

Cyclone Nargis and the Failure of Governance: A Case Study in Disaster Amplification

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Summary

Cyclone Nargis, which struck Myanmar's Irrawaddy Delta on May 2nd, 2008, remains one of the deadliest disasters of the 21st century. With sustained winds of 130 mph and a 12-foot storm surge that traveled approximately 40 kilometers inland, the equivalent of a category four hurricane on the Saffir-Simpson Hurricane Wind Scale, killed 84,537, left 53,836 missing, injured 19,359, and displaced 2.4 million (Baker et al., 2008; Shibayama et al., 2009; Shikada et al., 2012). This case study examines how systemic governance failures, deliberate suppression of early warnings, and political prioritization of regime security over civilian protection transformed a predictable meteorological event into a humanitarian catastrophe. Through analysis of Myanmar's militarized response, international aid barriers, and grassroots resilience, this study provides a framework for understanding how institutional instability amplifies disaster risk in authoritarian contexts..

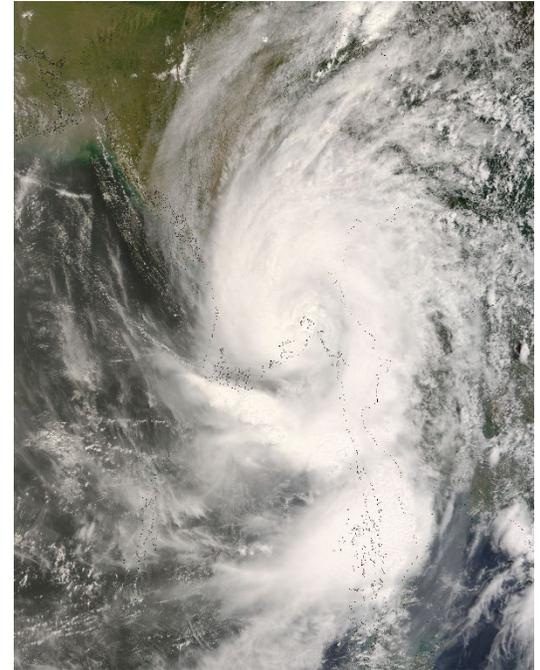


Image: [Cyclonic Storm Nargis, seen from MODIS on the Terra satellite/NASA](#)

Keywords

Authoritarianism, Cyclone, Disaster Governance, Disaster Response, Early Warning Systems, Emergency Management, Humanitarian Aid, Irrawaddy Delta, Junta, Myanmar, Political Instability, Risk Communication, Southeast Asia, Storm Surge, Suppression of Information, Tropical Cyclone, Vulnerability

The Storm's Progression and Meteorological Context

Nine days before landfall, on April 25th, the Indian Meteorological Department (IMD), as well as Myanmar's Department of Meteorology and Hydrology (DMH), began tracking a tropical disturbance in the basin (Ahmed et al., 2008; Indian Meteorological Department, 2009). At 3:00 UTC on April 27th, 2008, a tropical depression formed from this disturbance in the Bay of Bengal, and 24 hours later, the IMD noted that Cyclone Nargis formed at 3:00 UTC on April 28th, 2008 (Indian Meteorological Department, 2009). The United States Joint Typhoon Warning Center (JTWC) also began advisories on the cyclone on April 27th (Cooper & Falvey, 2008).

Nargis was steered northward across the Bay of Bengal, which would have taken the cyclone into Bangladesh or southeastern India. Most cyclones in the region typically take a slightly northeastward curve into Bangladesh. However, between April 28th and 29th, Nargis eventually slowed and weakened somewhat in the northern region of the bay due to competing atmospheric steering currents.

This new environment caused the cyclone to rapidly strengthen over warm sea surface temperatures exceeding 30°C, moderate vertical wind shear, and upper-level divergence (Indian Meteorological Department, 2009). Even as early as April 29th, the likely track of Cyclone Nargis would take it into Myanmar (Ferrell, 2008) when it became a "Very Severe Cyclonic Storm," the equivalent of a category one hurricane on the Saffir-Simpson Hurricane Wind Scale (SSHWS).

From May 1st, Nargis followed an unprecedented eastward trajectory directly into Myanmar's low-lying delta, a region that had never experienced a major tropical cyclone (Gottlieb, 2018).

The IMD analysis kept Nargis with maximum sustained winds of 90 knots or 105 mph (Indian Meteorological Department, 2009), the equivalent of a category two hurricane on the SSHWS. However, due to the differences in how sustained winds are measured using a three-minute average by the IMD (World Meteorological Organization, 2024b) versus a one-minute average in the Atlantic Basin (World Meteorological Organization, 2024a), Nargis had a peak intensity from the JTWC of 115 knots or 130 mph, making it a category four hurricane on the SSHWS (Cooper & Falvey, 2008).

Cyclone Nargis made landfall on Myanmar's Ayeyarwady Division at its peak intensity on May 2nd between 12:00 UTC and 14:00 UTC (6:30 PM and 8:30 PM local time). Twenty-four hours after landfall, Nargis dissipated over east-central Myanmar (Indian Meteorological Department, 2009).

Systemic Vulnerabilities in Pre-Nargis Myanmar

The Value of a Warning

In the Indian Ocean, even in 2008, a forecasting system for tropical cyclones existed. The World Meteorological Organization designates the IMD as a Regional Specialized Meteorological Center to issue official tropical cyclone forecasts and warnings for this region (World Meteorological Organization, 2024b). These forecasts and warnings would be sent to national hydrometeorological agencies that interpret and communicate hazards for local needs. For Cyclone Nargis, information from the IMD would have been sent to Myanmar's DMH.

A post-Nargis assessment by Myanmar's DMH and the Asian Disaster Preparedness Center showed that Myanmar's DMH detected the cyclone on April 25th, eight days before landfall, and made a formal notice of it (Ahmed et al., 2008). DMH was Myanmar's central source for information on Nargis, with "special storm news," "special bulletins," and "daily weather reports" being formally issued to the country's government agencies, media, and other entities (Ahmed et al., 2008).

Forecasts from international organizations, both governmental and private entities, accurately forecasted the location of Nargis's landfall despite rapid intensification, with warnings sent to the Myanmar government from the Indian government before landfall (DEMS, 2008; Salleh, 2008; Perez et al., 2022). The Asian Disaster Preparedness Center also provided Myanmar with advance warning as early as seven days (April 26th) before the system hit (LIRNEasia, 2008).

According to Dieter Schiessl, the then-director of the World Meteorological Organization's disaster risk reduction unit, Myanmar's authorities issued warnings six days before Nargis' landfall (Simmons, 2008). While Myanmar's DMH also said it posted warnings on its website as early as April 27th, six days before landfall, no such warning was ever found on their website, with the last weather warning issued by Myanmar dating back to March 1st (LIRNEasia, 2008).

Myanmar continued to receive warnings, forecast paths, and numerical weather prediction models from the IMD, which showed that Nargis was on a collision course with their country over the next six days. The IMD noted little response from Myanmar's government despite the consistent information flow to its DMH (Webster, 2008).

Myanmar's official weather forecast appeared on the state-owned newspaper's final page (page 15), the New Light of Myanmar, from April 29th through May 2nd. State media downplayed warnings as "minor seasonal disturbances" (Hattotuwa & ICT4Peace Foundation, 2008). Twenty-four hours before Cyclone Nargis made landfall on May 1st, already having sustained winds of 90 knots (105 mph) according to the IMD, Myanmar's DMH held a press conference stating expected winds were only to be approximately 35 mph – the strength of a weak tropical storm (Glassman, 2008).

On the same day, the New Light of Myanmar, a government-owned newspaper, published a short article on its back page (page 15) asking residents to be prepared for rainstorms with wind speeds in squalls reaching 40 mph to 50 mph (The New Light of Myanmar, 2008), with state radio and television following suit (Palmstrom, 2015). There was no additional preparation information, evacuation orders, or warning about the storm surge (LIRNEasia, 2008). The State Peace and Development Council's (SPDC), the ruling military junta, obsession with information control proved catastrophic, leaving many in the Delta unaware of the winds, rains, and, more importantly, the storm surge until the cyclone was at Myanmar's doorstep, making fleeing inland near impossible.

At the time of the forecasting arrangement in the Indian Ocean, there was no mandate for the IMD to produce storm-surge forecasts, and no warnings of impending storm surges were attached to their tropical cyclone alerts (Webster, 2008). However, in the post-Nargis assessment, Myanmar's DMH said it had a method to predict storm surge and accurately predicted a surge exceeding 12 feet along the most affected coasts (Ahmed et al., 2008). Over 80% of deaths were related to storm surge (Ahmed et al., 2008).

On the morning of May 2nd, the day of landfall, a major daily Burmese-language newspaper, The Mirror, published an interview with the then-head of Myanmar's meteorology department, U Htun Lwin, where he warned of a storm that could bring winds of 160 kilometers per hour or 100 mph (Human Rights Watch [Asia Division], 2023). The same day, the International Federation of Red Cross and Red Crescent Societies (IFRC) also issued a warning for information only (IFRC, 2008).

Myanmar's DMH contests that they provided ample warning, as seen in Tables 1 and 2, but documentation of these forecasts has not been uncovered. In addition, Ahmed et al. (2008) stated that warnings were disseminated across villages, towns, and camps with good lead time through various sources. However, the community response to the information remained slow, or in many cases, there was none. Researchers echoed the myriad of media reports that many did not even receive a warning from state media, and for those that did, the severity of what was to come was not conveyed (Human Rights Watch [Asia Division], 2023).

However, whether the warnings were suppressed or not heeded, the failure to realize the significance of Cyclone Nargis' threat, particularly along the Ayeyarwady coast, resulted in far more significant loss of life.

Breakdown of Emergency Response

When Cyclone Nargis hit Myanmar, a 12-foot (with some estimates even higher) wall of water swept through Myanmar's deltaic region, spanning 5,180 square kilometers, drowning tens to thousands (Seekins, 2009). The loss of life was catastrophic, with humanitarian workers recalling seeing bodies and livestock floating down rivers in the aftermath (World Vision International, 2015). In these devastated regions, not only were people swept away, but boats, jetties, and ports – all primary means of transport – were swept out to sea or sunk into rivers. As a result, any aid to survivors was slow to trickle into the hardest-hit areas.

International Aid Dilemmas

Myanmar's medical system faced collapse in the aftermath of Nargis. In the post-disaster assessment, 75% of health facilities in affected regions were damaged or destroyed, with destroyed structures concentrated in the Delta Nargis flooded by the storm surge (Baker et al., 2008).

In the face of a developing humanitarian crisis, the SPDC resisted external help, viewing international involvement as a threat to internal security (Gottlieb, 2018). The SPDC initially refused any international aid. The regime refused visas for international relief staff (BBC News, 2008), delayed relief supply ships (Washington Post, 2008), arrested citizens who undertook relief efforts (Human Rights Watch [Asia Division], 2023), and limited access (Emerson, 2008a; MacKinnon, 2008), then arrested journalists who covered the crisis on the ground (Emerson, 2008b; Stern, 2009).

The aid that trickled in landed at Yangon's Mingaladon Airport but was confiscated and stored by the authorities (Seekins, 2009). Planes waited in neighboring airports while ships waited offshore without guaranteeing entry to Myanmar. Aid workers who were not outright refused entry were subjected to a lengthy visa process (CNN, 2008). Once select aid workers were granted entry, they were then subject to travel restrictions, particularly disaster relief specialists who focused on logistics, water, and sanitation (Human Rights Watch [Asia Division], 2023).

The ruling junta's constitutional referendum was approaching on May 10th, and aid was used as a political tool. In many media reports, the junta handed out donated supplies as its own, maintaining the ban on international aid workers (Associated Press, 2008a). State media devoted more attention to the vote than natural disasters, with programming that included cheerful dancing to get out the vote (Seekins, 2009).

Two weeks after Nargis' landfall, a tripartite core group of stakeholders – the United Nations, the Association of Southeast Asian Nations, and the government of Myanmar – was set up to facilitate the effective distribution and utilization of assistance from the international community (Creach & Fan, 2008). This flow of aid followed international pressure from regional leaders, the U.N. secretary-general meeting with SPDC's top general (MSNBC News Services, 2008), and critiques from the U.S. and other Western countries. Aid was still refused by American, French, and British naval vessels located off the coast, all while their helicopters would have been invaluable in transporting relief to survivors within the Delta.

Local aid workers faced challenges similar to those of international aid workers. Burmese NGOs were often prevented from entering the Delta, being blocked by military roadblocks, or forced to transfer supplies to the junta (The New York Times, 2008a). By June, thousands of soldiers were sent to affected regions, taking control of supply distribution.

Local Agency and Grassroots Response

While the SPDC blocked relief, Myanmar's ordinary citizens began collecting food, clothes, and housing materials to deliver to the worst-affected delta regions via car. At the time, 90% of the population identified as Theravada Buddhists (Seekins, 2009), which fostered the growth of communities that pre-dated Nargis. These Buddhist monks, as well as the Christian church, led burial efforts for the thousands of people who perished, ferrying supplies, constructing and offering shelter, the first to clear roads, and taking care of those injured ((The New York Times, 2008b; Human Rights Watch [Asia Division], 2023), often acting in defiance of authorities.

Buddhist temples, monasteries, and churches were built stronger than the houses in the Delta. As a result, they were the last buildings left standing in villages that were swept away by Cyclone Nargis' storm surge and flooding. Even as the junta clamped down on the flow of foreign relief into the Delta, monasteries became soup kitchens, refugee camps, and donation collection and storage points (Associated Press, 2008b). As a result, international aid organizations relied on these monks to get aid where it was needed the most.

Aftermath and Reform: Lessons Unlearned

Myanmar has increased its forecasting capacity since Cyclone Nargis by installing several Doppler radars and automatic weather observation stations (Rohingya News Agency, 2014). The country's DMH has also worked with many organizations to improve its early warning capacity, which materialized when Cyclone Giri, another category four tropical cyclone, struck Myanmar in October 2010 (Maung, 2014). However, only 45 people perished, compared to approximately 138,000 with Nargis. Generally, disaster risk management in Myanmar has shifted to a whole-of-society approach post-Nargis (Tun & Lassa, 2023).

While progress has been made, evidenced by the response in subsequent tropical cyclone aftermaths (IFRC, 2015), more recent disasters showcase that there are still systemic failures within disaster governance in Myanmar. On March 25th, 2025, a magnitude 7.7 earthquake on the moment magnitude scale struck the Sagaing Region of Myanmar, home to the country's second-largest city (United States Geological Survey, 2025), with a magnitude 6.7 aftershock 12 minutes after the initial quake. The earthquakes caused extensive damage across Myanmar, with over 4,000 deaths reported, according to local authorities (Linn Aung, 2025).

Three weeks after the earthquakes, the worst-affected areas are still without safe shelter, clean water and sanitation, stable electricity, healthcare, and essential services (United Nations Office for the Coordination of Humanitarian Affairs, 2025). Like the aftermath of Cyclone Nargis, Myanmar's still-ruling junta has banned foreign media from accessing earthquake-devastated areas (IBTimes India, 2025), mishandled and blocked aid, and barred local volunteers from assisting (Graceffo, 2025). While previously, the junta's response to aid has been to delay or deny, in the earthquake response, aid convoys have been fired upon by junta soldiers (Butler, 2025) and even bombed a monastery that supported displaced civilians (Radio Free Asia, 2025).

Discussion Questions:

1. How might the SPDC's prioritization of its constitutional referendum over disaster response reflect broader tensions between authoritarian governance and humanitarian imperatives? What institutional incentives drove this choice?
2. Given Myanmar's technical capacity to predict Cyclone Nargis' storm surge, discuss the ethical implications of suppressing risk communication. How does this compare to modern disinformation challenges in disaster contexts?
3. The monastic network delivered significant aid despite military restrictions. How can international organizations better design contingency plans to leverage local social capital in politically fragile states?
4. While not explicitly addressed in the case, how might gender roles in delta communities have influenced survival strategies and post-disaster recovery? What data gaps exist in understanding these dynamics?
5. Contrast ASEAN's mediation role in Nargis with its response to the 2025 Myanmar earthquake. What systemic barriers persist in regional disaster diplomacy frameworks?

Appendix I

Table 1: Chronologically forecasted peak surge height by the Department of Meteorology and Hydrology (DMH)

Date	Observed Time (MST)	Issued Time (MST)	Forecast Peak Surge height (Feet)	Places
May 1, 2008	15:30 hrs	17:30 hrs	8-10	Southern Rakhine State and northern Ayeyarwady coastal areas.
	18:00 hrs	19:00 hrs	8-10	Southern Rakhine State and northern Ayeyarwady coastal areas.
	19:30 hrs	21:00 hrs	10-12	Along Ayeyarwady coast
May 2, 2008	03:00 hrs	06:00 hrs	10-12	Along Ayeyarwady coast
	12:30 hrs	13:00 hrs	10-12	Along Ayeyarwady coast
	13:30 hrs	14:00 hrs	12	Along Ayeyarwady coast
	14:30 hrs	15:00 hrs	12	Along Deltaic coast
	15:30 hrs	16:00 hrs	12	Along Deltaic coast
	17:00 hrs	18:00 hrs	12	Along Deltaic coast
May 3, 2008	05:30 hrs	06:00 hrs	12	Gulf of Mottama

Source: (DMH May, 2008)

Table 2: Chronological record of information (i.e., special news, warning) disseminated by DMH

Date	Base Observation Time	Issue time (MST)	Major information shared by DMH
25 April, 2008	[15:30 MST, 0900 UTC]	4:00 pm	Special News: Low Pressure Formation over South West Bay
26 April, 2008	[06:30 MST, 0000 UTC]	2:00 pm	Bulletin: Low Pressure Area (LPA) still persists
27 April, 2008	[06:30 MST, 0000 UTC]	7:00 am	Special News: Yesterday's LPA over South East Bay intensify further into a Depression. It is forecast to move North Westwards.
28 April, 2008	[09:30 MST, 0300 UTC]	7:30 am	Special News: Yesterday's Depression over South East Bay and adjoining South West Bay has intensified further into a Tropical Storm. It is forecast to move North Eastwards.
29 April, 2008	[06:30 MST, 0000 UTC]	7:00 am	Special News: Yesterday's Tropical Storm over South East Bay and adjoining South West Bay has intensified further into Severe Tropical Storm "NARGIS". Initially it is forecast to move Northwards.
30 April, 2008	[15:30 MST, 0900 UTC]	5:00 pm	Special News: The Severe Cyclonic Storm NARGIS has not appreciable further intensified and move eastwards slowly. It is forecast to move North-Northeastwards slowly next 24 hours commencing evening today
1 May, 2008	[12:30 MST, 0600 UTC]	1:00 pm	Special News: The Severe Cyclonic Storm is intensified and move East-Northeastward and it is forecast to cross the coast between Southern Rakhine State and Northern Ayeyarwady division during the next 36 hours commencing noon today.
2 May, 2008	[09:30 MST, 0300 UTC]	10:30 am	Special News: The Severe Cyclonic Storm NARGIS has crossed southern Ayeyarwaddy coast near Higyi Island in last few hours.
2 May, 2008	[14:30 MST, 0800 UTC]	3:00 pm	Special News: The Severe Cyclonic Storm further intensified and moved Eastwards. It's centered were continue to cross Ayeyarwady, Yangon and South Bago Divisions and it is forecast to cross the coast between the South Rakhine state and Northern Ayeyarwady divisions during the next 24 hours commencing 2 May evening.
3 May, 2008		6:00 am	Special News: The Sever Cyclonic Strom NARGIS has crossed the Southern Ayeyarwady and Southern Yangon during this morning (3 May) and the center of the storm crossed over the Pathein on morning 1 am of 3 May, over the Pyapon between 2-3 am morning, and over Yangon at 5 am. The wind speed was 100-120 mph. This SCS will continue to move as a land depression in next 24 hours to reach the northern part of Thailand.

Source: DMH reports and forecasting published from 25 April to 3 May, 2008.

Bibliography

Adams, B. (2009, May 3). The lessons of Cyclone Nargis. *Bangkok Post*.

<https://www.hrw.org/news/2009/05/03/lessons-cyclone-nargis>

Ahmed, A. K., Subbiah, A. R., & Lwin, T. (2008). *Joint Rapid Situation Assessment Report: Status and context of coastal townships of Yangon and Ayeyarwady divisions during Tropical Cyclone Nargis in Myanmar*. Department of Meteorology and Hydrology (Myanmar) and Asian Disaster Preparedness Center (Thailand). <https://doi.org/10.13140/RG.2.1.3659.1760>

Arnt Kyawt, N. (2018). *Origin, product evaluation and willingness to buy: A study of young Myanmar consumers' mobile phone choices* [PhD Dissertation, University of Huddersfield].

<https://eprints.hud.ac.uk/id/eprint/35285/1/FINAL%20THESIS%20-%20NI.pdf>

Associated Press. (2008a, May 11). *Myanmar holds referendum amidst aid crisis*. CBS News.

<https://www.cbsnews.com/news/myanmar-holds-referendum-amidst-aid-crisis/>

Associated Press. (2008b, June 23). *Myanmar's monks regroup after killer storm*. NBC News.

<https://www.nbcnews.com/id/wbna25333856>

Baker, D. B., H.E. U Kyaw Thu, & H.E. Robert Chua. (2008). *Post-Nargis joint assessment*.

https://www.gfdrr.org/sites/default/files/GFDRR_Myanmar_Post-Nargis_Joint_Assessment_2008_EN.pdf

BBC News. (2008, May 9). *Burma shuns foreign aid workers*. BBC. <http://news.bbc.co.uk/2/hi/asia-pacific/7391535.stm>

Butler, G. (2025, April 2). *How aid becomes a weapon in Myanmar's war zone*. BBC.

<https://www.bbc.com/news/articles/cp8je14g2eno>

CNN. (2008, May 10). *Myanmar tries to get out the vote as aid deliveries languish*. CNN.

<https://edition.cnn.com/2008/WORLD/asiapcf/05/10/myanmar.vote/index.html>

Cooper, G. A., & Falvey, R. J. (2008). 2008 Annual Tropical Cyclone Report. In M. Vancas (Ed.), *Naval Meteorology and Oceanography Command*. U.S. Naval Maritime Forecast Center/Joint Typhoon Warning Center. <https://www.metoc.navy.mil/jtwc/products/atcr/2008atcr.pdf>

Creach, Y.-K., & Fan, L. (2008, December 22). *ASEAN's role in the Cyclone Nargis response: implications, lessons and opportunities*. Humanitarian Practice Network.

<https://odihpn.org/publication/asean%C2%92s-role-in-the-cyclone-nargis-response-implications-lessons-and-opportunities/>

De Perez, E. C., Berse, K. B., Depante, L. a. C., Easton-Calabria, E., Evidente, E. P. R., Ezike, T., Heinrich, D., Jack, C., Lagmay, A. M. F. A., Lendelvo, S., Marunye, J., Maxwell, D. G., Murshed, S. B., Orach, C. G., Pinto, M., Poole, L. B., Rathod, K., Shampa, N., & Van Sant, C. (2022). Learning from the past in moving to the future: Invest in communication and response to weather early warnings to reduce death and damage. *Climate Risk Management*, 38, 100461. <https://doi.org/10.1016/j.crm.2022.100461>

DEMS. (2008, April 27). *DEMS-RSMC tropical cyclones New Delhi*. <https://web.archive.org/web/20080501162631/http://www.imd.ernet.in/section/nhac/dynamic/rsmc.htm>

Emerson, J. (2008a, May 14). *Authorities restrict Cyclone Nargis news coverage*. Committee to Protect Journalists. <https://cpj.org/2008/05/authorities-restrict-cyclone-nargis-news-coverage/>

Emerson, J. (2008b, July 1). *Journalists jailed in Cyclone Nargis aftermath*. Committee to Protect Journalists. <https://cpj.org/2008/07/journalists-jailed-in-cyclone-nargis-aftermath/>

Ferrell, J. (2008, May 4). *Strong, unusual tropical cyclone hits Burma*. AccuWeather. <https://www.accuweather.com/en/weather-blogs/weathermatrix/strong-unusual-tropical-cyclone-hits-burma/92694>

Glassman, J. (2008, May 21). U.S. international broadcasting on the frontlines of freedom. *The Heritage Foundation*. <https://www.heritage.org/report/us-international-broadcasting-the-frontlines-freedom>

Gottlieb, G. (2018, May 3). Greg Gottlieb describes lessons for Myanmar 10 years after Cyclone. *Tufts - Feinstein International Center*. <https://fic.tufts.edu/newsroom/greg-gottlieb-describes-lessons-for-myanmar-10-years-after-cyclone-nargis/>

Graceffo, A. (2025, April 9). The Burmese Junta is blocking and mishandling aid. *Mizzima News*. <https://eng.mizzima.com/2025/04/09/21171>

Hattotuwa, S. & ICT4Peace Foundation. (2008). *Cyclone Nargis: Lessons and implications for ICTs in humanitarian aid*. *ICT4Peace Foundation*. <https://ict4peace.org/wp-content/uploads/2019/11/ICT4Peace-2008-Cyclone-Nargis-and-ICT4Peace-Foundation.pdf>

Human Rights Watch [Asia Division]. (2023). I want to help my own people. In *Human Rights Watch*. <https://www.hrw.org/report/2010/04/28/i-want-help-my-own-people/state-control-and-civil-society-burma-after-cyclone>

IBTimes India. (2025, March 31). *Myanmar military Junta blocks the entry of international journalists to cover quake-affected areas*. IBTimes India. <https://www.ibtimes.co.in/myanmar-military-junta-blocks-entry-international-journalists-cover-quake-affected-areas-881587>

- IFRC. (2008). *Myanmar: Tropical Cyclone - Information Bulletin #1 (TC-2008-000047-MMR)*. International Federation of Red Cross and Red Crescent Societies. <https://reliefweb.int/report/myanmar/myanmar-tropical-cyclone-information-bulletin-n-1>
- IFRC. (2015, September 15). *Red Cross volunteers in Myanmar bring hope and aid to evacuees in flood-stricken villages*. International Federation of Red Cross and Red Crescent Societies.
- Indian Meteorological Department. (2009). Report on cyclonic disturbances over the north Indian Ocean during 2008. *Indian Meteorological Department*. https://rsmcnewdelhi.imd.gov.in/uploads/report/27/27_56679c_rsmc-2008.pdf
- Linn Aung, T. (2025, April 21). *Myanmar's ongoing struggles: Earthquake adds burden to decades of suffering*. Mizzinma News. <https://eng.mizzima.com/2025/04/21/21553>
- LIRNEasia. (2008, May 9). *Cyclone Nargis - Time Series before, during, and after*. LIRNE Asia. <https://lirneasia.net/2008/05/cyclone-nargis-%E2%80%93-time-series-before-during-and-after/>
- MacKinnon, I. (2008, June 6). Cyclone Nargis: Burmese junta claims media is making up horror stories. *The Guardian*. <https://www.theguardian.com/world/2008/jun/06/burma.cyclonenargis>
- Maung, L. (2014, May 5). Myanmar storm warnings get better. *The New Humanitarian*. <https://www.thenewhumanitarian.org/news/2014/05/05/myanmar-storm-warnings-get-better>
- MSNBC News Services. (2008, May 23). *U.N. chief: Myanmar will let in "all" aid workers*. NBC News. <https://www.nbcnews.com/id/wbna24787010>
- Palmstrom, B. (2015, August 13). *Myanmar: Seeing emergency information in a new light*. BBC. <https://www.bbc.co.uk/mediaaction/stories/myanmar-seeing-emergency-information-in-a-new-light>
- Radio Free Asia. (2025, April 14). *Myanmar Junta bombs monastery as it blames quake for religious devastation*. Radio Free Asia. <https://www.rfa.org/english/myanmar/2025/04/14/myanmar-junta-earthquake-religious-building/>
- Rohingya News Agency. (2014, June 2). *Japan grants US\$40 million to Myanmar to set up weather radar stations*. Rohingya News Agency. <https://www.rna-press.com/en/news/25172.html>
- Salleh, A. (2008, October 16). *Burma could have had 72-hour warning*. ABC Science. <https://www.abc.net.au/science/articles/2008/05/08/2238754.htm>
- Seekins, D. (2009). State, society, and natural disaster: Cyclone Nargis in Myanmar (Burma). *Asian Journal of Social Science*, 37(5), 717–737. <https://doi.org/10.1163/156848409x12474536440500>
- Shibayama, T., Takagi, H., & Hnu, N. (2009). Disaster survey after Cyclone Nargis in 2008. *Asian and Pacific Coasts 2009: Proceedings of the 5th International Conference on APAC 2009* (pp. 190–193). World Scientific Publishing Company. https://doi.org/10.1142/9789814287951_0069

Shikada, M., Myint, U. T., Gyi, U. K. K., Nakagawa, Y., & Shaw, R. (2012). Chapter 10: Reaching the unreachable: Myanmar experiences of community-based disaster risk reduction. *Community, Environment and Disaster Risk Management* (pp. 185–203). [https://doi.org/10.1108/s2040-7262\(2012\)0000010016](https://doi.org/10.1108/s2040-7262(2012)0000010016)

Simmons, P. (2008, May 8). Death toll in Burma rises, as major powers press to intervene. *World Socialist*. <https://www.wsws.org/en/articles/2008/05/bucy-m08.html>

Stern, M. (2009, May 1). Attacks on the press in 2008: Burma. *Committee to Protect Journalists*. <https://cpj.org/2009/02/attacks-on-the-press-in-2008-burma/>

Suwanvanichkij, V., Murakami, N., Lee, C. I., Leigh, J., Wirtz, A. L., Daniels, B., Mahn, M., Maung, C., & Beyrer, C. (2010). Community-based assessment of human rights in a complex humanitarian emergency: the emergency assistance teams in Burma and Cyclone Nargis. *Conflict and Health*, 4(1). <https://doi.org/10.1186/1752-1505-4-8>

The New Light of Myanmar. (2008, May 1). *Storm News*. 15.

The New York Times. (2008a, May 12). When the Burmese offer a hand, rulers slap it. *New York Times*. <https://www.nytimes.com/2008/05/12/world/asia/12myanmar.html>

The New York Times. (2008b, May 31). Monks succeed in cyclone relief as Junta falters. *New York Times*. <https://www.nytimes.com/2008/05/31/world/asia/31myanmar.html>

Tun, T., & Lassa, J. A. (2023). Governing disaster risk in Myanmar: Institutions and policy pathways during 1885–2015. *International Journal of Disaster Risk Reduction*, 96, 103992. <https://doi.org/10.1016/j.ijdrr.2023.103992>

United Nations Office for the Coordination of Humanitarian Affairs. (2025). Myanmar earthquake response situation report No. 3. *UNOCHA*. <https://www.unocha.org/myanmar>

United States Geological Survey. (2025, March 28). *M 7.7 - 2025 Mandalay, Burma (Myanmar) Earthquake*.

Washington Post. (2008, May 10). Burma's Blockade. *Washington Post*. <https://www.washingtonpost.com/archive/opinions/2008/05/11/burmas-blockade/2b3a8d5f-956b-4818-b96c-efaaaa3c56a7/>

Webster, P. J. (2008). Myanmar's deadly daffodil. *Nature Geoscience*, 1(8), 488–490. <https://doi.org/10.1038/ngeo257>

Win, H. N., Government of Myanmar, United Nations International Strategy for Disaster Reduction (UNISDR), & International Recovery Platform (IRP). (2009). Cyclone Nargis 2008: Rehabilitation in Myanmar. *United Nations International Strategy for Disaster Reduction*.

https://www.unisdr.org/files/16776_cyclonenargis2008.pdf

World Meteorological Organization. (2024a). Regional Association IV – Hurricane Operational Plan for North America, Central America, and the Caribbean. *Tropical Cyclone Programme* (TCP-30).

[https://wmoomm.sharepoint.com/:b:/r/sites/wmocpdb/eve_activityarea/Tropical%20Cyclone%20Programme%20\(TCP\)/Operational%20Plans/04_RAIV-HurricaneCommittee-RA%20IV%20HC/2024_HC-46/RAIV_HC-46_OP_EN_Final_Approved_30May2024.pdf?csf=1&web=1&e=1Cq1WK](https://wmoomm.sharepoint.com/:b:/r/sites/wmocpdb/eve_activityarea/Tropical%20Cyclone%20Programme%20(TCP)/Operational%20Plans/04_RAIV-HurricaneCommittee-RA%20IV%20HC/2024_HC-46/RAIV_HC-46_OP_EN_Final_Approved_30May2024.pdf?csf=1&web=1&e=1Cq1WK)

World Meteorological Organization. (2024b). Tropical Cyclone Operational Plan for the Bay of Bengal and the Arabian Sea. *World Meteorological Organization* (Report No. TCP-21).

[https://wmoomm.sharepoint.com/:b:/r/sites/wmocpdb/eve_activityarea/Tropical%20Cyclone%20Programme%20\(TCP\)/Operational%20Plans/02_WMO-ESCAP-PanelOnTropicalCyclones-PTC/2024_PTC-51/TCP21_Edition-2024.pdf?csf=1&web=1&e=FznAm1](https://wmoomm.sharepoint.com/:b:/r/sites/wmocpdb/eve_activityarea/Tropical%20Cyclone%20Programme%20(TCP)/Operational%20Plans/02_WMO-ESCAP-PanelOnTropicalCyclones-PTC/2024_PTC-51/TCP21_Edition-2024.pdf?csf=1&web=1&e=FznAm1)

World Vision International. (2015, August 20). Cyclone Nargis- Transforming a nightmare to readiness.

Myanmar World Vision International. <https://www.wvi.org/myanmar/article/cyclone-nargis-transforming-nightmare-readiness>