarev et al., 2014).

Second, we digitize 1954 electoral data to characterize areas with stronger *pre-existing* separatist sentiments. The impact of the cyclone on voting and guerrilla warfare was stronger in regions with higher preexisting separatist sentiment as expressed through 1954 voting patterns. This suggests that the cyclone and the government's inadequate response amplified pre-existing grievances, rather than creating them anew.

Third, we pay special attention to jute-producing areas identified through the agricultural census. Jute was East Pakistan's principal export crop and a central source of foreign exchange, and the diversion of these revenues to West Pakistan became an important economic grievance in Bengali nationalist politics (Jahan, 1972). Consistent with this interpretation, the effects of cyclone exposure are stronger in jute-producing areas, where economic grievances against the central state were likely more acute. As a falsification check of this interpretation, we find no comparable pattern for rice production, which, unlike jute, was primarily domestically consumed and not tied to the expropriation of foreign exchange.

Our analysis relies on historical data where an indirect measure of cyclone intensity had to be reconstructed from satellite images, and had to be combined with cross-sectional variation in the birthplaces of Bengali insurgents extracted from archival records. So we have to be careful about both measurement and empirical identification. To measure cyclone intensity, we use an insight from Hu et al. (2023): since cyclone clouds block solar radiation from reaching the Earth's surface, intensity can be inferred from satellite-measured radiation levels. We validate our measure with on-the-ground weather station data (Bangladesh Meteorological Department, 1970). Our granular measure is highly positively correlated with directly observed wind speeds in the subset of locations where weather stations were operational during the cyclone. In addition, cloud cover and radiation measured in the days prior to the landfall of the Bhola cyclone is not predictive of December 1970 voting in a placebo test, so it is likely that our regressions pick up the actual effect of the cyclone.

A central identification concern is that cyclone exposure may be correlated with pre-

existing spatial patterns in politics and conflict. The Bhola cyclone made landfall in the south of East Pakistan and traveled northward across the Bengal delta. If this path overlapped systematically with underlying political geography (e.g. stronger pre-existing separatist sentiment in coastal areas), then our estimates could reflect those background differences rather than the causal impact of the cyclone. Because our empirical strategy hinges on comparing more- and less-affected constituencies, addressing such confounders is important for interpreting the results as causal.

To control for potential confounders, we assemble and digitize the 1951 population census of East Pakistan with data on religious and ethnic compositions of constituency populations, some geographic information like distance to the Indian border, and an economic atlas published in 1958 and updated in 1968 that maps the locations of all paved roads, railroads, jute and rice plantations and factories, and incorporates other information from economic, agricultural, and livestock censuses conducted in the 1960s and from statistics published by East Pakistan government directorates (Ahmad, 1968).

We present several ancillary results to increase confidence in our causal interpretation. First, we show that more- and less-affected constituencies were well balanced in pre-1970 characteristics, including support for parties advocating greater regional autonomy in 1954. The balance in terms of 1954 vote shares is especially informative because it indicates that the post-cyclone divergence does not merely reflect pre-existing political alignments. Second, the Bhola cyclone devastation extended far inland, and was not only limited to coastal areas that often have distinctive political economy features (Balboni, 2024). Omitting coastal districts from our sample and restricting attention to variation across inland areas yields similar results. Third, we digitize satellite data on the 2007 Sidr and 2017 Mora cyclones that later hit the same coastal areas of Bangladesh to construct placebo tests. These placebo checks confirm that our 1970-71 electoral and conflict results are not generic artifacts of cyclone-prone areas. Fourth, placebo regressions with satellite images taken a few days before the Bhola cyclone struck further rule out spurious correlations. Fifth, randomization inference tests suggest that placebo estimates are centered around zero, so the results are unlikely to be driven by spatial clustering of unobservables.

Another concern separate from confounders is statistical precision, given the spatially correlated nature of a cyclone's movement. If both cyclone exposure and our political and conflict outcomes are spatially correlated across nearby constituencies, standard errors clustered by electoral constituency may overstate true sampling variation. To address this concern, we implement several complementary approaches and checks. We first apply Conley-type spatial corrections at multiple distance thresholds (Conley, 2010). We also employ the recent Thresholding Multiple Outcomes (TMO) method, which leverages cross-outcome cor-

relations to adjust inference in settings with residual spatial dependence (DellaVigna et al., 2025). As an additional check, we apply the wild cluster bootstrap procedure designed for small numbers of treated clusters (MacKinnon and Webb, 2018). Across all approaches, the estimated effects remain statistically precise at conventional levels, suggesting that our results are not an artifact of overly optimistic inference that ignores the spatial correlation. Lastly, to reduce spatial correlation, we replace our satellite-inferred continuous measure of cyclone intensity with a binary measure that tracks the 150km or 200km radius of the path of the eye of the Bhola cyclone. The path of the cyclone's eye was reconstructed in 1971 by a U.S. National Hurricane Center expert (Frank and Husain, 1971). Effects on voting and insurgency outcomes remain consistent under this alternative definition of cyclone exposure.

Historians have argued that other important natural disasters also transformed latent grievances into organized political mobilization. The 1978 Tabas Earthquake in Iran and the Shah's inadequate response are viewed as catalysts for the dissent that culminated in the 1979 Iranian Revolution (Axworthy, 2013). Other historical scholarship suggests that the 1976 Tangshan Earthquake in China similarly accelerated political shifts, including Deng Xiaoping's market reform agenda (Vogel, 2011). The Bengal Famine of 1943, exacerbated by British colonial policies, apparently galvanized support for the Indian independence movement (Sen, 1981). Like the Bhola cyclone, these events highlight how crises can reveal governance failures and fuel mass mobilization. Our empirical analysis sheds light on how distress created by natural disasters can inspire political dissent. Our distinctive contribution is to connect disaster exposure not only to voting behavior, conflict, and political attitudes, as in prior work (Besley and Burgess, 2002; Miguel et al., 2004; Healy and Malhotra, 2009; Lazarev et al., 2014), but also to armed mobilization against the state. This transition from political opposition to armed mobilization is central to many episodes of state formation (Grinin et al., 2022), including the birth of Bangladesh.

2 Related Literature

Recent literature on climate change and conflict has highlighted a consistent relationship between environmental shocks and violence, ranging from civil conflict, interpersonal crime, and even self-harm or suicide (Burke et al., 2015). A prominent meta-analysis reports that a one standard deviation (SD) adverse change in environmental conditions leads to a 2.5% to 5% increase in conflict risk (Burke et al., 2024). With most regions projected to warm by 2 to 4 SDs over the next 30 years, understanding the mechanisms driving this relationship is a critical research and policy priority. While our work highlights political economy mechanisms to explain this connection, there is complementary research on psychological mechanisms

(e.g., Almås et al., 2025; Kuroishi and Sawada, 2024).

Our paper connects to literature linking economic adversity to conflict and political mobilization. Existing studies show that adverse shocks shape political behavior through several channels: voters may punish incumbents for events partly outside government control, a phenomenon known as "blind retrospection" (Duch and Stevenson, 2008; Achen and Bartels, 2004); shocks can generate civil unrest and regime instability (Haggard and Kaufman, 1995); state violence can serve as a focal point for mobilization (De Kadt et al., 2024); and global trade slowdowns can have political repercussions (Campante et al., 2023). Complementary work examines how adverse conditions reshape preferences and decision-making (e.g., Almås et al., 2025; Kuroishi and Sawada, 2024). Multiple such mechanisms may have been responsible for the political effects of the Bhola cyclone. The cyclone revealed the central state's weak response, amplified pre-existing economic grievances in jute-producing areas and political grievances in marginalized areas, and translated these grievances into both pro-autonomy voting and subsequent armed mobilization. The effects are strongest where relief failed to arrive.

Closely related is research on how public policy mediates the link between extreme shocks and political and social outcomes. Studies of workfare programs (Fetzer, 2020), social protection (Garg et al., 2020; Christian et al., 2019), and food aid (Nunn and Qian, 2014) show that state responses can dampen the consequences of adverse shocks. Natural disasters also reshape economic activity through supply chains and labor markets (Castro-Vincenzi et al., 2024), and a growing body of work documents their political consequences (Belloc et al., 2016; Bai, 2023; Cerkez, 2025; Hong et al., 2025; Cremaschi and Stanig, 2024). As climate change increases the frequency and intensity of extreme events (Knutson et al., 2010), understanding their political ramifications becomes increasingly important.

Finally, our paper connects to the political-economy literature on coordination and political mobilization. Tilly et al. (1975) argued that state inaction can transform latent grievances into political upheaval; Tarrow (1994) emphasized how focal moments enable coordinated collective action; and Shadmehr and Bernhardt (2011) formalized how public signals can resolve uncertainty over the returns to mobilization. Satyanath et al. (2017) document how pre-existing social networks facilitated entry into the Nazi Party; Gawande et al. (2017) show that adverse shocks to renewable natural resources intensified the Maoist insurgency in India. Our setting shares a similar logic: cyclone-affected constituencies with stronger pre-existing separatist sentiment, as measured by 1954 vote shares, exhibited the largest electoral and insurgent responses, consistent with the view that focal events activate latent organizational capacity. Many would-be revolutions fail not for lack of grievance, but because of coordination failures among dispersed actors (Ostrom, 2000). Disjointed protest allows repression to

be selective and effective. Authoritarian regimes often exploit this fragmentation, targeting prominent individuals or institutions to instill fear and deter broader resistance (Acemoglu and Robinson, 2006; Tarrow, 1994). We also relate to the broader nation-building literature (Rohner and Zhuravskaya, 2024; Bazzi et al., 2019; Alesina et al., 2021; Miguel, 2004) by documenting how an environmental shock can activate economic and ethnic grievances in the context of state rupture.

3 Background

Colonial Origins. The country of Pakistan, with provinces in the East and West separated by 1,000 miles of Indian territory in between, was created through an abrupt partition of British India in 1947. A Commission chaired by British lawyer Cyril Radcliffe, who had never visited the region, spent all of 5 weeks partitioning the Indian subcontinent into India and Pakistan along religious lines without careful consideration of cultural and economic differences.[6] This contributed to growing tensions between the two wings of Pakistan immediately after independence. East Pakistan's agrarian economy, centered on jute production – a major global export and a critical source of Pakistan's foreign exchange – contrasted sharply with the industrial and political dominance of West Pakistan. Despite East Pakistan's significant economic contributions, investments disproportionately benefited West Pakistan. This laid the foundation for decades of political and economic discord.

Economic disparities were compounded by cultural and linguistic tensions that erupted soon after Pakistan's formation. East Pakistan's *Bhasha Andolon*, or "Language Movement" emerged as a key flashpoint in East-West tensions because the 1948 declaration of Urdu as Pakistan's sole national language was interpreted as another form of cultural hegemony (Jahan, 1972). The military government's policies prioritizing the Western wing further intensified regional grievances (Stern, 1971; Khan, 2022). Notably, during the first Five-Year Plan in 1955, per capita income in East Pakistan declined even though exports from the province generated 60-70 percent of the nation's foreign exchange. Foreign aid, loans, and export earnings were disproportionately reinvested in West Pakistan. Annual per capita electricity consumption was 1.6 Kwh in East Pakistan versus 28.8 Kwh in West Pakistan (Sobhan, 1962)

By 1960, these disparities had become stark: per capita income in East Pakistan was 33% lower than in the West (Rupees 330 versus Rupees 500) (Papanek, 1967). Between 1961 and 1965, East Pakistan sustained a consistent trade surplus, while West Pakistan

[6] Michalopoulos and Papaioannou (2016) has shown that such arbitrary drawing of borders can lead to persistent conflict.

maintained a substantial trade deficit. East Pakistan produced about 70% of the world's jute supply, a crucial export commodity that contributed over 50% to Pakistan's foreign exchange reserves. But the province received only around 30% of national development spending, fueling discontent and calls for greater autonomy (Haq et al., 1976).

The inadequate response of Pakistan's central government to East Pakistan's grievances, ranging from unequal economic policies to the denial of cultural and political autonomy, intensified divisions (Sisson and Rose, 1990). The "Six-Point Movement" of 1966, led by the Awami League, encapsulated East Pakistan's demands for economic and political autonomy, advocating for greater control over its resources.

Emergence of Awami League. The origins of the *Awami League* are closely linked to the 1948 Language Movement, when the Pakistani government's attempt to impose Urdu as the state language of East Pakistan encountered widespread resistance. While not the sole factor, this movement, grounded in the defense of Bengali as a core aspect of regional identity and cultural heritage, played a critical role. The backlash contributed to a faction of the ruling Muslim League breaking away to form the *Awami Muslim League*, which eventually evolved into the *Awami League* (AL, henceforth) under the leadership of a Bengali, East Pakistani, named Sheikh Mujibur Rahman. The new party rapidly gained traction, and emerged as the principal political force representing East Pakistan's regional interests. AL led a coalition called the "United Front," which achieved a decisive victory over the ruling Muslim League in the 1954 regional elections in East Pakistan (Stern, 1971). AL steadily consolidated its support base thereafter. The imposition of martial law in 1958 disrupted political activities across the country, halting the party's operations and exacerbating East Pakistan's sense of alienation. By 1966, the *Awami League* regained momentum through its Six-Point Movement, advocating for a federal structure and separate fiscal and monetary administration for East Pakistan, a separate military and currency, signaling escalating demands for autonomy and even independence (Rashiduzzaman, 1970).

The announcement of the 1970 general elections marked a turning point in Pakistan's history. Set against widespread student protests that culminated in General Ayub Khan's resignation in 1969, power was transferred not to a democratic regime but to General Yahya Khan's military government. General Yahya pledged to restore civilian rule by conducting Pakistan's first national elections under a universal adult franchise, aiming to address escalating political unrest, especially in East Pakistan.

Bhola Cyclone. The momentum for self-governance in the late 1960s and the anticipation of the 1970 elections were abruptly disrupted by the catastrophic Bhola cyclone, which

struck East Pakistan on November 12, 1970. The storm surge submerged vast coastal areas and caused an estimated 300,000 to 500,000 deaths, making it the deadliest tropical cyclone in recorded history. Named after the island of Bhola, one of the hardest-hit regions, the cyclone brought wind speeds of up to 205 km/h and a storm surge of 10 meters, causing widespread devastation that extended far inland beyond the coast (The Atlantic Oceanographic and Meteorological Laboratory, 2024).[7] East Pakistan's low-lying topography and proximity to the Bay of Bengal renders it exceptionally vulnerable to cyclonic activity. This inherent susceptibility, coupled with the region's vast floodplains and inadequate infrastructure, allow even less severe storms to penetrate far inland (Frank and Husain, 1971). The Bhola cyclone affected approximately 4.7 million people (World Bank Report, 1970). 400,000 houses were damaged and 115,000 fishermen were impacted, but pre-existing poverty and lack of infrastructure meant that the damage was estimated by the World Bank at only USD 330 million (World Bank Report, 1972). Coastal and some non-coastal regions of Bakerganj, Patuakhali, Noakhali, Khulna, Chittagong, Chittagong Hill Tracts, and Comilla were almost completely wiped out.

Lack of Relief Efforts by West Pakistan. In the immediate aftermath of the storm, the Pakistani government needed to provide relief swiftly. The World Bank underscored the urgency of restoring healthcare, food supplies, and clean water, alongside repairing roads, irrigation channels, and the fishing industry to protect the rural economy and upcoming harvest (World Bank Report, 1970). The report outlined critical measures to aid recovery, emphasizing the reconstruction of roads and irrigation systems alongside the provision of essential farm machinery, seeds, fertilizers, and livestock. To address these needs, the *Ministry for Relief and Rehabilitation* estimated post-storm expenditures at USD 45.5 million for the following year. This amount included USD 25 million pledged in the form of international loans, supplemented by foreign aid and charitable donations (World Bank Report, 1972). While the central government was slow to provide relief, Awami League leader Mujibur Rahman visited cyclone-affected areas by boat and suspended his election campaign to organize relief efforts (Rahman, 2012; Carney and Miklian, 2022; Islam et al., 2023). His operation lacked the resources of official agencies, but it exposed the divergent priorities of West Pakistani authorities and deepened political tensions in the country.

Despite the documented urgency, the Pakistani government's relief efforts were minimal, concentrated in only a few coastal regions, and largely limited to rebuilding select roads and distributing tractors and water pumps. Eric Griffel, the U.S. development officer leading relief operations in East Pakistan, bluntly highlighted the failure of the response, stating,

[7]The early warning alert system failed for a variety of reasons, described in Carney and Miklian (2022).

"*Hundreds (literally) of planes came in from all over the world. One could see them come into Dacca and Chittagong. They came from China, the US, India, Russia, Britain, Germany, Australia and many other countries bringing supplies, tents, food and hundreds of relief workers. For the first three days, nothing came in from West Pakistan. It was noticed.*" (Griffel, 2015). Similarly, the major English language newspaper *Pakistan Observer* reported that mismanagement by the Pakistan government led to relief goods piling up in Lahore instead of reaching East Pakistan (The Pakistan Observer, 1970). Graphic reports and photographs depicted relief goods, including 129 bales of blankets and clothes, stacked at Lahore Airport, while millions in East Pakistan faced starvation and lacked basic necessities.

In contrast, the international community mounted the more visible response, with the U.S., the Soviet Union, Britain, and other nations providing critical support (Rohde, 2014). American and Soviet helicopters, prominently visible in relief efforts, made the Pakistan government's limited involvement salient to suffering citizens. For many East Pakistanis, the dependence on foreign powers while their own government faltered became a moment of disillusionment. Martha Chen, a social worker in Dhaka in 1970 who helped organize a relief response remarked while discussing this manuscript at the Harvard South Asian Studies seminar, "*Our circle of friends had little doubt that the central government's failure to respond in a timely or appropriate manner to the Bhola Cyclone reinforced preexisting feelings of government neglect, impacted the election outcome, and emboldened the independence movement.*" (Chen, 2024). The National Security Advisor to US President Nixon, Henry Kissinger, also linked the disaster to politics in reporting to Nixon that "*the deep antagonism of Bengalis for the central Pakistani government is now much worse.*" (Kissinger, 1970).

Admittedly, not all historical narratives assign the same importance to the Bhola cyclone as an enabling factor in Bangladesh's independence. Raghavan (2013)'s *"Global History of the Creation of Bangladesh"* only mentions the cyclone once in a passing statement. The cyclone receives a similar terse treatment in Amrith (2013)'s history of the Bay of Bengal. Biswas and Daly (2021)'s historiography centers the cyclone, but Islam et al. (2023) characterizes the paper as ultimately concluding "that the Bhola cyclone acted merely as an accelerated status quo in the prevailing socio-political and economic tension in East Pakistan...the cyclone of 1970 did not alter the political configuration of East Pakistan, but rather reinforced pre-disaster arguments."

General Elections 1970. Less than a month after the cyclone made landfall, elections were held in East and West Pakistan. The Awami League platform strongly resonated with East Pakistan's demands for autonomy. Their nationalist platform effectively unified the region's longstanding grievances into a cohesive demand for greater control over its resources

and governance (e.g., Baxter, 1997; Al Mujahid, 1971). The party captured 160 out of 162 National Assembly seats in East Pakistan, with an average vote share of 75%. The Bhola Cyclone may have influenced the elections by serving as a unifying focal point for the grievances of East Pakistan. The U.S. aid mission director in Dhaka called the cyclone the "final straw" that led to large-scale political mobilization (Griffel, 2015). The main headline in the Bengali language daily with the largest circulation in East Pakistan declared on January 18, 1971: "*Awami League's huge electoral victory even in cyclone-hit areas: Victory for autonomy on the devastated coast of Bengal*" (The Daily Ittefaq, 1971), thereby connecting the cyclone's devastation to the election results (see Figure A2).

Aftermath of the Elections. Having secured an electoral majority in the Pakistani legislature, the Awami League set out plans to govern both the Eastern and Western wings of Pakistan and to draft a new constitution reflecting its Six-Point Program. This vision was obstructed by the incumbent West Pakistani government led by General Yahya Khan's military regime, which refused to transfer power to the elected government. The National Assembly session to elect the new Prime Minister – presumptively Sheikh Mujibur Rahman given Awami League's electoral victory – was never convened. By late February 1971, the military regime had already begun preparations for military action in East Pakistan to quell the escalating unrest. On February 27, 1971 troop reinforcements arrived in Dhaka to preempt any declaration of independence by Sheikh Mujib. Tensions escalated further on March 1, 1971, when the central government indefinitely postponed the National Assembly session, triggering widespread protests and a non-cooperation movement in East Pakistan. This marked the beginning of the war for Bangladesh's independence.

War of Independence. On the night of March 25, 1971, the Pakistan Army launched "Operation Searchlight" in East Pakistan, a military crackdown aimed at suppressing the growing independence movement in East Pakistan. General Yahya Khan justified the military intervention by branding Bengalis as "traitors" and "enemies of Pakistan." His inflammatory rhetoric culminated in the now-infamous statement, "Kill three million of them, and the rest will eat out of our hands," underscoring the regime's violent and oppressive approach toward the population of East Pakistan (Payne, 1972). Despite East Pakistanis comprising 56% of Pakistan's national population, they represented less than 10% of an army estimated at 350,000 personnel, with only two Bengalis among the top 50 officers. General Yahya's predecessor, General Ayub Khan, had disparagingly described East Pakistanis in his diaries as living a "largely uncultured life" and having "no culture or language of their own" (Ayub Khan, 2007).

The military crackdown resulted in widespread atrocities including mass killings, sexual violence, and the destruction of entire villages. In the wake of this military action, East Pakistan declared its independence as Bangladesh on March 26, 1971. By the end of April 1971, approximately 250,000 civilians had volunteered to join the newly formed Bangladeshi military force, the *Mukti Bahini* (Saday, 2021). Volunteers, screened by Awami League representatives, were sent to India for up to four weeks of military training, supported by 25 youth camps training 1,000 recruits each. Initially disorganized, the Bangladesh resistance suffered early setbacks, but by May 1971 efforts to build an insurgent army had intensified. By July, training facilities were preparing approximately 12,000 new fighters each month, with the first units targeting factories, electric pylons, and railway bridges. Training capacity expanded to about 20,000 recruits per month by September, accompanied by an escalation in guerrilla operations. With Indian support, Bangladesh also established a Navy and an Air Force. By November 1971, the steady influx of trained insurgents contributed to the growing momentum of the liberation effort (Lindquist, 1977).

Independence of Bangladesh. The guerrilla warfare had escalated into an international conflict when India decided to intervene directly in early December 1971, prompted by the influx of an estimated 10 million refugees at its borders, and increasing reports of atrocities in East Pakistan. Indian military involvement triggered the third Indo-Pakistani War, which shifted the balance decisively toward the Bangladeshi resistance. The war ended on December 16, 1971, when West Pakistan signed the "Instrument of Surrender," and its forces in East Pakistan laid down arms. Merely days before surrendering, the Pakistan army abducted numerous respected professionals—including doctors, engineers, civil servants, and teachers and executed them between December 12 and December 14, 1971. Akram (2002) estimates that nearly 80% of the intellectual community of Dacca – the capital of the new country – was killed. An estimated one to three million people had been killed over the course of this 9-month conflict and millions more displaced (Baxter, 1971). A timeline of key events, from the Bhola Cyclone to the War of Independence, is provided in Figure A3 of Appendix.

4 Data

At the core of this research is a large-scale digitization and data consolidation effort that connects the Bhola Cyclone to electoral and conflict outcomes. We construct gridpoint-level storm intensity measures and link these to data on electoral outcomes and conflict participation by aggregating up to the electoral constituency level. This section describes the key variables used in the study. All variable definitions and sources can be found in the

Online Appendix.

Storm Intensity. Our key explanatory variable is a measure of the intensity of the Bhola cyclone in each electoral constituency, constructed from ITOS-1 satellite imagery. The measure applies a recent insight validated in the atmospheric science literature (Hu et al., 2023) that cyclone clouds reduce the amount of solar radiation reaching the Earth's surface. The ITOS-1 satellite, funded by the U.S. Department of Defense, was among the most advanced real-time cloud monitoring systems of its time and a critical Cold War asset (Carney and Miklian, 2022). The satellite was only operational from January 23 to November 16, 1970 when a tape recorder failure halted data transmission (NASA Space Science Data Coordinated Archive, 1970). Fortunately, the November 12, 1970 Bhola Cyclone struck during this brief operational window, and NOAA's National Centers for Environmental Information shared with us composited images produced by the satellite for each day for each hemisphere. Images of the storm at peak intensity enable analysis of cloud cover distribution on the day of the cyclone.[8]

We cross-check the resulting storm intensity measure against wind speed readings from 17 on-the-ground weather stations active during the cyclone. This validation check reported in Figure A4 shows that our satellite-based measure is strongly positively correlated with the "ground" truth from weather stations. We have also re-run our main analyses using the weather station wind speed data and show that the results are consistent with those produced using the satellite-based storm intensity measure. The satellite data offers substantially finer spatial granularity, so we prefer those specifications and report those as our main estimates.

The satellite images also allow us to construct placebo tests using cloud cover patterns from the days immediately before the cyclone struck. In Table A3 we show that our main empirical results on the effects of the Bhola cyclone on political outcomes are entirely absent if we use satellite cloud cover one day before, when the cyclone had not yet reached the coastline of East Pakistan. The combination of the presence of an effect when the cyclone hit and the absence of an effect the day before makes us more confident that the satellite images are picking up the cyclone intensity accurately.

Votes for Awami League. We construct the constituency level vote share for the separatist party (The Awami League) in the December 1970 elections as one of our main outcome

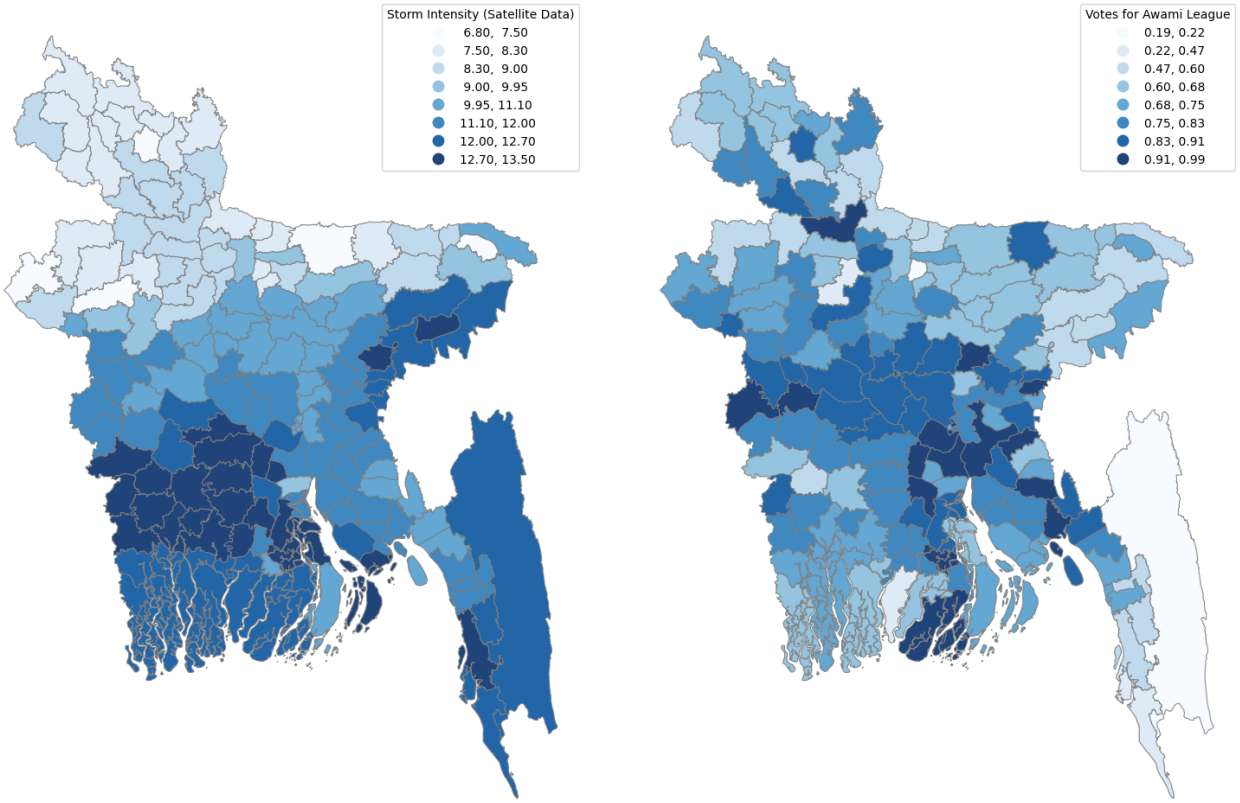
[8]The ITOS-1 imagery provided black-and-white Earth maps color-coded by a radiance intensity scale (0–15), with 0 representing the brightest and least cloudy areas. For East Pakistan, we isolate the relevant quadrant, divide it into smaller sectors, and use Python's `cv2` library to calculate the proportion of black pixels, producing grey-scale intensity values (0–255). These values are then rescaled to match the radiance scale, where 15 indicates the densest cloud cover.

variables. The Awami League's overwhelming support in East Pakistan secured an overall majority for the party across both East and West Pakistan. These elections marked a pivotal moment in the path to Bangladesh emerging as an independent nation. The Awami League advocated for greater autonomy for East Pakistan. The voting data are drawn from an electoral compendium on National Assembly elections in East Pakistan, archived by a prominent civil society organization (Free and Fair Election Network, 2010). In line with prior work that uses voting patterns to study identity-based preferences (Clots-Figueras and Masella, 2013; Dehdari and Gehring, 2022), we treat Awami League vote share as a proxy for nationalist preferences and support for a distinct national identity. Panel A of Figure 1 presents the spatial distribution of storm intensity across East Pakistan while Panel B shows the corresponding variation in Awami League vote shares. Some spatial correlation is already visually evident, except for the sparsely-populated Chittagong Hill Tracts tribal areas in the south-east (on the Burma border), which was the only district without a majority Bengali population.

Figure 1: Bhola Cyclone Intensity and Votes for Awami League

(a) Panel A. Storm Intensity

(b) Panel B. Votes for Awami League



Note: The figure maps the vote share for the nationalist Awami League in each electoral constituency in the 1970 election alongside storm intensity inferred from satellite imagery.

Insurgents. The Awami League's 1970 electoral victory granted them the constitutional right to form the government, but West Pakistan's refusal to honor the electoral mandate precipitated a period of organized civil disobedience in East Pakistan against the central government. This was met with a violent military crackdown designed to suppress the movement and reassert centralized control. In the ensuing period, an armed resistance movement against the central government took shape. We use historical military archives documenting the composition and mobilization of Bengali "freedom fighters" (The Ministry of Liberation War Affairs, 2024a) to geo-locate the birthplaces of 200,000 documented insurgents. The second key outcome variable in our analysis therefore tracks the number of individuals from

each subdistrict who took up arms to conduct guerrilla warfare during the 1971 Bangladesh War of Independence. Figure A8 presents the spatial distribution of these birthplaces across East Pakistan. This variable provides a basis for inferring variation in insurgent activity at the sub-district level. Some spatial correlation with Bhola cyclone intensity is again visually evident. The map shows a concentration of immigrants in an eastern district, Comilla, adjacent to Tripura in India where many insurgents sought refuge and were trained in guerrilla warfare tactics during the 1971 independence war (The Indian Express, 2021). We add "proximity to the Indian border" to many of our specifications to adjust for such effects.

We use the list endorsed by the Ministry of Liberation War Affairs which is the latest effort to produce a comprehensive registry of participants in Bangladesh's 1971 Liberation War, building on five decades of earlier compilations. It consolidates several foundational sources: the 1984 National List (102,458 names) derived from Bangladesh Freedom Fighters Welfare Trust records, East Bengal Regimental Centre files, and Indian military records; the 1988 "Indian list" of 69,833 fighters who trained or fought from Indian territory; and the Awami League's Mukti Barta publications (1996–2001), most notably the verified "Red Book" containing 158,452 names.

While applicants have strong incentives (monthly allowances, festival bonuses, and medical benefits) to want to be included, the stringent verification process demands submission of 33 types of documentation—such as witness statements from three already-recognized fighters, military service records, medical certificates for wounded participants, and multiple forms of identity. And applications are subjected to multi-level local and national review. This stringent procedure makes manipulation difficult and renders the list a trustworthy dataset for our analysis.

Murdered Intellectuals. The Pakistan army and their local collaborators orchestrated a massacre on December 14, 1971 where they rounded up and murdered many prominent Bengali intellectuals — professors, doctors, journalists, writers, artists, lawyers, engineers, and others. The murders started from March 25, 1971, but it accelerated on December 14, only two days before the Pakistan army surrendered. The intellectuals were largely abducted from their homes in Dhaka and other cities, but we compiled the records of these individuals' birthplaces (their subdistricts of origin) from Bangladesh Genocide Archive (2024).

Our list of murdered intellectuals is less reliable than the "insurgents" or *freedom fighters* list we analyze. First, the Bangladesh Ministry of Liberation War Affairs has maintained a formal list of *freedom fighters* because their families continue to receive government benefits post-independence. There is no equivalent list of murdered intellectuals endorsed or approved by this same Ministry (The Daily Star, 2024). Second, the *freedom fighters* list contains a

spreadsheet column for the individual's subdistrict of birth which allows us to code their location with confidence. In contrast, we compile the list of intellectuals from multiple sources which do not always report the exact birthplace. As a result, our list of martyred intellectuals is more likely to contain omissions and errors.

Nevertheless, we use the number of murdered intellectuals who hail from each subdistrict to proxy whether people who had a closer experience of the cyclone's devastation and the government's indifferent response subsequently became more politically active and attracted the attention of Pakistani occupying forces. This form of systematic persecution of intellectuals is not without precedent in autocratic regimes. Similar actions have been documented during Stalin's reign of terror (Cox, 1976).

Interaction Terms. To understand mechanisms by which the cyclone affects political outcomes, we study the effects of the interaction between cyclone intensity and a few pre-existing institutional characteristics. Two such variables play important roles in our interpretation of these historical events. First, we construct an indicator for areas where the Pakistan government administered cyclone relief, using reports published by the World Bank in 1970 and 1972 to accompany their loan disbursements to the Pakistan government to aid post-cyclone reconstruction and relief (World Bank Report, 1970, 1972). We digitize and map the tables in these reports that identify the specific *thanas* (sub-districts) where aid was distributed. Second, we digitize the 1954 East Pakistan election results to capture the vote share for the Awami League-led United Front (UF) in each electoral constituency. Interacting the UF vote share with cyclone intensity allows us to test whether disaster exposure had stronger effects in areas with pre-existing separatist sentiments.

Unit of Analysis, Geocoding and Matching. All 162 electoral constituencies in East Pakistan for the 1970 Pakistan National Assembly elections serve as our unit of analysis. We observe the 1970 Awami League vote share for all these constituencies. Awami League ultimately won 160 of these 162 seats. We construct the cyclone intensity measure at the 15km x 15km grid point level by overlaying satellite images on a map of the East Pakistan administrative boundary. To conduct our analysis at the 1970 electoral constituency level, we take the average cyclone intensity of all grid points that fall within the boundaries of each electoral constituency, and assign that average value to that constituency. The 2025 list of "freedom fighters" identifies the *upazila* or subdistrict of birth for each insurgent on the list. This allows us to construct a count of the number of insurgents hailing from each of the 495 *upazilas* that were in existence in Bangladesh in 2025. We overlay a map of 2025 *upazila* boundaries with the 1970 electoral constituency boundaries, and assign all insurgents

to a constituency if the centroid of the *upazila* where the insurgent was born falls within that constituency. In almost all cases, 2025 upazilas are proper subsets of 1970 electoral constituencies and the boundaries line up exactly, so this assignment is straighforward. In a handful of cases, a 2025 upazila boundary may intersect a 1970 electoral constituency boundary, and in such cases the assignment is made based on the location of the centroid of the *upazila*. The 1970 and 1972 World Bank reports identifies the *thanas* where post-cyclone relief was distributed. *Thanas* in East Pakistan are the precursor to *upazilas* in Bangladesh and they typically retained the same jurisdiction name. So we use a similar procedure overlaying the *thana* map on a consituency map, to assign each thana to a 1970 electoral constituency for our analysis. Finally, Baxter (1997) pp. 116-117 reports 1954 election outcomes aggregated up to the district level. We overlay maps of district boundaries and the 162 electoral constituency boundaries to assign the district-level UF vote share in the 1954 elections to each 1970 electoral constituency that falls within that district.

Control Variables. Our regression specifications contain three sets of control variables to mitigate concerns about any omitted variable correlated with both cyclone intensity and outcomes like the Awami League vote share in 1970. First, a "baseline set" of controls includes the distance of each subdistrict centroid to the coast, and the vote share of the Awami League-led "United Front" coalition in the 1954 election to proxy for variation in pre-existing nationalist preferences well before the Bhola cyclone hit.

Second, we construct a rich constituency-level historical dataset for East Pakistan and Bangladesh by compiling information from the 1951 agricultural and economic censuses, contemporary news archives, memoirs of Awami League founder Sheikh Mujibur Rahman, and election records. This produces several control variables including voter turnout in the 1970 elections, an indicator for Sheikh Mujib's visits to regions of East Pakistan before the Bhola cyclone, an indicator for the locations of student protests in 1969, the percentage of the Hindu population in each subdistrict in 1951, distance to the coast of the Bay of Bengal, distance to the Indian border, and an indicator for whether a subdistrict is classified as urban. Given Pakistan's religious identity, the Hindu minority was an important constituency for the Awami League. And many of the *freedom fighters* received weapons and training in camps in India, which makes distance to the border an important control in the insurgency regressions. In the robustness checks section 8, we estimate additional models incorporating distance to Dhaka, excluding coastal regions, including region fixed effects, and using alternative definitions of the dependent variable.

Third, we apply the double robust selection procedure from Belloni et al. (2014) which uses Lasso regressions to select covariates predictive of the treatment and the outcome. This

ensures robust control for confounding while balancing model fit.

Descriptive Statistics. In this subsection, we provide a brief overview of the data. Table A2 reports summary statistics for the main variables used in the analysis, including their means, medians, minimum and maximum values and standard deviations. The unit of observation is each of the 162 electoral constituencies in East Pakistan.

Mean storm intensity, derived from ITOS-1 satellite imagery, is 10.8 out of a maximum of 15, with a standard deviation of 1.8, reflecting the extensive cloud coverage during the Bhola storm. As shown in Figure A4 in Appendix, this measure is strongly correlated with contemporaneous weather station data on wind speeds (p-value < 0.01). The mean Awami League vote share is approximately 75 percent. The average number of documented insurgents per electoral constituency during the Bangladeshi War of Independence is about 1,300. Additional details on variable definitions, sources, and construction are provided in Appendix.

5 Empirical Methodology

Estimating Equation. To assess the impact of the Bhola cyclone on votes for the Awami League, and on the propensity to join the insurgency, we estimate:

$$Y_i = \beta \text{ Cyclone Intensity}_i + \gamma Y_{i,t-\tau} + \mathbf{X}'_{i,t-\tau}\theta + \epsilon_i, \tag{1}$$

Y_i, represents the outcome of interest, such as the vote share for the Awami League or the number of insurgents in the Bangladeshi War of Independence, in constituency i. The key independent variable, *Cyclone Intensity*$_i$, captures the intensity of the Bhola Cyclone in constituency i, as measured using ITOS-1 satellite data. We control for the vote share of the Awami League-led United Front (UF) coalition in the 1954 elections, $Y_{i,t-\tau}$, which is conceptually similar to controlling for the lagged dependent variable. 1954 was the last election held in East Pakistan prior to 1970, so the UF vote share serves as a reasonable proxy for Awami League's pre-existing political support. This controls for initial political conditions that may independently affect subsequent electoral outcomes and conflict.We also include distance to the coast as a control in all specifications.

In our second specification, we add a number of baseline historical and geographic characteristics to $\mathbf{X}_{i,t-\tau}$ as controls. These variables are all measured "pre-treatment", before the 1970 cyclone hit. These 10 control variables were digitized from historical sources, including the Awami League leader Sheikh Mujibur Rahman's memoirs, East Pakistan census records, government financing documents, population statistics, agricultural census data, and news

archives. Variable descriptions are included in Online Appendix. The control variables measure the demographic composition of the subdistrict population (e.g. % Hindu population, since Pakistan was founded with a religious identity), pre-existing political engagement (e.g. locations of student protests), and a proxy for infrastructure that may aid resilience and recovery from the storm. Voter turnout in the 1970 elections is also included in this group of covariates.

In our third specification, we address the possibility that including all available explanatory variables may lead to overfitting. To guide covariate selection in a more systematic way, we use the post-double-selection method Belloni et al. (2014). This procedure applies Lasso regressions to identify covariates that are predictive of both the treatment and the outcome, and then includes the union of these variables in the final model. By doing so, it provides a structured approach to controlling for confounding while limiting the inclusion of irrelevant variables. All standard errors in our main regressions are computed using the Newey–West method. The results are very similar when we account for spatial correlation using Conley (2010) standard errors, and when we implement the Wild bootstrap procedure (MacKinnon and Webb, 2018) that does not rely on asymptotic theory for inference.

Since the cyclone occurred between the 1954 and December 1970 elections, we can stack the 1954 United Front vote share and the 1970 Awami League vote share to estimate a difference-in-differences specification with constituency and election year fixed effects. This specification compares changes in electoral support within the same constituency over time before and after the cyclone, rather than only comparing more- and less-exposed constituencies in 1970. The 1954 United Front was a coalition of Bengali opposition parties that included the Awami Muslim League, and Figure A6 shows that the 1954 United Front vote share is highly correlated with the 1970 Awami League vote share. Constituency fixed effects absorb time-invariant local differences, such as geography, political history, and persistent economic conditions, while year fixed effects absorb province-wide changes in Bengali nationalist support between 1954 and 1970. We also allow baseline controls to vary with the post-1970 period, so that pre-existing constituency characteristics can flexibly predict changes in voting over time.[9]

6 Main Results

Effects on Votes for the Separatist Party. We begin by examining whether the experience of the Bhola Cyclone in November 1970 affected support for the Awami League

[9]We can apply the panel specification only to the voting outcome, because guerrilla mobilization is an outcome of the 1971 war itself and has no analogous pre-cyclone counterpart.

in the December 1970 elections in East Pakistan. Panel A, Column 1 of Table 1 reports a regression of vote share on cyclone intensity without any control variables. There is a positive and statistically significant association between storm intensity and the share of votes for the Awami League in the 1970 elections. A one standard deviation increase in log cyclone intensity (0.179) in a constituency is associated with a 3.15 percentage point increase in the Awami League's vote share, corresponding to a 4.2% increase relative to the mean. In Column 2, we add the two main controls: distance to the coast and the Awami League-led United Front coalition's vote share in the 1954 election, which proxies for pre-cyclone political preferences. This specification adjusts for baseline political support and gives the estimate a first-difference interpretation. The point estimate becomes slightly larger: a one standard deviation increase in cyclone intensity is associated with a 4.5 percentage point increase in vote share, or about 6% relative to the sample mean.

Column 3 adds the full set of available controls, including whether Sheikh Mujibur Rahman visited the subdistrict to campaign before the election, whether the subdistrict experienced student protests, whether the area was classified as urban in 1961, the share of the Hindu minority population, constituency population and area, the number of major industrial facilities, and the share of English speakers. The effect of cyclone intensity remains positive, statistically significant, and similar in magnitude.

Because Column 3 includes a relatively large number of controls compared to the sample size, Column 4 uses the post-double-selection procedure proposed by Belloni et al. (2014) to select covariates in a more structured manner. The results are very similar.

Column 5 reports the difference-in-differences specification using the stacked 1954 and 1970 voting data. This specification includes constituency fixed effects, election year fixed effects, and baseline controls interacted with the post period. The coefficient on cyclone intensity interacted with the post-cyclone election is positive, statistically significant, and remains similar to the cross-sectional specifications. A one-standard-deviation increase in cyclone intensity is associated with a 3.9 percentage point shift in vote share towards the pro-separatist Awami League from 1954 to 1970.

Finally, because the regressions are estimated at the constituency level, we also incorporate district fixed effects to account for unobserved heterogeneity at higher administrative levels. As shown in Table A11 in the Appendix, the results remain robust to the inclusion of these fixed effects.

Effects on Conflict Participation. The West Pakistani government's refusal to accept the Awami League's victory in the December 1970 elections set in motion a sequence of events that culminated in a large-scale conflict from March to December 1971. As shown in the timeline in Figure A3, the political stalemate quickly escalated into unrest, and by March

1971 the military had launched a widespread crackdown in East Pakistan. This repression prompted mass mobilization, and what began as an insurgency evolved into a full-scale war of independence. To explore whether experience with the Bhola cyclone induced conflict participation, we examine whether constituencies experiencing higher storm intensity were disproportionately represented among the birthplaces of insurgents recorded in the archival data. Panel B of Table 1 reports the estimates, and Figure A8 in Appendix shows the geographic distribution. A one standard deviation increase in cyclone intensity is associated with approximately 1.4 additional insurgents per 1,000 residents born in the constituency, which translates to about 265 individuals from that constituency joining guerrilla forces during the 1971 independence war. This represents a 21 percent increase relative to the mean insurgent count in the archival data. This result is robust across specifications using baseline controls, the full set of pre-cyclone covariates, and the post-double-selection procedure.

Table 1: Impact of Bhola Cyclone on Votes for Awami League and Participation in the War of Independence.

Panel A. Impact on Votes for Separatist Party					
	(1)	(2)	(3)	(4)	(5)
	Vote Share of Awami League				
Log (Storm Intensity)	0.176***	0.251**	0.215**	0.203**	
	(0.061)	(0.101)	(0.100)	(0.099)	
Log (Storm Intensity) × Post					0.215**
					(0.099)
Adj. R^2	.046	.085	.105	.117	.529
Mean Dep. Var.	.745	.745	.745	.745	.703
Constituency Fixed Effects					Yes
Year Fixed Effects					Yes
All Controls × Post					Yes
Observations	162	162	162	162	324
Panel B. Impact on Conflict					
	# of Insurgents per 1000 People				
Log (Storm Intensity)	4.973**	7.663**	7.183**	7.768**	
	(2.043)	(3.560)	(3.572)	(3.561)	
Baseline Controls	No	Yes	Yes	No	—
All Controls	No	No	Yes	No	—
PDS Controls	No	No	No	Yes	—
Adj. R^2	.025	.031	.144	.077	—
Mean Dep. Var.	6.715	6.715	6.715	6.715	—
SD of Log(Intensity)	.179	.179	.179	.179	—
Observations	162	162	162	162	—

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army. Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite Comissioned by NASA. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm (Belloni et al., 2014) are reported in Table A1. Adjusted R^2 is reported, for column 4 adjusted R^2 for OLS estimation with the same set of control is reported. Column 5 reports the TWFE estimation of the effect using votes for UF in 1954 and votes for AL in 1970 to create a panel, it controls for constituency and year fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

6.1 Identification Concerns

There is a tradition in the literature to treat major climatic shocks as exogenous when studying their political and economic consequences (Yang, 2008; Dell et al., 2014; Hsiang et al., 2013; Chaney, 2013), because prior analysis (Cavallo et al., 2013; Belloc et al., 2016) and meteorological evidence (Emanuel, 2005; Knutson et al., 2010) indicate that extreme weather events are generally unrelated to pre-existing political or economic dynamics. Nevertheless, the Bhola cyclone's path makes it a spatially correlated shock so we need to be careful about the possibility of spurious correlation with pre-existing socio-political characteristics in order to feel confident about the causal interpretation of our results.

Confounders. A central concern is that cyclone exposure may be correlated with pre-existing spatial patterns in politics and conflict. The Bhola cyclone made landfall in the south of East Pakistan and moved northward across the Bengal delta. If the path of the storm overlapped systematically with political geography, then our estimates could conflate the impact of the cyclone with underlying differences across regions. For example, separatist sentiment may have been stronger in coastal areas, or conflict intensity may already have differed inland. In this case, differences we attribute to the cyclone could instead (accidentally) reflect pre-existing political dynamics.

We assess this possibility in several ways. First, we test whether cyclone intensity predicts observable pre-treatment characteristics. Balance tests show that constituencies more and less affected by the storm look similar across socio-economic, demographic, and political covariates (Figure A5). In particular, cyclone intensity is uncorrelated with the 1954 United Front vote share (Table A4)—an important proxy for baseline nationalist sentiment that is strongly correlated with subsequent support for the Awami League.

Figure A7 provides a complementary visual check, in the spirit of Garin and Rothbaum (2025). The figure plots the relationship between cyclone intensity and support for pro-autonomy parties in 1954 and 1970. The pre-cyclone relationship is close to zero and statistically insignificant in 1954, while the relationship becomes positive and statistically significant in 1970. This pattern supports the interpretation that cyclone exposure shifted support toward the Awami League after the shock, rather than simply reflecting pre-existing differences in nationalist support.

Second, coastal areas often have different economic and political structures than inland areas (Balboni, 2024). If our findings were simply capturing these pre-existing coastal characteristics, we would expect the results to weaken once coastal areas are excluded. Instead, when we restrict the analysis to inland constituencies, the estimated effects on both electoral and conflict outcomes remain very similar (Table A5).

Third, we implement placebo tests using later cyclones that struck Bangladesh decades after the events of interest. These storms could not have caused voting behavior in 1970 or participation in the 1971 insurgency, but they provide a useful test of whether our results simply reflect persistent characteristics of cyclone-prone constituencies. If that were the case, later cyclone intensity should predict the same political and conflict outcomes.

We find little evidence of such a pattern (Table A6, Table A7). Cyclone Mora (2017) is not systematically related to Awami League vote share or insurgent participation across specifications. Cyclone Sidr (2007) is correlated with Awami League vote share only in the uncontrolled specification, but this relationship weakens with controls and disappears in the difference-in-differences voting specification. In particular, the placebo interaction between Sidr intensity and the post-1970 election is small and statistically insignificant. The conflict estimates are also imprecise and statistically insignificant. These placebo exercises suggest that the main results are unlikely to reflect general differences between cyclone-prone and less cyclone-prone areas; instead, they point to the political effect of the major climatic shock that occurred immediately before the December 1970 election.

Fourth, cloud cover on the day before the Bhola cyclone made landfall – satellite images processed using the same geospatial technique we use to construct the Bhola cyclone intensity measure – shows no systematic association with subsequent electoral or conflict outcomes (Table A3). This provides an additional check that our results are not driven by spurious correlation created by our processing of the satellite images.

Fifth, we use randomization inference to probe whether our estimates could be explained by chance correlations in spatially correlated data. The distribution of placebo estimates is centered around zero (Figure A11), suggesting that the effects we document are unlikely to arise from unobserved factors that happen to cluster geographically.

Finally, to further alleviate concerns about spatial correlation, we replace our continuous measure of cyclone exposure with a binary indicator tracking whether a constituency lies within a certain distance of the path of the eye of the Bhola cyclone. This path was mapped by Frank and Husain (1971), a staff member of the Pakistan meteorological department working together with a hurricane expert from the US National Hurricane Center in Miami who was deployed to East Pakistan in the aftermath of the Bhola cyclone by the World Bank. They reconstruct the path using both satellite images and measurements recorded by ground meteorological instruments. While they use the same ITOS satellite images we use, back in 1971 they did not have access to the atmospheric science research we use (Hu et al., 2023) to convert the satellite images into a validated measure of cyclone intensity.

Figure A12 displays the reconstructed path of the Bhola cyclone's eye, along with a 150 km buffer zone used to define binary exposure, as constructed by the U.S. National

Hurricane Center expert. Frank and Husain (1971) notes that "the anemometer blew down at the meteorological office in Chittagong 50 miles south-east of the point where the eye made landfall". With weather instruments blown off 80 km away, we report regressions in Table A8 where we classify constituencies that fall within 150 km (Panel A) or 200 km (Panel B) of the cyclone path as "exposed to the storm". Under these binary definitions of cyclone exposure, the results look very similar to our main specifications: residents of constituencies near the eye of the cyclone were more likely to vote for the Awami League, and also more likely to join the insurgency. While the binary indicator loses some information about granular spatial variation in cyclone intensity, it serves as a useful robustness exercise because there is less spatial correlation in this alternate measure.[10]

Precision of Estimates. Cyclone exposure is a spatially correlated shock not randomly scattered across space, with nearby jurisdictions experiencing similar levels of devastation. Political and conflict outcomes may likewise be spatially correlated even after controlling for observables. If such spatial dependence is present, conventional constituency-level clustering can overstate true sampling variation, because adjacent units do not provide fully independent information. Although our dataset covers 162 constituencies, the effective number of independent clusters may be considerably smaller. In that case, standard errors may be biased downward and our results could appear more statistically precise than the underlying data warrants.

We conduct three checks recommended by the applied econometrics literature to understand the true precision of our estimates. First, we apply Conley-type spatial corrections at multiple distance thresholds (Conley, 2010), which explicitly allow for correlation across space in both treatment and outcomes. Second, we use the Thresholding Multiple Outcomes (TMO) method, which adjusts inference by exploiting correlations across outcomes to better account for residual spatial dependence (DellaVigna et al., 2025). Third, we implement the wild cluster bootstrap procedure, which is specifically designed for settings with a small number of effective clusters (MacKinnon and Webb, 2018). Across all three approaches, the main results generally remain statistically significant at conventional levels, although the Conley standard errors at 50- and 100-km distance cutoffs take the p-values to 0.11 and 0.12 in two of the 24 specifications we try (Table A9, Figure A13). These exercises make us reasonably confident that our conclusions are not an artifact of overly optimistic inference. The connections between cyclone exposure and voting in the December 1970 elections, or joining the insurgency in 1971, are clear enough such that we can remain statistically confident even

[10]Because all relief activities took place within the 150 km band around the cyclone's path, this binary exposure measure does not allow for variation in aid intensity. As a result, we are unable to examine mechanisms in Section 7 using this specification, unlike our main specifications.

with consideration of spatial dependence.

The Targeting of Intellectuals to Murder. In the final days of the conflict, just before Pakistani forces surrendered in December 1971, the military carried out targeted attacks on intellectuals, including university professors, educators, journalists, physicians, artists, and other professionals. As *The New York Times* reported in the immediate aftermath of the war, "at least 125 persons, believed to be physicians, professors, writers and teachers, were found murdered today in a field outside Dacca… [and] were among an estimated 300 Bengali intellectuals who had been seized by West Pakistani soldiers and locally recruited supporters" (The New York Times, 1971). Modern accounts claim that thousands of such intellectuals were murdered between March and December 1971 (The Daily Star, 2024).

We have found thus far that experiencing the Bhola cyclone led to a political awakening in East Pakistan in two forms: it helped garner wider support for the Awami League-led autonomy and secessionist movement as expressed in the December 1970 polls, and it also encouraged citizens from the most cyclone-affected constituencies to subsequently take up arms against a government that tried to brutally repress dissent in 1971. We now explore whether the cyclone-affected areas are also over-represented in the birthplaces of the intellectuals who were targeted for murder by the Pakistani state in 1971. Presumably, politically active individuals would be more likely to be targeted, and this analysis provides an indirect way to assess whether intellectuals with more direct experience with the Bhola cyclone became more politically active in 1970-71 support of the cause of Bengali nationalism.

As described in section 4, our list of murdered intellectuals compiled from Bangladesh Genocide Archive (2024) is less comprehensive than the list of insurgents ("freedom fighters") used for our main analyses, which makes us less confident about this analysis. Nevertheless, estimates in Table A10 show that cyclone-affected areas are indeed over-represented in the birthplaces of murdered intellectuals, but unlike our main results on vote shares and insurgents reported in Table 1, this result is dependent on the exact regression specification and the set of control variables we include. In the specification without controls (Column 1), the coefficient is small and statistically insignificant. Adding baseline controls for pre–Awami League coalition performance and distance to the coast (Column 2) yields a positive and marginally significant estimate. When we include the full set of covariates (Column 3), 10% increase in storm intensity results in 20% more intellectuals murdered in that electoral constituency. Finally, applying the post–double–selection procedure to identify covariates (Column 4) produces a statistically significant coefficient at conventional levels: the relationship becomes more precisely estimated when controls are selected using a structured approach that balances model fit and complexity (Belloni et al., 2014).

We view this as only *suggestive* of a pattern in which intellectuals from cyclone–affected areas were likely more politically active, and thus were targeted for repression by the state in the war's final days. We do not emphasize this result in our main conclusions due to our data limitations (the imprecise, incomplete list of murdered intellectuals), and the fact that statistical significance of this effect is specification-dependent. We return to this point in the robustness analysis in section 8.

7 Mechanisms

The historical record suggests that the Bhola Cyclone may have shaped electoral outcomes and subsequent conflict through many possible mechanisms. We compile some additional historical data to test a few potential mechanisms econometrically.

(Lack of) Aid from West Pakistan. Official relief efforts from West Pakistan in response to the cyclone was limited and uneven. Shortly after the cyclone, World Bank staff assessed the damage and highlighted urgent priorities, including restoring road networks, repairing drainage and irrigation systems to prevent soil salinization, and supporting the upcoming harvest (World Bank Report, 1970). The rural economy had suffered extensive losses, with crops, livestock, and poultry nearly destroyed. The report emphasized the need for farm machinery, seeds, fertilizers, and animals to facilitate recovery. Despite these recommendations, contemporary accounts suggest that the government's response fell far short of what was required. General Yahya Khan's reported remark after a helicopter fly-by that the situation "doesn't look too bad" (Carney and Miklian, 2022), while relief workers' first-hand accounts complained of the overwhelming stench of death and disease from hundreds of dead bodies floating down rivers (Rohde, 2014) was emblematic of official complacency.

International observers also expressed concerns about government inaction. Eric Griffel, who oversaw the U.S. relief effort, stated that "the West Pakistani government didn't do anything," while U.S. diplomat Archer Blood reflected that "it was almost as if they just didn't care." Archival records of aid distribution support these assessments. Using information from World Bank reports (World Bank Report, 1972), we identify the locations that received assistance from West Pakistan. We map these locations in Appendix Figure A9. The distribution was sparse, and some critically affected areas like Chittagong received no recorded aid. Only a few coastal areas received some assistance from the central government.

We use these data to econometrically test whether this limited aid distribution mediated the effects of the Bhola cyclone on the voting and insurgency outcomes shown in Table 1. Table 2 shows results where we add an interaction term between the satellite measure of

storm intensity, and an indicator for receiving government aid. The negative coefficients on the interaction term suggest that cyclone-affected areas that received government aid did not move as strongly towards the separatist Awami League and were not as likely to take up arms against the government as cyclone-affected constituencies that did *not* receive aid. A one standard deviation increase in cyclone intensity increased the Awami League's vote share by 4.8 percentage points in the areas without any government aid, but decreased the AL vote share in areas receiving aid from West Pakistan. But less 10% of all constituencies received any aid at all, so the overall effect in the entire sample is an *increase* in the AL vote share by 3.4 percentage points.

Aid similarly attenuated some of the cyclone's effects on joining the insurgency, but not significantly so. In constituencies without aid, a standard deviation increase in cyclone intensity increases the number of insurgents per 1000 people by 1.47, and in the few locations with aid, there is no statistically significant effect on the insurgency.

In summary, while government aid distribution attenuated the political effects of the cyclone, the scale of relief provided was too limited to materially alter the broader trajectory of political mobilization and conflict. On net, experiencing the storm's devastation and the government's indifferent response broadened support for the separatist movement, and induced citizens to engage in guerrilla warfare against their oppressors.

Table 2: Storm and Aid to East Pakistan

Panel A. Impact on Votes for Separatist Party				
	(1)	(2)	(3)	(4)
	Vote Share of Awami League			
Log (Storm Intensity), Recentered X Aid by West Pakistan	-0.876***	-0.986***	-1.089***	-1.089***
	(0.283)	(0.299)	(0.330)	(0.313)
Log (Storm Intensity), Recentered	0.191***	0.301***	0.260**	0.260**
	(0.064)	(0.111)	(0.108)	(0.103)
Aid By West Pakistan	0.313**	0.563***	0.427**	0.427**
	(0.155)	(0.177)	(0.186)	(0.176)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	-.123	-.123	-.148	-.148
For District Provided with Aid, p-val. in parentheses	(0.014)	(0.015)	(0.009)	(0.029)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.034	.054	.047	.047
For District not Provided with Aid, p-val. in parentheses	(0.003)	(0.007)	(0.018)	(0.010)
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (Storm Intensity), Recentered X Aid by West Pakistan	-27.687	-29.642	-22.595	-22.595
	(25.788)	(26.080)	(23.931)	(22.641)
Log (Storm Intensity), Recentered	5.794***	7.748**	7.744**	7.744**
	(2.196)	(3.378)	(3.441)	(3.255)
Aid By West Pakistan	-5.157	-1.156	8.310	8.310
	(7.777)	(8.126)	(8.811)	(8.336)
Baseline Controls X Aid	Yes	Yes	Yes	Yes
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	-3.923	-3.923	-2.661	-2.661
For District Provided with Aid, p-val. in parentheses	(0.395)	(0.399)	(0.536)	(0.417)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	1.038	1.388	1.388	1.388
For District not Provided with Aid, p-val. in parentheses	(0.009)	(0.023)	(0.026)	(0.026)
Observations	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army. Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite Commissioned by NASA. Aid Provided by West Pakistan is an indicator that switches to 1 if any aid was provided by West Pakistan to the constituency according to World Bank reporting from the scene of the cyclone (World Bank, 1970). West Pakistan provided relief goods, including road repairs, bridges, tractors, and water pumps, to 16 constituencies, while the remaining 146 constituencies did not receive any such aid. Baseline controls include votes for United Front, the electoral alliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral alliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table Table A1. The mean of log(storm intensity) is recentered to zero to insure the interpretability of the results. The table includes Effect of one standard deviation of increase in log(storm intensity) for districts provided with aid and not provided with aid as well as p-values for these effects in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The aid interaction effects, while informative, should be interpreted with caution. Aid allocation may not have been random, and it is plausible that the West Pakistani government directed relief toward areas where it sought to maintain political support. Such targeting complicates causal interpretation. In contexts of this kind, Heckman and Pinto (2024) recommends the use of causal mediation analysis to assess the extent to which an intermediary variable – in this case, the allocation of aid – correlates with the observed outcomes. While such methods cannot fully resolve the identification challenges, they provide a structured framework for exploring potential pathways. Following this approach, we estimate the indirect effect of cyclone intensity on Awami League support operating through aid provision. Column 1 of Table A15 reports the results, which indicate that aid provision statistically mediates this relationship, with the indirect pathway accounting for roughly 40% of the observed variation.

Pre-existing Grievances. Another mechanism by which the cyclone have altered the trajectory of this conflict, as suggested by the historical record, is that it intensified pre-existing political and economic grievances (Griffel, 2015). For the Bhola Cyclone to act as a focal point for collective action and for broadening support for a movement, some deep-rooted grievances needed to already be present. The political marginalization of East Pakistan began soon after the creation of Pakistan. The 1948 decision to declare Urdu as the sole official language, despite Bengali being the mother tongue of the majority, provoked an intense backlash. Beyond linguistic rights, there was a demand for a more just political and economic representation for the East. The Awami League-led United Front coalition campaigned on a platform of greater autonomy and more equitable distribution of resources during the 1954 legislative elections.

The 1954 election data give us an opportunity to empirically identify the areas where the pre-existing grievances were more intense. Specifically, we test whether cyclone intensity had a larger marginal effect on the Awami League vote share in the 1970 elections in areas where the AL-led United Front (UF) coalition and their election platform of greater autonomy for East Pakistan were more popular in 1954. We indeed find a significant interaction effect between the 1954 UF vote share and cyclone in panel A of Table 3. In an electoral constituency at the 75th percentile of 1954 UF vote share, a standard deviation increase in cyclone intensity increased the 1970 Awami League vote share by about 6 percentage points (p-value <0.01), but only by a statistically insignificant 2 percentage points at the 25th percentile. Similarly, the storm induced over 2 additional insurgents per thousand people in 1971 (p-value<0.01) in constituencies at the 75th percentile of UF vote share in 1954, but a small statistically insignificant effect at the 25th percentile.

Table 3: Did the Storm Intensify Preexisting Political Sentiment?

Panel A. Impact on Votes for Separatist Party

	(1)	(2)	(3)	(4)
	Vote Share of Awami League			
Log (Storm Intensity), Recentered X Votes for UF	1.287**	2.059***	1.474*	1.612**
	(0.502)	(0.755)	(0.772)	(0.741)
Log (Storm Intensity), Recentered	-0.576*	-1.074**	-0.731	-0.829*
	(0.331)	(0.503)	(0.511)	(0.493)
Votes for UF	0.172	-0.123	-0.032	-0.088
	(0.106)	(0.285)	(0.295)	(0.283)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.025	.012	.015	.011
for Districts with 25th perc. Votes for UF, p-val. in parentheses	(0.184)	(0.578)	(0.481)	(0.362)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.072	.088	.07	.071
for Districts with 75th perc. Votes for UF, p-val. in parentheses	(0.001)	< 0.001	(0.003)	(0.004)
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (Storm Intensity), Recentered X Votes for UF	46.962**	53.943	66.844*	55.104
	(22.368)	(34.628)	(34.835)	(33.596)
Log (Storm Intensity), Recentered	-23.027	-27.526	-35.613	-28.063
	(14.009)	(21.902)	(22.232)	(21.304)
Votes for UF	2.174	-0.495	-4.976	-0.025
	(4.199)	(10.018)	(10.479)	(10.009)
Baseline Controls X Votes for UF	Yes	Yes	Yes	Yes
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.536	.423	.254	.442
for Districts with 25th perc. Votes for UF, p-val. in parentheses	(0.427)	(0.589)	(0.752)	(0.361)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	2.277	2.423	2.733	2.485
for Districts with 75th perc. Votes for UF, p-val. in parentheses	(0.012)	(0.025)	(0.010)	(0.012)
Mean Dep. Var.	6.715	6.715	6.715	6.715
Observations	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army scaled by the population of constituency. Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite commissioned by NASA. Votes for UF are percentage of votes received by United Front, electoral alliance led by Awami League, on 1954 elections. Baseline controls include distance to coast. Interaction of votes for UF and distance to coast are added to control for omitted variable bias following . Controls include indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table A1. The table includes effects of increase of 1 standard deviation in storm intensity and the p-value for the post-estimation t-test for Storm Intensity+Storm IntensityX Yth percent Votes for UF=0 as a row for 25th and 75th percentile of votes variable. The mean of log(storm intensity) is recentered to zero to insure the interpretability of the results. The post estimation tests the total effect against zero for 2 values of the votes for UF. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We again implement a causal mediation analysis (Heckman and Pinto, 2024), reported in Column 2 of Table A15, which assigns roughly 33% of the observed variation in outcomes to pre-existing political discontent. While these estimates should be interpreted with caution given unobserved correlates of 1954 UF vote shares, they are consistent with the view that the cyclone acted as a focal point especially in areas with a stronger pre-existing desire for East Pakistani autonomy.

A related possibility is that the cyclone's devastation exacerbated pre-existing economic grievances. Characteristics of the two main crops produced in East Pakistan provides an econometric test of this theory. Jute was an export commodity that was the major source of foreign exchange for the Pakistan government, while rice was largely consumed locally. In the 1966 "Six Point Movement" described in section 3 that advocated for greater economic autonomy for East Pakistan (including a separate currency) was partly inspired by jute as a symbol of a neo-colonial economic extraction by the West Pakistan government. The foreign exchange proceeds from jute exports were disproportionately used to benefit the central government and re-invested in West Pakistan (Baxter, 1971).

To construct our econometric test of this economic grievance mechanism, we examine whether the Bhola cyclone's political effects were stronger in jute-producing areas. Rice, being locally consumed, was less tied to these extractive dynamics, so an analogous test with rice-producing areas serves as a useful point of contrast. We digitize the 1964 Agricultural Census – the last such census conducted before the Bhola Cyclone – and use as our measure "the area of jute plantations as a share of the territory of the constituency in 1963-1964." Table 4 Panel A adds an interaction term between cyclone intensity and the fraction of land under jute cultivation. The positive coefficients on this interaction term suggest that indeed, experiencing a more intense cyclone led to a larger move towards the Awami League in the 1970 elections, and made it even more likely for citizens to join the insurgency, *especially in* jute-producing areas. In a constituency at the 75th percentile value of jute production, a one standard deviation increase in cyclone intensity increased the AL vote share by 6.3 percentage points and induced an additional 2 insurgents per 1000 people to join the insurgency. These effects are negative and statistically indistinguishable from zero at the 25th percentile of jute production. We don't see an interaction effect in that same direction with respect to rice-producing areas. If anything, the cyclone had a more muted effect on political outcomes in rice-producing regions.

Jointly, these results in panels A and B are consistent with the view that the cyclone amplified grievances in areas tied to extractive economic structures. In East Pakistan, jute production was closely associated with resource extraction and the perception that local economic output disproportionately benefited West Pakistan. Rice, being primarily a locally

consumed subsistence crop, was far less connected to the structures of economic exploitation.

Table 4: Did the Storm Disproportionately impact Major Crop Producing Districts?

Panel A. Jute						
	(1)	(2)	(3)	(4)	(5)	(6)
	Vote Share of Awami League			# of Insurgents per 1000 People		
log(Storm Intensity), Recentered X Jute	0.745**	0.637*	0.704**	11.135	18.484	8.184
	(0.354)	(0.379)	(0.346)	(13.857)	(13.580)	(13.793)
Log (Storm Intensity), Recentered	-0.255	-0.238	-0.282*	-0.772	-4.973	0.438
	(0.166)	(0.163)	(0.151)	(7.443)	(7.507)	(7.460)
Jute, 1964	0.590**	0.720***	0.670***	5.007	6.068	4.075
	(0.240)	(0.250)	(0.241)	(8.442)	(8.625)	(7.863)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	-.031	-.03	-.036	.087	-.517	.244
for Districts with 25th perc. Jute, p-val. in parentheses	(0.205)	(0.203)	(0.075)	(0.937)	(0.641)	(0.834)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.051	.04	.041	1.313	1.518	1.145
for Districts with 75th perc. Jute, p-val. in parentheses	(0.053)	(0.175)	(0.003)	(0.136)	(0.069)	(0.010)
Mean Ind. Var.	.443	.443	.443	.443	.443	.443
Panel B. Rice						
	Vote Share of Awami League			# of Insurgents per 1000 People		
Log(Storm Intensity), Recentered X Rice	-1.937*	-1.784*	-1.751*	-21.649	-41.587	-29.299
	(0.996)	(1.003)	(0.944)	(40.650)	(38.808)	(41.584)
Log (Storm Intensity), Recentered	0.951**	0.868**	0.862**	15.905	22.662	17.992
	(0.429)	(0.436)	(0.412)	(16.975)	(16.404)	(17.235)
Rice, 1964	0.654	0.291	0.391	24.438	19.846	13.214
	(0.913)	(0.975)	(0.896)	(23.061)	(25.037)	(22.803)
Baseline Controls X Rice/Jute	Yes	Yes	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	No	Yes	Yes	No
All Controls	No	Yes	No	No	Yes	No
PDS Controls	No	No	Yes	No	No	Yes
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.064	.058	.059	1.665	1.784	1.62
for Districts with 25th perc. Rice, p-val. in parentheses	(0.018)	(0.039)	(0.012)	(0.088)	(0.067)	(0.015)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.021	.018	.02	1.183	.858	.968
for Districts with 75th perc. Rice, p-val. in parentheses	(0.228)	(0.325)	(0.112)	(0.061)	(0.166)	(0.179)
Mean Ind. Var.	.363	.363	.363	.363	.363	.363
Observations	162	162	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite commissioned by NASA. Rice indicates the area of rice plantations as a share of territory of constituency in 1963-1964, Jute indicates the area of jute plantations as a share of territory of constituency in 1963-1964. Baseline controls include votes for United Front, the electoral alliance led by Awami League, in 1954 and distance to coast. Interaction of the rice and jute variables and baseline controls are added to control for omitted variable bias following . Controls include votes for United Front, the electoral alliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table A1. The table includes effects of increase of 1 standard deviation in storm intensity and the p-value for the post-estimation t-test for Storm Intensity+Storm IntensityX Yth Rice / Jute=0 as a row for 25th and 75th percentile of Rice / Jute variable. The mean of log(storm intensity) is recentered to zero to insure the interpretability of the results. The post estimation tests the total effect against zero for 2 values of the Rice / Jute. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The patterns in Table 3 and Table 4 suggest that the cyclone's political consequences were shaped by both historical political alignments and underlying economic structures. Rather than creating separatist aspirations anew, the disaster appears to have intensified pre-existing sentiments and united political and economic grievances into a more urgent demand for greater autonomy and, ultimately, independence.

The contrast between jute and rice also helps address an alternative opportunity-cost explanation. As in Dube and Vargas (2013), adverse income shocks may increase conflict by lowering the opportunity cost of joining armed groups. In our setting, this would imply that the cyclone increased insurgent participation by destroying agricultural livelihoods, rather than by sharpening grievances against the central state. We examine this possibility using rice suitability in Appendix Table A19. Rice was primarily a locally consumed subsistence crop in East Pakistan and was therefore less directly connected to the extractive political economy associated with jute. If a general agricultural opportunity-cost mechanism were driving our results, cyclone-affected areas more suitable for rice cultivation should also display stronger support for the Awami League and higher insurgent participation. The evidence does not support this interpretation: rice suitability is not positively associated with either outcome, and the insurgency coefficients are negative and statistically insignificant.

This pattern points more naturally to a grievance-based interpretation. The cyclone had larger political effects in constituencies where pre-existing political and economic grievances were already more pronounced: areas with stronger historical support for East Pakistani autonomy and areas more closely tied to jute production, the crop most associated with perceived extraction by West Pakistan. Rice suitability does not display the same pattern, which helps rule out a simple livelihood-shock explanation. In sum, while aid provision attenuated some of the cyclone's political effects, the scale of relief was too limited to alter the broader trajectory of mobilization and conflict. Experiencing the storm's devastation, alongside the central government's indifferent response, broadened support for the separatist movement and encouraged participation in guerrilla warfare.

8 Robustness Checks

Alternative Explanations. We examine four alternative mechanisms for the storm-induced increase in Awami League vote share. First, if the cyclone coincided with an increase in the number of candidates, the observed rise in Awami League vote share might reflect a more fragmented field. Table A12 shows no meaningful or statistically significant relationship between storm intensity and the number of candidates per constituency, suggesting greater competition is unlikely to explain the result.

Second, we consider voter participation and composition. If the cyclone reduced turnout through destruction or fatalities, changes in vote shares could reflect a compositional shift among those able to vote. Table A13 shows no evidence of a negative effect on turnout; if anything, the estimates are weakly positive and largely not significant, suggesting lower electoral participation is not a plausible explanation.

Third, we consider differences in colonial-era infrastructure. If the cyclone's effects were concentrated in areas with historically limited development, the results might capture the legacy of deprivation rather than the shock itself. Table A14 in the Appendix shows no significant relationship between storm intensity and the distribution of railroads or pre-1947 industries. The strongest effects appear instead in locations tied to resource extraction and economic exploitation by West Pakistan, particularly those producing jute. These exercises provide little evidence in favor of these alternative explanations.

Fourth, cyclone exposure may be correlated with subsequent military activity, which could itself contribute to insurgent recruitment. Using the locations of Pakistani military units in East Pakistan reported in Gill (2003), we construct a measure of early military deployment in East Pakistan. Because these data capture military presence rather than the full intensity of civilian victimization, we interpret this exercise cautiously. Cyclone exposure is not correlated with Pakistan military deployment ($\rho = -0.03$, $p = 0.686$). We do not control for military deployment in the main specifications because it may itself respond to mobilization following the cyclone, making it a potential post-treatment variable. While these patterns do not rule out a role for wartime violence, they suggest that the estimated increase in insurgent violence is not simply explained by greater early military presence in cyclone-exposed areas.

Finally, we examine robustness to chance, multiple hypothesis adjustments, functional form, and the choice of controls:

Randomization Inference. The statistical relationship between the November 1970 Bhola storm intensity and December 1970 - December 1971 political mobilization outcomes seems less likely to be a product of random chance once you consider the results of our placebo tests. Measures of storm intensity for the 2007 Sidr or the 2017 Mora cyclones constructed using the same method do not demonstrate a similar correlation with 1970-71 political outcomes (Tables A6 and A7). Nevertheless, we implement a randomization inference test that permutes storm intensity across constituencies and recomputes p-values (Heß, 2017). As shown in Figure A11, the null of random association is rejected at conventional levels.

Multiple Hypotheses Testing. Because we examine several related outcomes, there is a risk that some coefficients could appear statistically significant purely by chance. We address

this by applying corrections for multiple hypothesis testing, which adjust the p-values to account for the number of tests performed. Specifically, we compute Anderson q-values and the Romano–Wolf stepdown procedure. As reported in Table A16, the adjusted results indicate that the likelihood of false positives is low, even after correcting our standard errors for multiple hypothesis testing.

Spatial Correlation. Spatial proximity can generate correlation in unobserved determinants of political outcomes, potentially inflating statistical significance if not addressed. Section 6.1 describes in more detail the various ways we address this, including computing Conley (2010) standard errors. Table A9 shows that our main results remain statistically precise, even after inflating standard errors to account for potential spatial correlation and clustering among neighboring constituencies.

Wild Bootstrap. Statistical inference can be sensitive to distributional assumptions; we apply the Wild cluster bootstrap procedure, which provides valid inference without relying on large-sample asymptotic approximations (MacKinnon and Webb, 2018). Our main sample contains all 162 constituencies in East Pakistan in 1970 so small-sample bias is unlikely to be a major concern, but this method nonetheless offers a more conservative check on significance. As shown in Figure A13, the bootstrap confidence intervals exclude zero for both our main variables.

Functional Form. We assess whether the results are sensitive to how the dependent variable is defined. We replace our two main outcome variables with their log transformation, the inverse hyperbolic sine (IHS) transformation, or a Poisson specification (Chen and Roth, 2024). The results shown in Table A17 retain statistical significance, and the quantitative interpretations remain similar.

In contrast, results on "intellectuals murdered" by the Pakistan army are comparatively less stable. While Table A18 shows that cyclone intensity is positively associated with the birthplaces of murdered intellectuals across all specifications, the relationship reaches statistical significance only under transformations such as log, IHS, or Poisson models. This instability reduces our confidence in the finding, and accordingly, we exclude this outcome from our main specification and refrain from placing it at the center of our interpretation of the broader revolutionary process.

Control Variables Robustness. We assess whether the results are sensitive to the choice or influence of individual controls. Starting with baseline covariates for distance to the coast and pre-1970 Awami League support, proxied by the United Front vote share in 1954, we expand to an extended set of ten additional covariates and apply the post-double selection procedure. Across these specifications, the effects for Awami League votes and insurgent activity remain stable, while estimates for intellectuals murdered are again less robust. To

evaluate whether any single control variable drives the results, we add each variable sequentially to the baseline model. As shown in Panels A of Figure A14 for Awami League votes and Panels B for insurgent activity, the coefficient on storm intensity changes little when controls are added individually. This stability indicates that the main results (on voting and insurgency participation) are not dependent on the inclusion of any specific covariate. However, this level of stability is not observed for the "intellectuals murdered" outcome, which continues to display sensitivity to specification choice.

9 Concluding Remarks

This paper brings together a modern measurement tool developed by atmospheric scientists with archival satellite imagery, voting records, and insurgent biographies to study the causal mechanisms by which a large environmental shock led to a successful revolution in East Pakistan. The 1970 Bhola cyclone, the deadliest recorded tropical storm, struck only weeks before Pakistan's first democratic elections in over 15 years. Using electoral constituency-level variation in storm intensity, we demonstrate that greater exposure to the cyclone's devastation widened support for East Pakistanis' desire for self-governance and also fueled insurgent participation in the subsequent War of Independence. Building unified support around disparate separatist sentiments *and* success in armed conflict are both typical prerequisites for state formation through secession, so we interpret these results as suggesting that the Bhola cyclone played a non-trivial role in the creation of Bangladesh.

Relief distribution varied across subdistricts, and cyclone-hit areas that received little or no government aid exhibited the sharpest separatist shifts. Mediation analysis suggests that the lack of government aid distribution was an important mediator for the electoral response. This is consistent with the Besley and Burgess (2002) mechanism in which inadequate disaster responses reveal leaders' type, which can magnify citizens' desire for secession and self-governance.

The archival record provides ample support for our interpretations of these statistical results. Rohde (2014) chronicles post-cyclone relief efforts and repeatedly highlights the Pakistan government's slow and inadequate response to citizens' suffering: "Though the Government is a military one, the army was not fully mobilized for ten days... not a single [airdrop] was made in the first few days." Bass (2013) emphasizes the electoral consequences, noting that the storm gave Bengali nationalists "a chance to shout their rejection of West Pakistan," and allowed them to use the government's inaction to strengthen calls for autonomy. But the historical record also contains more cautious views, such as Sobhan (2007)'s characterization: "the cyclone merely dramatized the argument and reaffirmed [Bengalis']

conviction," while pre-existing political discontent and demographic factors played a decisive role in the election.

Our quantitative results provide some support for each perspective. A one standard deviation increase in cyclone intensity moved the separatist vote share from 74 to 77 percentage points. This suggests that the cyclone was unlikely pivotal, in that the Awami League would have handily won the election anyway. As Sobhan (2007) argues, the cyclone may have merely widened the base of support for pre-existing secessionist sentiments. But the history of political revolutions also teaches us that secession often requires citizens to make the courageous and risky decision to stand up to the state and its military. Our estimates imply that the cyclone induced an additional 48,000 East Pakistanis to join the insurgency. That surge may have been crucial for sustaining nine months of guerrilla warfare against the Pakistan military, buying sufficient time for the Indian military to intervene decisively in December 1971.

Models which interact 1970 cyclone exposure with 1954 voting outcomes and with jute-producing areas suggest the cyclone amplified pre-existing economic and political grievances, and converted them into sustained collective action. This contributes to the literature on climate and conflict by tracing the specific channels through which environmental shocks influence political change: they shift voting behavior, expose state indifference, and convert grievance into armed mobilization. Although our historical setting is unique, the dynamics of environmental vulnerability, state neglect, and mass mobilization are relevant to many regions facing intensifying climate risks. The Bhola cyclone's legacy underscores that severe climate events can do more than test the resilience of institutions; they can determine their survival. As climate risks intensify worldwide, understanding how environmental shocks interact with political institutions is critical for anticipating the conditions under which states endure or collapse, and how our world is poised to be reshaped.

References

Acemoglu, D., G. Egorov, and K. Sonin (2015). Political economy in a changing world. *Journal of Political Economy 123*(5), 1038–1086.

Acemoglu, D. and J. A. Robinson (2006). *Economic origins of dictatorship and democracy*. Cambridge university press.

Achen, C. H. and L. M. Bartels (2004). Blind retrospection: Electoral responses to drought, flu, and shark attacks. Working Paper.

Ahmad, N. (1968). *An Economic Geography of East Pakistan*. London: Oxford University Press.

Akerlof, R. (2016, May). "we thinking" and its consequences. *American Economic Review 106*(5), 415–19.

Akram, Z. (2002). *The Genocide in Bangladesh, 1971: A Documentation of Atrocities and Struggle for Justice*. Dhaka, Bangladesh: University Press Limited.

Al Mujahid, S. (1971). Pakistan: First general elections. *Asian Survey 11*(2), 159–171.

Alesina, A., P. Giuliano, and B. Reich (2021). Nation-building and education. *Economic Journal 131*(638), 2273–2303.

Almås, I., M. Auffhammer, T. Bold, I. Bolliger, A. Dembo, S. M. Hsiang, S. Kitamura, E. Miguel, and R. Pickmans (2025). Destructive behaviour, judgement, and economic decision-making under thermal stress*. *The Economic Journal*.

Amrith, S. S. (2013). *Crossing the Bay of Bengal*. Harvard University Press.

Axworthy, M. (2013). *Revolutionary Iran: A History of the Islamic Republic*. Oxford University Press.

Ayub Khan, M. (2007). *Diaries of Field Marshal Mohammad Ayub Khan, 1966-1972*. Karachi, Pakistan: Oxford University Press.

Bai, Y. (2023). Shaking legitimacy: the impact of earthquakes on conflict in historical china. *The Economic Journal 133*(652), 1286–1317.

Balboni, C. A. (2024). In harm's way? infrastructure investments and the persistence of coastal cities. *American Economic Review*.

Bangladesh Genocide Archive (2024). Martyred intellectuals. Accessed: 2024-08-21, available at: `https://www.genocidebangladesh.org/martyred-intellectuals/`.

Bangladesh Meteorological Department (1970). Bangladesh meteorological department website. Accessed: 2024-08-21, available at: `https://www.bmd.gov.bd/`.

Bass, G. J. (2013). *The Blood Telegram: Nixon, Kissinger, and a Forgotten Genocide*. New York: Alfred A. Knopf.

Baxter, C. (1971). Pakistan votes–1970. *Asian Survey 11*(3), 197–218.

Baxter, C. (1997). *Bangladesh: From A Nation To A State*. Nations of the modern world: Asia. Avalon Publishing.

Bazzi, S., A. Gaduh, A. D. Rothenberg, and M. Wong (2019). Unity in diversity? how intergroup contact can foster nation building. *American Economic Review 109*(11), 3978–4025.

Beath, A., F. Christia, and R. Enikolopov (2025). Can development programs counter insurgencies? evidence from a field experiment in afghanistan. *American Economic Journal: Applied Economics 17*(3), 80–116.

Belloc, M., F. Drago, and R. Galbiati (2016). Earthquakes, religion, and transition to self-government in italian cities. *The Quarterly Journal of Economics 131*(4), 1875–1926.

Belloni, A., V. Chernozhukov, and C. Hansen (2014, May). High-dimensional methods and inference on structural and treatment effects. *Journal of Economic Perspectives 28*(2), 29–50.

Besley, T. and R. Burgess (2002). The political economy of government responsiveness: Theory and evidence from india. *The Quarterly Journal of Economics 117*(4), 1415–1451.

Besley, T. and T. Persson (2009). The origins of state capacity: Property rights, taxation, and politics. *American Economic Review 99*(4), 1218–1244.

Biswas, S. and P. Daly (2021). 'cyclone not above politics': East pakistan, disaster politics, and the 1970 bhola cyclone. *Modern Asian Studies 55*(4), 1382–1410.

Blood, A. (2002). *The Cruel Birth of Bangladesh: Memoirs of an American Diplomat*. Dhaka, Bangladesh: University Press of Bangladesh.

Buckley, B. M., K. J. Anchukaitis, D. Penny, R. Fletcher, E. R. Cook, M. Sano, L. C. Nam, A. Wichienkeeo, T. T. Minh, and T. M. Hong (2010). Climate as a contributing factor in the demise of angkor, cambodia. *Proceedings of the National Academy of Sciences 107*(15), 6748–6752.

Burke, M., J. Ferguson, S. Hsiang, and E. Miguel (2024). Will wealth weaken weather wars? In *AEA Papers and Proceedings*, Volume 114, pp. 65–69. American Economic Association.

Burke, M., S. M. Hsiang, and E. Miguel (2015). Climate and conflict. *Annual Review of Economics 7*(1), 577–617.

Campante, F. R., D. Chor, and B. Li (2023). The political economy consequences of china's export slowdown. *Journal of the European Economic Association 21*(5), 1721–1771.

Cantoni, D., Y. Chen, D. Y. Yang, N. Yuchtman, and Y. J. Zhang (2017). Curriculum and ideology. *Journal of Political Economy 125*(2), 338–392.

Carleton, T., S. M. Hsiang, and M. Burke (2016). Conflict in a changing climate. *The European Physical Journal Special Topics 225*(3), 489–511.

Carney, S. and J. Miklian (2022). *The Vortex: A True Story of History's Deadliest Storm, an Unspeakable War, and Liberation*. HarperCollins.

Castro-Vincenzi, J., G. Khanna, N. Morales, and N. Pandalai-Nayar (2024). Weathering the storm: Supply chains and climate risk. Technical report, National Bureau of Economic Research.

Cavallo, E., S. Galiani, I. Noy, and J. Pantano (2013). Catastrophic natural disasters and economic growth. *Review of Economics and Statistics 95*(5), 1549–1561.

Cerkez, N. (2025). Extreme weather events and the support for democracy. CSAE Working Paper WPS/2025-03.

Chaney, E. (2013). Revolt on the nile: Economic shocks, religion, and political power. *Econometrica 81*(5), 2033–2053.

Chen, J. and J. Roth (2024). Logs with zeros? some problems and solutions. *The Quarterly Journal of Economics 139*(2), 891–936.

Chen, M. A. (2024, November 15). Comments by martha alter chen. Given as part of a discussion at the Mittal South Asia Institute. Available at https://www.dropbox.com/scl/fi/o9wkf6i8ic1mdtpw418t0/Mittal-South-Asia-Institute-Seminar.mp4?rlkey=2f3ud8mwogrs5923buo8inm7sst=ybw3wpqmdl=0.

Chiovelli, G., S. Michalopoulos, E. Papaioannou, and S. Sequeira (2023). Forced displacement and human capital. Working Paper.

Christian, C., L. Hensel, and C. Roth (2019). Income shocks and suicides: Causal evidence from indonesia. *Review of Economics and Statistics 101*(5), 905–920.

Clots-Figueras, I. and P. Masella (2013). Education, language and identity. *The Economic Journal 123*(570), F332–F357.

Conley, T. G. (2010). Spatial econometrics. In *Microeconometrics*, pp. 303–313. Springer.

Cooperative Institute for Meteorological Satellite Studies (2007). Accessed: 2024-12-20, available at `https://cimss.ssec.wisc.edu/satellite-blog/archives/571`.

Cox, M. (1976). The politics of the dissenting intellectual. *Critique: Journal of Socialist Theory 5*(1), 5–34.

Cremaschi, S. and P. Stanig (2024). Voting and climate change: How an extreme weather event increased support for a radical-right incumbent in italy. *The Journal of Politics 87*.

De Kadt, D., A. Johnson-Kanu, and M. L. Sands (2024). State violence, party formation, and electoral accountability: The political legacy of the marikana massacre. *American Political Science Review 118*(2), 563–583.

Dehdari, S. H. and K. Gehring (2022). The origins of common identity: Evidence from alsace-lorraine. *American Economic Journal: Applied Economics 14*(2), 261–292.

Dell, M., B. F. Jones, and B. A. Olken (2014). What do we learn from the weather? the new climate-economy literature. *Journal of Economic Literature 52*(3), 740–798.

DellaVigna, S., G. Imbens, W. Kim, and D. M. Ritzwoller (2025). Using multiple outcomes to adjust

standard errors for spatial correlation. Working Paper 33716, National Bureau of Economic Research.

Diamond, J. (2011). *Collapse: How Societies Choose to Fail or Succeed: Revised Edition*. Penguin.

Dube, O. and J. F. Vargas (2013). Commodity price shocks and civil conflict: Evidence from colombia. *Review of Economic Studies 80*(4), 1384–1421.

Duch, R. M. and R. T. Stevenson (2008). *The Economic Vote: How Political and Economic Institutions Condition Election Results*. Cambridge University Press.

Emanuel, K. (2005). Increasing destructiveness of tropical cyclones over the past 30 years. *Nature 436*(7051), 686–688.

Fetzer, T. (2020). Can workfare programs moderate conflict? evidence from india. *Journal of the European Economic Association 18*(6), 3337–3375.

Frank, N. L. and S. A. Husain (1971). The deadliest tropical cyclone in history? *Bulletin of the American Meteorological Society 52*(6), 438–444.

Free and Fair Election Network (2010). *National Assembly Elections in Pakistan: 1970–2008*. Church World Service Pakistan/Afghanistan/Karachi and Free and Fair Election Network, Islamabad. Accessed: 2024-08-21. Available at: `https://fafen.org/wp-content/uploads/2010/08/Compendium-National-Assembly-Elections-1970-2008-Pakistan.pdf`.

Garg, T., G. C. McCord, and A. Montfort (2020). Can social protection reduce environmental damages? *Available at SSRN 3465356*. Working paper.

Garin, A. and J. Rothbaum (2025). The long-run impacts of public industrial investment on local development and economic mobility: Evidence from world war ii. *The Quarterly Journal of Economics 140*(1), 459–520.

Gawande, K., D. Kapur, and S. Satyanath (2017). Renewable natural resource shocks and conflict intensity: Findings from India's ongoing Maoist insurgency. *Journal of Conflict Resolution 61*(1), 140–172.

Gill, J. H. (2003). *An Atlas of the 1971 India - Pakistan War: The Creation of Bangladesh*. National Defense University, Near East South Asia Center for Strategic Studies.

Giuliano, P. and N. Nunn (2021). Understanding cultural persistence and change. *The Review of Economic Studies 88*(4), 1541–1581.

Government of Pakistan (1951). Census of pakistan. Accessed: 2024-08-21, available at: `https://repository.lahoreschool.edu.pk/xmlui/handle/123456789/14510`.

Griffel, E. (2015, November). *A Non-Forgiving Life*. Foreign Affairs Oral History Project. The Association for Diplomatic Studies and Training.

Grinin, L., A. Grinin, and A. Korotayev (2022). 20th century revolutions: characteristics, types, and waves. *Humanities and Social Sciences Communications 9*(1), 1–13.

Haggard, S. and R. R. Kaufman (1995). *The Political Economy of Democratic Transitions*. Princeton University Press.

Haq, M., N. Islam, R. Sobhan, M. A. Rehman, A. G. Rabbani, and A. Rehman (1976). Growth and causes of regional disparity in pakistan. *Pakistan Economic and Social Review 14*(1/4), 265–290.

Haug, G. H., D. Gunther, L. C. Peterson, D. M. Sigman, K. A. Hughen, and B. Aeschlimann (2003). Climate and the collapse of maya civilization. *Science 299*(5613), 1731–1735.

Healy, A. and N. Malhotra (2009). Myopic voters and natural disaster policy. *American Political Science Review 103*(3), 387–406.

Heckman, J. and R. Pinto (2024). Econometric causality: The central role of thought experiments. *Journal of Econometrics*, 105719.

Heß, S. (2017). Randomization inference with stata: A guide and software. *The Stata Journal 17*(3), 630–651.

Homer-Dixon, T. F. (1994). Environmental scarcities and violent conflict: Evidence from cases. *International Security 19*(1), 5–40.

Hong, H., S. Ng, and J. Xu (2025). The return of adaptation to extreme weather. NBER Working Paper 33824, National Bureau of Economic Research.

Hopkinson, M. (2002). *The Irish War of Independence*. Montreal; Ithaca: McGill-Queen's University Press.

Horne, A. (2006). *A Savage War of Peace: Algeria 1954-1962*. New York Review of Books.

Hsiang, S. M., M. Burke, and E. Miguel (2013). Quantifying the influence of climate on human conflict. *Science 341*(6151), 1235367.

Hu, L., E. Ritchie, and S. J. Tyo (2023). Quantifying the cooling effect of tropical cyclone clouds on the climate system. *Nature: npj Climate and Atmospheric Science 99*(6).

Hunczak, T. (1977). *The Ukraine, 1917-1921: A Study in Revolution*. Cambridge, Mass.: Harvard University Press.

Islam, M. M., N. Chatterjee, and M. A. Basar (2023). The final straw? bhola cyclone, 1970 election, disaster politics, and the making of bangladesh. *Contemporary South Asia 31*(2), 236–250.

Jahan, R. (1972). Pakistan: Failure in national integration. *New York: Columbia University Press.*.

Jha, S. and S. Wilkinson (2023). Revolutionary contagion. *Stanford University Graduate School of Business Research Paper*.

Khan, M. S. (2022). Experiments in constitutional design: East-west symbiosis in united pakistan. *Available at SSRN 4174393*.

Kissinger, H. (1970). Kissinger to nixon, 19 november 1970. NSC Files, Box 624, Country Files—Middle East, Pakistan, vol. III.

Knutson, T. R., J. L. McBride, J. Chan, K. Emanuel, G. Holland, C. Landsea, I. Held, J. P. Kossin, A. K. Srivastava, and M. Sugi (2010). Tropical cyclones and climate change. *Nature Geoscience 3*(3), 157–163.

Kuroishi, Y. and Y. Sawada (2024). On the stability of preferences: Experimental evidence from two disasters. *European Economic Review 161*, 104632.

Lazarev, E., A. Sobolev, I. V. Soboleva, and B. Sokolov (2014). Trial by fire: A natural disaster's impact on support for the authorities in rural russia. *World politics 66*(4), 641–668.

Lindquist, A. (1977). Military and development in bangladesh. *The IDS Bulletin 9*(1), 10–18.

MacKinnon, J. G. and M. D. Webb (2018). The wild bootstrap for few (treated) clusters. *The Econometrics Journal 21*(2), 114–135.

Malik, A. (2018). Political economy of arab uprisings. In *The New Palgrave Dictionary of Economics*, pp. 10415–10424. Springer.

Meriläinen, J., M. Mitrunen, and T. Virkola (2023). Famine, inequality, and conflict. *Journal of the European Economic Association 21*(4), 1478–1509.

Michalopoulos, S. and E. Papaioannou (2016). The long-run effects of the scramble for africa. *American Economic Review 106*(7), 1802–1848.

Middleton, G. D. (2012). Nothing lasts forever: Environmental discourses on the collapse of past societies. *Journal of Archaeological Research 20*, 257–307.

Miguel, E. (2004). Tribe or nation? nation building and public goods in kenya versus tanzania. *World Politics 56*(3), 327–362.

Miguel, E., S. Satyanath, and E. Sergenti (2004). Economic shocks and civil conflict: An instrumental variables approach. *Journal of Political Economy 112*(4), 725–753.

NASA Earth Observatory (2017). Accessed: 2024-12-20, available at `https://earthobservatory.nasa.gov/images/90304/cyclone-mora-makes-landfall`.

NASA Space Science Data Coordinated Archive (1970). Itos 1. Accessed: 2024-08-21, available at `https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=1970-008A`.

National Centers for Environmental Information (2024). Accessed: 2024-08-21, available at `https://www.ncei.noaa.gov/data/poes-essa-noaa-image-files/access/1970/11/`.

NOAA Atlantic Oceanographic Meteorological Laboratory (2015). 45th Anniversary of the Bhola Cyclone. Accessed: 2025-10-07.

Nunn, N. (2020). The historical roots of economic development. *Science 367*(6485), eaaz9986.

Nunn, N. and N. Qian (2014). Us food aid and civil conflict. *American Economic Review 104*(6), 1630–1666.

Ostrom, E. (2000). Collective action and the evolution of social norms. *Journal of economic perspectives 14*(3), 137–158.

Papanek, G. F. (1967). *Pakistan's Development: Social Goals and Private Incentives*. Harvard University. Center for International Affairs. Publications. Harvard University Press.

Payne, R. (1972). *Massacre*. New York: Macmillan.

Raghavan, S. (2013). *1971: Global History of the Creation of Bangladesh*. Harvard University Press.

Rahman, M. (2012). *The Unfinished Memoirs*. Oxford University Press.

Rahman, S. M. (1972). *Bangladesh, My Bangladesh*. New Delhi: Orient Longman Limited.

Rashiduzzaman, M. (1970). The awami league in the political development of pakistan. *Asian Survey 10*(7), 574–587.

Rohde, C. (2014). *Catalyst: In the Wake of the Great Bhola Cyclone*. CreateSpace Independent Publishing Platform.

Rohner, D. and E. Zhuravskaya (2024). The economics of nation-building: Methodological tool kit and policy lessons. *Annual Review of Economics 17*.

Saday, B. G. (2021). *Politico military strategy of Bangladesh liberation war 1971.* Routledge.

Satyanath, S., N. Voigtländer, and H.-J. Voth (2017). Bowling for fascism: Social capital and the rise of the Nazi party. *Journal of Political Economy 125*(2), 478–526.

Sen, A. (1981). *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford University Press.

Shadmehr, M. and D. Bernhardt (2011). Collective action with uncertain payoffs: coordination, public signals, and punishment dilemmas. *American Political Science Review 105*(4), 829–851.

Sisson, R. and L. E. Rose (1990). *War and Secession: Pakistan, India, and the Creation of Bangladesh*. Berkeley, CA: University of California Press.

Sobhan, R. (1962). The problem of regional imbalance in the economic development of pakistan. *Asian Survey 2*(5), 31–37.

Sobhan, R. (2007). *Milestones to Bangladesh: Collected Works of Rehman Sobhan, Volume 2*. Dhaka: The University Press Limited.

Stern, J. J. (1971). Growth, development, and regional equity in pakistan. *Development Policy II: The Pakistan Experience.*, 8–55.

Tarrow, S. (1994). *Power in Movement: Social Movements, Collective Action and Politics*. Cambridge: Cambridge University Press.

The Atlantic Oceanographic and Meteorological Laboratory (2024). The atlantic oceanographic and meteorological laboratory. Accessed: 2024-08-21, available at: `https://www.aoml.noaa.gov/`.

The Daily Ittefaq (1971, January 18). **ঘূর্ণি উপদ্রুত এলাকার নির্বাচনেও আওয়ামী লীগের বিরাট জয় বাংলার বিদ্ধস্ত উপকূলে স্বাধিকারের বিজয় কেতন**. Accessed: 2025-10-12, available at: `https://`

drive.google.com/file/d/1xmib1P5eN-D9M2zcCQE1-fLq8wwZyscB/view?usp=drivesdk.

The Daily Star (2024, December 14). Martyred intellectuals' day: No list of martyred intellectuals for now. Accessed: 2025-10-11, available at: https://www.thedailystar.net/news/bangladesh/news/martyred-intellectuals-day-no-list-martyred-intellectuals-now-3775741.

The Indian Express (2021, December 17). Bangladesh liberation war: Factors that made tripura's 1971 experience unique. Accessed: 2025-10-09, available at: https://indianexpress.com/article/north-east-india/tripura/bangladesh-liberation-war-tripura-1971-experience-7677655/.

The Ministry of Liberation War Affairs (2024a). List of freedom fighters. Accessed: 2025-08-21, available at: http://mis.molwa.gov.bd/combined-list.

The Ministry of Liberation War Affairs (2024b). List of martyred intellectuals. Accessed: 2025-08-21, available at: https://bdnews24.com/bangladesh/6r4tjj7bpk.

The New York Times (1971, December 19). 125 slain in dacca area believed elite of bengal. *The New York Times*. Accessed: 2025-08-12, available at https://www.nytimes.com/1971/12/19/archives/125-slain-in-dacca-area-believed-elite-of-bengal-125-found-slain.html.

The New York Times (1991, May 20). Croatia votes for sovereignty and confederation. *The New York Times*. Accessed 13-07-2025, available at: https://www.nytimes.com/1991/05/20/world/croatia-votes-for-sovereignty-and-confederation.html.

The Pakistan Observer (1970, November 25). Relief goods pile up in lahore.

Tilly, C. (1978). *From Mobilization to Revolution*. Reading, MA: McGraw-Hill.

Tilly, C., L. Tilly, and R. Tilly (1975). *The Rebellious Century, 1830–1930*. Harvard University Press.

Vogel, E. F. (2011). *Deng Xiaoping and the Transformation of China*. Belknap Press.

Wallis, J. (2005, September-October). What the waters have revealed. *Sojourners Magazine*.

Wikidata (2024). Wikidata. Accessed: 2024-08-21, available at: https://www.wikidata.org/wiki/Wikidata:Main_Page.

World Bank Report (1970). A reconstruction program for the cyclone damaged coastal ares of east pakistan. Accessed: 2024-08-21, available at: https://documents1.worldbank.org/curated/en/355331492972393778/pdf/East-Pakistan-Reconstruction-program-for-the-cyclone-damaged-coastal-areas.pdf.

World Bank Report (1972). Report and recomendation of the president to executive directors on a proposed credit to people's republic of bangladesh for a coastal area rehabilitation and cyclone protection program. Accessed: 2024-08-21, available at: https://documents1.worldbank.org/

curated/en/324111468007479422/pdf/Bangladesh-Reconstruction-Project.pdf.

Yang, D. (2008). Coping with disaster: The impact of hurricanes on international financial flows, 1970-2002. *The BE Journal of Economic Analysis & Policy 8*(1).

Online Appendix

Variable Definitions, Additional Figures and Tables

Outcomes

Awami League Vote Share = The variable measures the share of votes received by *Awami League* candidates in the December 1970 Pakistan General Election. The data cover all 162 electoral constituencies in East Pakistan and are drawn from *National Assembly Elections in East Pakistan* (Free and Fair Election Network (2010), pp. 46–73).

Insurgents = This count variable represents the number of soldiers from each electoral constituency who joined the Liberation War army. We construct it using official records from the Bangladesh Ministry of Liberation War (The Ministry of Liberation War Affairs, 2024a).

Number of Intellectuals Murdered = The number of intellectuals murdered by Pakistan toward the end of the War of Independence. The data are compiled from two sources: (Bangladesh Genocide Archive, 2024; The Ministry of Liberation War Affairs, 2024b).

Turnout in the 1970 Election = This variable represents voter turnout in the Pakistan General Election of December 1970. The dataset covers 162 constituencies in East Pakistan and is derived from the electoral compendium *National Assembly Elections in East Pakistan* (Free and Fair Election Network (2010), pp. 46–73).

Number of Candidates in the Electoral Constituency = The number of registered candidates in each constituency for the Pakistan General Election of December 1970 (Free and Fair Election Network, 2010).

Explanatory Variables

Storm Intensity 1970 (Satellite) = This variable measures the intensity of the Bhola Cyclone using imagery from the ITOS-1 satellite. The available satellite data consist of visible-channel imagery from multiple daily passes, from which we infer radiance values on a grey scale to reproduce the original 0–15 radiance scale used at the time. Radiance values range from 0 to 15, with 0 representing the brightest color, indicative of clouds with the highest reflectivity. We construct this variable using the satellite images over East Pakistan into small grids, calculating the mean grey-scale intensity for each segment, and rescaling these values to the orignial 0–15 range, where 15 denotes the densest cloud coverage. The data are sourced from the National Centers for Environmental Information (National Centers for Environmental Information, 2024).

Storm Intensity 1970 (Wind) = This variable measures the intensity of the Bhola Cyclone using wind speed data from 17 weather stations located in East Pakistan in 1970. The information is obtained from the Wikidata database (Wikidata, 2024).

Storm Path Within 150 (200) km from the Eye of the Storm = An indicator for whether an electoral constituency is located within 150 (200) km of the path of the eye of the storm, according to NOAA Atlantic Oceanographic Meteorological Laboratory (2015). The buffer zones are depicted in corresponding Figure A12.

Control Variables

Votes for the United Front, 1954 = The percentage of votes secured by the United Front, the coalition led by the Awami League in the 1954 election (Baxter, 1997).

Distance to Coast = This variable represents the straight-line distance from a given constituency to the coast of the Bay of Bengal and is calculated using QGIS software.

Data on Linguistic Composition = Data on language distribution (including the share of Bengali, Arabic, English, Urdu, and Persian speakers) are sourced from the 1951 Census conducted in East and West Pakistan (Government of Pakistan, 1951).

Population = The number of registered voters in the constituency (Free and Fair Election Network, 2010).

Indicator of Mujib Visits = This is a binary variable that takes the value 1 if Sheikh Mujibur Rahman visited a given region in 1969. The data are sourced from the memoirs of Sheikh Mujibur Rahman (Rahman, 1972).

Indicator of Student Protest = This is a binary variable denoting whether a constituency experienced student protests in 1969.

Indicator of City = A binary variable that takes the value 1 if a given region contains a city with a population over 20,000 people. The data are taken from *The Economic Geography of East Pakistan* (Ahmad (1968), p. 314).

Number of Major Industrial Facilities = This count variable represents the total number of major industrial facilities located within a constituency as of 1964. The data are taken from *The Economic Geography of East Pakistan* (Ahmad (1968), p. 224).

Number of Politicians Born = This count variable represents the total number of Bangladeshi politicians born in the constituency before the storm (Wikidata, 2024).

Distance to Indian Border = This variable represents the straight-line distance from a given constituency to the border with India and is calculated using QGIS software.

Other Variables

Jute Plantations = This variable indicates the area of jute plantations in East Pakistan divided by the area of the district (in percentage) in 1963–1964. The data are taken from *The Economic Geography of East Pakistan* (Ahmad (1968), p. 133).

Rice Plantations = This variable indicates the area of rice plantations in East Pakistan divided by the area of the district (in percentage) in 1963–1964. The data are taken from *The Economic Geography of East Pakistan* (Ahmad (1968), p. 187).

Paved Road Exists = This binary variable equals 1 if a region had any portion of a paved road within its boundaries in 1964. The data are taken from *The Economic Geography of East Pakistan* (Ahmad (1968), p. 257).

Railroad Exists = This binary variable equals 1 if a region had any portion of a railroad within its boundaries in 1964. The data are taken from *The Economic Geography of East Pakistan* (Ahmad (1968), p. 257).

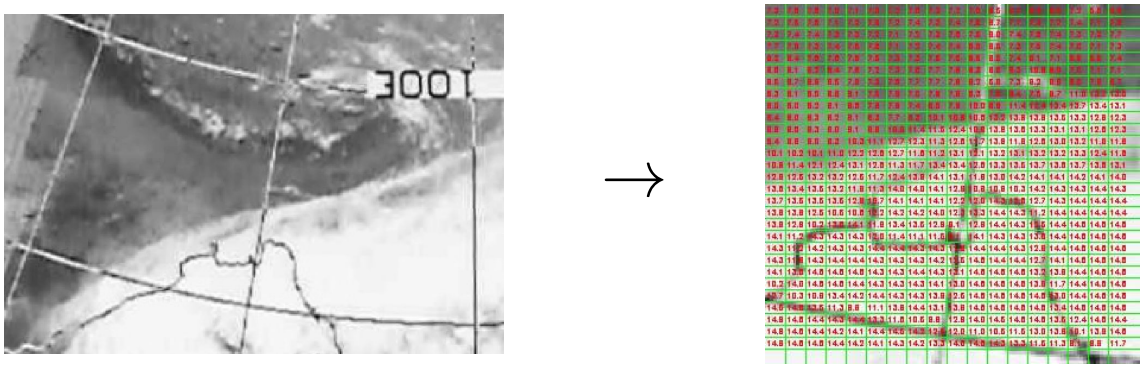
Aid Provided = This binary variable equals 1 if any form of relief was provided to a constituency by the government shortly after the Bhola Cyclone. The data include measures such as miles of reconstructed and newly constructed roads, the number of bridges and culverts built, the distribution of tractors and tillers, and expenditures under the Agricultural Rehabilitation Project and Rural Works Program. The data at the thana (village) level are sourced from the *Report and Recommendation of the President to the Executive Directors on a Proposed Credit to the People's Republic of Bangladesh for a Coastal Area Rehabilitation and Cyclone Protection Program, 1972*, archived by the World Bank (World Bank Report, 1972, pp. 35, 41). Specifically, the World Bank reports from 1970 and 1972 document loans extended to the Government of Pakistan for reconstruction and rehabilitation following the cyclone. These reports also list the specific thanas where relief was distributed. Since the Pakistan government administered the distribution of aid financed by these World Bank funds, we treat these locations as areas where government relief was provided.

One Day Before Storm Intensity = Storm intensity calculated using the same approach as for the main independent variable, based on the satellite image from one day before the Bhola Cyclone (National Centers for Environmental Information, 2024).

Sidr Cyclone Intensity = Storm intensity of the 2007 Sidr Cyclone calculated using the same approach with satellite data from the Cooperative Institute for Meteorological Satellite Studies (Cooperative Institute for Meteorological Satellite Studies, 2007).

Mora Cyclone Intensity = Storm intensity of the 2017 Mora Cyclone calculated using the same approach with satellite data from NASA Earth Observatory (NASA Earth Observatory, 2017).

Figure A1: Satellite Image of Bhola Storm



Note: The figure depicts raw and processed satellite image of emerging Bhola storm. Satellite image was taken by ITOS satellite, commissioned by NASA and then processed using specialized software. We extract color intensity of satellite image and construct our main explanatory variable in which more intense shades of white correspond to more severe storm.

Figure A2: The Daily Ittefaq Cover Page on January 18, 1971.


দৈনিক
ইত্তেফাক
THE DAILY ITTEFAQ
ঘূর্ণি উপদ্রুত এলাকার নির্বাচনেও আওয়ামী লীগের বিরাট জয়
বাংলার বিধ্বস্ত উপকূলে স্বাধিকারের বিজয় কেতন
নির্দিষ্ট সময়ের মধ্যেই শাসনতন্ত্র তৈরী হইবে
প্রেসিডেন্ট ইয়াহিয়ার দৃঢ় আশাবাদঃ
ভুট্টোর সহিত আলোচনা শুরু

Note: The figure depicts the cover page of The Daily Ittefaq on January 18, 1971. The main headline states, "**ঘূর্ণি উপদ্রুত এলাকার নির্বাচনেও আওয়ামী লীগের বিরাট জয়: বাংলার বিধ্বস্ত উপকূলে স্বাধিকারের বিজয় কেতন**", which translates to "Awami League's huge electoral victory even in cyclone-hit areas: The victorious flag of autonomy flies on the devastated coast of Bengal". (Authors' translation)

Figure A3: Bhola Storm and Independence of Bangladesh: Key Events

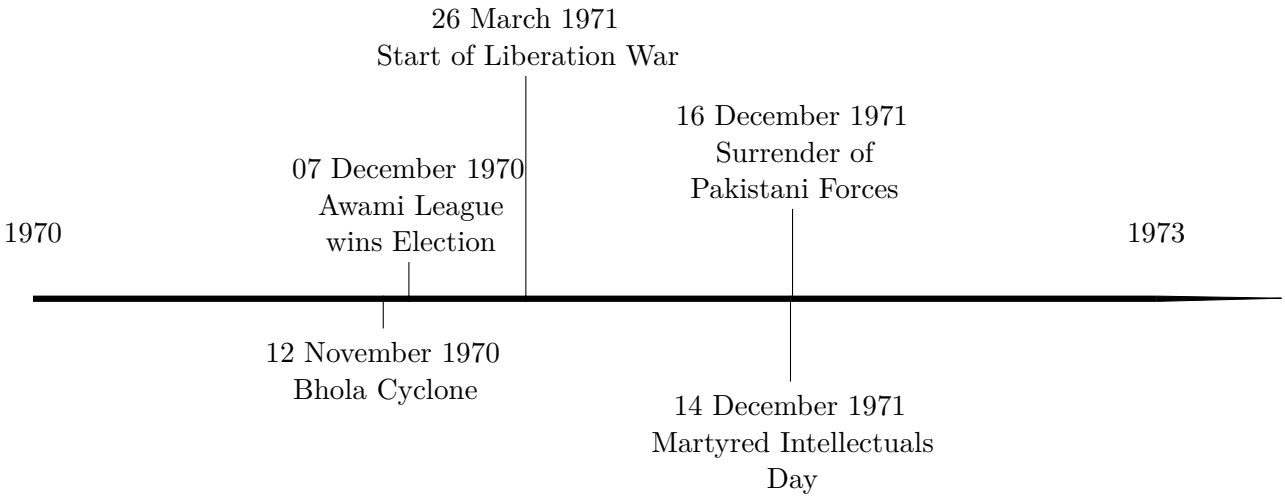
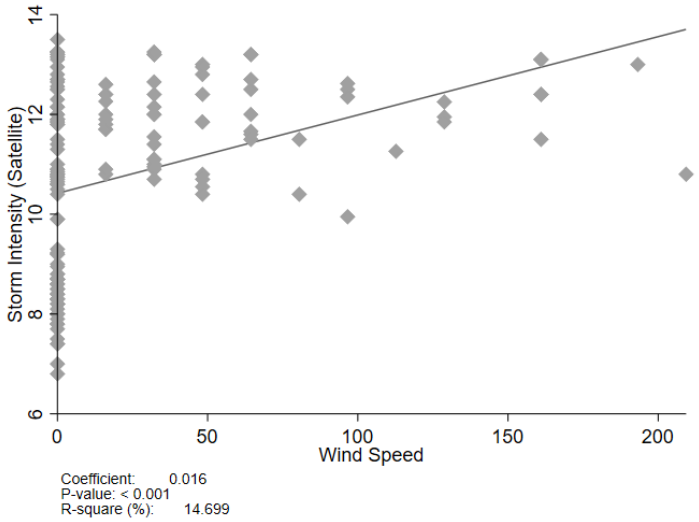
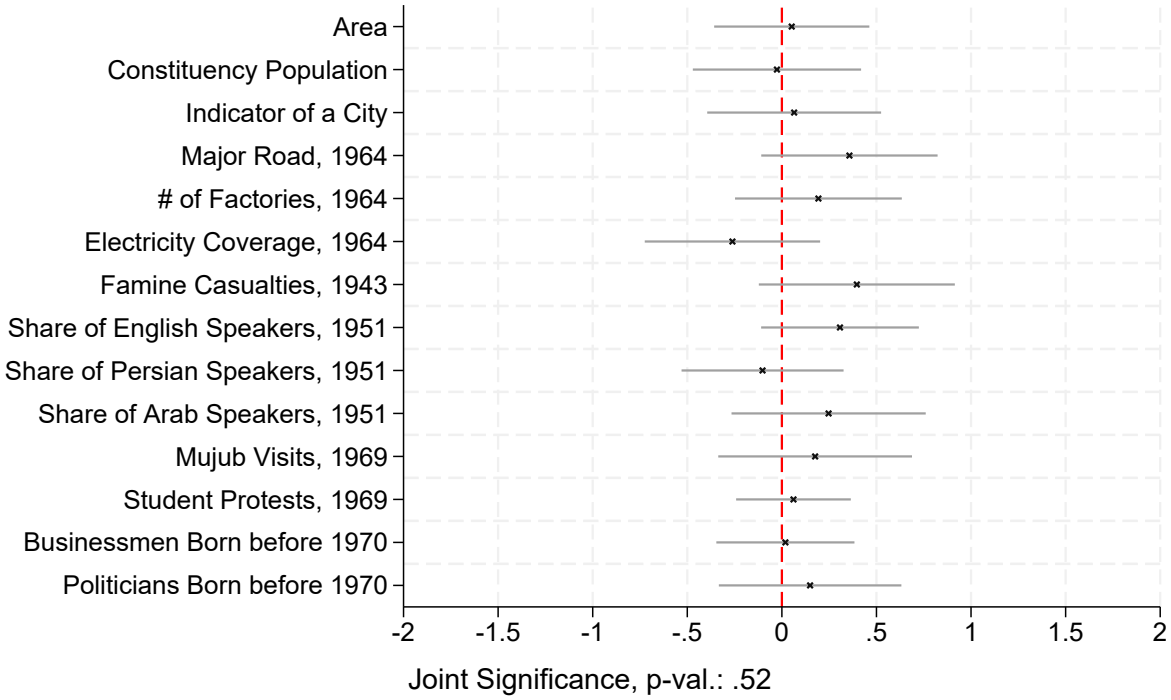


Figure A4: Storm Intensity: satellite and wind speed data.



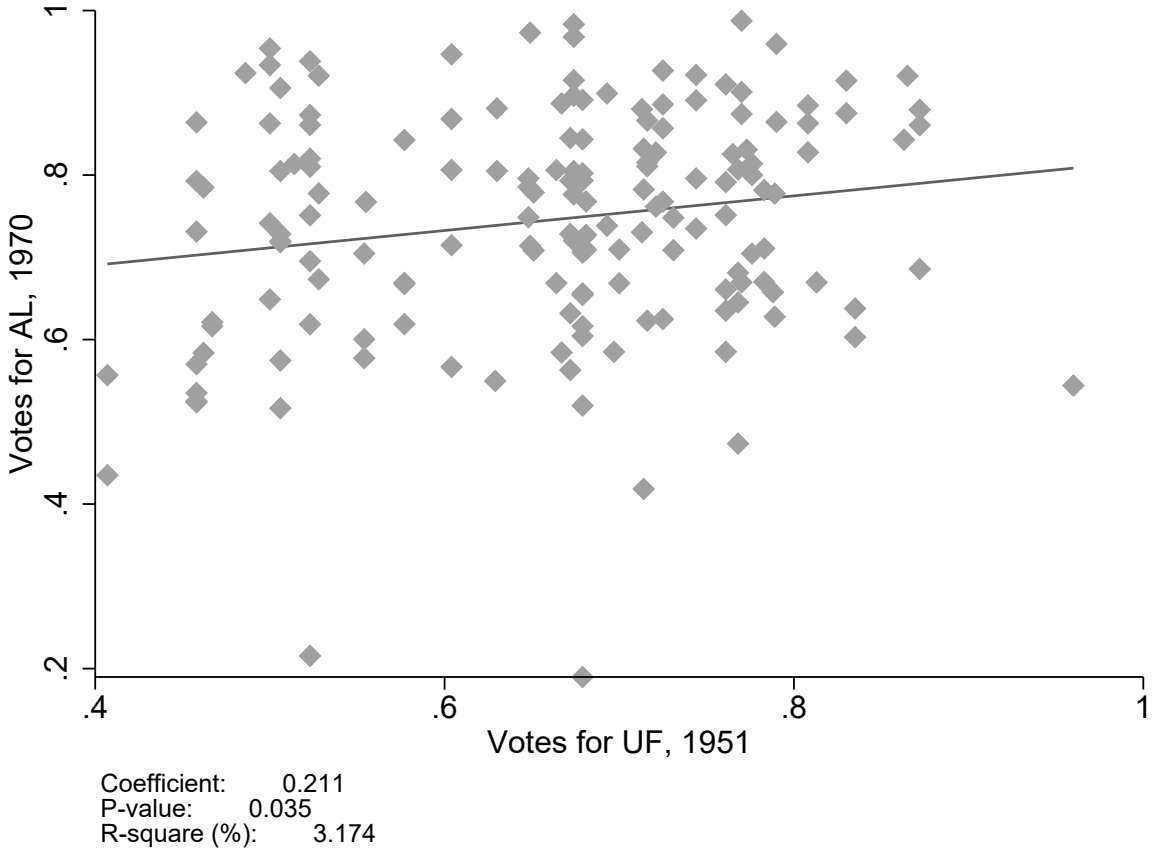
Note: The figure illustrates the relationship between wind storm intensity measured from weather stations and satellite data from ITOS-1 (National Centers for Environmental Information, 2024).

Figure A5: Balance Test



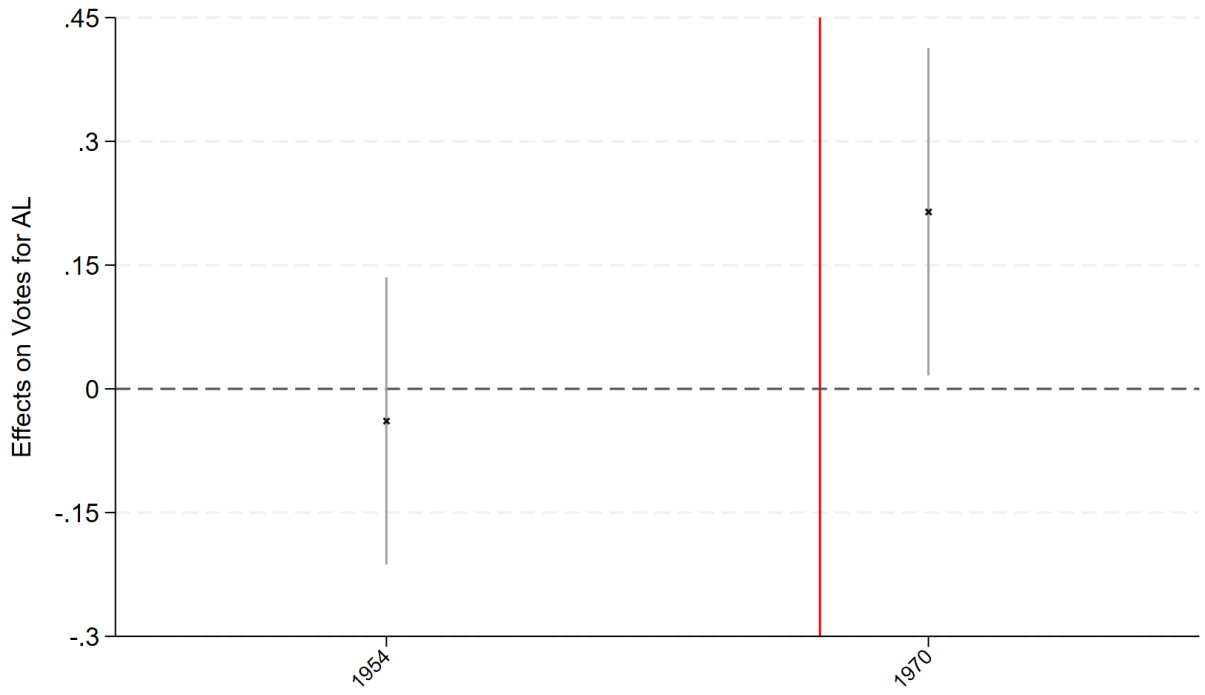
Note: The figure reports the balance test. For regression with covariate as a dependent variable we report the point estimate along with 95% confidence interval. Each regression controls for distance to coast. P-value of the test for joint significance is reported. Storm intensity refers to the strength of the storm based on satellite data collected from images captured by the ITOS-1 satellite commissioned by NASA. The data are sourced from various materials on the history of East Pakistan (present-day Bangladesh), including The Economic Geography of East Pakistan, the memoirs of Sheikh Mujibur Rahman, and the 1951 Census of Pakistan.

Figure A6: Votes for Awami League and Votes for the United Front



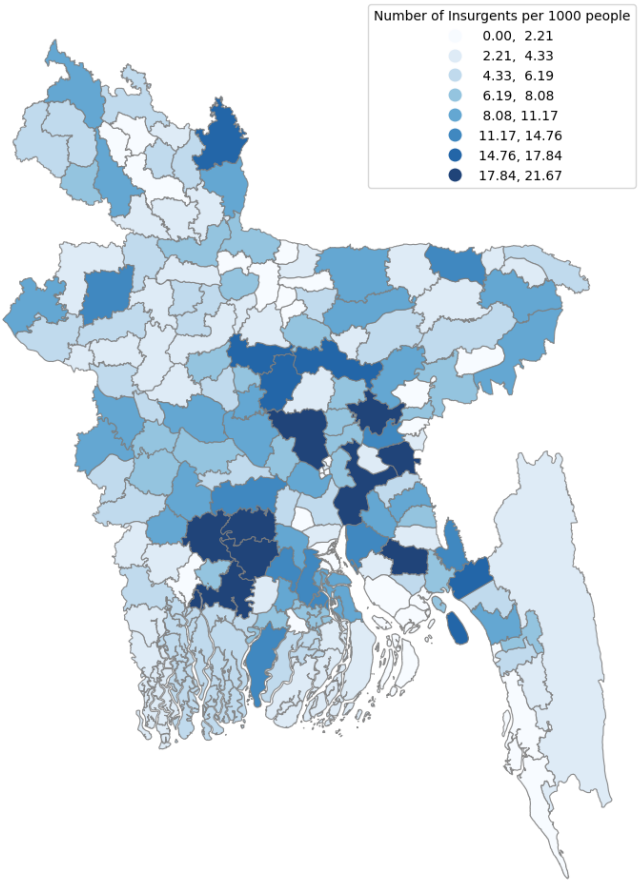
Note: The figure compares constituency-level Awami League vote share in the 1970 election with United Front vote share in the 1954 election. The United Front was an electoral alliance led by the Awami League.

Figure A7: Votes for Awami League and Storm Intensity over Time



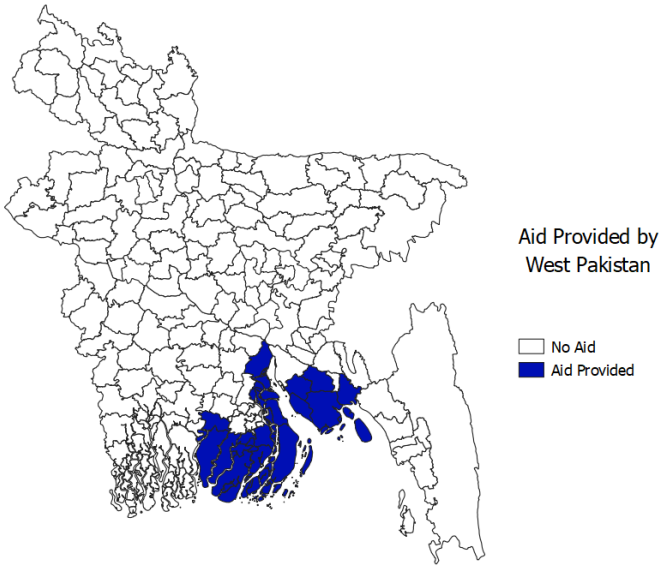
Note: The figure reports relationship between the votes for the Awami League in 1954 and 1970 election and the storm intensity, both specification have all controls. Vertical red line corresponds to 1970 Bhola Cyclone. 95% CI based on heteroskedasticity-robust standard errors are depicted alongside the point estimate.

Figure A8: Distribution of Insurgents



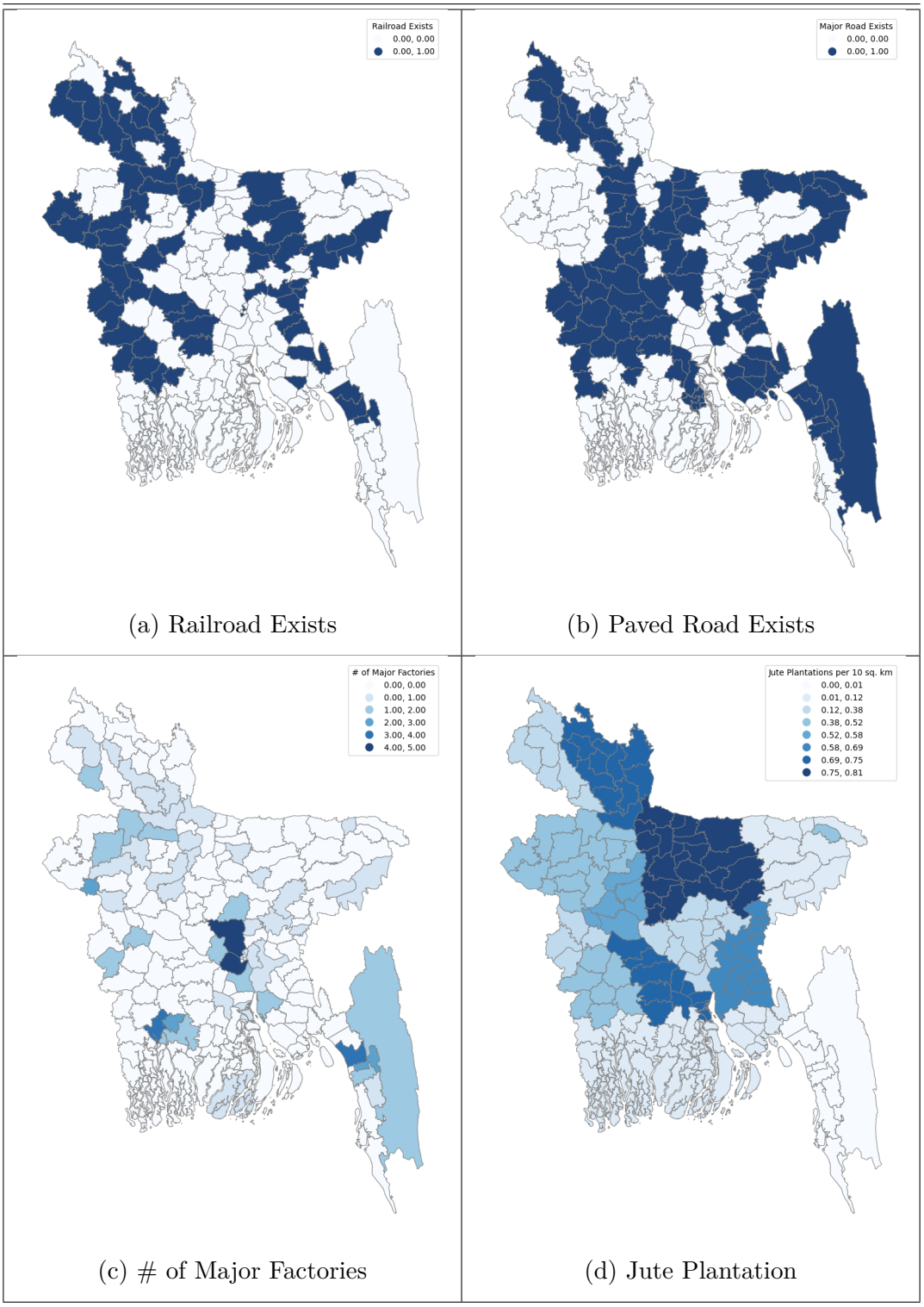
Note: The map illustrates the number of soldiers from each electoral constituency who joined the Liberation War army for Bangladesh's independence. The data come from records of the Bangladesh Ministry of Liberation War Affairs The Ministry of Liberation War Affairs (2024a).

Figure A9: Regions Provided with Aid from Pakistani State



Note: The map illustrates the regions of Bangladesh that received financial, infrastructural, or other forms of aid distributed through the Pakistani state in 1970 following the storm. The data come from World Bank reports (World Bank Report, 1970, 1972).

Figure A10: Spatial Variation of Main Economic Variables



(a) Railroad Exists

(b) Paved Road Exists

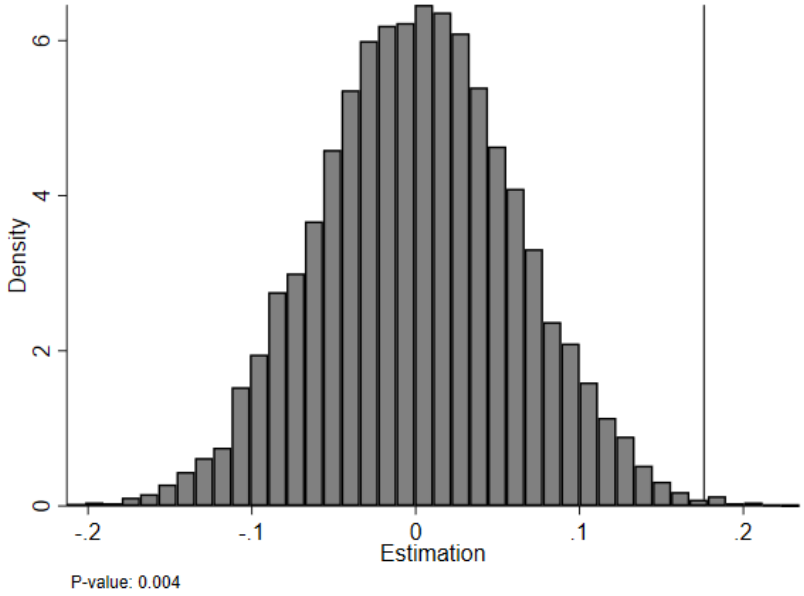
(c) # of Major Factories

(d) Jute Plantation

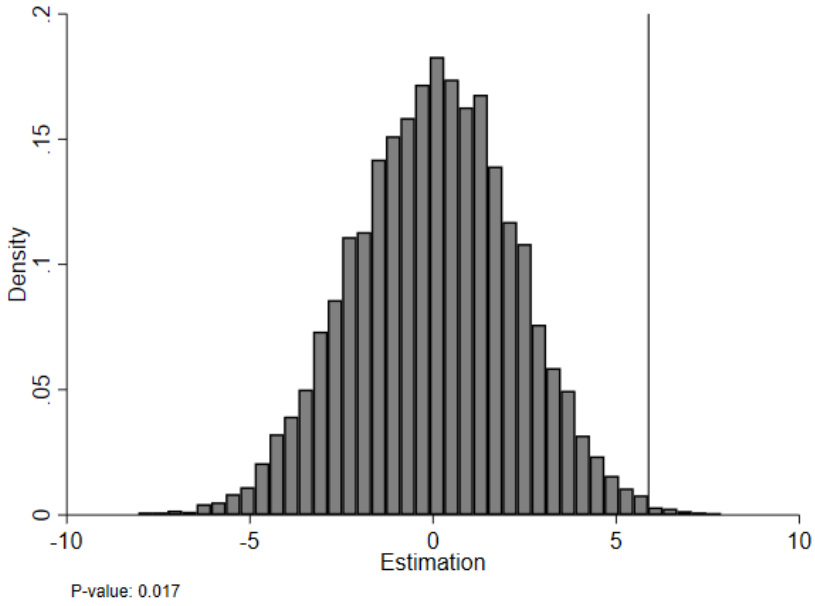
Note: The panel depicts variation in the main economic variables in East Pakistan in 1964. The data are from *The Economic Geography of East Pakistan* (Ahmad, 1968).

Figure A11: Permutation Inference Test

Panel A: Votes for Awami League



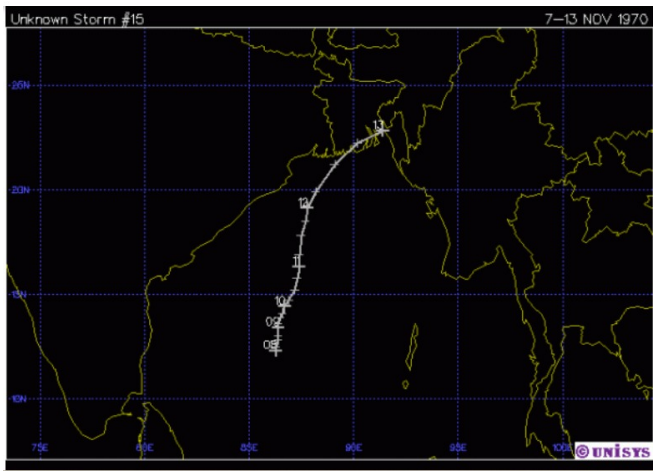
Panel B: Impact on Conflict



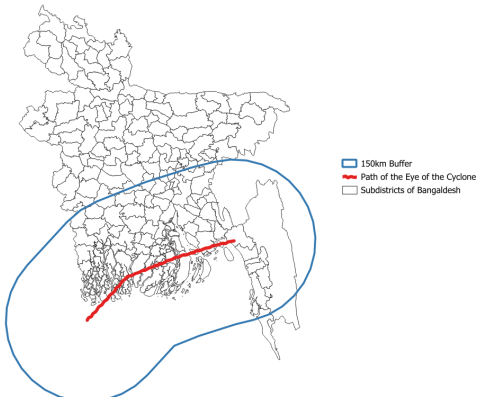
Note: The figure reports the results of a permutation inference test based on 10,000 permutations. The histogram shows the estimated probability density function of the coefficient under the null hypothesis that the storm had no effect on votes for the Awami League or on conflict. The vertical line indicates the actual estimated coefficient.

Figure A12: Cyclone Path and Construction of an Alternative Cyclone Measure

Panel A. NOAA Atlantic Oceanographic Meteorological Laboratory (2015) Cyclone Path



Panel B. Path of the Eye of the Storm + 150km Buffer

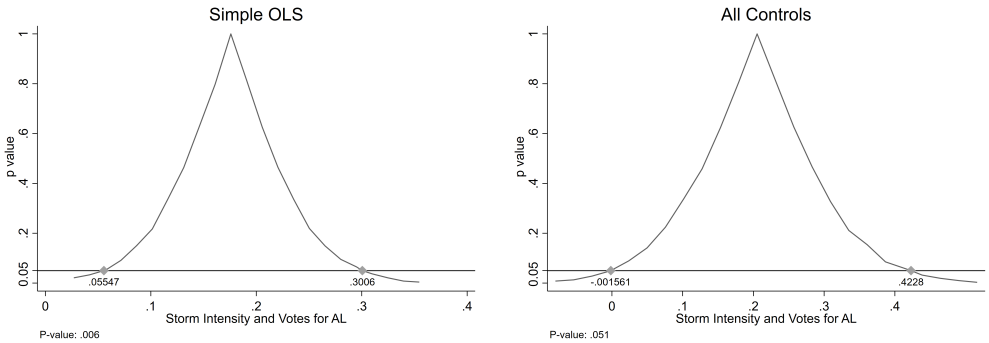


Note: The figure illustrates the path of the Bhola Cyclone and the construction of the related independent variable. Panel A shows the path estimated by NOAA, while Panel B zooms in on the path the cyclone followed after making landfall in East Pakistan (in red), along with a 150 km buffer around it. This approach is used to construct the independent variable employed in Table A8. Constituencies located within the cyclone path are coded as one, and those outside as zero. Panel A reports results using a 150 km band around the path, while Panel B extends the band to 200 km. The estimates are even stronger when using bands greater than 200 km.

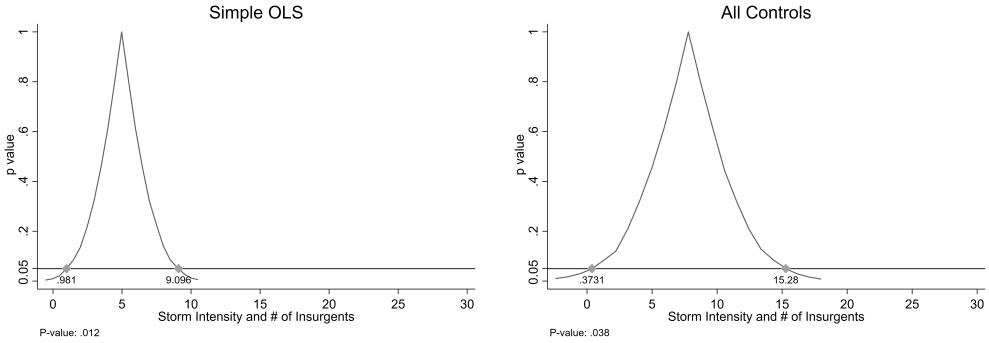
.

Figure A13: Wild Bootstrap Test

Panel A: Votes for Awami League



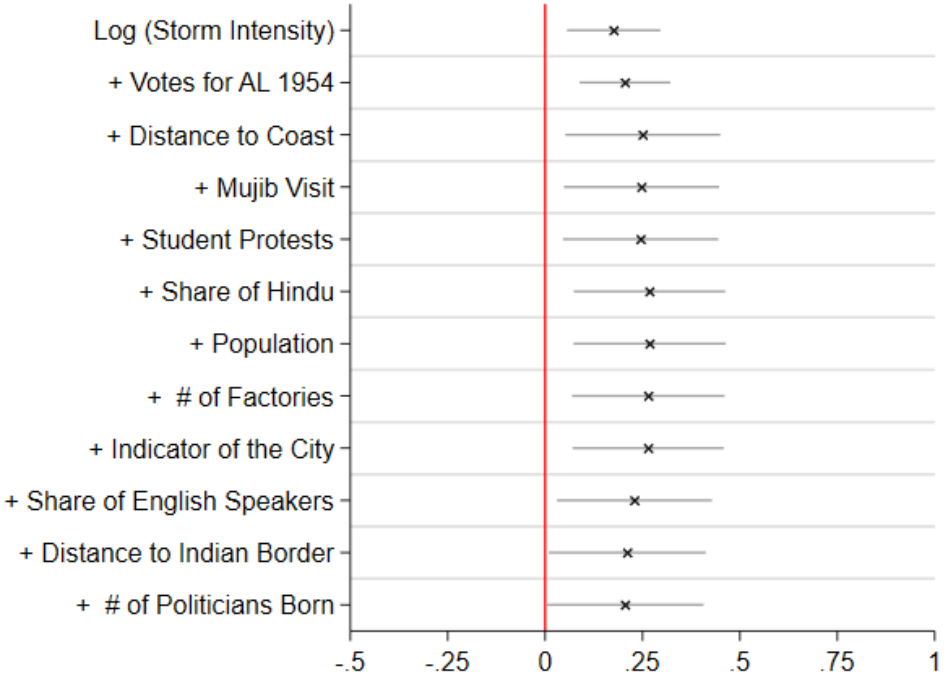
Panel B: Participation in the Insurgency



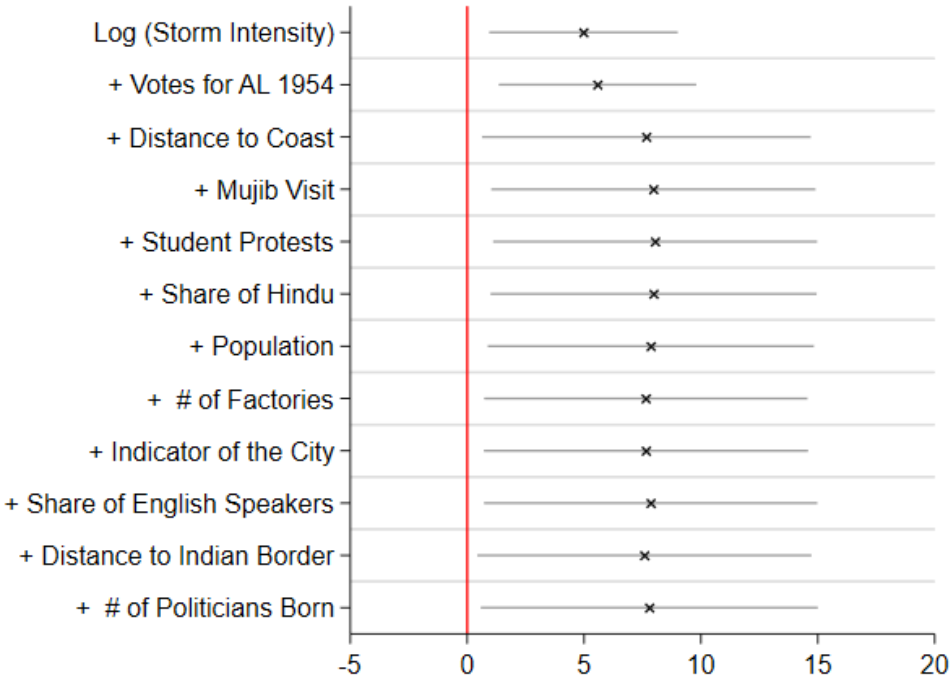
Note: The figure reports the results of a wild bootstrap test based on 999 replications. The histogram shows the confidence intervals for the coefficient of the logarithm of storm intensity. The horizontal line corresponds to a p-value of 0.05, and the points of intersection indicate the confidence interval bounds.

Figure A14: Robustness Check: Main Coefficients Including One Control Variable at Time

Panel A: Votes for Awami League



Panel B: # of Insurgents per 1000 people



Note: The figure reports the coefficients of the logarithm of storm intensity from regressions of votes for the Awami League and the number of insurgents on the logarithm of the Bhola Cyclone, with control variables added sequentially.

Table A1: Post-double-selection covariates for each regression

Table	Selected Covariates for Panel A	Selected Covariates for Panel B
Table 1	Distance to Coast, Share of English Speakers, Distance to Indian Border	Distance to Coast
Table 2	Full set of controls	Full set of controls
Table 3	Distance to Coast, Share of English Speakers, Distance to Indian Border	Distance to Coast, Distance to Indian Border
Table 4	Full Set of Controls for Jute; and Distance to Coast, Share of English Speakers, Share of Hindu, Indicator of Mujib Visit, Share of Votes for UF, Population for Rice	Distance to Coast, Share of Hindu in Population for Jute; and Distance to Coast, Share of English Speakers, Share of Hindu, Indicator of Mujib Visit, Share of Votes for UF, Total Population for Rice
Table A3	Distance to Coast, Share of English Speakers, Distance to Indian Border	
Table A4	Distance to Coast	
Table A5	Indicator of Mujib Visit, Share of English Speakers, Distance to Indian Border	Indicator of Mujib Visit, Indicator of Student Protests, Distance to Indian Border
Table A6	Distance to Indian Border, Votes for UF 1954, Share of English Speakers	Votes for UF 1954, Share of Hindu Population
Table A7	Distance to Coast, Share of English Speakers, Distance to Indian Border	Distance to Coast, Share of Hindu Population
Table A8	Distance to Coast, Share of English Speakers, Distance to Indian Border	Distance to Coast, Total Population
Table A10	Distance to Coast, Number of Politicians Born	
Table A12	Distance to Coast	
Table A13	Distance to Coast, Share of English Speakers, Share of Hindu Population	
Table A19	None	None

Note: The table reports the set of covariates which was chosen by post-double-selection algorithm Belloni et al. (2014) for each regression

Table A2: Summary Statistics of Main Variables

	Mean	Median	SD	Min	Max	N obs
Bhola Storm Intensity (Satellite)	10.82	11.10	1.829	6.800	13.50	162
Bhola Storm Intensity (Wind Speed)	25.44	0	44.67	0	209.3	162
Share of Votes for Awami League	0.745	0.764	0.138	0.190	0.988	162
# of Insurgents per 1000 People	6.715	5.415	5.081	0	21.67	162
Turnout on 1970 Election	0.567	0.567	0.0860	0.394	0.779	162
Distance to Coast	208.6	217.2	123.1	0.808	479.6	162
Distance to Indian Border	37.48	30.80	35.06	0	112.8	162
One Day Before Storm Intensity (Satellite)	8.773	8.600	0.981	6.800	13.20	163
Mora Storm Intensity (Satellite)	10.99	11.40	1.336	8	13.30	162
Sidr Storm Intensity (Satellite)	14.25	14.40	0.638	10.80	14.80	162
Share of Bengali Speakers	0.765	0.770	0.0341	0.700	0.840	162
Share of Arab Speakers	0.0162	0.0150	0.00814	0.00300	0.0300	162
Share of English Speakers	0.169	0.170	0.0260	0.130	0.220	162
Share of Persian Speakers	0.00523	0.00500	0.00250	0.00200	0.0100	162
Indicator of Mujib Visit	0.0556	0	0.230	0	1	162
Indicator of Student Protest	0.0432	0	0.204	0	1	162
Share of Votes for Awami League Coalition (UF)	0.660	0.679	0.117	0.407	0.960	162
Population of the Constituence	192655.4	191217.5	20391.5	148226	283933	162
Indicator of City	0.191	0	0.395	0	1	162
Paved Road Exists 1964	0.512	1	0.501	0	1	162
Rail Road Exists 1964	0.420	0	0.495	0	1	162
# of Major Factories 1964	0.525	0	0.960	0	5	162
Rice, Share of territory	0.363	0.333	0.108	0.121	0.533	162
Jute, Share of territory	0.443	0.459	0.280	0.000922	0.813	162
Aid Provided	0.105	0	0.307	0	1	162
Number of Intellectuals Murdered	0.896	0	2.675	0	23	163
# of Political Leaders	1.796	1	2.668	0	19	162
# of Business Leaders	0.111	0	0.473	0	4	162
# of Candidates in the Constituency	4.753	5	1.449	2	9	162

Notes: This table reports mean, median, standard deviation for main variables in our analysis. The unit of analysis is electoral sub-district known as constituency. Figures 1 provides spatial variation of selected variables. For description of variables see Appendix A.

Table A3: Placebo Test. Effect of the Radiation One Day Before the Bhola Storm

Panel A. Impact on Votes for Separatist Party					
	(1)	(2)	(3)	(4)	(5)
	Vote Share of Awami League				
Log (One Day before Bhola Storm Radiation)	-0.146	-0.210	-0.200	-0.163	
	(0.135)	(0.136)	(0.135)	(0.122)	
Log (One Day before Bhola Storm Radiation) × Post					-0.200
					(0.132)
Adj. R^2	.005	.066	.095	.108	.523
Mean Dep. Var.	.745	.745	.745	.745	.703
Constituency Fixed Effects					Yes
Year Fixed Effects					Yes
All Controls × Post					Yes
Observations	162	162	162	162	324
Panel B. Impact on Conflict					
	# of Insurgents per 1000 People				
Log (One Day before Bhola Storm Radiation)	-4.072	-5.991	-3.959	-2.398	
	(3.633)	(3.769)	(4.233)	(3.667)	
Baseline Controls	No	Yes	Yes	No	—
All Controls	No	No	Yes	No	—
PDS Controls	No	No	No	Yes	—
Adj. R^2	0	.016	.126	.056	—
Mean Dep. Var.	6.715	6.715	6.715	6.715	—
Observations	162	162	162	162	—

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh), of War of Independence participance living in the constituency, scaled by the population of the constituency. One Day before Bhola Storm Radiation is the variable constructed from ITOS-1 satellite image of Bangladesh one day before forming of Bhola Cyclone (7 Novemner 1970). To construct it the same approach as for the main independent variable was used. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, population of the constituency, number of politicians born before 1970, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table A1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Placebo: Storm and Pretreatment Election

	(1)	(2)	(3)	(4)
	Votes for AL on 1954 Election			
Log (Storm Intensity 1970)	-0.110**	0.040	-0.039	0.040
	(0.048)	(0.087)	(0.088)	(0.086)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Adj. R^2	.022	.048	.149	.048
Mean Dep. Var.	.66	.66	.66	.66
Observations	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is Share of Votes for the Awami League led electoral alliance in the 1954 election. Storm intensity is the intensity of the storm based on satellite data collected from images captured by the ITOS-1 satellite Comissioned by NASA. Baseline controls include distance to coast. Controls include indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table A1. Adjusted R^2 is reported, for column 4 adjusted R^2 for OLS estimation with the same set of control is reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A5: Effect of the Storm on the Vote Share of Awami League Excluding Coastal Districts.

Panel A. Impact on Votes for Separatist Party					
	(1)	(2)	(3)	(4)	(5)
	Vote Share of Awami League				
Log (Storm Intensity)	0.278***	0.301***	0.216***	0.178**	
	(0.065)	(0.063)	(0.083)	(0.076)	
Log (Storm Intensity) × Post					0.216***
					(0.081)
Adj. R^2	.139	.179	.225	.219	.589
Mean Dep. Var.	.753	.753	.753	.753	.713
Constituency Fixed Effects					Yes
Year Fixed Effects					Yes
All Controls × Post					Yes
Observations	126	126	126	126	252
Panel B. Impact on Conflict					
	# of Insurgents per 1000 People				
Log (Storm Intensity)	7.435***	7.919***	7.301**	6.416**	
	(2.397)	(2.435)	(2.788)	(2.651)	
Coastal Regions Excluded	Yes	Yes	Yes	Yes	—
Baseline Controls	No	Yes	Yes	No	—
All Controls	No	No	Yes	No	—
PDS Controls	No	No	No	Yes	—
Adj. R^2	.066	.074	.216	.121	—
Mean Dep. Var.	6.925	6.925	6.925	6.925	—
Observations	126	126	126	126	—

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army. Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite Comissioned by NASA. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with Population over 20.000 people as for 1961 in the constituency, percentage of Hindu across the Population, number of politicians born before 1970 in the constituency, population of the constituency, number of major industrial facilities in the constituency, share of English speaking Population and distance to Indian border. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table Table A1. Coastal regions (within 100 km from the coast) are dropped in the analysis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A6: Placebo Test on Mora Cyclone (2017) on Awami League Votes and Conflict

Panel A. Impact on Votes for Separatist Party					
	(1)	(2)	(3)	(4)	(5)
	Vote Share of Awami League				
Log (Mora Storm Intensity 2017)	-0.062	0.036	-0.051	-0.076	
	(0.068)	(0.071)	(0.081)	(0.075)	
Log (Mora Storm Intensity 2017) × Post					-0.051
					(0.080)
Adj. R^2	-.003	.047	.079	.103	.515
Mean Dep. Var.	.745	.745	.745	.745	.703
Constituency Fixed Effects					Yes
Year Fixed Effects					Yes
All Controls × Post					Yes
Observations	162	162	162	162	324
Panel B. Impact on Conflict					
	# of Insurgents per 1000 People				
Log (Mora Storm Intensity 2017)	-0.838	1.280	0.151	1.222	
	(2.285)	(2.364)	(2.472)	(2.082)	
Baseline Controls	No	Yes	Yes	No	—
All Controls	No	No	Yes	No	—
PDS Controls	No	No	No	Yes	—
Adj. R^2	-.006	.005	.121	.048	—
Mean Dep. Var.	6.715	6.715	6.715	6.715	—
Observations	162	162	162	162	—

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh), of War of Independence participance living in the constituency, scaled by the population of the constituency. Mora Storm Intensity is the intensity of the storm based on satellite data by NASA. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, population of the constituency, number of politicians born before 1970, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table Table A1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A7: Placebo Test on Sidr Cyclone (2007) on Awami League Votes and Conflict

Panel A. Impact on Votes for Separatist Party					
	(1)	(2)	(3)	(4)	(5)
	Vote Share of Awami League				
Log (Sidr Storm Intensity 2007)	0.532***	0.371	0.205	0.215	
	(0.188)	(0.241)	(0.235)	(0.247)	
Log (Sidr Storm Intensity 2007) × Post					0.205
					(0.231)
Adj. R^2	.027	.058	.081	.096	.516
Mean Dep. Var.	.745	.745	.745	.745	.703
Constituency Fixed Effects					Yes
Year Fixed Effects					Yes
All Controls × Post					Yes
Observations	162	162	162	162	324
Panel B. Impact on Conflict					
	# of Insurgents per 1000 People				
Log (Sidr Storm Intensity 2007)	12.056	7.824	7.887	7.982	
	(7.582)	(8.318)	(7.806)	(8.123)	
Baseline Controls	No	Yes	Yes	No	—
All Controls	No	No	Yes	No	—
PDS Controls	No	No	No	Yes	—
Adj. R^2	.007	.008	.125	.054	—
Mean Dep. Var.	6.715	6.715	6.715	6.715	—
Observations	162	162	162	162	—

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh), of War of Independence participance living in the constituency, scaled by the population of the constituency. Sidr Storm Intensity is the intensity of the storm based on satellite data by NASA. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, population of the constituency, number of politicians born before 1970, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table Table A1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A8: Impact of Bhola Cyclone on Votes for Awami League and Participation in the War of Independence. Cyclone Path Approach

Panel A. 150km Buffer					
	(1)	(2)	(3)	(4)	(5)
	Vote Share of Awami League			# of Insurgents per 1000 People	
Within 150km of the Path of the Eye of the Storm	0.115***	0.093***		1.981	2.179
	(0.032)	(0.031)		(1.399)	(1.344)
Within 150km of the Path of the Eye of the Storm × Post			0.115***		
			(0.032)		
Adj. R^2	.135	.131	.545	.134	.064
Mean Dep. Var.	.745	.745	.703	6.715	6.715
Constituency Fixed Effects			Yes		
Year Fixed Effects			Yes		
All Controls × Post			Yes		
Observations	162	162	324	162	162
Panel B. 200km Buffer					
	Vote Share of Awami League			# of Insurgents per 1000 People	
Within 200km of the Path of the Eye of the Storm	0.140***	0.116***		3.253**	3.351***
	(0.037)	(0.038)		(1.255)	(1.204)
Within 200km of the Path of the Eye of the Storm × Post			0.140***		
			(0.037)		
Baseline Controls	Yes	No		Yes	No
All Controls	Yes	No		Yes	No
PDS Controls	No	Yes		No	Yes
Adj. R^2	.156	.148	.556	.153	.085
Mean Dep. Var.	.745	.745	.703	6.715	6.715
Constituency Fixed Effects			Yes		
Year Fixed Effects			Yes		
All Controls × Post			Yes		
Observations	162	162	324	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army. Storm path is a binary indicator of the district being located closer than 150 in panel A and 200 km in panel B from the path of the storm eye. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm (Belloni et al., 2014) are reported in Table A1. Adjusted R^2 is reported, for column 4 adjusted R^2 for OLS estimation with the same set of control is reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Robustness to Spatial Correlation

Approach and Cutoff	Votes for Awami League		# of Insurgents per 1000 People	
Baseline p-val.	0.014	0.046	0.033	0.034
Conley, 10 km, p-val.	0.014	0.036	0.023	0.023
Conley, 50 km, p-val.	0.084	0.123	0.049	0.065
Conley, 100 km, p-val.	0.112	0.096	0.031	0.154
Conley, 150 km, p-val.	0.018	0.002	0.072	0.118
DellaVigna et al., TMO	0.005	0.007	0.029	0.035
Baseline Controls	Yes	Yes	Yes	Yes
All Controls	No	Yes	No	Yes
Mean. Dep. Var.	.745	.745	6.715	6.715
Observations	162	162	162	162

Notes: The table presents robustness checks for introducing Conley standard errors(rows 2-5), Thresholding Multiple Outcomes (DellaVigna et al., 2025), Moran's I. 4 distance cutoffs of 10, 50, 100, 150 km are used for Conley Spatial correlation p-values for each are displayed. We use three our outcomes: Votes for Awami League, Insurgents per 1000 people and log(Intellectuals Murdered) for thresholding. Baseline p-values are added for comparison. Column 1 and 2 report OLS estimations for votes for Awami League as a dependent variable, while columns 3 and 4 focuses on the number of insurgents. Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite commissioned by NASA. Baseline controls include votes for United Front, the electoral alliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral alliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with Population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the Population, number of politicians born before 1970 in the constituency, population of the constituency, number of major industrial facilities in the constituency, number of businessmen born in the constituency, share of English speaking Population and distance to Indian border.

Table A10: Effect of Storm on Intellectuals Murdered

	(1)	(2)	(3)	(4)
	Log (Intellectuals Murdered)			
Log (Storm Intensity)	0.833	2.088*	2.155*	2.120**
	(0.629)	(1.099)	(1.104)	(1.042)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Adj. R^2	.004	.011	.138	.14
Mean Dep. Var.	-1.35	-1.35	-1.35	-1.35

Notes: Newey-West standard errors in parentheses. In the dependent variable is logarithm of number of intellectuals murdered + 0.1. The murders happenned at the end of the war of independence as a part of Strategy of Pakistan to sabotage the emergence of a new country. Storm intensity is the intensity of the storm based on satellite data collected from images captured by the ITOS-1 satellite commissioned by NASA. Baseline controls include votes for United Front, the electoral alliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral alliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table A1. Adjusted R^2 is reported, for column 4 adjusted R^2 for OLS estimation with the same set of control is reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A11: Robustness to Adding Fixed Effects.

	Vote Share of Awami League			# of Insurgents per 1000 People		
Log (Storm Intensity)	0.176***	0.245***	0.251**	4.973**	4.743*	7.253**
	(0.061)	(0.086)	(0.105)	(2.043)	(2.666)	(3.644)
Region Fixed Effects	No	Yes	Yes	No	Yes	Yes
Baseline Controls	No	No	Yes	No	No	Yes
Mean Dep. Var.	.745	.745	.745	6.715	6.715	6.715
Observations	162	162	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army. Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite Comissioned by NASA. Baseline Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, distance to the coast. Fixed effects used include 5 regions fixed effects. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A12: Effect of the Bhola Storm on the Number of Candidates in the Constituency

	(1)	(2)	(3)	(4)
	# of Candidates			
Log (Storm Intensity)	-1.309**	-1.359	-1.215	-1.401
	(0.628)	(1.102)	(1.135)	(1.084)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Adj. R^2	.02	.015	.023	.014
Mean Dep. Var.	4.753	4.753	4.753	4.753
Observations	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is number of candidates in constituency on the December 1970 election in East Pakistan (present-day Bangladesh). Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite Comissioned by NASA. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table Table A1. Adjusted R^2 is reported, for column 4 adjusted R^2 for OLS estimation with the same set of control is reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A13: Effect of Storm on Political Participation

	(1)	(2)	(3)	(4)
	Turnout on December 1970 Election			
Log (Storm Intensity 1970)	0.032	0.189***	0.112*	0.100*
	(0.036)	(0.058)	(0.058)	(0.055)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Adj. R^2	-.002	.062	.268	.22
Mean Dep. Var.	.567	.567	.567	.567
Observations	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is turnout on the 1970 election in East Pakistan (present-day Bangladesh). Storm intensity is the intensity of the storm based on satellite data collected from images captured by the ITOS-1 satellite Comissioned by NASA. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table Table A1. Adjusted R^2 is reported, for column 4 adjusted R^2 for OLS estimation with the same set of control is reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A14: Did the Storm Intensify Preexisting Economic Grievance?

Panel A. Railroads						
	(1)	(2)	(3)	(4)	(5)	(6)
	Vote Share of Awami League			# of Insurgents per 1000 People		
Log (Storm Intensity 1970), Recentered X Railroad 1964	-0.319	-0.256	-0.256	-14.835**	-14.709**	-14.709**
	(0.207)	(0.218)	(0.207)	(6.770)	(7.328)	(6.957)
Log (Storm Intensity 1970), Recentered	0.357**	0.283*	0.283*	13.986**	14.259**	14.259**
	(0.161)	(0.168)	(0.160)	(5.613)	(5.972)	(5.669)
Railroad Coverage 1964	0.264*	0.282*	0.282*	6.525	4.695	4.695
	(0.144)	(0.156)	(0.148)	(4.192)	(4.423)	(4.199)
StormXRailroads and Railoads = 0 P-val.	.103	.164	.131	.07	.131	.102
Observations	162	162	162	162	162	162
Panel B. Factories						
	Vote Share of Awami League			# of Insurgents per 1000 People		
Log (Storm Intensity 1970), Recentered X Major Factories 1964	0.093	0.100	-0.021	-4.689	-2.776	1.012
	(0.149)	(0.139)	(0.069)	(4.729)	(4.953)	(3.163)
Log (Storm Intensity 1970), Recentered	0.198*	0.160	0.196*	8.911**	8.275**	6.892*
	(0.114)	(0.118)	(0.106)	(4.086)	(4.146)	(3.694)
# of Major Factories 1964	-0.104	-0.108	-0.135**	-2.827	-3.465	-2.843
	(0.083)	(0.080)	(0.066)	(2.496)	(2.502)	(2.208)
Baseline Controls X Infrastructure	Yes	Yes	Yes	Yes	Yes	Yes
Baseline Controls	Yes	Yes	No	Yes	Yes	No
All Controls	No	Yes	No	No	Yes	No
PDS Controls	No	No	Yes	No	No	Yes
Mean Dep. Var.	.745	.745	.745	6.715	6.715	6.715
StormXFactories and Factories = 0 P-val.	.261	.251	.114	.298	.324	.425
Observations	162	162	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is number of participants in Liberation war of 1971 living in the constituency scaled by the population of constituency. Storm intensity is the intensity of the storm based on satellite data collected from images captured by the ITOS-1 satellite Commissioned by NASA, Railroad Exists is an indicator which switches to 1 if the railroad crosses the constituency, # of Factories is a variable that captures the number of large industrial facilities in the constituency as for 1964. Baseline controls include votes for United Front, the electoral alliance led by Awami League, in 1954 and distance to coast. Interaction of the infrastructure variables and baseline controls are added to control for omitted variable bias following . Controls include votes for United Front, the electoral alliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, area of constituency in square miles, population of the constituency, share of English speaking population and distance to Indian border. PDS controls, which were selected using post-double selection algorithm Belloni et al. (2014) are reported in Table Table A1. The mean of log(storm intensity) is recentered to zero to insure the interpretability of the results. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A15: Aid Mechanism. Causal Mediation analysis

	Aid from W. Pakistan	Votes for UF 1954	Roads 1964	Mujib Visits 1970
	(1)	(2)	(3)	(4)
	Vote Share of Awami League			
NIE				
Log (Storm Intensity)	-0.514**	-0.212	-0.044	0.006
	(0.241)	(0.132)	(0.078)	(0.020)
NDE				
Log (Storm Intensity)	1.764***	0.853***	0.649*	0.475**
	(0.609)	(0.307)	(0.333)	(0.204)
TE				
Log (Storm Intensity)	1.250***	0.641***	0.605**	0.482**
	(0.399)	(0.225)	(0.273)	(0.201)
Baseline Controls	Yes	Yes	Yes	Yes
% of Effect Mediated	41.1% ***	33.1% *	7.2%	1.3%
% of Effect Mediated P-val.	< 0.001	.073	.502	.754
Observations	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). Storm intensity is the intensity of the storm based on satellite data collected from images captured by the ITOS-1 satellite Comissioned by NASA. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Aid Provided by West Pakistan is an indicator that switches to 1 if any aid was provided by West Pakistan to the constituency according to World Bank reporting from the scene of the cyclone (World Bank, 1970). West Pakistan provided relief goods, including road repairs, bridges, tractors, and water pumps, to 16 subdistricts, while the remaining 146 subdistricts did not receive any such aid. Mujib visit is an indicator that is 1 for constituencies visited by Mujib in electoral campain of 1970, Roads is an indicator of main (paved) road presented in the distric in 1964, votes for UF is percentage of votes gained by United Front, electoral aliance led by Awami League. Natural indirect effect mediated by Aid provided reported in the first row, natural direct effect of the storm reported in the second row, total effect reported in the thirs row. Proportion explained and P-value of significance of proportion explained are reported in the table. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A16: Robustenss For Multiple Hypotheses Testing

	Votes for Awami League	# of Insurgents per 1000 People	Log(Intellectuals Murdered)
	(1)	(2)	(3)
Log (Storm Intensity)	0.205**	10.860**	2.155*
	(0.102)	(4.524)	(1.104)
Sharpenned q-value	[.029]**	[.001]***	[.001]***
Romano-Wolf Corrected p-value	{.0978}*	{.0659}*	{.0978}*
Baseline Controls	Yes	Yes	Yes
All Controls	Yes	Yes	Yes
Mean Dep. Var.	.745	6.94	-1.35
Observations	162	162	162

Notes: This table presents re-adjustment to p-values after accounting for multiple hypotheses. Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army. To speak to multiple hypothesis testing, sharpened q-values and Romano-Wolf p-values are reported. The dependent variable is logarithm of number of intellectuals murdered + 0.1. The murders happened at the end of the war of independence as a part of Strategy of Pakistan to sabotage the emergence of a new country. Storm intensity is the intensity of the storm based on satellite data collected from images captured by the ITOS-1 satellite commissioned by NASA. Baseline controls include votes for United Front, the electoral alliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral alliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A17: Robustness to Alternate Definitions of Dependent Variable.

Panel A. Impact on Votes for Separatist Party				
	(1)	(2)	(3)	(4)
	Vote Share of Awami League	Log(Votes)	Ihs(Votes)	Poisson
main				
Log (Storm Intensity)	0.215**	0.331*	0.174**	0.293**
	(0.100)	(0.171)	(0.083)	(0.135)
Mean Dep. Var.	.75	-.32	.69	.75
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People	Log(Insurgents)	Ihs(Insurgents)	Poisson
main				
Log (Storm Intensity)	7.183**	0.786	0.943	1.122**
	(3.572)	(0.563)	(0.651)	(0.539)
All Controls	Yes	Yes	Yes	Yes
Mean Dep. Var.	6.71	1.71	2.31	6.71
Observations	162	154	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is share of votes got by Awami League, logarithm of share of votes and inversed hyperbolic sine of share of votes got by Awami League on the 1970 election in East Pakistan (present-day Bangladesh) and # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army. Storm intensity is the intensity of the storm in November 1970 based on satellite data collected from images captured by the ITOS-1 satellite Comissioned by NASA. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with Population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the Population, number of politicians born before 1970 in the constituency, population of the constituency, number of major industrial facilities in the constituency, share of English speaking Population and distance to Indian border. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A18: Effect of Storm on Intellectuals Murdered. Robustness to Different Specifications

	(1)	(2)	(3)	(4)
	# of Intellectuals Murdered	Intellectuals Murdered per 1000 People	IHS(Intellectuals Murdered)	Poisson
Log (Storm Intensity)	3.331	0.018	1.187**	4.462**
	(2.298)	(0.013)	(0.581)	(1.900)
Baseline Controls	Yes	Yes	Yes	Yes
All Controls	Yes	Yes	Yes	Yes
Mean Dep. Var.	.901	.005	.451	.451
Observations	162	162	162	162

Notes: Newey-West standard errors in parentheses. In panel A the dependent variable is logarithm of number of intellectuals murdered + 0.1. The murders happenned at the end of the war of independence as a part of Strategy of Pakistan to sabotage the mergence of a new country. Storm intensity is the intensity of the storm based on satellite data collected from images captured by the ITOS-1 satellite commissioned by NASA. Baseline controls include votes for United Front, the electoral alliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral alliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. This table explores the robustness of the result in different specifications, specifically number of intellectuals murdered in column 1, number of intellectuals murdered per 1000 people in column 2, inverse hyperbolic sine of intellectuals murdered in column 3 and poisson regression in column 4. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A19: Rice Suitability and Outcomes in Cyclone Affected Areas

Panel A. Impact on Votes for Separatist Party					
	(1)	(2)	(3)	(4)	(5)
	Vote Share of Awami League				
Log (Rice Suitability)	1.164	1.088	0.842	1.164	
	(0.887)	(1.024)	(1.019)	(0.878)	
Log (Rice Suitability) × Post					0.842
					(0.987)
Adj. R^2	.019	.139	.131	.019	.62
Mean Dep. Var.	.772	.772	.772	.772	.708
Constituency Fixed Effects					Yes
Year Fixed Effects					Yes
All Controls × Post					Yes
Observations	96	96	96	96	192
Panel B. Impact on Conflict					
	# of Insurgents per 1000 People				
Log (Rice Suitability)	-33.149	-41.457	-10.406	-33.149	
	(25.090)	(28.498)	(36.765)	(24.827)	
Baseline Controls	No	Yes	Yes	No	—
All Controls	No	No	Yes	No	—
PDS Controls	No	No	No	Yes	—
Adj. R^2	.003	.063	.13	.003	—
Mean Dep. Var.	7.7	7.7	7.7	7.7	—
SD of Log(Suitability)	.02	.02	.02	.02	—
Observations	96	96	96	96	—

Notes: Newey-West standard errors in parentheses. Only districts within 200 km of a storm path included in the analysis. The dependent variable is share of votes got by Awami League on the December 1970 election in East Pakistan (present-day Bangladesh). # of Insurgents per 1000 People is total number of soldiers who were fighting in the Liberation War of 1971 who war living in the constituency before joining the army. Rice Suitability is an index of suitability of wetland rice under available water content and low input of management as per GAEZ database of FOA. Baseline controls include votes for United Front, the electoral aliance led by Awami League, in 1954 and distance to coast. Controls include votes for United Front, the electoral aliance led by Awami League, in 1954, indicator of Mujib visit, indicator of student protests, indicator of city with population over 20.000 people as for 1961 in the constituency, distance to the coast, percentage of Hindu across the population, number of politicians born in the constituency before 1970, population of the constituency, number of major industrial facilities in the constituency, share of English speaking population. PDS controls, which were selected using post-double selection algorithm (Belloni et al., 2014) are reported in Table A1. Adjusted R^2 is reported, for column 4 adjusted R^2 for OLS estimation with the same set of control is reported. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$