Climate Shocks and State Formation: The 1970 Bhola Cyclone and the Birth of Bangladesh

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Abstract

State formation through secession often requires two critical steps: building mass support for independence, and engaging in violent conflict against a state resisting territorial loss. Combining satellite data with archival sources, we statistically document how exposure to the 1970 Bhola cyclone in East Pakistan which killed 350,000 people led to a rise in separatist sentiments expressed in voting booths, and later induced citizens to take up arms against the government and engage in guerrilla warfare. We identify the cyclone as a *focal point* that helped galvanize dispersed separatist sentiments into an organized political movement and war, in part by revealing the Pakistan government's indifference to Bengalis' suffering. This important historical case identifies the specific causal channels by which a climate shock produces armed conflict (Hsiang et al., 2013).

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

Wallis (2005)

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1 Introduction

The 20th century was marked by a wave of major political upheavals that redefined borders and reordered global politics. A recent dataset identifies 145 such episodes, 27 of which produced new sovereign states (Grinin et al., 2022). This paper examines one of these rare successes: the creation of the world's eighth most populous country. We use newly digitized archival and geospatial data to understand the mechanisms that enabled this successful state formation.[1]

Understanding why some attempts at state formation succeed, while others collapse, is central to explaining large-scale political and economic change. These moments have far-reaching consequences (Michalopoulos and Papaioannou, 2016; Giuliano and Nunn, 2021; Jha and Wilkinson, 2023; Chiovelli et al., 2023), but their mechanics remain underexplored using quantitative empirical methods. Existing work has primarily drawn on historical narratives and formal models.[2] We offer a complementary empirical perspective, leveraging sub-national variation in people's experience of an environmental shock and linking it to broadened separatist demands and insurgency in those exact locations – processes that culminated in the emergence of Bangladesh as a new nation-state.

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.[3] Yet most studies rely on qualitative narratives and cross-country comparisons, which limit our ability to draw causal connections. We build on this literature by providing microeconometric evidence for a historically important case in which one of the deadliest natural disasters in recorded history – the 1970 Bhola Cyclone in the Bay of Bengal – interacted with entrenched grievances to trigger mass political mobilization. This case offers a rare opportunity to use large-sample statistical methods and data to identify mechanisms by which separatist movements succeed in creating new sovereign states.

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). Both 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

[1] Literature on nation-building and state formation: Besley and Persson (2009); Cantoni et al. (2017); Nunn (2020); Rohner and Zhuravskaya (2024); Beath et al. (2025).

[2] Allie (2025); Malik (2018); Tilly (1978); Acemoglu et al. (2015); Akerlof (2016).

[3] Middleton (2012); Diamond (2011); Homer-Dixon (1994); Burke et al. (2015); Carleton et al. (2016).

mobilization (Griffel, 2015; The Pakistan Observer, 1970; Chen, 2024; Kissinger, 1970). Yet 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). We contribute to this historical debate by assembling large-sample geospatial, archival, and electoral data to investigate causal links between this climate shock and political mobilization. Our analysis may hold more general lessons for understanding when revolutions are likely to succeed (or fail) to create new nation-states elsewhere.

While each revolution and political movement is unique, analyzing two common elements may help us better understand the conditions for success. 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. 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). Garnering such widespread support may be a prerequisite, as 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).

Second, the voting is commonly followed by some form of armed conflict, as incumbent leadership often reacts with violence when faced with the threat of losing territory. 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).

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. This raises fundamental questions about how successful separatist groups 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.

We document how the 1970 Bhola cyclone and the Pakistan government's negligent response in its aftermath served as a catalytic focal point and enabled success in the two aforementioned steps: (a) garnering wider support for secessionist sentiments expressed at the polls, and (b) encouraging citizens to subsequently take up arms against the government. We merge satellite images with archival data to statistically connect sub-national variation

in exposure to the cyclone's devastation to political mobilization and war. In a fortunate coincidence, the cyclone made 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 caused by the cyclone was salient to East Pakistanis when they went to the polls.

Some accounts of prominent actors present at that moment in history, such as the US Consul General and the USAID Mission Director in East Pakistan in 1970, strongly suggest 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 B1), which suggests that these connections were in people's minds at the time (The Daily Ittefaq, 1971). But 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). Assembling data from all electoral constituencies in East Pakistan, we find that greater exposure to the cyclone and to the government's negligent response intensified pro-secessionist voting *and* increased the likelihood that specific citizens took up arms and joined the insurgency. A one standard deviation increase in storm intensity felt in a constituency in November 1970 is associated with a 5 percentage point rise in the vote share of the pro-independence Awami League in the December 1970 Pakistan general elections, as well as an increase of approximately 265 insurgents from that area joining guerrilla warfare in the 1971 independence war.

We further show that the Pakistan government's inadequate response to the suffering of citizens played a critical role in this political mobilization. Cyclone-affected constituencies which received no state relief, where grievances were likely most acute, witnessed the highest levels of political mobilization and violence during the War of Independence. Causal mediation analysis (Heckman and Pinto, 2024) reveals that roughly 40% of the Bhola Cyclone's impact on voting patterns can be traced to the central government's failure to provide aid. This is related to the Besley and Burgess (2002) argument that disasters affect electoral outcomes because the government response reveals the character of political leaders to voters.

Documenting these mechanisms by which this separatist movement transformed into a full-scale conflict is also a contribution to the literature on climate and conflict. An influential meta-analysis notes the impressive statistical regularity with which weather aberrations increase the risk of conflict and political instability (Hsiang et al., 2013). 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). But the precise mechanisms connecting climate events to human conflict often remain unclear. Our empirical analysis

outlines the specific causal channels in one important historical case.

Our analysis is 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. This fortunate timing allows us to measure variation in the storm's intensity with unprecedented precision. We apply modern atmospheric science research techniques to the archived satellite images to reconstruct granular variation in cyclone intensity felt across all electoral constituencies in East Pakistan in November 1970. Hu et al. (2023) demonstrates that since cyclone clouds block solar radiation from reaching the Earth's surface, one can indirectly infer cyclone intensity using satellite-measured radiation levels. We validate our satellite-based cyclone intensity 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.

We digitize electoral records from the pivotal December 1970 Pakistan general elections and connect them to the November cyclone exposure at the electoral constituency level. We add insurgency records from historical military archives, which identify the birthplaces of "*freedom fighters*" in the March-December 1971 Bangladesh War of Independence (The Ministry of Liberation War Affairs, 2024a). These are the individuals who joined the insurgency, and many of them died on the battlefield. The Ministry of Liberation War Affairs of the Government of Bangladesh maintains a validated list of their identities. To control for potential confounders and to better understand mechanisms, we also 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).

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 essential for interpreting the results as causal.

Several ancillary results make us confident about our causal interpretation. First, we show that more- and less-affected constituencies were well balanced in pre-1970 characteristics, including prior support in the 1954 elections for parties advocating greater regional autonomy. 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). Restricting attention to inland areas yields similar results, alleviating concerns that findings are driven by coastal-specific dynamics. 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 pre-Bhola satellite images unrelated to cyclone activity further rule out spurious correlations. Fifth, randomization inference tests suggest that placebo estimates are centered around zero, reinforcing that results are not driven by spatial clustering of unobservables. Lastly, to reduce spatial correlation, we replace our continuous measure of cyclone intensity inferred from satellite images by constructing a simpler cyclone exposure measure as a binary indicator of being within 150 or 200km 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 commissioned by the World Bank in 1970 to evaluate the deficiencies of Pakistan's hurricane warning system (Frank and Husain, 1971). Effects on voting and insurgency outcomes remain consistent under this alternative definition of cyclone exposure.

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 correlations 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.

We next explore mechanisms to understand why voters and insurgents reacted so strongly to cyclone exposure. First, we identify areas that received cyclone relief using World Bank reports from 1970 and 1972 tracking aid distribution (World Bank Report, 1970, 1972). Second, we digitize 1954 electoral data to characterize areas with stronger pre-existing separatist sentiments. Third, we pay special attention to jute-producing areas identified through the agricultural census, because foreign exchange receipts from jute exports were being expropriated by the West Pakistani government and served as an important political flash point. We find that areas hit by the cyclone that *did not* receive aid displayed even stronger separatist electoral reactions than even worse-hit areas where some relief was distributed. Further, the impact of the 1970 cyclone on voting and guerrilla warfare was stronger in regions with higher preexisting separatist sentiment as expressed through 1954 voting patterns. The effects are also stronger in jute-producing areas where economic grievances were likely more acute.

One important lesson from our analysis is that climatic shocks, when paired with state neglect, can shape the trajectory of political mobilization and conflict by acting as a *focal point* that enables coordination. 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).

It is generally difficult to causally identify the importance of such focal points because they often coincide with other political activities. In our setting, the November cyclone overlapped with the Awami League's pre-election mobilization. We geocode and control for Awami League leader Sheikh Mujibur Rahman's 1969 travel diaries and campaign activities, as revealed in his published memoir. But the more important advantage of our research design is that the storm's reach – determined by atmospheric and geographic forces beyond political control – generated fine-grained variation in exposure. We use the spatial gradient in cyclone severity (sometimes within the subset of non-coastal areas) to study the political consequences of differential exposure and *isolate* the effects of the cyclone as a focal point.

Scholarship in history suggests that other important natural disasters have also acted as focal points that 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). Scholars argue 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 establishes the causal mechanisms through which the distress created by a natural disaster inspires dissent.

Related Literature

Recent literature on climate change and conflict (Miguel et al., 2004; Dube and Vargas, 2013; Dell et al., 2014; Burke et al., 2015) has highlighted a consistent relationship between environmental shocks and violence, ranging from civil conflict, interpersonal crime, and even self-harm or suicide. 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 as well (Almås et al., 2025; Kuroishi and Sawada, 2024; Cameron and Shah, 2015; Callen et al., 2014; Vieider, 2018).

Our paper also connects to research on how adverse shocks shape political outcomes. Some studies suggest that voters may punish incumbents for events largely outside government control, a phenomenon known as "blind retrospection," which links economic or environmental shocks to electoral backlash (Lewis-Beck, 1988; Duch and Stevenson, 2008; Achen and Bartels, 2004, 2018). Such shocks have also been associated with civil unrest and regime instability (Haggard and Kaufman, 1995; Miguel et al., 2004; Brückner and Ciccone, 2011). Work on global trade slowdowns similarly documents political repercussions of such events (Campante et al., 2023). We contribute by tracing *how* large shocks alters political outcomes: government (non-)response to the cyclone's devastation allowed voters to update beliefs about their leaders.

Research on the economic determinants of conflict (Harari and Ferrara, 2018; McGuirk and Nunn, 2024) is also closely related. Studies on how public policy, like providing social protection, mediates the link between extreme climate shocks and violence (Fetzer, 2020; Garg et al., 2020; Christian et al., 2019; Nunn and Qian, 2014) are relevant to our thesis. Natural disasters also affect the broader economy, as firms restructure sourcing patterns and wages in response to climate risk (Castro-Vincenzi et al., 2024). Research examining the political consequences of natural disasters (Belloc et al., 2016; Cerkez, 2025; Hong et al., 2025; Bai, 2023; Cremaschi and Stanig, 2024; Djourelova et al., 2023) is related as well. As natural disasters become increasingly frequent due to climate change (Knutson et al., 2010),

understanding their broader political ramifications becomes critical. We take a step further by linking environmental shocks to state formation and nationhood. Extending Tilly's influential argument that state inaction can transform latent grievances into political upheaval, our study identifies natural disasters as a focal point that gives citizens the opportunity to observe inaction, express discontent, and engage in coordinated collective action and political mobilization (Tilly et al., 1975; Tarrow, 1994; Shadmehr and Bernhardt, 2011).

Jha (2022) argues that translating such disruptions into lasting political change hinges on organizational capacity and strategic complementarities within and across groups. Such crises can reconfigure collective identities through inter-group contact (Bazzi et al., 2019), reshape the role of education in forging national cohesion (Alesina et al., 2021), alter patterns of public goods provision in ways that consolidate state authority (Miguel, 2004), among other mechanisms identified in recent syntheses of the economics of nation-building (Rohner and Zhuravskaya, 2024). Reactions to the Pakistan government's inadequate relief efforts appear in line with the accountability model proposed by Besley and Burgess (2002), where state failures expose the true nature of leadership to citizens, eroding trust and fueling demands for political change. In East Pakistan, the absence of effective relief from the government headquartered in the West accelerated support for the independence movement. This mirrors other historical events where crises undermine centralized authority and intensify calls for political change (Wimmer and Feinstein, 2010; Acemoglu and Robinson, 2001). This paper offers a framework for understanding how governance failures during crises can catalyze systemic change, and even reconfigure political boundaries.

2 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.[4] 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

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

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 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).[5] 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

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

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, "*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 B1).

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 B2 of Appendix B.

3 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 Appendix A1. Variable Definitions and Sources.

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.[6]

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

[6]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.

in Figure B3 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.

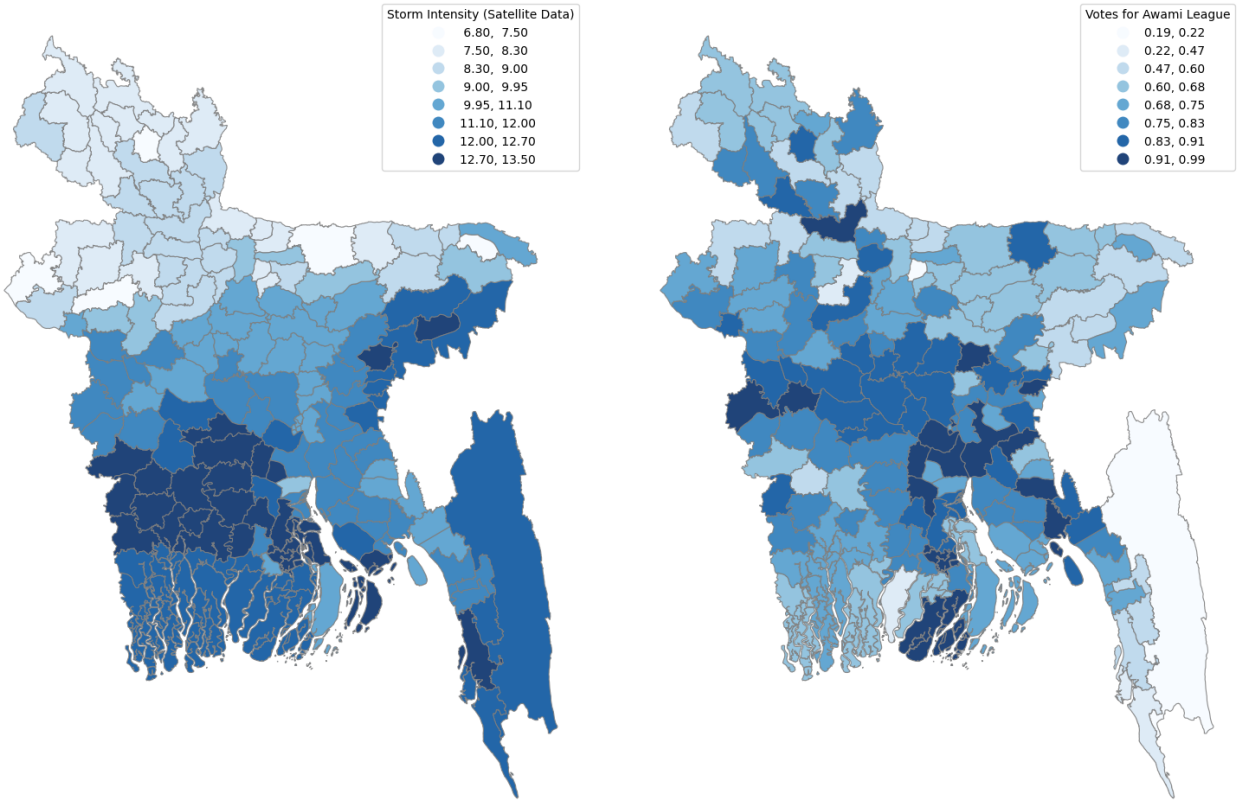
The satellite images also allow us to construct placebo tests using cloud cover patterns from the days immediately before the cyclone struck. In Table B2 we show that our main empirical results on the effects of the Bhola cyclone on political outcomes are entirely absent if we use satellite cloud cover 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 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 B4 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 7, 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 B1 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 B3 in Appendix B, 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 A.

4 Empirical Methodology

Estimation 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 UF coalition in the 1954 elections, $Y_{i,t-\tau}$, which is conceptually similar to controlling for the lagged dependent variable. This captures geographic variation in Awami League's popularity across East Pakistan, and helps adjust for initial political conditions that may independently affect subsequent electoral outcomes and conflict.[7] This results in a first-differences model is similar in design to Heldring et al. (2021). It helps to adjust for pre-treatment differences across constituencies. We also include distance to the coast as a control in all specifications.

[7]The 1954 United Front vote share captured in the last elections in East Pakistan prior to 1970 serves as a reasonable proxy for Awami League's pre-existing political support. The Awami League was the principal party in the UF coalition.

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 Appendix A1. Variable Definitions and Sources. 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.

5 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 in the December 1970 elections in East Pakistan. Panel A, Column 1 of Table 1 reports a regression of cyclone intensity on vote share 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 in that constituency, which corresponds to a 4.2% increase relative to the mean. In Column 2, we add the two main control variables: distance to the coast, and the Awami League-led UF coalition's vote share in the 1954 elections as a proxy for pre-cyclone political preferences. This gives the specification in Column 2 a first-difference interpretation. The point estimate becomes slightly larger, with a one standard

deviation increase in cyclone intensity 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 an indicator for whether Sheikh Mujibur Rahman visited the subdistrict to campaign pre-election, whether the subdistrict experienced student protests, whether the area was classified as urban in 1961, the fraction of the Hindu minority population (who would have a closer affinity to the Awami League and Bengali nationalism over Pakistan's religious identity), the population and area size of the constituency, the number of major industrial facilities, and the share of English speakers in that area. The effect of the Bhola cyclone intensity remains positive, statistically significant, and of similar magnitude.

Since the specification in Column 3 includes a relatively large number of controls compared to the sample size, we use the post-double-selection procedure proposed by Belloni et al. (2014) to select covariates in a more structured manner. The results from this approach, reported in Column 4 of Panel A in Table 1, are very similar. Since 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 B12 of Appendix B, the results remain robust to the inclusion of these fixed effects.

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)
	Vote Share of Awami League			
Log (Storm Intensity)	0.176***	0.251**	0.205**	0.203**
	(0.061)	(0.101)	(0.102)	(0.099)
Adj. R^2	.046	.085	.104	.117
Mean Dep. Var.	.745	.745	.745	.745
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (Storm Intensity)	4.973**	7.663**	7.788**	7.862**
	(2.043)	(3.560)	(3.649)	(3.576)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Adj. R^2	.025	.031	.071	.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 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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 B2, 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 B4 in Appendix B 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.

5.1 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 (Table B3). In particular, cyclone intensity is not correlated with the 1954 United Front vote share (Table B4), which is an important proxy for baseline nationalist sentiment. This suggests that more exposed constituencies were not systematically more nationalist prior to the cyclone.

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 B5).

Third, we implement placebo tests using later cyclones that struck Bangladesh but occurred decades after the events of interest. If our results were a generic feature of cyclone-prone areas, we would expect similar patterns for these later storms. However, we find no evidence that either Cyclone Mora (2017) or Cyclone Sidr (2007) are systematically correlated with the 1970 Awami League vote share or participation in the 1971 insurgency (Table B6, Table B7). The results we document are therefore unlikely to reflect the differential tendencies of people who reside in cyclone-prone areas; it was more likely an effect of a major climatic shock that occurred in November 1970.

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 B2). 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 B7), 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 B8 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 B8 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.[8]

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

[8]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 6 using this specification, unlike our main specifications.

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 B9, Figure B9). 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 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 3, 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 B10 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 7.

6 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 B5.

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.

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 B16 reports the results, which indicate that aid provision statistically mediates this relationship, with the indirect pathway accounting for roughly 40% of the observed variation.

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) X Aid by West Pakistan	-1.080***	-1.348***	-1.311***	-1.311***
	(0.399)	(0.482)	(0.488)	(0.465)
Log (Storm Intensity)	0.191***	0.313***	0.270**	0.270***
	(0.063)	(0.109)	(0.109)	(0.103)
Aid By West Pakistan	2.676***	3.375***	3.294***	3.294***
	(0.982)	(1.198)	(1.210)	(1.152)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	-.159	-.185	-.186	-.186
For District Provided with Aid, p-val. in parentheses	(0.026)	(0.028)	(0.028)	(0.028)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.034	.056	.048	.048
For District not Provided with Aid, p-val. in parentheses	(0.003)	(0.005)	(0.014)	(0.014)
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (Storm Intensity) X Aid by West Pakistan	-22.660	-27.953	-27.497	-27.497
	(23.879)	(24.856)	(25.194)	(23.999)
Log (Storm Intensity)	5.739***	8.196**	8.248**	8.248**
	(2.172)	(3.377)	(3.551)	(3.383)
Aid By West Pakistan	54.935	68.756	67.119	67.119
	(59.736)	(62.305)	(63.134)	(60.140)
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)	-3.032	-3.54	-3.449	-3.449
For District Provided with Aid, p-val. in parentheses	(0.478)	(0.424)	(0.446)	(0.446)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	1.028	1.469	1.478	1.478
For District not Provided with Aid, p-val. in parentheses	(0.009)	(0.016)	(0.022)	(0.022)
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 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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.

We again implement a causal mediation analysis (Heckman and Pinto, 2024), reported in Column 2 of Table B16, 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.

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) X Votes for UF	1.164**	1.170**	1.051**	1.028**
	(0.479)	(0.485)	(0.502)	(0.470)
Log (Storm Intensity)	-0.567*	-0.522	-0.476	-0.468
	(0.325)	(0.338)	(0.341)	(0.326)
Votes for UF	-2.522**	-2.546**	-2.352**	-2.297**
	(1.129)	(1.146)	(1.180)	(1.105)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.014	.023	.019	.018
for Districts with 25th perc. Votes for UF, p-val. in parentheses	(0.331)	(0.261)	(0.337)	(0.362)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.057	.066	.058	.056
for Districts with 75th perc. Votes for UF, p-val. in parentheses	< 0.001	(0.001)	(0.005)	(0.004)
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (Storm Intensity) X Votes for UF	42.640**	42.904**	41.092*	43.982**
	(20.504)	(20.884)	(22.736)	(20.422)
Log (Storm Intensity)	-22.696*	-20.678	-18.854	-21.166
	(13.678)	(13.820)	(14.981)	(13.536)
Votes for UF	-96.622*	-97.732*	-93.910*	-99.788**
	(49.194)	(50.272)	(54.956)	(49.106)
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)	.166	.554	.701	.573
for Districts with 25th perc. Votes for UF, p-val. in parentheses	(0.760)	(0.444)	(0.352)	(0.361)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	1.747	2.145	2.225	2.205
for Districts with 75th perc. Votes for UF, p-val. in parentheses	(0.001)	(0.008)	(0.009)	(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. 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 post estimation tests the total effect against zero for 2 values of the votes for UF. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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 2 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.

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.

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		
Storm Intensity X Jute	0.905***	0.915***	0.909***	18.334**	22.795**	18.307**
	(0.227)	(0.236)	(0.228)	(8.485)	(8.892)	(8.539)
Log (Storm Intensity)	-0.279**	-0.312**	-0.310**	-3.218	-5.712	-3.122
	(0.132)	(0.133)	(0.133)	(5.907)	(6.106)	(5.761)
Jute, 1964	-2.086***	-2.138***	-2.126***	-41.801**	-51.783**	-41.487**
	(0.547)	(0.566)	(0.547)	(19.660)	(20.885)	(19.936)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	-.032	-.037	-.037	-.206	-.563	-.189
for Districts with 25th perc. Jute, p-val. in parentheses	(0.125)	(0.072)	(0.072)	(0.824)	(0.556)	(0.834)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.068	.063	.063	1.813	1.948	1.827
for Districts with 75th perc. Jute, p-val. in parentheses	(0.001)	(0.003)	(0.003)	(0.008)	(0.006)	(0.010)
Mean Ind. Var.	.443	.443	.443	.443	.443	.443
Panel B. Rice						
	Vote Share of Awami League			# of Insurgents per 1000 People		
Storm Intensity X Rice	-0.967	-1.146*	-1.152*	-41.729*	-43.910*	-39.408*
	(0.685)	(0.634)	(0.633)	(21.932)	(22.239)	(21.824)
Log (Storm Intensity)	0.587*	0.609**	0.629**	23.645**	23.922**	22.809**
	(0.298)	(0.285)	(0.282)	(9.505)	(9.631)	(9.477)
Rice, 1964	2.093	2.537*	2.621*	98.722*	100.755*	89.355*
	(1.633)	(1.501)	(1.498)	(51.857)	(52.407)	(51.500)
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)	.052	.046	.05	1.952	1.882	1.929
for Districts with 25th perc. Rice, p-val. in parentheses	(0.021)	(0.045)	(0.012)	(0.010)	(0.015)	(0.015)
Effect of 1 Std. Dev. Increase in Log(Storm Intensity)	.031	.021	.024	1.023	.905	1.052
for Districts with 75th perc. Rice, p-val. in parentheses	(0.101)	(0.278)	(0.112)	(0.119)	(0.181)	(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. 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 post estimation tests the total effect against zero for 2 values of the Rice / Jute. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

7 Robustness Checks

Alternative Explanations. We examine three 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 B13 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 B14 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 B15 in Appendix B 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. We next 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 B6 and B7). Nevertheless, we implement a randomization inference test that permutes storm intensity across constituencies and recomputes p-values (Heß, 2017). As shown in Figure B7, 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 B17, 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. To account for this, we implement the Conley spatial correlation correction (Conley, 2010), which allows for correlation that decays with geographic distance. We also vary the cutoff distance from 10 km to 150 km to test the sensitivity of our inference to different spatial ranges. Across all specifications, reported in Table B9, 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 B9, 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 B18 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 B19 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 B10 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.

8 Concluding Remarks

Large shocks can realign political coalitions, reshape collective action, and in some cases accelerate processes of state formation. Yet most separatist movements do not culminate in the creation of new sovereign states, which makes it important to identify the causal mechanisms that determine success of such movements. This paper brings together a modern measurement tool developed by atmospheric scientists with archival satellite imagery, political records, and conflict data to study the causal mechanisms behind the successful revolution in East Pakistan, which gave rise to the world's eighth most populous country.

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 as well as success in armed conflict are both typical pre-requisites 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. The government's inadequate response revealed the indifference of leaders to suffering citizens a la Besley and Burgess (2002), which magnified their desire for secession and self-governance. Causal mediation analysis suggests that the lack of government responsiveness explains a large share of the electoral response.

The cyclone, therefore, served as a focal point that transformed dispersed grievances into coordinated political mobilization. Historical accounts have long emphasized that many revolutionary movements fail not because grievances are absent, but because participants cannot coordinate effectively. This large environmental shock amplified grievances, exposed governance failures, and created a coordination device for citizens willing to take action at the polls and on the battlefield.

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. 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 same variation in cyclone intensity induced an additional 43,000 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.

While it is difficult to fully separate whether the cyclone acted as an independent cause or primarily as an amplifier, our evidence suggests that it did play an important role by converting preexisting grievances into sustained collective action. Beyond the specific case of Bangladesh, these findings shed light on how environmental shocks can reshape political outcomes. This contributes to the literature on climate and conflict by tracing one specific channel through which environmental shocks influence political change. Although the 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.

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Online Appendices; Not for Publication

Appendix A1. Variable Definitions and Sources

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 Cen-

ters 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 storm's eye path, according to NOAA Atlantic Oceanographic Meteorological Laboratory (2015). The buffer zones are depicted in the corresponding figure. Figure B8.

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)).

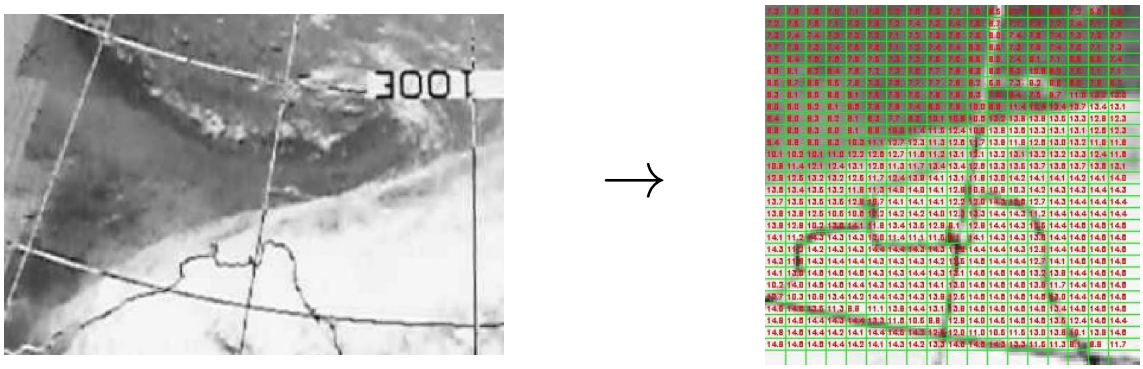
Sidr Cyclone Intensity = Storm intensity of the 2007 Sidr Cyclone calculated using the same approach with satellite data from the Cooperative Institute for Meteorological Satellite Studies (Cooperative Institute for Meteorological Satellite Studies (2007)).

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)).

Appendix A2. Raw Data and details on PDS Selection

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.

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 B2	Distance to Coast, Share of English Speakers, Distance to Indian Border	
Table B4	Distance to Coast	
Table B5	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 B6	Distance to Indian Border, Votes for UF 1954, Share of English Speakers	Votes for UF 1954, Share of Hindu Population
Table B7	Distance to Coast, Share of English Speakers, Distance to Indian Border	Distance to Coast, Share of Hindu Population
Table B8	Distance to Coast, Share of English Speakers, Distance to Indian Border	Distance to Coast, Total Population
Table B10	Distance to Coast, Number of Politicians Born	
Table B11	Distance to Coast	
Table B13	Distance to Coast	
Table B14	Distance to Coast, Share of English Speakers, Share of Hindu Population	

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

Appendix B. Additional Figures and Tables

Figure B1: 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 দুচ আশাবাদ ঃ ভুট্টোর সহিত আলোচনা শুরু
আপোষ ফর্মুলা উদ্ভাবনের প্রচেষ্টা ব্যর্থ
এগার দফা ফর্মুলা বাস্তবায়নের কার্যোপযোগী সমঝোতার জন্য চেষ্টার ত্রুটি করিব না
—টেলিভিশন সাংবাদিকদের কাছে ভুট্টো
সপ্তাহ পালন শুরু
কলিকাতায়

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".

Figure B2: Bhola Storm and Independence of Bangladesh: Key Events

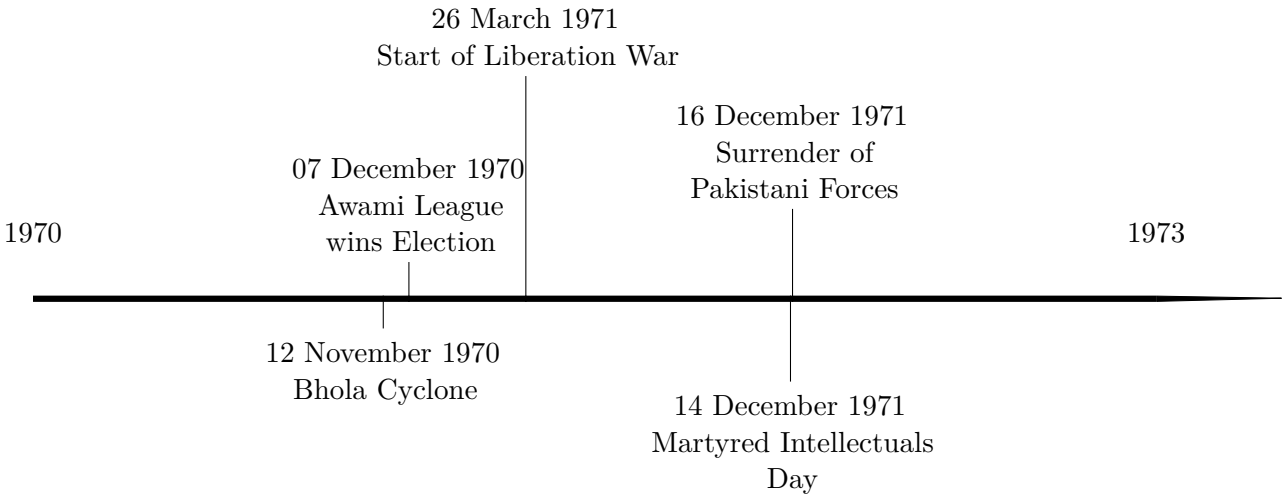
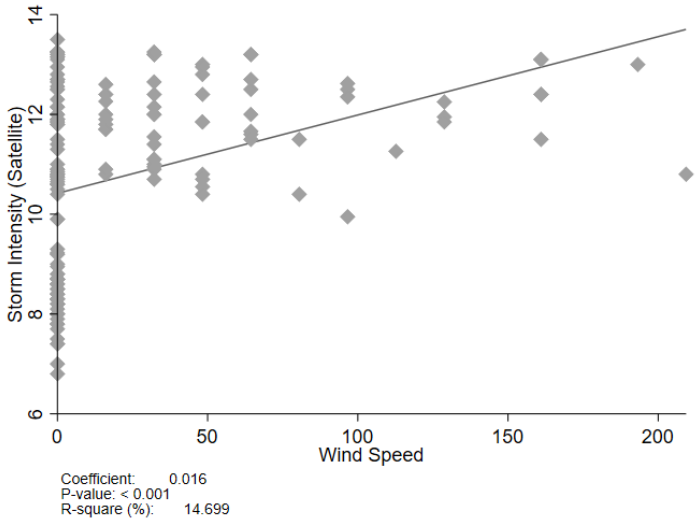
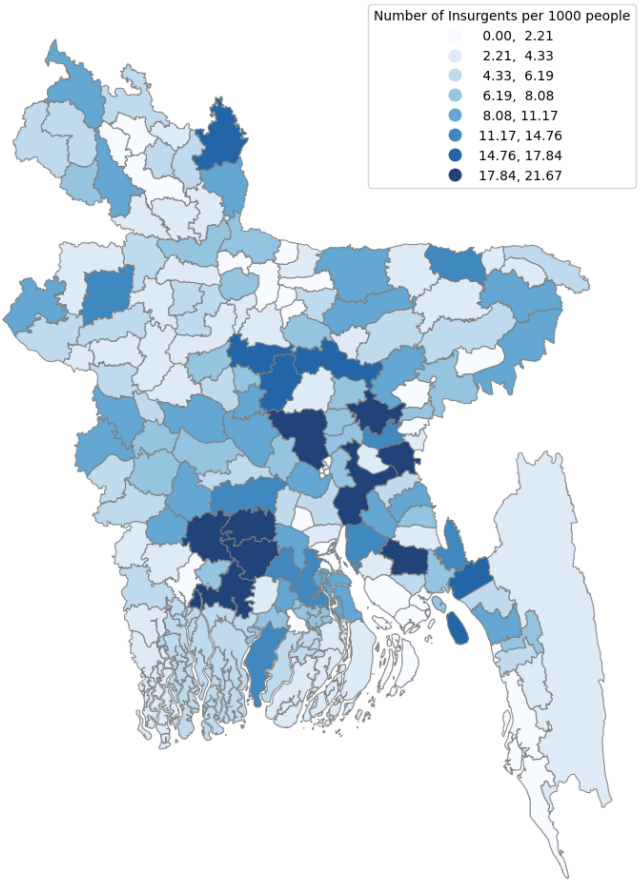


Figure B3: Storm Intensity: satellite and wind speed data.



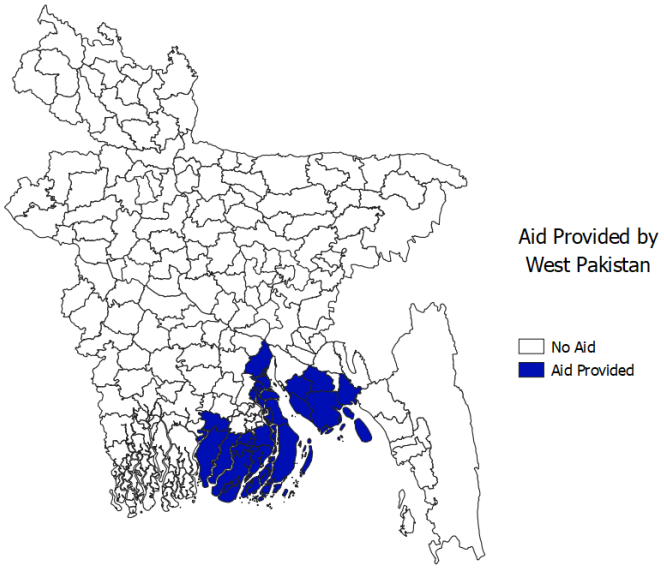
Note: The figure illustrates the relationship between wind storm intensity measured from weather stations and satellite data from ITOS-1 (National Centers for Environmental Information, 2024).

Figure B4: Distribution of Insurgents



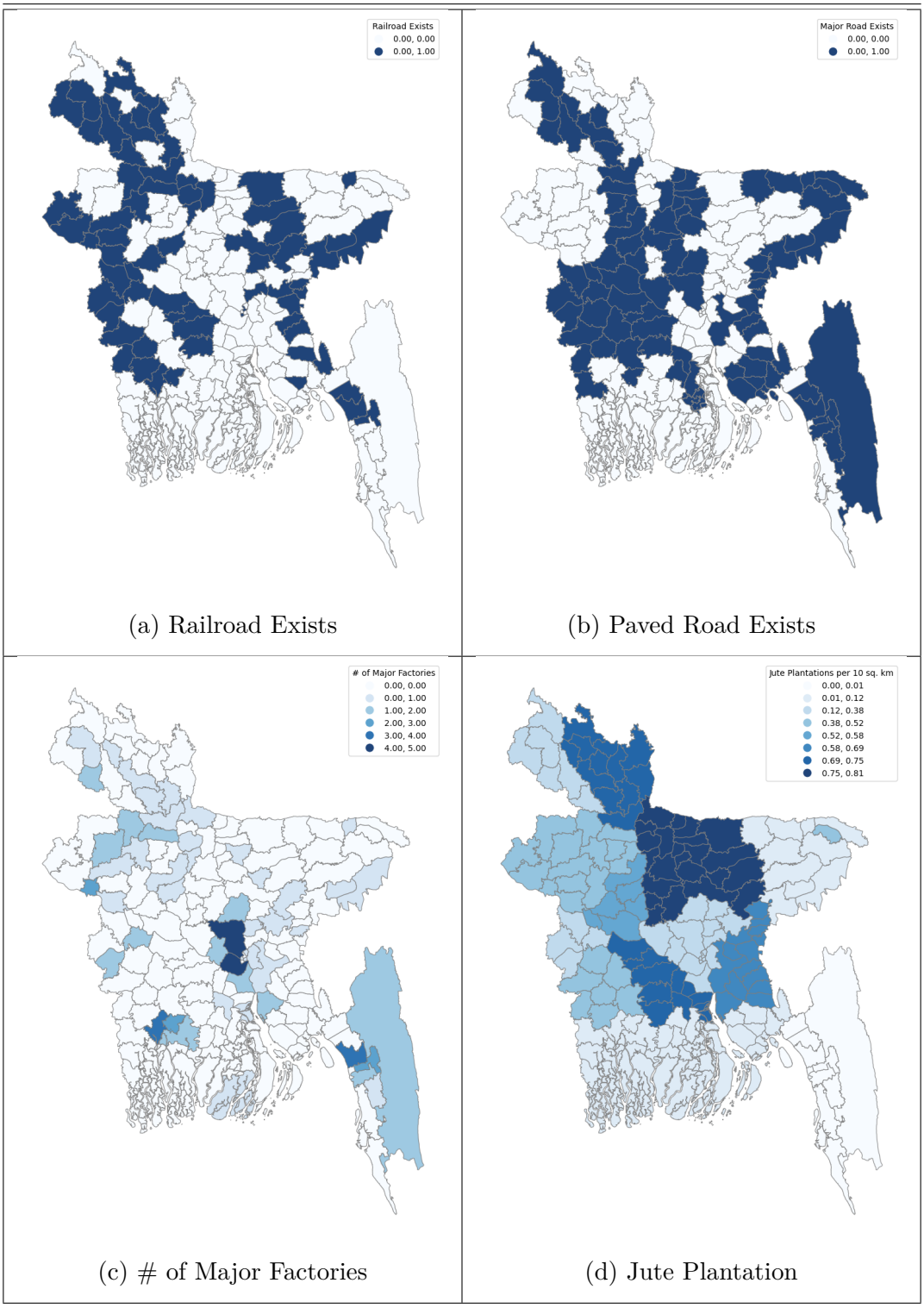
Note: The map illustrates the number of soldiers from each electoral constituency who joined the Liberation War army for Bangladesh's independence. The data come from records of the Bangladesh Ministry of Liberation War Affairs The Ministry of Liberation War Affairs (2024a).

Figure B5: 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 B6: Spatial Variation of Main Economic Variables



(a) Railroad Exists

(b) Paved Road Exists

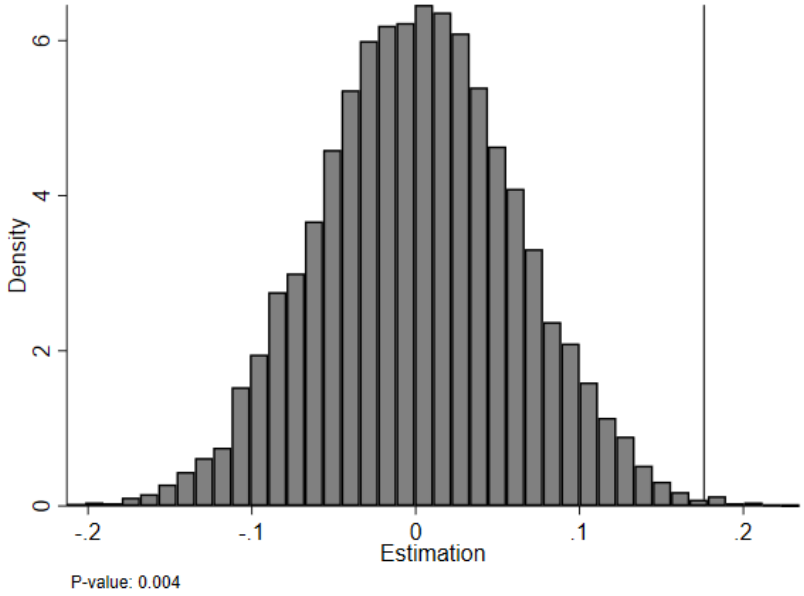
(c) # of Major Factories

(d) Jute Plantation

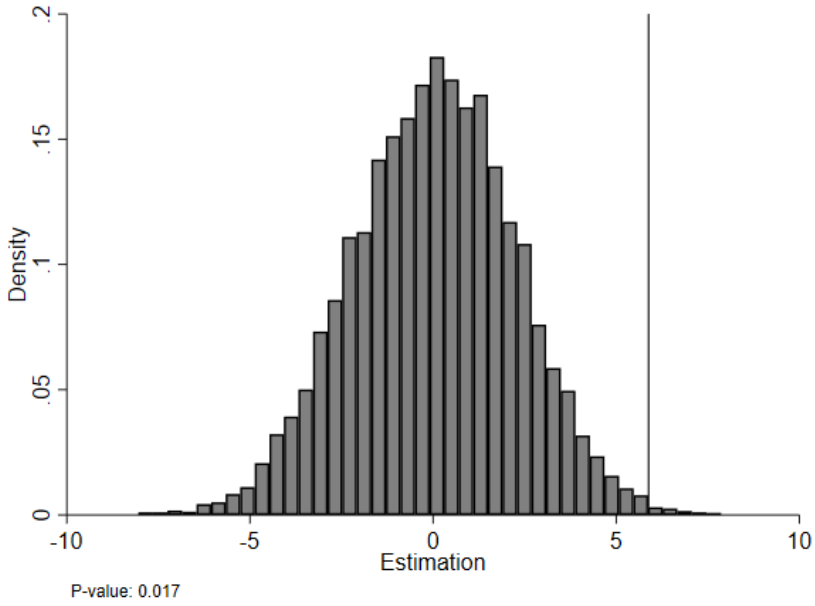
Note: The panel depicts variation in the main economic variables in East Pakistan in 1964. The data are from *The Economic Geography of East Pakistan* (Ahmad, 1968).

Figure B7: Permutation Inference Test

Panel A: Votes for Awami League



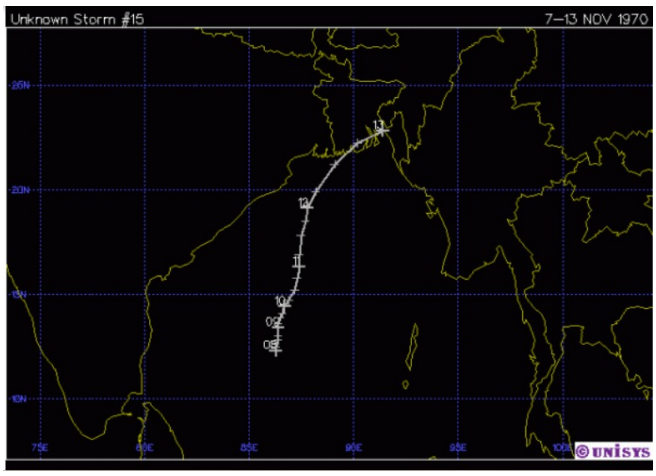
Panel B: Impact on Conflict



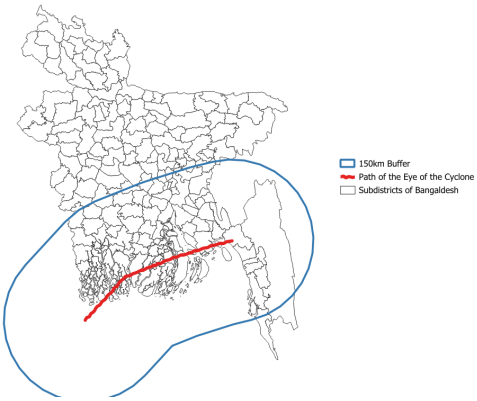
Note: The figure reports the results of a permutation inference test based on 10,000 permutations. The histogram shows the estimated probability density function of the coefficient under the null hypothesis that the storm had no effect on votes for the Awami League or on conflict. The vertical line indicates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

Figure B8: Cyclone Path and Construction of the Independent Variable

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



Panel B. Path of the Storm Eye Along with the 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 B8. 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.

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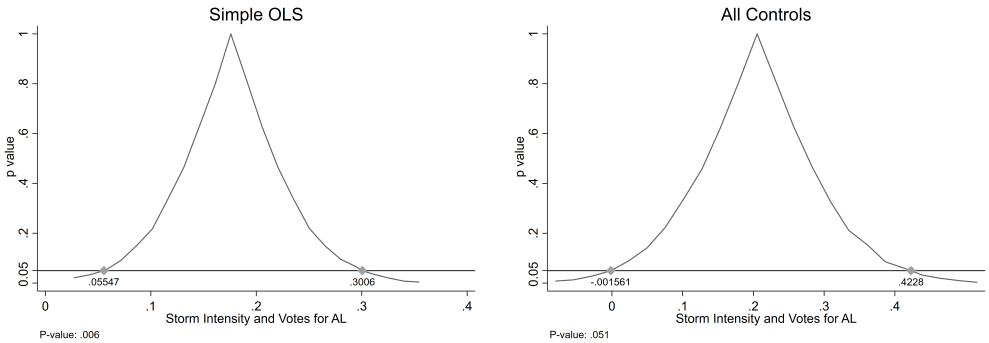
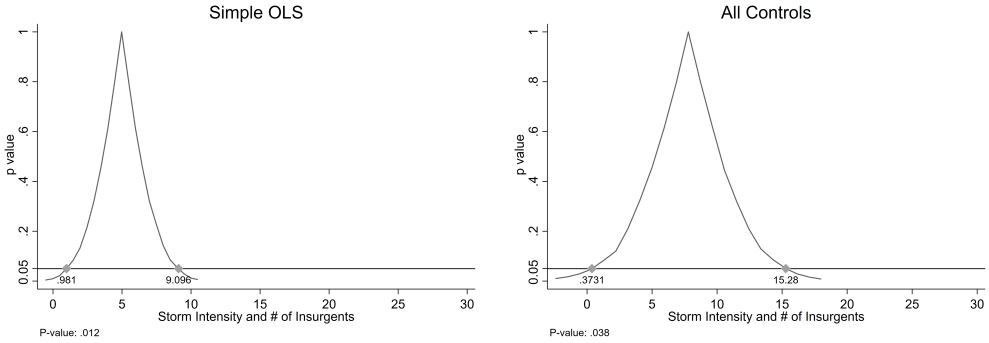
Figure B9: Wild Bootstrap Test

Panel A: Votes for Awami League



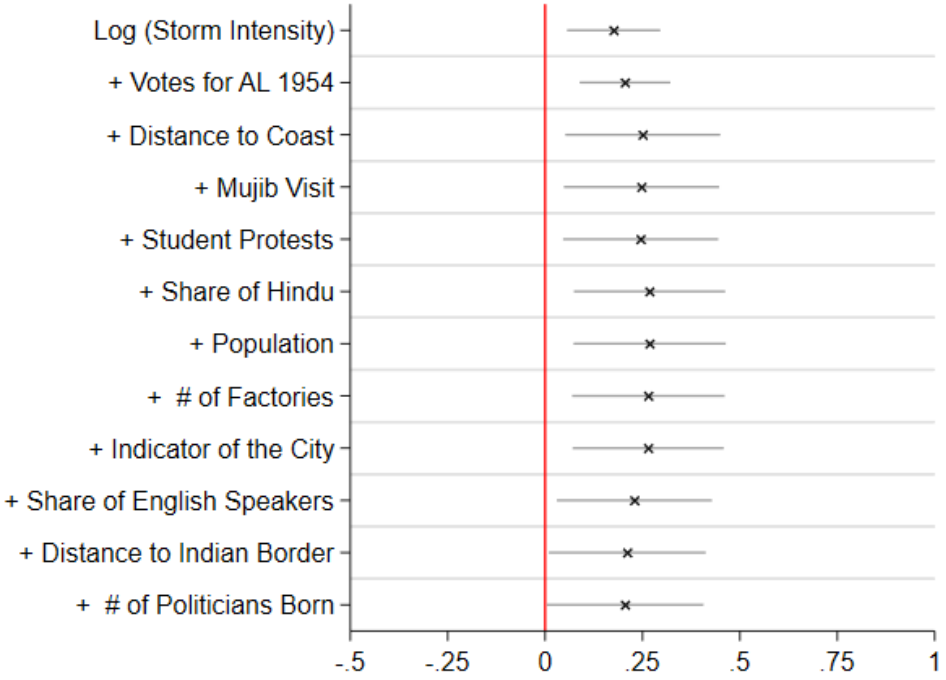
Panel B: Participation in the Insurgency



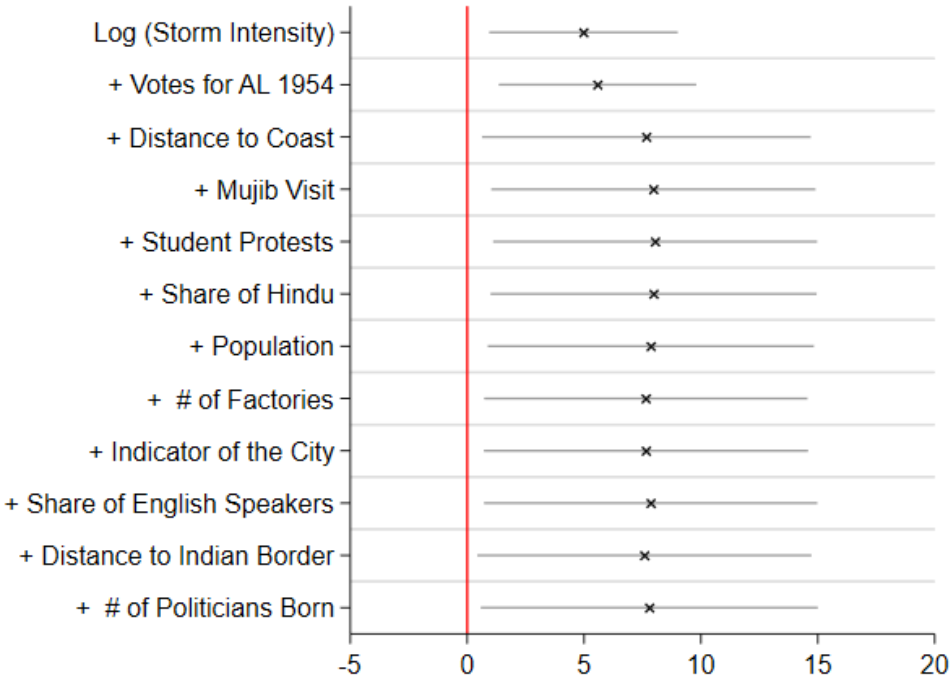
Note: The figure reports the results of a wild bootstrap test based on 999 replications. The histogram shows the confidence intervals for the coefficient of the logarithm of storm intensity. The horizontal line corresponds to a p-value of 0.05, and the points of intersection indicate the confidence interval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

Figure B10: 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 B1: 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)	8.774	8.600	0.984	6.800	13.20	162
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 Constituency	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	0.0988	0	0.299	0	1	162
Number of Intellectuals Murdered	0.901	0	2.682	0	23	162
# of Political Leaders	1.821	1	2.714	0	16	162
# of Business Leaders	0.123	0	0.483	0	4	162
# of Candidates in the Constituency	4.753	5	1.449	2	9	162

Note: This table reports the mean, median, and standard deviation of the main variables used in our analysis. The unit of analysis is the electoral constituency. Figures 1–5 illustrate the spatial variation of selected variables. Descriptions of all variables are provided in Appendix A.

Table B2: Placebo Test. Effect of the Radiation One Day Before the Bhola Storm

Panel A. Impact on Votes for Separatist Party				
	(1)	(2)	(3)	(4)
	Vote Share of Awami League			
Log (One Day before Bhola Storm Radiation)	-0.146	-0.210	-0.197	-0.163
	(0.135)	(0.136)	(0.134)	(0.122)
Mean Dep. Var.	.745	.745	.745	.745
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (One Day before Bhola Storm Radiation)	-4.072	-5.991	-5.102	-4.072
	(3.633)	(3.769)	(4.296)	(3.610)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Mean Dep. Var.	6.715	6.715	6.715	6.715
Observations	162	162	162	162

Note: Newey–West standard errors are reported in parentheses. The dependent variable is the share of votes received by the Awami League in the December 1970 election in East Pakistan (present-day Bangladesh), and the share of War of Independence participants residing in the constituency, scaled by the constituency's population. *One Day Before Bhola Storm Radiation* is constructed from ITOS-1 satellite imagery of Bangladesh from one day before the formation of the Bhola Cyclone (7 November 1970), using the same approach as for the main independent variable. Baseline controls include votes for the United Front, the electoral alliance led by the Awami League in 1954, and distance to the coast. Additional controls include votes for the United Front (1954), an indicator for Mujib's visit, an indicator for student protests, an indicator for cities with populations over 20,000 people (as of 1961), distance to the coast, the percentage of Hindus in the population, total population of the constituency, the number of politicians born before 1970, the number of major industrial facilities in the constituency, and the share of English-speaking residents. PDS controls, selected using the post-double selection algorithm Belloni et al. (2014), are reported in Table A1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B3: Balance over District Characteriscs and Pre-Treatment Outcomes

	(1) Area	(2) Population 1964	(3) Indicator of City 1961	(4) Rail Road 1964
Log (Storm Intensity 1970)	46.855	-1590.283	0.077	0.641*
	(186.417)	(13776.666)	(0.275)	(0.360)
Distance to Coast	Yes	Yes	Yes	Yes
Mean Dep. Var.	231.384	192655.432	.191	.42
Observations	162	162	162	162
	Road 1964	# of Factories 1964	Electricity, Coverage 1964	Famine Casualties 1943
Log (Storm Intensity 1970)	0.537	0.557	16.275	2.280
	(0.355)	(0.643)	(17.511)	(1.509)
Distance to Coast	Yes	Yes	Yes	Yes
Mean Dep. Var.	.512	.525	11.532	4.025
Observations	162	162	162	162
	English Speakers 1951	Persian Speakers 1951	Bengali Speakers 1951	Arab Speakers 1951
Log (Storm Intensity 1970)	0.024	-0.001	-0.057**	0.006
	(0.016)	(0.002)	(0.026)	(0.006)
Distance to Coast	Yes	Yes	Yes	Yes
Mean Dep. Var.	.169	.005	.765	.016
Observations	162	162	162	162
	Mujib Visit 1969	Student Protests 1969	# of Businessmen Born in the District Before 1970	# of Politicians Born in the District Before 1970
Log (Storm Intensity 1970)	0.121	0.038	-0.416	-0.364
	(0.179)	(0.094)	(0.281)	(2.399)
Distance to Coast	Yes	Yes	Yes	Yes
Mean Dep. Var.	.056	.043	.123	1.821
Observations	162	162	162	162

Note: Newey–West standard errors are reported in parentheses. This regression analysis assesses the balance of covariates across control variables. 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B4: Placebo: Storm and Pretreatment Election

	(1)	(2)	(3)	(4)
	Votes for AL on 1954 Election			
Log (Storm Intensity 1970)	-0.110**	0.040	-0.042	0.040
	(0.048)	(0.087)	(0.087)	(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

Nots: Newey–West standard errors are reported in parentheses. The dependent variable is the share of votes for the Awami League–led electoral alliance in the 1954 election. 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. Baseline controls include distance to the coast. Additional controls include an indicator for Mujib's visit, an indicator for student protests, an indicator for cities with populations over 20,000 people (as of 1961) in the constituency, distance to the coast, the percentage of Hindus in the population, the number of politicians born in the constituency before 1970, the population of the constituency, the number of major industrial facilities in the constituency, and the share of English-speaking residents. PDS controls, which were selected using the post-double selection algorithm Belloni et al. (2014), are reported in Table A1. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B5: 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)
	Vote Share of Awami League			
Log (Storm Intensity)	0.278***	0.301***	0.210**	0.178**
	(0.065)	(0.063)	(0.083)	(0.076)
Mean Dep. Var.	.753	.753	.753	.753
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (Storm Intensity)	7.435***	7.919***	7.717***	7.077***
	(2.397)	(2.435)	(2.836)	(2.674)
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
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 Commissioned by NASA. Baseline controls include votes for United Front, the electoral alliance led by Awami League, in 1954. 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, 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 A1. Coastal regions (within 100 km from the coast) are dropped in the analysis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B6: Placebo Test on Mora Cyclone (2017) on Awami League Votes and Conflict

Panel A. Impact on Votes for Separatist Party				
	(1)	(2)	(3)	(4)
	Vote Share of Awami League			
Log (Mora Storm Intensity 2017)	-0.062	0.036	-0.038	-0.076
	(0.068)	(0.071)	(0.083)	(0.075)
Mean Dep. Var.	.745	.745	.745	.745
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (Mora Storm Intensity 2017)	-0.838	1.280	0.634	0.928
	(2.285)	(2.364)	(2.543)	(2.150)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
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 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, 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 B7: Placebo Test on Sidr Cyclone (2007) on Awami League Votes and Conflict

Panel A. Impact on Votes for Separatist Party				
	(1)	(2)	(3)	(4)
	Vote Share of Awami League			
Log (Sidr Storm Intensity 2007)	0.532***	0.371	0.200	0.215
	(0.188)	(0.241)	(0.235)	(0.247)
Mean Dep. Var.	.745	.745	.745	.745
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People			
Log (Sidr Storm Intensity 2007)	12.056	7.824	7.847	8.549
	(7.582)	(8.318)	(8.290)	(8.389)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
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 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, 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 B8: 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)
	Vote Share of Awami League		# of Insurgents per 1000 People	
Within 150km of the Path of the Eye of the Storm	0.085**	0.079**	2.967*	3.045**
	(0.034)	(0.033)	(1.539)	(1.506)
Adj. R^2	.107	.117	.069	.071
Mean Dep. Var.	.745	.745	6.715	6.715
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	0.129***	0.101***	3.405**	2.861**
	(0.038)	(0.038)	(1.324)	(1.314)
Baseline Controls	Yes	No	Yes	No
All Controls	Yes	No	Yes	No
PDS Controls	No	Yes	No	Yes
Adj. R^2	.145	.135	.077	.082
Mean Dep. Var.	.745	.745	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. 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 B9: 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 B10: 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 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 B11: Effect of Storm on Total Number of Insurgents

	(1)	(2)	(3)	(4)
	# of Insurgents			
Log (Storm Intensity 1970)	849.347**	1343.136**	1375.841**	1379.707**
	(384.866)	(654.093)	(675.986)	(659.560)
Baseline Controls	No	Yes	Yes	No
All Controls	No	No	Yes	No
PDS Controls	No	No	No	Yes
Adj. R^2	.02	.026	.034	.02
Mean Dep. Var.	1269.136	1269.136	1269.136	1269.136
Observations	162	162	162	162

Notes: Newey-West standard errors in parentheses. The dependent variable is number of participants of War of Independence. 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 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 B12: 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 Commissioned by NASA. Baseline Controls include votes for United Front, the electoral alliance 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 B13: Effect of the Bhola Storm on the Number of Candidates in the Electoral Constituency

	(1)	(2)	(3)	(4)
	# of Candidates			
Log (Storm Intensity)	-1.309**	-1.359	-1.245	-1.401
	(0.628)	(1.102)	(1.134)	(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	.028	.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 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 table: tablepds. 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 B14: Effect of Storm on Political Participation

	(1)	(2)	(3)	(4)
	Turnout on December 1970 Election			
Log (Storm Intensity 1970)	0.032	0.189***	0.109*	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	.27	.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 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 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 B15: 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) X Railroad 1964	-0.053	-0.085	-0.085	-0.353	-0.124	-0.124
	(0.128)	(0.138)	(0.132)	(4.090)	(4.642)	(4.437)
Log (Storm Intensity 1970)	0.260*	0.218	0.218	8.174*	8.226*	8.226*
	(0.133)	(0.143)	(0.137)	(4.451)	(4.792)	(4.581)
Railroad Coverage 1964	0.156	0.246	0.246	0.363	-0.211	-0.211
	(0.302)	(0.325)	(0.310)	(9.387)	(10.569)	(10.102)
StormXRailroads and Railoads = 0 P-val.	.272	.115	.09	.853	.863	.851
Observations	162	162	162	162	162	162
Panel B. Factories						
	Vote Share of Awami League			# of Insurgents per 1000 People		
Log (Storm Intensity 1970) X Major Factories 1964	-0.017	-0.037	-0.042	0.842	1.933	0.526
	(0.074)	(0.075)	(0.067)	(3.064)	(3.135)	(2.902)
Log (Storm Intensity 1970)	0.253**	0.223**	0.218**	7.257**	7.031*	7.530**
	(0.110)	(0.109)	(0.108)	(3.652)	(3.748)	(3.651)
# of Major Factories 1964	0.047	0.088	0.105	-1.845	-4.219	-1.014
	(0.180)	(0.180)	(0.164)	(7.339)	(7.477)	(6.924)
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.	.782	.875	.809	.907	.629	.869
Observations	162	162	162	162	162	162

Notes: 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. 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B16: 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)	-0.487**	-0.212	-0.044	0.006
	(0.232)	(0.132)	(0.078)	(0.020)
NDE				
Log (Storm Intensity)	1.699***	0.853***	0.649*	0.475**
	(0.591)	(0.307)	(0.333)	(0.204)
TE				
Log (Storm Intensity)	1.213***	0.641***	0.605**	0.482**
	(0.391)	(0.225)	(0.273)	(0.201)
Baseline Controls	Yes	Yes	Yes	Yes
% of Effect Mediated	40.1% ***	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 constituencies, while the remaining 146 constituencies did not receive any such aid. Mujib visit is an indicator that is 1 for constituencies visited by Mujib in electoral campaign of 1970, Roads is an indicator of main (paved) road presented in the district in 1964, votes for UF is percentage of votes gained by United Front, electoral alliance 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 B17: 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 B18: 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
Log (Storm Intensity)	0.205**	0.321*	0.167**	0.279**
	(0.102)	(0.174)	(0.085)	(0.137)
Mean Dep. Var.	.75	-.32	.690	.75
Panel B. Impact on Conflict				
	# of Insurgents per 1000 People	Log(Insurgents)	Ihs(Insurgents)	Poisson
Log (Storm Intensity)	7.788**	0.867	1.048	1.205**
	(3.649)	(0.576)	(0.670)	(0.546)
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 inverse 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 Commissioned by NASA. 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, share of English speaking Population and distance to Indian border. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B19: 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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$