

# On the 2024 Habagat- and Typhoon Carina-induced flood disaster: a preliminary analysis

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Residents of Metro Manila, Cavite, Bulacan, Pampanga, Rizal, and Bataan awoke to steady torrential rains on the morning of July 24, 2024. At that time, Typhoon *Carina* (international name: Gaemi) was already more than 900 km from Metro Manila, slowly approaching Taiwan. To the southwest of the archipelago, the moisture-heavy southwest monsoon—*habagat* to Filipinos—was also bringing rain showers in most parts of Luzon. By early afternoon, most news outlets and social media feeds were already filled with accounts of flooded streets and houses, as well as people pleading to be rescued.

As of this writing, the National Disaster Risk Reduction and Management Council reported 14 casualties, 2 injuries, and 2 people missing<sup>1</sup>. More than 1.3 million people have been affected, with over 128,000 families evacuated from their homes, and more than 12,000 families taking shelter in evacuation centers. The estimated loss to agriculture stands at about ₱9.7 million. As a result, 21 cities and municipalities were declared under a state of calamity. As more reports of affected communities are expected in the coming days, we take an initial look at the events that transpired, their effects, and raise critical questions.

## *On Typhoon Carina and the enhanced Habagat*

The state weather bureau, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), reported that a low pressure area at the eastern part of Luzon over the Philippines had developed into a tropical depression on July 19, 2024, and named it *Carina*. The next day, it gained strength and was upgraded into a “Tropical Storm,” after which over the next two days, *Carina* would move on a generally westward track before making a sharp turn northward on the early morning of July 22. By this time, PAGASA reported that *Carina* intensified into a typhoon as it continued to increase strength over the Philippine Sea. However, it did not make landfall on any Philippine island.

*Carina*, despite being more than 900 km away from Metro Manila on July 24, enhanced the *habagat* to produce massive amounts of rainfall on July 24 which led to widespread flooding in the capital region and beyond. According to PAGASA, a total of 461 mm amount of rainfall was recorded in its synoptic station in Science Garden, Quezon City<sup>2</sup>, exceeding the total recorded rainfall of *Ondoy* (international name: Ketsana) in 2009<sup>3</sup> — one of the memorable heavy flood events experienced by the residents of Metro Manila.

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<sup>1</sup> National Disaster Risk Reduction and Management Council. (2024 July 26). Combined Effects of Southwest Monsoon, TC BUTCHOY (2024), and TC CARINA (2024). [https://monitoring-dashboard.ndrrmc.gov.ph/assets/uploads/situations/SitRep\\_No\\_\\_17\\_for\\_the\\_Combined\\_Effects\\_of\\_Southwest\\_Monsoon\\_TC\\_BUTCHOY\\_2024\\_and\\_TC\\_CARINA\\_2024\\_Summary\\_Table.pdf](https://monitoring-dashboard.ndrrmc.gov.ph/assets/uploads/situations/SitRep_No__17_for_the_Combined_Effects_of_Southwest_Monsoon_TC_BUTCHOY_2024_and_TC_CARINA_2024_Summary_Table.pdf)

<sup>2</sup> ABS-CBN News (2024 July 24) *Weather Patrol* [Image Attached] [Status Update] Facebook. <https://www.facebook.com/photo/?fbid=925737406268183&set=a.650104283831498>

<sup>3</sup> Philippine Atmospheric, Geophysical, and Astronomical Services Administration (2010). *Countering the threat of a changing climate*. <https://pubfiles.pagasa.dost.gov.ph/pagasaweb/files/hmd/transparency/Annex55.pdf>

## *The question of flooding in Metro Manila and beyond*

Generally speaking, a flood is defined as water that overflows onto land that is usually dry. It can be caused by a variety of reasons, but in this particular case, the massive amount of rainfall caused the numerous rivers, streams, and *esteros* (estuarial creeks) that crisscross Metro Manila to swell and water to overflow, inundating surrounding areas. At the coastal areas of Metro Manila, Cavite and Bulacan, the reports of flooding could have been caused by higher than normal waves pushed by the strong *habagat* and typhoon winds crashing onto the shore. Storm surges, a rise in sea level caused by pressure and winds from storms, may have also been a factor, but additional data and analysis is needed to confirm its occurrence.

Questions have been raised on why flooding in Metro Manila persists despite various state-led interventions, supposedly drawing lessons from the massive Ondoy-induced flooding in 2009 and other similar events<sup>4,5</sup>. Geographically, the capital region sits atop flat alluvial lands that extend from the mouth of the Pasig River in the west to the Marikina Valley in the east and has many estuaries that connect to the main tributaries in the Metro. Estuaries gradually disappeared in the city between 1899 and 1908 according from old maps and references<sup>6</sup>. Furthermore, after an ocular inspection of sites closely related to the “lost estuaries,” the exposed culverts imply that these were covered by urban housing instead. The buried estuaries were historically linked to extend up to the Pasig River, which could also contribute to the occurrence of flooding.

While the susceptibility of most of Metro Manila to flood-related hazards can be attributed to natural causes (aggravated by unabated urbanization), one must also consider the socio-environmental processes<sup>7,8</sup> that have enabled the massive flooding to occur in Metro Manila and beyond. These processes are entangled with a long history of state and capital-driven urbanization. With the Philippines still ranking the highest in the World Risk Index for two consecutive years<sup>9,10</sup>, it is necessary to probe how socio-economic inequities and lack of coping and adaptive capacities figure into the picture of compounding vulnerabilities of communities to these hazards.

## *State-led interventions to flooding within and beyond the capital region and their impacts*

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<sup>4</sup> Mananghaya, J. (2009 September 28). *Ondoy' leaves 95 dead; 247,555 affected by floods*  
<https://www.philstar.com/headlines/2009/09/28/508947/ondoy-leaves-95-dead-247555-affected-floods>

<sup>5</sup> Rappler (2013) *By the numbers: Ondoy, Habagat 2012, Habagat 2013 Retrieved July 24, 2024* from  
<https://www.rappler.com/newsbreak/39948-by-the-numbers-ondoy-habagat-2012-2013/>

<sup>6</sup> Jubilo, K. G., Algodon, M. R., Torres, E. M., Abraham, Z. D., Ide-Ektessabi, A., and Soriano, M.: LOST WATERWAYS: CLUES FROM DIGITIZED HISTORICAL MAPS OF MANILA AND OTHER PHILIPPINES CITIES, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci., XLII-4/W19, 249–254,  
<https://doi.org/10.5194/isprs-archives-XLII-4-W19-249-2019>, 2019.

<sup>7</sup> Bankoff, G. E. A., Frerks, G. E., & Hilhorst, D. J. M. (Eds.) (2004). *Mapping vulnerability: Disasters, development & people*. Earthscan.

<sup>8</sup> Marks, D. (2019). The political ecology of uneven development and vulnerability to disasters. In R. Padawangi (Ed.), *Routledge handbook of urbanization in Southeast Asia* (pp. 345-354).

<sup>9</sup> Atwii, F., Sandvik, K.B, Kirch, L., Paragi, B., Radtke, K., Schneider, S., Weller, D. (2022) *World Risk Report 2022*. Bündnis Entwicklung Hilft, Ruhr University Bochum – Institute for International Law of Peace and Armed Conflict [https://weltrisikobericht.de/wp-content/uploads/2022/09/WorldRiskReport-2022\\_Online.pdf](https://weltrisikobericht.de/wp-content/uploads/2022/09/WorldRiskReport-2022_Online.pdf)

<sup>10</sup> Bündnis Entwicklung Hilft, Ruhr-Universität Bochum – Institute for International Law of Peace and Armed Conflict (2023) *World Risk Report 2023*.  
[https://weltrisikobericht.de/wp-content/uploads/2024/01/WorldRiskReport\\_2023\\_english\\_online.pdf](https://weltrisikobericht.de/wp-content/uploads/2024/01/WorldRiskReport_2023_english_online.pdf)

Since the American occupation of the Philippines, much of the state-led interventions to flooding have focused on engineering approaches<sup>11</sup>, putting a premium on flushing out excessive stormwater to large bodies of water and preventing it from reaching people in their communities and key infrastructure<sup>12,13</sup>.

President Ferdinand R. Marcos Jr. drew from his late dictator father's playbook in the 1970s for his administration's *Build Better More* plan. He turned to infrastructure and large urban-scale technologies to attempt to mitigate flood impacts and anticipate future flooding events within and beyond the capital region. In 2023, Marcos Jr., pushed for the approval of the ₱255 billion budget for flood control projects under the Department of Public Works and Highways (DPWH). This is the fifth biggest budget allocation in the 2024 National Budget, compared to the ₱167 billion budget of the Department of Agriculture, ₱27 billion budget of the Department of Science and Technology, ₱31 billion of the Commission on Higher Education and the ₱106 billion for the combined 116 state universities and colleges.

During his third State of the Nation Address on July 22, he touted the completion of 5,500 flood control projects during his administration amounting to ₱208.55 billion under the auspices of DPWH<sup>14</sup>. One of these is the foreign loaned \$207.6 million (equal to around ₱12.13 billion) Metro Manila Flood Management Project which started in 2017. It aims to help solve the flooding problem in the metropolis, expecting to benefit 3.5 million flood-affected people in NCR. Major components of the project include 'modernizing' drainage areas by improving 36 existing pumping stations and constructing 20 new ones. Another major component is minimizing solid waste dumping in waterways focusing on waste collection and disposal systems in the vicinity of pumping stations<sup>15</sup>. During the height of *Carina* and the *habagat*, the Metro Manila Development Authority reported that all of its 71 pumping stations were operational but could not contain the flood waters. The volume of rain that the existing pumping stations could handle 30 mm/hour intensity, but the recorded rainfall in Metro Manila was at 74 mm/hour at that time, more than double its supposed capacity<sup>16</sup>.

Despite the heavy state investment in these projects, massive floods still occurred in the capital region and nearby provinces. After visiting flood-hit areas in Malabon and Navotas, President Marcos Jr. attributed these to the garbage problems surrounding the Metro and climate change, putting the responsibility on ordinary people as the culprits of the disaster<sup>17</sup>. This victim-blaming of the recent flooding event misses out on many aspects:

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<sup>11</sup> Saguin, K. (2017). Producing an urban hazardscape beyond the city. *Environment and Planning A*, 49(9), 1968-1985.

<sup>12</sup> Macdonald, N., Chester, D., Sangster, H., Todd, B. & Hooke, J. (2012). The significance of Gilbert F. White's 1945 paper "Human Adjustment to Floods" in the development of risk and hazard management, *Progress in Physical Geography*, 36(1), 125-133.

<sup>13</sup> Wenger, C. (2015). Better use and management of levees: reducing flood risk in a changing climate, *Environmental Reviews*, 23(2), 240-255.

<sup>14</sup> Marcos, F. R., Jr. (2024, July 22). 3rd State of the Nation Address of His Excellency Ferdinand R. Marcos Jr., President of the Philippines to the Congress of the Philippines. Presidential Communications Office. Retrieved July 24, 2024, from <https://pco.gov.ph/presidential-speech/3rd-state-of-the-nation-address-of-his-excellency-ferdinand-r-marcos-jr-president-of-the-philippines-to-the-congress-of-the-philippines>

<sup>15</sup> Asian Infrastructure Investment Bank. (2017). Philippines: Metro Manila Flood Management. <https://www.aiib.org/en/projects/details/2017/approved/Philippines-Metro-Manila-Flood-Management.html>

<sup>16</sup> Mendoza, J. E. (2024 July 25). Metro Manila pumping stations overwhelmed by heavy rains — MMDA. Inquirer. <https://newsinfo.inquirer.net/1965075/metro-manila-pumping-stations-overwhelmed-by-heavy-rains-mmda>

<sup>17</sup> De Leon, D. (2024 July 25). Marcos blames climate change, poor trash disposal for severe Metro Manila floods. Rappler.

1. Flooding itself is a complex phenomenon. Given the extreme rainfall event that happened in recent days, it is important to determine whether the flood type is pluvial (street-level flooding), coastal (mostly caused by storm surges), or riverine (overflow of rivers), or combinations of these<sup>18</sup>. Recognizing the differing dynamics of these flood types will provide a better picture of the flood management interventions that should be implemented.
2. Metro Manila has a long history of flooding with several infrastructural interventions to control it. These include the multibillion-peso flood projects supposedly designed for 'extreme weather events' which clearly failed to contain the recent flooding, raising the question of where these billions of funds went. As pointed out previously, the purpose is to ensure that excess stormwater flows to larger water bodies. However, given the massive flooding that occurred in the capital region and its nearby provinces, it is important to examine whether these measures work in the context of other types of flooding (i.e., riverine), and to explore methods beyond structural ones to manage flooding in the city.
3. There is a clear lack of prioritization of both non-structural (e.g., inclusive land use policy) and soft structural (e.g., watershed rehabilitation and restoration) approaches in the government's flood management policy.

The government's flood control program in Metro Manila and beyond reflects an exclusionary technocratic and top-down approach to disaster governance in the urban setting<sup>19</sup>. While these structural projects provide some protection to communities living in these areas in the short term, risk production becomes more pronounced, especially when infrastructure fails, thereby exacerbating their vulnerability to flood-related hazards<sup>20</sup>. This often happens at the expense of urban poor and fishing communities living along rivers and coastal areas<sup>21</sup>, evicting them in the process to make way for 'development projects'<sup>22</sup>. Furthermore, as different forms of development aggressions are being pushed to make way for profit-oriented interest of the private and foreign corporations, some in the form of greenwashing, Filipinos are being pushed out to conditions where their risk to disasters are amplified. Even now, we are still coming to terms and have yet to fully grasp how much the reclamation projects in Manila Bay, the different quarrying activities in nearby provinces, the denudation of Sierra Madre, and the removal of protections to key protected areas contributed to the different flooding events we experienced the past few days. This flooding incident is further compounded by Metro Manila's annual land subsidence and sea level rise<sup>23,24</sup>.

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<https://www.rappler.com/philippines/metro-manila/marcos-blames-climate-change-poor-trash-disposal-severe-floods-july-2024/>

<sup>18</sup> Rahman, A.. (n.d.). Common flood types explained.

<https://www.zurich.com/-/media/project/zurich/dotcom/industry-knowledge/flood-and-water-damage/docs/three-common-types-of-flood.pdf>.

<sup>19</sup> Pante, M. D. (2016). The politics of flood control and the making of Metro Manila. *Philippine Studies: Historical and Ethnographic Viewpoints*, 64(3-4), 555–592.

<sup>20</sup> Saguin, K. (2017). Producing an urban hazardscape beyond the city. *Environment and Planning A*, 49(9), 1968–1985.

<sup>21</sup> Alvarez, M. K. (2019). Benevolent evictions and cooperative housing models in post-Ondoy Manila. *Radical Housing Journal*, 1(1), 49–68.

<sup>22</sup> Alvarez, M. K. and Cardenas, K. (2019). Evicting slums, 'building back better': Resiliency revanchism and disaster risk management in Manila. *International Journal of Urban and Regional Research*, 43(2), 227–249.

<sup>23</sup> Rodolfo, K. S., & Siringan, F. P. (2006). Global sea-level rise is recognised, but flooding from anthropogenic land subsidence is ignored around northern Manila Bay, Philippines. *Disasters*, 30(1), 118–139.

<sup>24</sup> Eco, R. C., Rodolfo, K. S., Sulapas, J. J., Morales Rivera, A. M., Lagmay, A. M. F., & Amelung, F. (2020). Disaster in slow motion: Widespread land subsidence in and around Metro Manila, Philippines quantified by InSAR time-series analysis. *JSM Environmental Science & Ecology*, 8(1), 1068.

## *Ways Forward*

The case of the flooding disaster in the past days and the different disasters that Filipinos unequally historically faced is a yearly event that we are forced to accept. Must we be stuck in this time loop of unpreparedness despite ideally being used to natural hazards by now?

The Marcos government must be accountable for the death, damages, and sufferings our people experienced in the latest flooding disaster. His administration's poor disaster risk reduction and management structure, its corruption-laden and ineffective flood-control projects are the major culprits of this recent disaster. Environmentally destructive projects like quarrying and large-scale mining exacerbate the hazards associated with floods by increasing sediment load resulting in more damaging floods. Reclamation projects, on the other hand, reconfigure flooding patterns in coastal regions, potentially altering natural outflow and stream discharge to the sea. More importantly, these types of development aggression projects often result in dispossession and displacement of communities. As climate change and its impacts have become a normative discourse in the past decade, there is no space for its blatant use to divert the real condition in our country—climate change and individual responsibility are excuses used by those in power for their ineptitude and inutility.

Mitigating the effects of disasters will require the people push for the various systemic reforms to the current governance and economic structures. The most immediate action can be for communities to push the government to ensure the proper utilization of the country's budget for disaster risk reduction and management. Plans and programs must be appropriate to conditions of each community, putting into the front and center concerns of marginalized oppressed sectors. There is also a need to establish and construct effective evacuation centers that are based on the appropriate hazard maps, early warning systems, and appropriate flood management interventions. Information and data related to disaster management planning must be readily available to the public using open data and open science frameworks. Flood preparation plans must be people-centered; current disaster governance bureaucracy, policies, and disaster risk and reduction management policies must be reviewed, and if need be, overhauled.

Whatever the government does, disasters will continue to happen under its neoliberal regime of policies and projects that further devastate our environment and communities, worsens economic hardships in the country, and increases the vulnerability of our countrymen. If we are to indeed live in a climate-ready, healthy, and safe environment, we must hold our leaders and the government accountable for the chronic disasters our cities face. Calls for climate justice should also highlight the need to include calls for genuine pro-people hazard preparedness in our cities and radical change in governance. In the long run, the people must struggle to have a government that is responsible and accountable, unlike the present one which victim-blames the people of a flood disaster that itself is responsible.