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Tuning in to Survive: Media and Disaster Mitigation in Post-Yolanda Philippines

A Dissertation submitted in partial satisfaction
of the requirements for the degree of

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by

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This dissertation is dedicated to the survivors and victims of Typhoon Yolanda.

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ABSTRACT OF THE DISSERTATION

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by

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"We did not know we would be swimming," residents of San Jose Beach neighborhood in Tacloban City, Philippines told me, reflecting on Typhoon Yolanda wave surges. However, storm surge warnings circulated in official state updates. How could they have not known? Something was lost in communication. This dissertation shows how low-income coastal dwellers experience inequality within the disaster communication infrastructure of the Philippines, and examines the stakes involved in typhoon communication as a tool for survival in a time of global climate change. Communication gaps and assumptions made in disaster media have created the conditions for death, injury and property loss. I show in this dissertation that vulnerability and inequalities are not only experienced in disaster, but are also produced within the disaster mitigation and relief infrastructures. This dissertation is based on long-term ethnographic research conducted in Tacloban City, Philippines in the years after Super-typhoon Yolanda (Haiyan) caused extensive death and destruction in the region.

Communication is an integral part of experiencing disaster. Residents of the Philippine Islands receive on average 19 typhoons every year. Typhoon alerts help affected people prepare for and survive oncoming typhoons. Beyond that, media like television and radio help interpret state-issued alerts to the public, or act as hotlines to answer questions. While these alerts are produced with the expectation that the message will make its way to all residents equally, that is not the reality. Residents across the Philippines experience disaster communication in different ways—according to their relationship to the infrastructure (access to media, their relationship to their local government, and more). This project asks: How do people experience the disaster communication infrastructure unequally? How does infrastructural inequality affect the ability of families and neighborhoods to respond to and survive a typhoon? I show throughout the dissertation that vulnerability and inequalities are not only experienced in disaster, but are also created in the space of disaster and media infrastructure. In particular I consider how vulnerabilities are produced through lived interactions with the disaster media infrastructure, historically-rooted marginalizations from infrastructure, and experiences of temporality through media and disaster.

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INTRODUCTION

"We did not know that we would be swimming." That was a recollection of Typhoon Yolanda shared to me by several residents of the neighborhood of San Jose Beach in Tacloban City, Philippines. Residents experienced 5-meter storm surges during Super-Typhoon Yolanda (Haiyan) in 2013. Within minutes, the walls of water washed people out of their homes to open sea, and left the neighborhood completely demolished. The "victims" drowned, and the "survivors" swam.[1] Most of the 10,000 estimated deaths from Yolanda were attributed to the storm surges.[2] The storm surge warning circulated in media typhoon updates, but something happened in communication. The residents of San Jose Beach had radios, cellphones, TVs and vigilantly collected typhoon updates. What happened to the storm surge warning in those hours before Yolanda's landfall? Why did they not know that they "would be swimming"?

Communication is everything in the hours before a typhoon's landfall. I learned how typhoon preparation strategies changed hourly. In these hours, people listened to and watched alerts prepared by the national meteorological service, PAGASA, and disseminated through media and local government. People also shared information and updates between family, friends, neighbors to anticipate what the typhoon might do to their homes, belongings, and personal safety. Preparations and evacuations were made over hours, not minutes. While the intensity of Yolanda was unprecedented, the experience of typhoons was not. People had

[1] This was the terminology used by disaster-affected people themselves. Other organizations may differently define people affected by Typhoon Yolanda as "victims," whether they survived or not, or "disaster-affected people," for example.

[2] The government count of deceased was 6,300 (NDRRMC, 2013). However, many from Tacloban City claimed that the death toll was too low, and possibly did not account for those bodies buried en masse within just a few days after the typhoon. Other estimates that the death toll was closer to 10,000, or even more.

strategies for preparing for and sheltering during the course of typhoons. As the typhoon approached, people adjusted to different challenges by the hour: boarding up the house, packing essential needs, evacuating entire neighborhoods, emotionally and physically bracing the environmental hazards like winds, flying debris and walls of water, and the challenge of knowing or anticipating the immediate future during crisis. Through each challenge of preparation, people continued to communicate, watch, listen and adjust to a typhoon's growing intensity or redirection. These were the important experiences of disaster that were often disregarded by the media, and missing from our conceptions of disaster.

Research on disaster tends to analyze media and communication as they are produced and disseminated by the government and the media, and stops short of considering how this information is received and interpreted by the public. Researching media from the audience end, I found that people do not receive disaster information uniformly due to unequal media access, and that the most important part of disaster communication is what happens in the home, and the streets. Experiences of disaster communication depend on certain conditions such as a person's access to technologies, language barriers, and relationship to the local government. In this regard, media uses are also diverse, and may deviate from their intended uses. For example, weather updates are meant to be uniformly announced across all media in the Philippines, but residents know that each program interprets the information in different ways. Therefore, residents piece information together the media programs they trust most. This is the value of an ethnographic perspective on disaster communication: that the everyday choices and everyday practices of disaster communication are revealed.

This dissertation shows how low-income coastal dwellers experience inequality within the disaster communication infrastructure of the Philippines, and examines the stakes involved

in typhoon communication as a tool for survival. Communication is an integral part of experiencing disaster. Residents of the Philippine Islands receive on average 19 typhoons every year. Life-saving alerts give affected people time to prepare for oncoming typhoons, plus information about how to best prepare. Beyond that, media like television and radio help interpret state-issued alerts to the public, or act as hotlines to answer questions. While these alerts are produced with the expectation that the message will make its way to all residents equally, that is not the reality. Residents across the Philippines experience disaster communication in different ways—according to their relationship to the infrastructure (access to media, their relationship to their local government, and more). This project asks: How do people experience the disaster communication infrastructure differently/unequally? How does infrastructural inequality affect the ability of families and neighborhoods to respond to and survive a typhoon?

This dissertation project looks at issues of unequal experiences of disaster, and unequal disaster vulnerability through a unique lens: media infrastructure. While the social scientific study of disaster contributes to our understanding of how risks and vulnerabilities are unequally distributed, it has not considered in depth disaster inequalities and media infrastructures. Scholars have focused on media coverage of disaster, and certain "effectiveness" studies of media warnings (Button, 2010; Klinenberg, 2002). These studies take media production as the point of analysis. They do not enter into the question of the experience of media infrastructure for media audiences/ disaster-affected people. Other research, which does take the experiences of media audiences as a main object of study, focuses on social media use in disaster communication (Madianou, 2015). This excludes consideration of those who rely on more affordable technologies like television and radio for disaster alerts. This dissertation project

takes media reception as the point of analysis in order to understand the life of the disaster alert after it has been broadcast, and when it has reached the public, and takes a more holistic approach to understanding peoples' relationships to disaster communication and media infrastructures. Furthermore, important to this direction, is the study of the disaster alert after its broadcast—as it circulates peoples' social relationships. How do people interpret and use the information they receive? What are peoples' strategies for gathering information, and what family, friend and neighbor networks do they use for sharing information? This fills an important, missing piece of our understanding of disaster communication: What is the afterlife of the message once it has been broadcast, specifically in the experiences of residents of an impoverished coastal/storm-surge prone neighborhood?

To answer this question, I analyzed the ways one neighborhood of disaster-affected people receive and use disaster alerts. Through long-term ethnographic research, I show how people accessed, experienced, and interpreted disaster communication in diverse ways. At the time of my field research (2016-2018) San Jose Beach was a coastal purok ("neighborhood," the smallest governing unit in the Philippines) of about 50 households. San Jose Beach had been completely destroyed by the storm surges of Typhoon Yolanda in 2013. Many residents there died during the storm. Many survivors moved away to be with family in other parts of the Philippines, or to the relocation villages later built outside the city. A fraction of the original residents (originally more than 300 households) stayed in the beach-side area due to their vocation as fisherfolk, or their desire to stay in the place they had lived for all or most of their lives. Through ethnographic research, such as participant-observation and interviews, I investigated how these residents (as previously disaster-affected people) dealt with ongoing residence in a storm-surge prone zone. I focused in particular on communications and media

which were a central disaster prevention infrastructure that they relied on. I researched how people accessed, experienced, and interpreted disaster communication in diverse ways in order to improve their ability to survive a typhoon or earthquake.

I found that people do not receive disaster information uniformly due to unequal media access, and so the most important part of disaster communication is what happens in the home and on the streets after an alert has been broadcast. Although people faced lack of access to media technologies, they devised work-arounds to obtain weather updates regularly. Often, people worked together with their neighbors to listen to the radio or watch television in groups, to share information gained from multiple sources, or to decide together whether to evacuate. I found that people could not—and they did not—rely on government communications. Rather, they built networks of trust and communication with family, friends and neighbors to circulate information, and carry out disaster risk reduction. Finally, I found that disaster communication for the impoverished coastal residents of this study was an everyday practice, rather than a practice restricted to crisis moments. As residents anticipate extreme typhoons due to climate change, any day can be the day that the next Yolanda forms, and the sooner they can be alerted, the better.

This project focuses in particular on socioeconomic status to investigate differential/unequal relationships to infrastructure. Star has argued that people have different relationships to infrastructure and therefore they carry different understandings and meanings for infrastructure as well (Susan Leigh Star, 1999). Star and other scholars of infrastructure tend to analyze “hard” infrastructures such as water pipelines, electricity grids. Brian Larkin shows how media infrastructures are different because of their “hard” (technical/material) and “soft” (informational) aspects. For Larkin infrastructure are the, “totality of both technical and cultural

systems that create institutionalized structures whereby goods of all sorts circulate, connecting and binding people into collectivities." (Larkin, 2008, p.6). This project also focuses on this "collectivities" aspects of infrastructure. Considering infrastructure's role in producing social relationships and collectivities, I consider how disaster communication binds people based on social relationship (family, friend, coworker, etc.), and also based on shared vulnerabilities of location. I find that experience of certain common/shared hazards (infrastructural marginalization, governmental disenfranchisement and experiences of environmental hazard due to location) socially binds and defines the neighborhood of San Jose Beach.

Impoverished coastal residents, who experience governmental disenfranchisement, access to fewer resources and dwell in the "danger zone" of storm surges experience disaster in certain infrastructural relationships, governmental relationships and temporal experiences that construct a certain experience of vulnerability. This dissertation considers disaster vulnerability as produced by technologies that we assume to help in disaster situations. This aligns with Lakoff and Collier (2010) that vulnerability is focused on areas reliant on infrastructure—the presence of infrastructure is itself seen as a vulnerability. In other words, the conditions for vulnerability are set by the presence and peoples' dependence on infrastructures. For the authors, vulnerability materializes as the relationship between event and infrastructure—the catastrophe, and the ability for response. However, I focus on the vulnerabilities produced specifically for low-income and those who were not included in design of the technology—not just when infrastructure is in breakdown. As Larkin recognizes the "hard" and "soft" aspects of infrastructure, Anthony Oliver-Smith speaks to the idea that disasters are created in both (and between) the material and the social worlds. Anthony Oliver-Smith conceptualizes vulnerability as a way to understand the multidimensionality of disaster (Oliver-Smith 2001, 2004). Oliver-

Smith sees vulnerability as a key concept making the multidimensionality of disasters better understood: “At least from the perspective of hazards and disasters, vulnerability is the conceptual nexus that links the relationship that people have with their environment, to social forces and the institutions and cultural values that sustain or contest them” (Oliver-Smith, 2004, p. 10).

Within this framework, this dissertation considers the production of vulnerability through infrastructure—disaster media infrastructures in specific. How does the presence of an infrastructure actually create vulnerabilities for its users? In specific, I look at the vulnerabilities produced for low-income media users living in a coastal area prone to storm-surge during typhoons.

Media infrastructure as they are analyzed in this dissertation, take on different characteristics in use for disaster. Temporality is one such characteristic. By combining theoretical framework on disaster and infrastructure, I add another dimension to consideration of disaster media infrastructures. I apply the concept of “slow violence” to understanding disaster media infrastructure. This helps us analyze media infrastructures and the temporalities of disaster. Rob Nixon defines “slow violence” as, “a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all” (Nixon, 2011, p.2). Nixon argues that “slow violence” shows how temporal displacements of disaster conceals its magnitude (from our perception). I find this concept applicable to disaster media infrastructures, in which disaster is experienced at different temporalities. I consider specifically, anticipation of future disaster due to climate change, and the urgency of the possibility that the approaching typhoon is the

fruition of those anticipations. "Slow violence" adds another dimension, therefore, to understanding disaster media infrastructures.

With these theoretical frameworks in mind, I here outline my main arguments in the dissertation. I earlier mentioned that this project investigates how Philippines unequally experience disaster communication. More specifically, I aim to show throughout the dissertation that **vulnerability and inequalities are not only experienced in disaster, but are also created in the space of disaster and media infrastructure.** In many respects, disaster media has created the conditions for death, injury and property loss. This has happened through miscommunications and assumptions in the gap between government/scientific expectations and realities. For example, the technical term "storm surge" was used for the first time during Typhoon Yolanda without adequate explanation. Although this was scientifically accurate language, it was not culturally (useful) term because more people would have understood they were in danger of large seawater swells if "tsunami" had been used instead to warn them. **People experience disaster vulnerability through multiple temporalities of disaster, and media plays a prominent role in constructing those temporal experiences.** People, like the residents of San Jose Beach, who currently experience vulnerabilities to storm surge during typhoons experience. I compare DRR sense of disaster temporality with temporalities expressed/experienced by the disaster-affected people I worked with. I found that while DRR frames climate change related disaster as a somewhat distant, not-yet-tangible possibility, disaster-affected people in San Jose Beach understand the next extreme weather event as a visceral, immediate reality. Finally, the creation of vulnerabilities within disaster and media has roots in the Philippines' colonial history. **This project understands media technologies and**

disaster communication as specifically colonial inventions, and considers what continues in the colonial afterlife of the structure of disaster communication and media technologies.

I first argue that the national disaster communication infrastructure produces uncertainty for impoverished coastal residents because they use an infrastructure that is not designed around their needs. Whitington (2018) defines uncertainty as a tactical relationship to knowledge. For him, this means that uncertainty has a constitutive relationship with knowledge: "…a condition for action or of not knowing how to act, as well as a predicament of disenfranchisement in the material conditions of infrastructure and environment" (emphasis original) (Whitington, 2018, p.6). This disenfranchisement from disaster communication has roots in the colonial foundations and later nationalistic re-organization of meteorological services in the Philippines. I show how meteorological sciences and disaster alert system, developed in tandem, were founded in service to colonial science and the military, and later to urban dwellers of Manila. During my field research, I found that SJB residents could not participate in disaster communication as intended because of several assumptions about how publics engage with disaster communications. First, government assumed that all publics interpreted information (especially scientific information) in ways that scientists intended. Second, the government assumed that people have equal access to communications. Last, the government assumed that all branches and officers of the government would function as planned during a disaster. These assumptions produced the conditions for reoccurring uncertainty with typhoons and earthquakes experienced in SJB.

I also argue that the most important aspects of the disaster communication infrastructure are not what we imagine to be the scientific reports and media dissemination, but rather the re-circulation of information among social connections. Star (1999) puts forth the

idea that infrastructure is "relational"—that it means different things to different groups—and that infrastructure is differently understood and experienced outside of its "master narrative." For Star, infrastructure gets complicated when we look at situations where people are not served by the infrastructure. In SJB, disaster communication posed such a situation. SJB residents had unequal access to disaster information from radio, television, text message, internet government communications. However, they still used the infrastructure—only they adapted other communication practices to get a fuller experience of available information. For example, those without a television formed regular viewing gatherings with those who did. Or, in another example, a radio-listener and a television-watcher shared with each other what they had learned through the different media. These two individuals created a more rounded understanding of the approaching typhoon by sharing information. Looking at the "other narrative" of infrastructure, I show how disaster communication for SJB residents, who are not served by the infrastructure, involved both infrastructural interaction and social practices.

Finally, I argue that disaster communication is temporally unbound to a disaster's onset event, and that there are multiple temporalities experienced in disaster communication. In SJB, disaster communication was an everyday practice that was engaged in before a typhoon alert was issued. In the Philippines, typhoons form throughout almost every month of the year. Therefore, many SJB residents tuned in to media everyday—and often multiple times per day—to get the very first knowledge that a typhoon was forming. This gave them several days to monitor the situation and make preparations. The time spent monitoring for typhoons before they even form, then, was an important part of their disaster communication practices. Yet, in disaster research, these everyday monitoring practices are not considered as part of disaster communication. Social science perspectives on disaster inequalities have pushed for re-

conceptualizing how we understand the temporal and spatial bounds of disaster. The sort of failures and injustices that occur in disaster often means looking at history before and events after the onset event. From the perspective of vulnerability and the political ecology of disaster, Oliver- Smith (1999) argues that, "the life-history of a disaster begins prior to the appearance of a specific event-focused agent" (Oliver-Smith, 1999, p.p.29-30). Oliver-Smith here interprets the "pattern of vulnerability" (Hoffman & Oliver-Smith, 1999) to disaster that people differentially experience as a product of history. Klinenberg (2002) found that the history of social breakdown and neglect of senior and poor areas contributed to several hundreds of deaths during the Chicago heat wave in 1995. In this way, certain populations were formed into victims of the heat wave even before it occurred. Adams (2013) found that disaster inequalities in New Orleans also occurred after Hurricane Katrina. Privatized relief services imposed economic hardship on affected people because they profited by providing services, and then used volunteer labor to sustain their businesses. In both these works, the inequality in disaster is evident outside the onset of the disaster event. I show how this is an important consideration to understand how SJB residents prepare to mitigate their vulnerabilities long before a typhoon alert is sent out. However, I push this further by showing how, in a situation where typhoons are cyclical and earthquakes are frequent, the beginning of a disaster's life history often occurs within the life history of another disaster. Residents of SJB still considered themselves in the recovery process from Yolanda, and continued to refer to themselves as Yolanda survivors. Yolanda was not over for them when the category 4 Typhoon Ruby (2014) arrived, and all the other typhoons from then and into the time of my field research. Through the lens of media and disaster communication, I show how the life history of disaster extends into multiple temporalities including a sense of preparation for the anticipated future of hazards associated with climate

change (Crate & Nuthall, 2016), and what I call the "urgent future" in which people must put their knowledge to practice to respond to the anticipated future of the next Yolanda.

In the following sections, I introduce several the themes I work through in this dissertation: disaster communication, different experiences, different needs, inequalities, and typhoon temporalities. I also give background to Typhoon Yolanda's significance to the Philippines and in Tacloban City in particular. I explain how, at the time of this research, Yolanda was an enduring part of how people conceptualized and prepared for typhoons every year. At this time, people primarily understood typhoon hazards and preparation through the concepts of disaster risk reduction (DRR), which constructed the future in terms of anticipation of intensified weather events due to climate change.

16 Hours to Landfall

Typhoon Yolanda (Haiyan) shocked the world as it developed over several days from a low-level typhoon into an unprecedented super-typhoon. News and social media circulated radar images which showed a cyclone swirl of clouds covering nearly the entire Philippine islands. Then, a day later, news and social media circulated images of total destruction, death and suffering. Many narratives of Yolanda focused on the hours of typhoon impact—experiences of winds, rain and storms surges—and on the months and years of recovery. However, an understanding of what Yolanda was like for people *before* it made landfall was missing. There have been many journalistic and academic recounts of survivors' experiences during the horrors at landfall, and excruciating recovery after destruction. These articles constructed meaning from the astonishing power of the storm's destruction, or the tragedies in its aftermath. But, what about the experiences before landfall? Certain experiences of disaster,

like that, are continually unseen and unaccounted for in our policies, research, histories and knowledge of disaster.

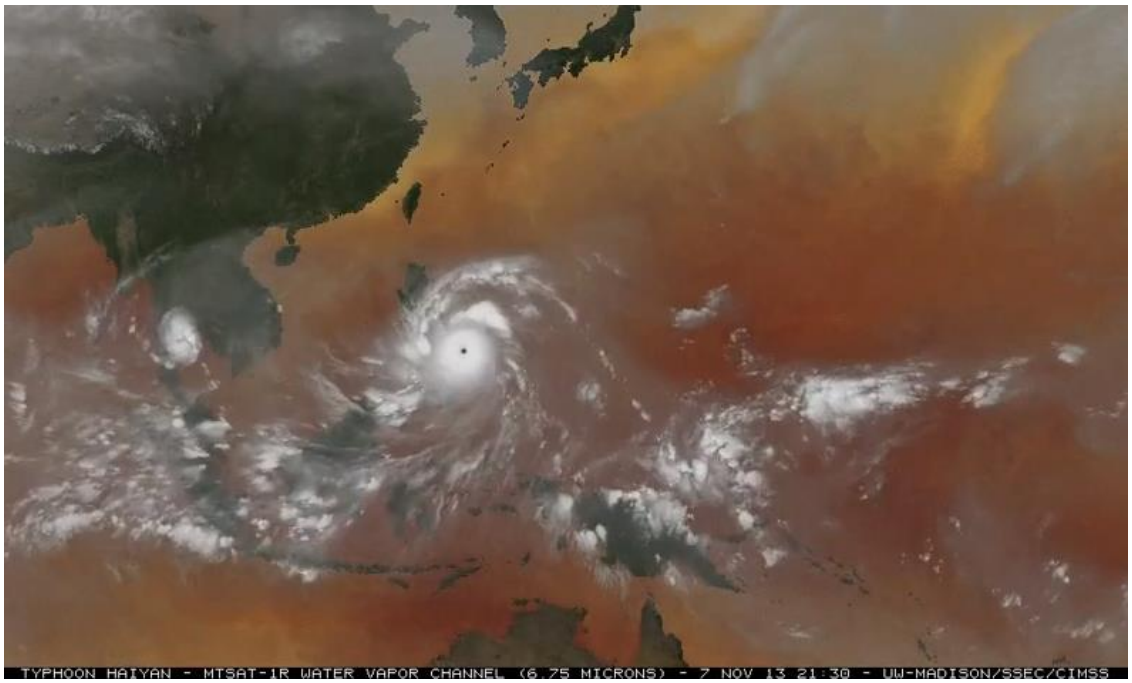

Figure 0.1: Satellite image of Typhoon Yolanda (Haiyan) making landfall over the Philippines, 2013. Image courtesy of CIMSS Satellite, University of Wisconsin, Madison: https://cimss.ssec.wisc.edu/satellite-blog/archives/14311 . Time lapse viewable at: https://www.youtube.com/watch?v=lvCJFV1u69M

The experiences of media use and disaster communication among SJB residents were an unseen area of disaster experiences. To better round out the picture of Typhoon Yolanda, I include here a narrative of what happened in San Jose Beach 16 hours before Typhoon Yolanda made landfall over Tacloban City. This is a creative narrative of Typhoon Yolanda that shifts the timeline of how we understand disaster. I convey what I have learned during my years researching with Yolanda survivors—that the urgent preparations just before disaster were full of hours of mentally exhausting uncertainty, emotionally exhausting fear, and physically exhausting work like boarding up windows, packing up supplies, and evacuating whole

neighborhoods. The narrative is a composition based on the stories told to me by research participants who experienced Typhoon Yolanda in Tacloban City, as well as: news reports on Typhoon Yolanda's progression, scholarly research on the environmental activities that occurred during Typhoon Yolanda, disaster communications from media sources, and participant-observation of typhoon monitoring, typhoon preparation, and the ground conditions experienced in severe weather.[3] Therefore, this narrative does not capture the story of any one person, but rather a mural of what preparing for Yolanda was like. For the purpose of this dissertation, I focus in on the important role of disaster communication and information gathering in the hours before a typhoon landfall.

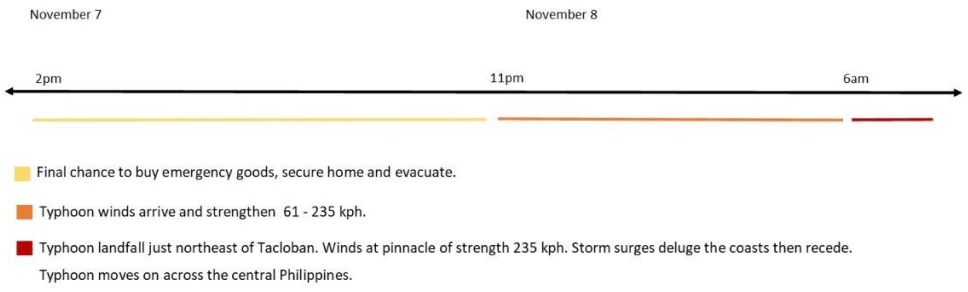

Figure 0.2: Timeline showing the preparations and time spent in uncertainty before Typhoon Yolanda's few hours of landfall over Tacloban City.

[3] Although I received consent, all San Jose Beach participant names, and place names of smaller areas they are involved with, have been changed to protect identity.

2:00 pm, November 7, 2013

There is a mandatory evacuation in place. Yet, the sky is clear, and the air is still and heavy. There are no signs of typhoon—no rainclouds, no wind. The day is unusually hot for November--a month within the "wet season" when rain comes almost daily. In many ways, life proceeds as usual. Neighbors are drinking tuba, and singing karaoke.[4] The music drifts into open doorways where parents take an afternoon nap with their small children. The wistful tunes of an unrequited love song mix with the blare of a nearing voice over megaphone. A local government worker is making an announcement from a moving truck. Evacuation procedures are in effect. Typhoon Yolanda will make landfall tomorrow morning.

4:00 pm, November 7, 2013

Those who decide to leave are already packing their rice, baon, canned goods, cookware, blankets, medicines, flashlights, cellphones, and battery-operated radios.[5] They will carry their supplies, children and livestock 1.4 kilometers (20 minutes' walk) down the highway to San Jose Central School, the designated evacuation center for nearly all 11,000 residents of San Jose Barangay. Some will go to the Astrodome, a large events arena, where there is more space. Others, recounting their experiences of past category 3 typhoons, decide to stay home in San Jose Beach. They weathered those storms, and they will do it again.

[4] *Tuba* is a locally made, or "moonshine" coconut wine.
[5] *Baon* refers to packed meal.

6:00 pm, November 7, 2013

Mano Fidoy prepares for a night alone with the typhoon. He nails shut his home's windows, and covers the porch with a tarp. His wife packs supplies. They agree that she will evacuate with their young children to her brother's house located in another barangay of Tacloban that is distant from the sea. They will stay there for the duration of the typhoon. Fidoy will stay behind in San Jose Beach to guard their home from looters, and prevent water damage where he can.

7:00 pm, November 7, 2013

Mana Josie approaches Fidoy from the neighboring home.[6] *She tells Fidoy that according to the television news, the typhoon has been upgraded to Signal 4. They watch the news together. The field journalists report on preparations happening across the Visayas, in Cebu City, Guiuan, Davao and Tacloban City, they reel footage of volunteers organizing boxes of relief supplies in government buildings, and people setting up mats and blankets in the city buildings that act as evacuation centers in a typhoon. The weather man appears onscreen discussing the path and intensity of Typhoon Yolanda. He says that the typhoon is still approaching the Visayas. Winds have already reached 235 kph with 275 kph gustiness. He advises that people should stay indoors to protect themselves from flying debris. If people live in areas that are prone to flooding or landslides, they should be aware that these are likely to happen. Additionally, there will be a storm surge up to 5 meters in some areas.*

[6] Manang is used to address an older woman who is not a relative, and can indicate a working role.

8:00 pm, November 7, 2013

Mano Fidoy's 5-year-old daughter walks through the open door of Mana Josie's home, and climbs onto her father's knee. A journalist interviews a PAGASA representative.[7] He warns: "Evacuation to safe shelters should be completed already, since it may be too late under a Signal Number 4 situation." Fidoy excuses himself from Mana Josie's company, and brings his daughter back to his home where is wife is waiting and ready to travel to her brother's home. Fidoy accompanies his wife and children to the highway where they will catch a jeepney traveling off the peninsula. As they pass by Mana Josie's open door, they hear the voice of President Aquino making a national address. He urges residents not to take chances, and work together: "Let us exhibit calm, especially as we buy our primary necessities, and as we evacuate to safer areas. Let us coordinate and cooperate with the authorities. If you already know that you are in a hazardous area, evacuate."

10:00 pm, November 7, 2013

Fidoy looks outside to check for any signs of the typhoon's arrival. The night sky is clear and clam. The typhoon is due to arrive by morning, but there does not seem to be any sign of weather. He wonders if the storm shifted course away from Tacloban. He clicks on the battery-operated radio to check for any updates. Nothing new yet, and he turns the radio off to conserve battery. He calls his wife, now at their relatives' house. She is safe and surrounded by many family members, but she worries about him there alone.

[7] PAGASA is the governmental agency responsible for the Philippine national weather monitoring and alerts (the Philippine Atmospheric, Geophysical and Astronomical Services Administration).

11:00 pm, November 7, 2013

Winds have started to pick. Mano Fidoy hears the low steady howling punctuated by the brunt of a gale. He switches on the radio, and this time he does not shut it off.

12:00 am, November 8, 2013

A fellow fisherman calls to Mano Fidoy from outside of the house. He noticed that the sea had receded far out from the coast. Together they investigate. The water has gone out further than low tide, even, and they see that they could walk for nearly a kilometer off the coast if they wanted. The two don't know what to make of it. It is like what they know to be a sign of tsunami. But this is no tsunami this is a typhoon. The strong gales whip around them. They go for shelter back in their homes.

2:00 am, November 8, 2013

Rain water is forced through even the smallest openings by the wind, which rattles the whole house and rips at the roof.

Broadcaster Ronald Viña and station technician Allan Mendiola at DYVL have not gone home to their families. They made their decision just hours earlier to stay at the radio station in downtown Tacloban City, and broadcast updates throughout the typhoon. They have been asking listeners to text in updates and concerns from their locations.

4:00 am, November 8, 2013

Wind speed is now roaring town on the house. It sounds like a steady stream of airplanes swooping down overhead for landing. The radio is still on, and the Ronald Viña's voice is firm and

paternalistic. It is the only comfort, though barely audible, against the noises of the typhoon outside. Mano Fidoy wonders if the typhoon has made landfall already, and decides to text in this question to the radio station. Within a few minutes he hears Ronald Viña read his question out, and he says he will try to communicate with his PAGASA contacts for information.

5:00 am, November 8, 2013

Ronald Viña announces that PAGASA has confirmed that Typhoon Yolanda is now making landfall over the Philippines, only 140 kilometers east of Tacloban, in Guiuan. He reads off text messages from those in Guiuan giving descriptions of the wind and damages occurring there.

7:00 am, November 8, 2013

On the radio, Ronald Viña expresses concern that for 2 hours now, no text updates have come from the city of Guiuan. The host requests again for any news from Guiuan, and adds, "Our prayers are with you." Whatever weather hits Guiuan usually follows through to Tacloban a couple hours afterward. There is only roar of typhoon gales and rainstorm, and the silence of the radio.[8]

A wave crashes into the side of the house. Flows of seawater follow, filling up Fidoy's home. He looks for a way up to the roof. After a minute, the water has already reached his thighs. Another wave rocks the house, and more water follows. The water raises past Fidoy's rooftop, and he is swimming to stay afloat on the rushing wave.

[8] Visual of morning of November 8, 2013 Typhoon Yolanda windspeed and gusts: Retrieved from: https://www.youtube.com/watch?v=wUOK2sn-cDQ

Mano Fidoy was swept out 3.5 kilometers to the Astrodome, the city's stadium that tragically was not able to protect many evacuees sheltered within. He swam to stay afloat the fast water, and clung to debris and buildings. Many others, though, were not able to survive the storm surges. Bodies were found as far as the San Juanico Bridge, 16 kilometers away from SJB.

I also start the dissertation with this narrative to show how these pre-landfall hours were a critical part of experiencing Yolanda. People went through arduous preparations of buying food, boarding up windows, locating and packing up important documents and evacuation needs, uncertainty through each hour of changing weather conditions, and a sleepless night to be ready for any development in the typhoon.

Media and disaster communication in particular took on increased importance in the hours before Yolanda's landfall. SJB residents had a limited timeframe to collect information, process that information for their own locations and needs, make decisions and take life-saving and property-saving action. The communication networks they relied upon to make this happen became vital. Communications were a constant part of everything else that was going on to prepare for disaster. For example, the local government (barangay) sent out a truck to announce by megaphone (bandilya) that mandatory evacuations were in place for the area. Mana Josie shared her TV with Mano Fidoy to view an important update—an address from the President. Mano Fidoy's neighbor made a home visit to discuss the new development of the receding shoreline. With his family evacuated, the cellphone became the only way for Mano Fidoy to keep in touch with his wife and children. Finally, Fidoy's radio gave him non-stop local updates through multi-directional communications—he texted in a question, other listeners texted in updates, and the radio station facilitated the flow of communications locally. The circulation of

typhoon knowledge and information has intricate relationships with the multiple temporalities of experiencing disaster.

Typhoon Yolanda as a Context for Disaster Communication

The dissertation is about Yolanda, and it is not. I came to research in Tacloban City after Typhoon Yolanda made landfall, in November 2013, and even after most relief operations ended their services in 2014. However, this dissertation is still about Yolanda in the sense that the experience of Yolanda cannot be bound to the time of landfall and the departure of relief services. Yolanda is a part of all the other typhoons, alerts and disaster preparations experienced and anticipated afterward. Typhoon Yolanda was an unprecedented experience for Philippine residents who prepare for typhoons to landfall every year, and have already experienced at least a few typhoon landfalls in their lifetime. Yolanda also stressed and challenged the limits of the decades of built disaster management and risk reduction policies in the Philippines. Typhoon Yolanda was a key turning point to how citizens and the government conceptualized typhoons and the needs of the Philippines to face them. Typhoon Yolanda set the context of disaster communication practices at the time I was conducting research in Tacloban City.

Typhoon Yolanda mostly affected the central Philippine islands known as the Visayas, but the disaster shook the whole nation. On November 8, 2013, the typhoon traveled east to west across the Visayas. Samar and Leyte, the easternmost islands, took the brunt of the force. Tacloban City, the major urban area in the islands, ended up with the most significant destruction in the country in terms of people affected and damage costs. Yolanda was categorized as a Level 4 “super-typhoon” all through its travel across the Philippines. The next

day, however, PAGASA determined that Yolanda should be retroactively re-categorized as a level 5 typhoon based on its maximum windspeeds of 235 kph. At the time, the Philippine typhoon warning categories only went as high as Level 4. Besides the wind damages, people across the Visayas experienced flooding and landslides due to substantial rain. In the eastern-most islands, where Tacloban City is located, coastal areas experienced storm surges 5 meters high—enough to deluge the entire first floor of buildings. An estimated 10,000 people were killed, 4 million people displaced, and 1.1 million houses damaged or destroyed (United Nations Children's Fund (UNICEF), 2013).[9] News of the supertyphoon made international headlines, and Typhoon Yolanda remained an international humanitarian event for several months.

Typhoon Yolanda's strength was unprecedented, and citizens and government alike could not fully prepare for what happened. On average, 20 typhoons enter the Philippine Area of Responsibility (PAR) every year, typically in the range of Signal 1-3. Typhoon Yolanda (Haiyan) surprised Filipinos when it grew into a Signal 5 super-typhoon—the strongest storm to make landfall in history. At the time, PAGASA categorized a storm's threat level by windspeed of a scale of Storm Signal 1-4. So, when Typhoon Yolanda surpassed the highest scaled storm signal, there was no pre-existing way to describe its threat. People understood, though, that this typhoon would pose a grave threat—something never experienced before. However, people only really prepared for Yolanda based on previous experience and knowledge of Category 3 typhoons. Category 3 typhoons are known to bring strong winds, and large waves, but not for 5-meter-high storm surges.

[9] The Philippine government reported the official death count at 6,300 people. However, I use here the death count estimates of local people who say that bodies buried in mass graves in the two days before the government relief arrived were not accounted for.

In Tacloban City, when the storm surge waters receded, the disaster had only just begun. Tacloban City was considered one of the most direct and hardest hit areas. Coastal areas were completely reduced to ruins. Infrastructures such as roads, communications, local government were non-functioning. Relief services were not operational until about two days later. Until then, survivors found ways to help each other, despite still carrying the shock of the event, and the horror of not knowing what happened to their loved ones. Some people told me stories of walking several kilometers up to coast to contact family, or to find news about relief services. They posted messages on the wall of the city's central cathedral to reconnect with loved ones. Walking, talking, and posting messages were the only ways for the public to communicate for weeks. Radio was the first media active after the typhoon. Emergency radio services, like First Response Radio, set up stations and started broadcasting after two days to those who could still access a radio. Local radio received equipment from their mother stations in Manila after one week, and some NGO radio stations were set up after two weeks. Limited mobile services were set up a few days after the typhoon, but limited cellphone signal made it difficult to connect. Full mobile service was not restored until four months later, when grid electricity was re-connected. Emergency radio was the main form of public communication until infrastructures were slowly reconstructed.

Over the next several months, survivors went through many different experiences and interactions associated with disaster recovery. Many went to stay with relatives in less-affected parts of the Philippines, and did not return to Tacloban for several months, if at all. Those who had access to financial savings and remittances from family abroad, began to clear their ruined homes and businesses and rebuild. Most people, however, had no adequate savings or family remittances, and relied on governmental and NGO assistance and donations both to survive and

to recover after Yolanda. Hundreds of international organizations including NGOS, militaries, and government assistance arrived mostly in Tacloban to provide relief. This brought thousands of international volunteers through the Visayas, and particularly focused through Tacloban. While several international organizations, like the Tzu Chi Foundation, were praised by residents for their quick and direct assistance giving sacks of rice, providing daily work, the national and local government were criticized for their failures to release relief goods and monetary assistance in a timely manner. In the weeks after Yolanda, the media revealed various ways the offices of the Department of Social Welfare and Development (DSWD), failed to deliver relief goods. A ship docked in Cebu City was found holding 12 container vans of spoiled relief goods donations from Belgium in early 2014 (Recuerdo, 2017). In Dagami, Leyte, 284 sacks of rice spoiled while sitting in storage, and were later found buried to cover the mishap (Rappler, 2015). Thousands of survivors in the Visayas joined a grassroots movement called People Surge that sought to bring government attention to how Yolanda survivors continued to suffer due to government failures in recovery. The group identified six "persisting injustices" of the government including plundering, corruption, state violence, and "deceptive rehabilitation" (Salamat, 2014). On the one-year remembrance of Yolanda, 12,000 People Surge protestors gathered in Tacloban to bring attention to the continuing injustices and failures of the government to assist the 2.3 million families across the Visayas in need of recovery funds and services.

President Aquino's promise to provide 205,000 relocation homes to Yolanda-affected families. In 2016, three years after the storm, only 1% of the "build back better" plan had been completed (Doyle, 2016). Families across the central Philippines still resided in temporary, unsustainable or unsafe conditions such as donated tents, meagerly rebuilt homes with salvaged

and donated materials, or living with family in a less affected town or area, etc. Thousands of people never returned to the city; they built new lives in the places they took shelter with family. Some businesses never returned, other corporations bought the ruined land and built new businesses. Whole neighborhoods along the coast were destroyed by the storm surges, then marked as "no-build zones" by the government, and the families resettled in the Northern Barangay. Many people in Tacloban referred to "after Yolanda" as a marker. Sometimes this was in reference to a life before Yolanda that was lost—lost loved ones, belongings, livelihood, social activities. People often said the Tacloban before and after Yolanda were completely different.

Disaster communication also adjusted to "after Yolanda" needs. One regional government officer handling disaster communication awareness told me that people now "panic" even if there is only a Category 1 typhoon on the way. He explained, they don't know whether they should evacuate or not. Before Yolanda, most adults in Tacloban had already experienced up to a Category 3 typhoon. One radio host told me that it was hard to ask people to evacuate because people have experienced many times before, and know what their preparations and responses will be. "Now," he said. "People will go on their own to evacuate without instruction, because of past experience with Yolanda."

Facing the Future with Disaster Risk Reduction (DRR)

In this dissertation, I consider the "after Yolanda" as a continuing part of Yolanda. Yolanda has affected how governments construct understandings and appropriate responses to typhoons, framed more and more as potentially intensified and erratic due to climate change. Typhoon Yolanda was more often recognized as a wake-up to the growing hazards facing the Philippines with climate change, and the government's lack of preparation to adequately handle

intensified storms, rather than as a one-time disaster. One local governmental officer told me that DRR strategies were being implemented from the national to the local governments for two years before Yolanda, but not many offices prioritized the new strategies, or even sent the correct personnel to the trainings. After Yolanda, local offices across the Philippines made DRR their primary effort apart from recovery projects. Local governments hastened to assemble City Disaster Risk Reduction Management Offices (CDRRMO), and the National Disaster Risk Reduction Management Council (NDRRMC) improved and extended their services. For example, they began to contact the public directly through automatic mass texting. National and local offices also focused on improving disaster communication. This was mostly due to a major failure in communication during Yolanda that ran from the national weather service, PAGASA, to national and local governments, to the media. PAGASA had used the term "storm surge" which was unfamiliar to most people, including those in the government and media. This meant that people did not know a wall of water was going to deluge the coastlines in the eastern Visayas. Yolanda opened peoples' eyes to the real stakes in disaster communication, with the multiple failures of communication.

I show, however, that DRR efforts to improve peoples' abilities to survive fall short for some because people benefit from DRR project unequally. This dissertation shows how the disaster communication projects made after Yolanda in service to achieving DRR were not designed to serve the needs of impoverished coastal residents. Rather, government assumed their needs and conditions of participation. During my research, I visited the Vice Mayor's office to ask about the government's use of radio for disaster communication. The Vice Mayor insisted that people do not use radio, and instead use texting and Facebook for emergency updates. He handed me a leaflet for the city's project for free emergency updates through mass text

messaging, Community Climate Guide and Response (CCGR), which rolled out a month earlier. Over the next months, as I got to know people from SJB, I found that none I spoke to had registered or even heard of the program. They used radio and television, however, on a daily basis for weather updates.

A running theme through this dissertation is the construction of inequality through disaster communication and disaster risk reduction infrastructures and practices. I consider first how inequality was constructed into the first scientific typhoon monitoring institutions during the colonial eras in the Philippines, and follow into how inequality was differently constructed into these institutions turned nationalistic projects after independence. During my research, as in the experienced in the Vice Mayor's office, I found that residents of SJB were using typhoon communications that were not designed with their needs in mind. DRR practices meant to serve all Filipinos actually ended up excluding the participants of my research. I show in different ways throughout the chapters how government assumptions gave SJB residents unequal ability to prepare for typhoons.

Although SJB residents faced unequal access to the benefits of DRR projects, they also found ways to improve their ability to survive through social connections. People faced disaster through relationships with their neighbors, friends, families, local businesses, schools, media, infrastructures and other institutions—especially, when they knew no help was coming from the government. Oliver-Smith stresses that disasters have multiple dimensions and multiple identities: "In fact, disasters, because of their material impacts, their emergence from human-environment relations, and their cultural construction, possess multiple identities and range over multiple spaces from purely object (nature) to purely subject (social discourse)" (Oliver-Smith, 1999). I hope that this dissertation shows how disaster is produced and experienced for

certain people by way of their relationships to a multiplicity of components in their society: the local government, the national language, technologies, infrastructures, income, family support, and more. This means also then that people experience disaster and recovery unequally.

The Fieldsite: San Jose Beach

News typically described Tacloban City as completely destroyed during Yolanda, but it is misleading to think that Tacloban City uniformly experienced Yolanda in the same way. The city, built along a strait, has coastal, inland and upland areas. All coastal areas—up to 1 kilometer inland in some parts—experienced storm surges. Coastal areas near the mouth of the strait where the open ocean meets, received the first and therefore strongest impact of the storm surges. Furthermore, those in the peninsular handle of Barangay San Jose, were both at the mouth of the strait and open to storm surge on two coastlines. This is where San Jose Beach is located.

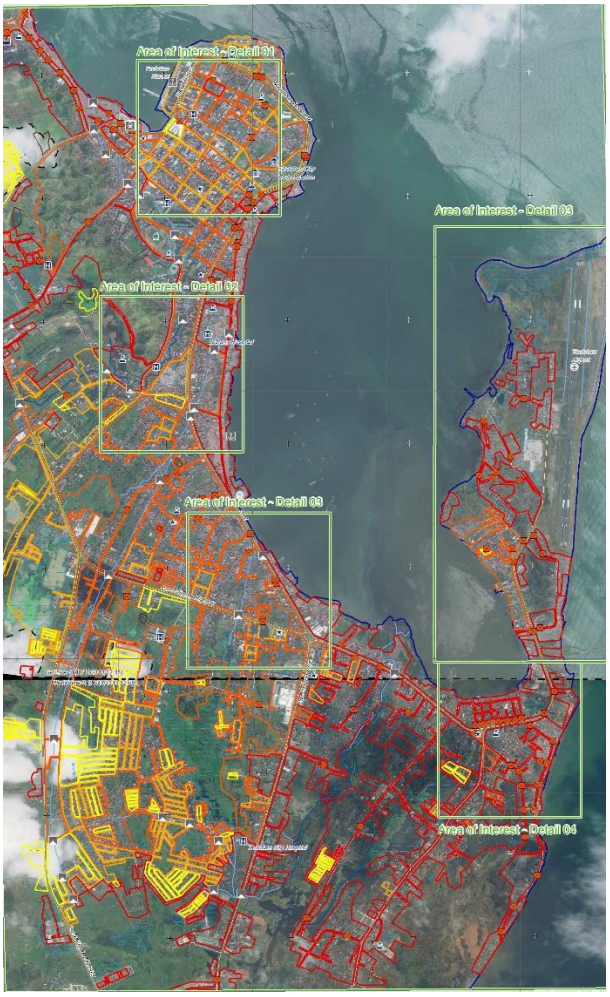

Figure 0.3: Map showing destruction levels in Tacloban City: red markings denote destroyed areas, and orange markings denote heavily damaged areas. San Jose Beach is located within the red-marked southern region of the city. Image courtesy of Copernicus Emergency Management Service (© European Union, 2012-present_year).

San Jose Beach received 5-meter-high storm surges on the morning of November 8, 2013, when Yolanda made landfall in the Philippines. At the time of the storm, the neighborhood held (1,000) households—many built informally, so space was crowded and houses unfortified to withstand a Signal 5 typhoon. All were destroyed completely by the storm surges. Barangay San Jose alone accounted for 1,000 of the 6,000 recorded deaths (across the Philippines) in the typhoon. So, it was common that residents of San Jose Beach I spoke to lost

several people they knew. In the aftermath of Yolanda, SJB had a unique experience as well. The area remained a tent city for a year while waiting for temporary housing and relocation assistance to come through. In response to the thousands of Tacloban residents rendered homeless by the typhoon, the government together with NGOs and other relief agencies built several resettlement villages in some mostly unused land on the upland outskirts of the city. Slowly families in SJB received placements first in the temporary nipa-hut housing in the Northern Barangay, and then moved on to the permanent resettlement villages of hastily constructed rows of concrete housing blocks. In San Jose Beach, temporary shelters were constructed to house residents as they waited for a permanent relocation. About 100 temporary households were constructed by an international NGO in SJB, and a Philippine NGO, Urban Poor Aid, separated the households into two Home Owners' Associations—San Jose Beach and Gutiay Beach. So, the 1,000 informally built homes located in SJB before Yolanda, transformed to 100 plywood temporary shelters in a grid pattern stretching from the highway to the beach. Many were lucky enough to get homes in SJB nearby their families and friends, but still many neighbors were unfamiliar to them.

This was the arrangement of SJB in late 2016, when I was first introduced to the residents of San Jose Beach through an NGO doing a solar power demonstration. We gathered in the community hall which was an open-air room with a chalkboard in the center of SJB. Around 50 people attended—adults and children—sitting inside and standing just outside the hall. Looking around, I saw sari-sari stores, shops selling packaged goods like candy, chips, soda, sachets of shampoo, cigarettes and other necessities on the fronts of some houses. Clothing lines full of the day's wash hung between neighbors' roofs. Fishing net hung from others' roofs. To me, this communicated that SJB was a settled-in community, despite the fact that these

temporary plywood homes had already expired their intended duration by a year, and that everyone here should have been relocated to the Northern Barangay a long time ago.

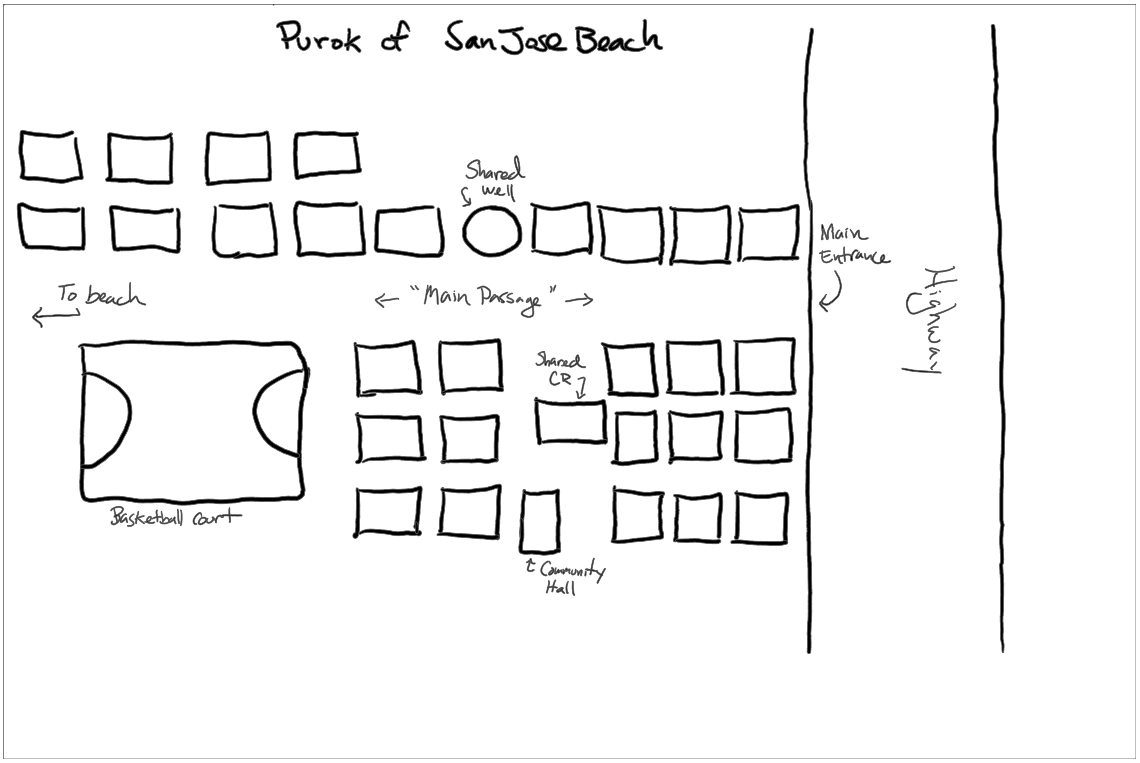

Figure 0.4: Basic map of San Jose Beach purok showing arrangement of houses and landmarks mentioned in the dissertation, 2016-2018. Drawing by author.

As I came back and visited SJB often, I came to understand the significance of places. The community Hall was not a main hub of activity. It was just used for meetings, sometimes to relax in the shade, sometimes to weave and repair fishing nets, and sometimes to shelter livestock from rain. The main hubs of the purok were what I refer to as the "main passage," the basketball court and the beach. The main passage was the central thoroughfare for SJB residents going off to work, coming home, and throughout the day finding neighbors for *tsismis* (chit-chat/gossip). The passage was not quite a road; it was a wide dirt stretch that mostly took

foot traffic and the occasional motorcycle. It stretched from the highway, at the sign that announced San Jose Beach, and stretched down the purok to the beach, about 200 meters in all. Walking down the main passage on a weekday afternoon, I often found the same familiar faces, women sitting together on porch steps and talking, or chatting by the barbecue stand while having a snack. I knew I could always find someone here to point me in the right direction of so-and-so's house. In the later afternoon, when the day cooled off, neighbors often found a place along the main passage to sit and watch the young men play basketball. Further down the passage, near the beach, there was a picnic table near the place where people hung laundry, and women sometimes sat together there and talked in the shade.

Residents of San Jose Beach

One day, as I got off the jeepney arriving at SJB, a resident whom I had met and bought halo-halo from last week had her halo-halo shop set up in the small *talipapa* (market) stand at the entrance of the purok. She was lounging back in a hammock while also manning the halo-halo vending, feeding her young children lunch, and socializing with two friends, also mothers holding/watching their children. She waved to me and invited me to sit with them. I purchased a cup of halo-halo for 15 pesos, and her friend passed me a filled drinking glass they were sharing to drink *tuba*. We began to talk, fumbling through Waray-Waray, Tagalog and English to get our messages across. It was the first time I learned more candidly about the purok.

The vendor said she had grown up in SJB, and lived there all her life. In fact, more than one generation of her family had lived there. During Yolanda, she was safe with family in Samar Island, but decided to move back to SJB when the NGO-built temporary housing was completed a year after the typhoon. She and the other two women had signed up for houses at the

relocation villages in Diit because that location was not so far away as the Northern Barangay and their husbands could better continue their occupation as fishermen from there. They still had yet to hear an update in three years. I realized then that I had mis-identified SJB as a relocation village because of the NGO constructed houses and community layout. I asked her if SJB was a relocation village. She paused and considered, then answered: “We are squatters.”

I learned later that SJB residents had entered into precarious status as tenants on the land after Yolanda. Residents who have lived there for generations explained that the man who owned the land had let them live there all these years, and in his death he left the land to the people. The paperwork, however, was lost in the storm surges of Yolanda. The regional electricity company began to claim that the land was theirs. Most people I spoke to in SJB did not know what to think. Some tried to make negotiations with the company with the assistance of an NGO worker as mediator. Most others waited to see how the card would fall—if they would finally be relocated to a resettlement village, or if they would be evicted. Until then, they remained settled in SJB, making homes out of the temporary shelters constructed three years ago.

SJB Home Owner’s Association (HOA) officially included 47 households. The HOA was set up as a way for the neighborhood to govern itself—make collective decisions, share information, share responsibility over the community’s upkeep, etc. Although the HOA was in place to deal with neighborhood-based concerns, they took on larger responsibilities of neighborhood communication and evacuation during disaster communication. This was because the local barangay offered them no communication with and no assistance. I often heard frustrations from residents that they could not rely on the barangay, though the explanations for this varied. Some people said they were disregarded by the barangay because they were poor, or because

the area included “informal settlers.” So, the HOA was the unit that called community meetings in an emergency, updated residents on the typhoon conditions, and planned communal evacuation.

Every person I worked with lived through Typhoon Yolanda—lost their homes, belongings, and in many cases multiple loved ones, friends and neighbors. Many people referred to themselves in conversation as a “Yolanda survivor.” I make this clear to give context to their typhoon monitoring and preparation practices. Their typhoon monitoring and preparation practices were informed by both the experience of previously unimagined hazards, and the experience of post-Yolanda disaster risk reduction (DRR) reforms from the government and NGOs that assisted with months to years of recovery.

Methods

This dissertation includes 15 months of field work completed between September 2016-February 2018 in Tacloban City, focusing on the disaster-affected population of Barangay 88. Barangay 88 sits on a narrow peninsular land that received most of Supertyphoon Yolanda’s death and destruction via storm surges (seawater floods) from both coasts. Residents who have remained in Barangay 88 are among the city’s most impoverished, and still face hazard to storm surges. Therefore, research is designed to understand how these residents monitor storms for themselves and for each other, and how these actions are integrated into their everyday cultural understandings of media and communication technologies.

I use ethnographic methodology including participant-observation, interviews (informal conversation, formal interviews, and group interviews) and surveys to bring forth different types of knowledge and information. Participant-Observation: I used participant-observation

throughout the entire year of field research. In Barangay 88, I make frequent visits to a single purok (smallest unit of government which includes about 50 households) in order to participate daily in interactions centering on, or including, cellphones, televisions, radios, and internet-accessing devices. For example, I watch the evening news with one family to receive the weather update. Participant-observation is needed to understand the integration of these technologies in everyday social encounters—information that is not readily recounted in surveys and interviews. Surveys: Surveys taken in the local language of Waray-Waray collect information on the types of media and communication technologies the respondent owns, shares or borrows, and how he or she monitors storms using these technologies. Interviews: Formal interviews provide in-depth and topic-oriented information. I conduct and record formal interviews, lasting 30-60 minutes, to expand on information given through initial surveys, such as personal and social uses of the technology, the technology's perceived impact and role within community, and what the technology means in various social situations of everyday life. In another interview, I learn how individuals interpret weather information received through media. I have conversational abilities both in the local language of Waray-Waray, and the national language of Tagalog to conduct interviews, and also to interact with participants during participant-observation.

I became interested in San Jose Beach after a friend working with an NGO invited me to accompany their team for a community information session about their solar energy program. I learned that while these residents were not in one of the resettlement villages I originally intended to research in, they were likewise recovering in NGO built temporary houses.

Asking disaster-affected people to participate in research was guilt-striking for me. It was difficult to ask people to participate and offer very little tangible reciprocation, when they

were working hard just to make the day's income suffice for their family's immediate needs. With the assurance of the HOA Vice President, however, most households had at least on volunteer to fill the survey, and participate in a follow-up interview. Fewer were interested in repeat visits for participant-observation, but a handful of people were willing to make a lasting connection with me.

Understanding my positionality in this post-disaster context was a complex experience. Based on recent contacts with outsiders, people often categorized me as either a government worker from Manila, or a foreign NGO worker. The difference was based on whether they perceived me racially as a mixed-race Filipina, mestiza, or White foreigner. It was difficult to for me to explain why I was interested in hearing how they monitored typhoons, and how they used media technologies when the preoccupation of so many were to figure out how to secure their livelihood after their stores, fishing boats, trikes were destroyed, and when they would hear about relocating to resettlement villages in the Northern Barangay, in the uplands outside the city. The HOA leaders eventually asked what I could do for them in exchange for helping me with my research. I ask them to propose something I could help with, and eventually we came up with the idea that I could hold weekly English lessons in the community hall. I was understood in many identities then—foreigner, mestiza, student, NGO worker, government worker, and teacher. People decided what messages I could relay based on these roles, and a recurring theme in the stories communicated to me were the hardships produced through inequalities and injustices Yolanda survivors experienced, which are shown throughout the chapters.

Yolanda aid and study has been focused on urban center Tacloban to the neglect of smaller, rural and secondarily hit towns. Many other islands, cities, towns, and rural areas were in the path of Yolanda. Some of them experienced tragic stories of destructions and loss of life,

and others experienced stories of successful evacuations and life preserved. The conversation about Typhoon Yolanda in media and other research has been centered on Tacloban. I want to point out here that experiences of Yolanda and the aftermath vary across the Philippines. I do not wish to discount or detract from other experiences of Yolanda, nor homogenize typhoon experiences in the Philippines. This dissertation is about how a single neighborhood in Tacloban City has experienced and responded to disaster.

Layout of chapters

The dissertation is formed into two sections. The first section, "History of Disaster Governance in the Philippines," explores a history of trying to know typhoons through science. Current disaster management practices are the result of many decades of disaster event and subsequent policy making. Chapter 1 shows how scientific monitoring of typhoons and typhoon warning system that was the foundation of typhoon warning system today was never built to serve low-income Filipinos, and Chapter 2 shows how—once a nation of Filipino people was formed—protection from typhoons and other natural hazards became a major project. What I mean to point to here is that the idea of disaster management for the Filipino people was a major nation-building activity from the late 1960s on.

Chapter 1, “Colonial Science, Technology and Typhoon Monitoring,” considers how vulnerability and inequality were constructed into the earliest efforts towards a disaster alert system in the Philippines because alerting was never designed with the safety of local residents in mind. Scientific typhoon monitoring and public alerting began out of the shared interests of university scientists, commercial shipping and the Spanish navy in the mid-1800s, during Spanish colonization. This particular way of understanding disaster and media alerting is the foundation

for the Philippines' current weather monitoring agency, PAGASA, which directly evolved from this early Spanish institutionalization of weather monitoring. Although people of the Philippine islands already had ways of predicting or anticipating a coming typhoon, I focus on colonial science and typhoon prediction to show how scientific, colonial institutions of weather alerting produced an unequal "invention" in disaster media. As stated at the beginning of this dissertation's Introduction, this project understands media technologies and disaster communication as specifically colonial inventions. This chapter looks at the colonial foundations of typhoon monitoring to better understand how everyday Filipino citizens are structurally excluded from disaster communication infrastructure. My point for going through the history of different stakeholders in typhoon science and techno-politics throughout colonization is to show how meteorology in the Philippines has a legacy of service toward certain populations, and has never been designed with other populations in mind (colonized people, the poor, women, etc.). I use literature that shows how colonial knowledge-making was a part of colonial power (Cohn, 1996; Larkin, 2008; Scott, 1998) to describe how colonial roots of knowledge as power structured inequality through meteorology, and to this day cannot serve Filipinos equally. Chapter 2, "Nationalizing Disaster," takes a look at another important era in Philippine disaster communication history. In the 1960s and 1970s, the urban areas of the Philippines—and Metro Manila, especially—went through a period of rapid migration and development. This created the conditions for chronic urban disasters—most especially flooding—and the acute need for updates to how the government handled these crises. I analyze this period of history in Philippine disaster response to show how disaster response, including disaster communication, played a large role in political campaigning, and not solely as tools for the benefit of the Filipino people. I make the point that political intentions to impress voters shaped the design of disaster

communication and response, rather than user-centered design. As stated at the beginning of this dissertation's Introduction, this project understands media technologies and disaster communication as specifically colonial invention. These were also re-invented in the post-colonial period. In the 1970s, the Philippine weather bureau became a political tool specifically useful in the post-colonial narrative of nationalism. President Marcos shook off colonial forms of organization, and intended purposes from the then American "Weather Bureau," and reorganized the agency into PAGASA—an institution intended to serve the Filipino people. Marcos' administration, however, had also helped produce conditions for disaster with rapid urban development. This chapter looks at the post-colonial foundations of typhoon monitoring and disaster response to better understand how everyday Filipino citizens are structurally excluded from disaster communication infrastructure—in ways different from how they were excluded in colonial foundations of disaster alerting infrastructure.

The second section, "Tuning in at San Jose Beach," is an ethnography on residents of San Jose Beach understood disaster and typhoons at the time of this research, 2016-2018. In the 2000s, there were significant shifts in how disaster was understood. Knowing and responding to disasters was constructed with the context of the anticipated and uncertain future within climate change, and the strategies of disaster risk reduction (DRR) to pre-emptively reduce the disastrous effects of environmental hazard. I bridge the history and ethnographic sections with an interlude that introduces this shift in conceptualizing disaster and that also introduces key participants in the ethnography.

Chapter 3, "Producing Uncertainty in Emergencies," analyzes how uncertainty was produced during Typhoon Yolanda, and some subsequent typhoons. I treat uncertainty as a vulnerability produced through disaster media infrastructure. For the impoverished coastal

residents of San Jose Beach, uncertainty was produced via certain assumptions on the part of government, scientists and media: 1) That all publics will interpret information (especially scientific information) in ways scientists/meteorologists intend, 2) that people will have equal access to communications, and 3) that the government functions as planned during a disaster. I show how residents of SJB are at the margins of disaster media infrastructure, and how they must deal with uncertainties produced at these margins. In the chapter, I first describe what sorts of information SJB residents monitor, and how they go about collecting weather information. Then, I show how uncertainty was produced in SJB during an earthquake.

In Chapter 4, "'Prepared na kami' (We are prepared)," I analyze how residents of SJB come together in their shared vulnerabilities to form and participate in localized/non-governmental disaster responses. I consider how communities in SJB come together for information sharing, resources sharing and mutual support in potential disaster. In many ways SJB is a neighborhood formed from disaster—the existing neighborhood before was completely destroyed by Yolanda, and the SJB was reconstructed by NGOS very differently from how it was before. Residents had to get used to new neighbors, new HOA regulations, and find ways to support each other if another Yolanda arrived. Like affected communities in Solnit's study on people who come together to respond to disaster without guidance from the government (2010), residents of SJB found their own ways to help themselves and each other deal with disaster. For SJB residents, however, their mutual reliance and reliance on other friend and family networks, came from experiences of being marginalized access to certain infrastructures, including communication, and neglected from government assistance.

Residents of SJB "fill the gaps" left by government and media infrastructure in disaster response and communication. In this perspective, I consider the life of disaster communications

after they have been broadcast. People circulate their gathered information within family, friend and neighbor networks. Together, people then interpret and decide how to act on this information. This disrupts the assumption that government releases an alert, and individuals are expected to follow the directives. Instead, people discuss together what information is pertinent to their situation, and how to prepare themselves, their homes, or evacuate together. Disaster communications are not automatically taken for truth. The many media outlets often present altering information or contradict each other's messages. People go to their trusted social relationships to interpret and determine what to believe and act on. This chapter analyzes how SJB residents manage disaster from the margins of infrastructure, and how SJB residents overcome this shared circumstance by working together.

In Chapter 5, "Typhoon Temporalities in Climate Change," I consider certain temporalities of disaster in DRR and SJB residents' temporal experiences of disaster as they form experiences of vulnerability. I take disaster risk reduction (DRR), the mainstream/government and NGO conceptual framework for disaster at the time of this research, and consider the sense of temporality within this conceptual framework. This includes specifically DRR-oriented ways of viewing the anticipated future of the Philippines through climate change adaptation, "resilience," and "build back better." I compare the DRR sense of disaster temporality with SJB residents' use of or refutation of these ways of facing the future. I found that while DRR frames climate change related disaster as a somewhat distant, not-yet-tangible possibility, disaster-affected people in San Jose Beach understand the next extreme weather event as a visceral, immediate reality. In this chapter, I integrate anthropological literature on disaster and climate change to analyze how SJB residents experience temporalities of typhoons in an era of uncertain future due to climate change. Last, I reflect on some times in which some sign of danger, like

and LPA warning or heavy rain, set off the need to think in terms of the more immediate future, or what I call the “urgent future.”

In the Conclusion, I offer some recommendation for how this research can be applied to revising the experiences of disaster communication for many populations in the Philippines. I also reflect on the meeting of Typhoon Yolanda recovery with the onset of the COVID-19 pandemic.

CHAPTER 1

Colonial Science, Technology and Typhoon monitoring

"… meteorological science, which was founded on the pragmatic and empirical character of knowledge, was indeed a colonial legacy." (Alvarez, 2016, p. 387)

On April 30, 1904, the gates opened at the St. Louis World's Fair. The fair—officially named the Louisiana Purchase Exposition—was intended to be the United States' largest event of its kind. The city of St. Louis wanted to surpass the grandeur of Chicago's World's Columbian Exposition in 1893, yet carry the same spirit of that fair which celebrated exploration and conquest (Kennedy, 1998). The fair was spread over 1,270 acres of land, and featured full-building installations from each U.S. state and several other countries. Over its nine months of operations, the fair became a focal point of national attention. Over 600 international congresses and meetings were held at the fair over its duration, and the 1904 Olympics were held nearby. However, the world's fair is most remembered today for its anthropological curations, and the Philippine Exposition in particular.

The Philippine Encampment (also referred to as the Philippine Reservation) was as much an attraction as the entire fair itself. The Philippines was then a newly acquired territory (since 1898) and the American government wanted to convince the public of its decision to colonize. With the support of William Howard Taft (Governor of the Philippines until 1904 then U.S. Secretary of War), and President Roosevelt, who formerly fought as a leader in the Spanish-American War, $1.1 million was invested into the project for construction of buildings, "native

villages," and the transportation of 70,000 exhibits which included people, animals, and objects. Members of over 40 different Philippine cultures were transported to the U.S. to be displayed as if viewers were peering into their lives in the Philippines. Filipino homes were constructed on the encampment, organized according to "tribe," and families lived in these houses. The encampment was built along a lake so that attendees could see different Filipino boats in use. Filipinos could be viewed in daily activities like cooking, working and interacting with one another. One section, displaying "Igorotes," showed men skinning and roasting a dog. These displays were intended to emphasize difference—the exotic—through clothing, language, bodies, and dining.

Other less remembered exhibits of the Philippine section, however, were themed around a story of science and progress. Several buildings displayed taxonomies of natural resources in the Philippines, such as the Fish and Game, Forestry, Agricultural and Mining buildings.[10] In this same vein, the Ethnological Building displayed classifications of people and cultures of the Philippines. This history of Filipinos on display for American audiences has been well researched. Many documentaries and literature have critiqued and analyzed the U.S. display of Filipino bodies to American audiences (Fuentes & Yearen, 1995; Talusan, 2004; Sit, 2008; Grindstaff, 1999). However, not much has been discussed about the complementary component of the Philippine exposition—the display of American science and technology in the Philippines. The displays of 40 Philippine "tribes" actually formed a peripheral surrounding to buildings which displayed American-gained knowledges of the Philippines resources and people. In this center of the Philippine exposition, there were entire buildings constructed each for

[10] Philippine Exposition pamphlet. Retrieved from: https://babel.hathitrust.org/cgi/pt?id=uiuc.2869262&view=1up&seq=2

forestry, agriculture, commerce and education. These exhibits were a display of American science in the Philippines which communicated to the American public the value of retaining the Philippines as a colonial territory, and the benefits of "benevolent assimilation" for Filipinos.

A shining star in this circle of science, technology and knowledge was an exhibit building for the Manila Observatory and Philippine Weather Bureau. Upon colonization, the American government invested heavily in and built upon the work of Spanish Jesuit meteorologists of the Observatorio Meterológico de Manila (Meteorological Observatory of Manila; hereafter referred as the Observatorio). For the past three decades, the Spanish Jesuits had built up a typhoon prediction and warning system serving the Spanish colonial city of Manila, and a few other colonies across the Southern China Sea. The American government immediately entered into a partnership with the Jesuits, investing in typhoon prediction development, extended telegraph lines to communicate weather information, and extensive cartography to map the entire archipelago. All these knowledge products—weather instruments, seismographic instruments, lightening registering steel towers, and multiple maps including a giant relief map of the entire archipelago—were displayed to the American public in 1904 at the World's Fair within a 33 by 33-foot building with observatory towers that were lit up and stood out against the fair's skyline. Observatorio staff, including the Observatorio director, Father José Algué, demonstrated and explained the devices to visitors. The Observatory and its personnel were decorated with several Grand Prizes from the fair. Visitors left with the understanding that benevolent assimilation based on education, science, technology and development would benefit both Americans and Filipinos.

Figure 1.1: “A Bird's Eye view of the Philippine Exposition.” Retrieved from: http://collections.mohistory.org/resource/991690

This chapter explores the colonial foundations of disaster communication infrastructures in the Philippines. The current infrastructures for typhoon monitoring and typhoon alerts in the Philippines are built upon the initial research endeavors of Jesuit scholars in the Philippines starting in the 1860s. However, several stakeholders in colonial Philippines—under Spain and the US—have played a significant role in shaping early typhoon prediction and warning services. Scientific typhoon monitoring in the Philippines has a been built directly through several reorganizations of the Observatorio Meterológico de Manila, originally a Jesuit missionary project. I argue that Spanish colonial roots of for typhoon monitoring and disaster

communication, followed by American adoption of the typhoon monitoring projects in the Philippines, laid the ground for uneven experiences of disaster communication infrastructures in the Philippines that persist today.

Spanish colonists in the Philippines had various investments and stakes in increasing scientific knowledge about typhoons in the area. The Jesuit scientists were committed to cultivating knowledge of the natural world in pursuit of their faith, and join in on conversations happening among the international scientific community. Meteorology, astronomy and seismology were the most popular and newly developing studies among Jesuit observatories in Europe. The Royal Navy and other mariners, who had for centuries used weather observation to inform their travel, were interested in a scientific approach to weather to help with sea transport. Local businesspeople invested in the abilities of meteorology to protect sea trade, and later to protect businesses and infrastructure in the capital area. Meteorology was a quickly developing science in the later part of the 19th century due to the coinciding opportunities to use instruments in the field, and observe cyclones in colonial protected areas around the world (Alvarez, 2016; Udías, 1996).

While pre-Spanish societies in the Philippines had methods for determining the arrival of a typhoon, this chapter does not include knowledges of colonized populations. Neither does it include religious interpretations of weather, which were popular in the colony before meteorology gained presence in public life (Alvarez, 2016). I do not wish to discount these knowledges. I focus on colonial disaster communication infrastructures because current disaster monitoring and communication institutions (and their structures of inequality) can be traced back to Spanish and American colonial foundations.

Many scholars have studied the politics of knowledge and the politics of technology ("techno-politics") involved with colonial infrastructure, technology, science and knowledge gathering. For Cohn and Scott, power during late colonialism was concentrated in understanding and exploiting colonized people and lands, rather than through explicit violence. Colonial "specialists" (Cohn, 1996) could enact the power of knowledge. Colonial knowledge projects like map-making and social/cultural classifications rendered people and the environment "legible" for control (Scott, 1998). Knowledge-making helped colonizing and state forces administer power over previously unknowable others.

Typhoon prediction sciences, like other fields of colonial science, technology and knowledge, were used to make a conquered environment more manageable. How, then, did colonial development of typhoon prediction work to serve those in power? What were the techno-politics of typhoon predication and communication infrastructures during Spanish and American colonization? And, how do those foundations of colonial techno-politics continue on today? These questions frame my ethnographic research which analyzes how disaster communications today may underserve and even dis-serve certain people who rely on an infrastructure that was not constructed with their needs in mind.

Tracing the history of colonial typhoon monitoring helps us understand the roots of its development in the Philippines—which reminds us was not originally for the safety of most populations on the Philippine archipelago–most especially the impoverished or rural of the colonized populations. With each administrative transformation of weather prediction services, certain colonial benefits are enfolded. Continuing into independence, it would be revealing to ask who benefitted from subsequent administrative changes, and how—if at all—was the

typhoon alert system intended to benefit the broader public, and in particular certain underserved populations.

Colonial Techno-politics, Knowledge and Power

Scholars have analyzed colonial technologies, science and infrastructural projects as political and social tools for governance, rather than simple material infrastructures as part of development (Cohn, 1996; Larkin, 2008; Mrázek, 2002; Scott, 1998). Within this direction, the concept of "techno-politics" describes the use of technologies as a way do invisibly govern people, undoing the need for "overt intervention by governmental bodies in everyday affairs" (Larkin, 2008, p. 47). In this section, I review some concepts of colonial knowledge and technologies used in thinking about governance and disaster in the Philippines. I approach the history of disaster prediction and warning infrastructures in the Philippines in terms of colonial governance through technology and knowledge.

Knowledge figured importantly into colonial governance. Bernard S. Cohn argues in his book, Colonialism and Its Forms of Knowledge, that knowledge was a generative part of British colonial power in India. Various "specialists" in British colonization managed various forms of knowledge required to maintain the "theater of power" such as priest and ritual preceptors, historians and bards, artists and artisans (Cohn, 1996). Cohn constructs several "investigative modalities" to conceptualize the ways in which power and knowledge were integrated in colonial rule: historiographic, observational/travel, survey, enumerative, museological and surveillance. The "historiographic modality" describes practices of using history to strengthen and legitimize colonial rule through: understanding local customs of land tenure, and typifying

civilizations and people in India, drawing up representations of events in "popular culture" that legitimize the "civilizing mission." The "observational/travel modality" describes the colonial way of receiving information about the colonized land and people through travel and associated writings and images to represent travels or, "a repertoire of images and typifactions that determined what was significant to the European eye" (Cohn, 1996, p. 6). The "survey modality" describes the projects of collecting, classifying and writing up zoological, botanical, geographical, ethnographic, historical, sociological and economic information often by famed scholar, or "great men." The "enumerative modality" describes how colonials objectified populations of India (especially through a series of census' after the Indian uprising in 1857-1858) to better govern and justify British control over India. The "museological modality" describes archeological research and museum/antiquarian collection practices for both public and private collections that gave colonials, "the power to define the nature of the past, and establish priorities in the making of a monumental record of civilization, and propound canons of taste..." (Cohn, 1996, p. 9). The "surveillance modality" describes the "special instrumentalities to control those as defined beyond civil bounds" (Cohn, 1996, p. 12). Populations were defined, and some groups/ cultures were labeled/stigmatized with criminality. Taken together, these modalities form a picture of the importance of knowledge—knowledge production, and maintenance—to power in colonization.

What is particularly useful about Cohn's layout of modalities for this dissertation is that it gives a sense of the many ways power and knowledge were practiced, and subsequently the many points of access that members and organizations of the colonizing culture could act in. So, in the Philippines, force through the Spanish and American militaries should not completely

define colonization. Scientific research on predicting typhoons and relating typhoon updates can make up a mode Philippine colonization as well.

In his book, *Seeing Like a State*, Scott analyzes how the state makes people and environments more governable through simplification and records (Scott, 1998). Similar to Cohn, Scott finds that knowledge, science and technology attempts to render environment and people as manageable. Scott gives an interesting perspective on the relationship of governance and nature. He is concerned with the question, "How did the state gradually get a handle on its subjects and their environments?" Researching a variety of state governing strategies across the globe, spanning “late colonialism” to “modern state,” Scott recognizes a common direction states take to simplify people and environments in order to make them administratively “legible.” Legibility is necessary in the colonial state for the benefit of colonials, and not necessarily for colonized people. More specifically, legibility benefitted rule, "from above and from the center"—colonial hierarchical and spatial configurations of power. While Scott mainly focuses on agricultural practices, such as monocropping and forestry, he gives certain focus to the organizational relationship between colonies and the environment that is useful to my dissertation.

Scott’s focus on mapping leads well into the relationship between colonial media, science technology and the environment. Mapping is a clear demonstration of “seeing like a state” because a map is a visual representation of how colonials organize the land. Scott distinguishes that in the practices of mapping and recording, “facts on paper” do not accurately reflect “facts on the ground” (Scott, 1998, p. 49). People could not be expected to conform to what was written on a map. Scott argues that maps, however, had potential to shape reality:

"They were, moreover, not just maps. Rather, they were maps that, when allied state power, would enable much of the reality they depicted to be remade" (Scott, 1998, p.3).

Scott is also interested why so many “high-modernist” projects focused on using science and technology to benefit humankind fail. Scott argues that over-simplification of social organization and natural environment risk certain failures and disasters. Scott recognizes four elements that result in full-fledged disaster (Scott, 1998, p.p. 4-5):

1. "The administrative ordering of nature and society"

2) "high-modernist ideology"

3) "an authoritarian state that is willing and able to use the full weight of its coercive power to bring these high-modernist designs into being"

4) "a prostrate civil society that lacks the capacity to resist these plans."

Scott highlights that high-modernist projects privilege only certain forms of knowledge and exclude others. Scott identifies legibility and development projects as an, “imperial or hegemonic planning mentality” that, “excludes the necessary role of local knowledge and know-how" (Scott, 1998, p.6). For him, this is a part of their failure.

Media in particular was a tool of colonial governance. Media helped to define lines of modernity. As Larkin shows, the introduction of a new technology could redefine identity and relations: “The coming of electricity effected a split in Nigeria between electrified towns and those that remained without electric power” (Larkin, 2008, p. 18). Media within colonial rule, therefore, could likewise cast boundaries of inclusion and exclusion. Technologies and infrastructures were an evolving tool of governance for colonies. In his book, *Signal and Noise*, Brian Larkin considers both the material and immaterial (media) emblems of colonial

knowledge. Like Cohn and Mrazek, Larkin finds that knowledge, technology and infrastructure were important tools of colonization. Larkin's sense of techno-politics refers to, "the technological organization of society through roads and rail, telegraph networks and phone lines, was intended as a political means of subjection" (Larkin, 2008, p.47). He engages the term techno-politics (as used by Joyce (2003), Mitchell (2002), Scott (1998) and Prakash (1999)) to analyze, "The intimacy between infrastructural projects and the ideological needs of the Nigerian state…" (Larkin, 2008, p.47). The "technological organization of society" through techno-politics that he refers to was primarily based on separation—between colonizer and colonized:

> "This is how technology functioned in its governmental mode, promising a coming together (at some point, always in the future) of colonizer and colonized, where power operated not by difference but by the cultivation of sameness. This promise of sameness existed at the same time and in constant tension with its opposite, the use of technology as sublime, based on separation and difference ..." (Larkin, 2008, p.43)

For this reason, technologies were not invisible, but rather were invested with "intense representational loads" and "dense—if unstable—symbolic meaning" (Larkin, 2008, p.33).

Larkin analyzes also how infrastructure defined some people as modern and others consequently as non-modern. With the arrival of electricity, for example, Nigeria became split into electrified towns and towns without electricity. Larkin refers to this as an "ideological mode" of infrastructures: "In this way, technology had a double function: its technical one of transmitting radio waves, or moving people faster from one place to another, and its ideological mode of address, hailing people as new sorts of political subjects" (Larkin, 2008, p.43). For Larkin, the "intimacy" between infrastructural projects and the ideological needs of the state show how technology and science really enacted colonial rule.

Colonial knowledge production, technology, infrastructure and media carried out various modes of colonial governance and enacted colonial social norms—including hierarchies and status. While technology as part of state governance made subjugated people and environments "visible" through simplification, technologies and infrastructures made governance "invisible" in certain aspects to ruled populations, or were highly visible carrying "representational loads."

A Partnership of Science, Military and Commerce: Jesuit Meteorology and Spanish Typhoon Warning System

In January 1865, the Observatorio Meterológico began as a humble project of passion tucked into the pigeon wing of a university building with a pair of instructors at the Jesuit college of Ateneo, Fr. Colina and Fr. Nonell (Repetti, 1948; Schumacher, 1965). Both had been born and educated in Europe, and relocated Manila to teach at the college, which opened only 6 years earlier in 1859. Though the Fathers had been stationed at the college to teach other mathematical and scientific disciplines, they were interested in participating in the rising science of meteorology, which was a growing discipline in Europe. This informal site for experimentation was the first meteorological observatory in the "Far East." Colina set up basic, and sometimes self-constructed instruments to measure such as: a thermometer, hygrometer, a barometer that used oil instead of mercury, and an anemometer made of cloth and twine (Alvarez, 2016). In September that very year, a strong typhoon passed through Manila, and Colina was able to record the event's data. Nonell used the data to render a diagram of the typhoon's path based on measurements, like barometric pressures, on geographic locations across time. Colina then

presented the information to the Diario de Manila, a popular Spanish language newspaper in the colonial administrative center of Manila. Several readers, such as mariners and merchants, gained interest in the published data, and recognized potential benefits of developing the Observatorio's ability for typhoon predictions. The community petitioned for the observatory to make this a routine service.

This origination story sets up the circumstances of scientific typhoon prediction in the Philippines. Though typhoon science in the Philippines started as a Jesuit missionary to contribute to scientific theory, multiple people in different roles have staked claims to the usefulness and directions of developing a public typhoon warning infrastructure. Historians have different interpretations of the beginning of typhoon science and warning infrastructures in the Philippines. Udías centers the Jesuit motivations for contributing to meteorology, and sees other influences as "exogenous." He also makes the distinction that typhoon prediction should be understood as an international "missionary science" rather than "imperial science." Anduaga analyzes typhoon prediction in the Philippines as "multidirectional"—although the research was housed by the Observatorio, the direction of research was influenced by different financial supporters, and interests. Alvarez explains typhoon prediction science as a unique "point of convergence" for many different interests in colonial Philippines. As mentioned earlier, Cohn places particular emphasis on the power that "specialists" held as managers of colonial knowledge. Scientific typhoon prediction in the Philippines started out of an educational institution—the Ateneo de Manila college—and their legitimization in the eyes of the Spanish empire and the public was constructed in opposition to other knowledges such as those of local fishermen, Spanish seafarers, farmers, religious interpretations, etc. Their legitimization in

Philippine governance came out of membership to a community of international scholarship and research. As in the mid-19th century, specialists today are the legitimate managers of typhoon knowledge.

In the Philippines, multiple stakeholders in typhoon warning system shaped initial efforts at a science-based and media-communicated typhoon warning system. Analyzing Fr. Faura's obituary which reflects the groups he was engaged with over his 20 years as director of the Observatorio, Anduaga refers to "socio-political" groups involved in the shaping of typhoon prediction and warning. He divides these groups into: the governmental group of Spanish civil servants, made up of the Navy, telegraphic engineers, and mine engineers; the commercial group of merchant shipping companies, traders and shipowners; and the Jesuit group including directors of other observatories and clerics from other orders. He emphasizes that it was not just Spanish interests that moved meteorological study. For me, this shows the basis of how typhoon warning communications were established for select populations with select purposes (protection of ships, mines, goods stored and goods in transit) and for the international scientific community. It sets a precedence to exclude other voices—most especially the urban poor. I outline the multiple perspectives and investments here.

Jesuit Scientists' Stakes in Typhoon Science

Jesuit scientists were motivated to be included in an international dialogue in the growing field of meteorology. The Jesuit scientific community is well known for their contributions to astronomy and mathematics, but it is little known that Jesuits were the pioneers of the growing field of meteorology in the mid-19th century. Scientific research has

been an important part of the Jesuit religious order which was founded in 1540. The goals of Jesuit science was to show the harmony between religion and the natural world, add to core value of education, and to "aid human progress" and practice of "apostolic spirituality" (Udías 1996). As Udías argues, it is critical to understand Jesuit meteorology in this context. The Jesuit colleges were founded in Europe and across the world in 16th and 17th centuries. In the mid-1700s, Jesuit scientists in Europe had made contributions to meteorology with their study of temperature, atmospheric pressure, humidity and rainfall. Opportunity to study non-European environmental phenomenon came with establishing institutions in colonized territories all over the world, but cyclones (typhoons and hurricanes) in particular in the Caribbean and the "Far East." These were often the first scientific institutions in these areas. Following universities, Jesuits scientists also established observatories throughout the world specifically for meteorological observation and data collection, and these institutions communicated findings as a network. From the 1860s onward, the Jesuit scientists led tropical cyclone research, and were particularly strengthened by their ability to share research across a few major outposts whose main work was to study tropical cyclones—Belen, Cuba, Manila, Philippines and Zikawei, China, Tanarive, Madagascar. By the 1930s, there were 30 Jesuit observatories.

Publishing the typhoon records in Diario de Manila, a popular newspaper read by many in Manila area, was a step in fulfilling Jesuit motivation to use science to help the public. This was one of the first major instances in the Philippines of typhoon data becoming part of public knowledge rather than just useful for mariners and scientists. The relationship between the Jesuit scientists of the Observatorio and the public via local businesses and merchant strengthened into a partnership, which pulled the scientists away from developing theory and

into practical applications. According to Anduaga, though, the scientists were fulfilled to provide public usefulness of their science as much as to contribute to theory: “However, few Jesuit scientists saw any contradiction between their humanitarian duty and the more immediate requirements of commerce. Indeed, almost all of them believed that cyclone prediction--as a form of previewing the unobservable--had the catholic dimension of the faith in God's domain (Anduaga, 2017, p. xxi).

Typhoon science helped Jesuits gain legitimacy in the eyes of the Spanish Kingdom. Alvarez notes that meteorology in the Philippines (as well as in another Spanish colony, Cuba) disrupted the expected flow of knowledge production, invention and theoretical advancement from Europe to the colonies. Jesuit scientists were also committed to carving out legitimization within the Spanish empire because The Society of Jesus was banned in Spain in 1773 and allowed to reorganize in 1814 (Cushman, 2013). The religious order sought to serve Spain and humanity through education, and scientific research was part of the plan for educational strength. Cushman explains that typhoon science helped Jesuit organizations navigate within the Spanish Empire: “This work helped the society of Jesus both to expand its influence internationally during the nineteenth century and regain some of its former strength as an autonomous power within the colonized world.” (Cushman, 2013, p.139)

Local Merchant and Business’s Stakes in Typhoon Science

Local colonial and elite merchants/businesspeople were motivated to develop typhoon prediction and warning to protect commercial trade: products, their transportation, the means of transportation. These elite were made up of merchants, industrialists, landowners and

shipping and insurance agents. After the first typhoon data was published in the Diario de Manila in 1865, the community petitioned for the observatory to make this a routine service, but the observatory decided that this request could not be met without better equipment. By 1869, the shipowners, merchants and business people raised funds for the Secchi meteorograph to be purchased—a prize-winning new invention by the Jesuit scientist Angelo Secchi, then director of the observatory at the Collegio Romano, Italy. Monetary support from various stakeholders in the colony made typhoon prediction and warning development an ongoing partnership between scholars, engineers, businesspeople, military and administrative government: "…the creation of the Observatorio was made possible by the existence of an 'exogenous' commercial element that led the Jesuit authorities to be aware of the importance of cyclonic forecasting…" (Anduaga 2014: 504)

Royal Navy of the Spanish Empire's Stakes in Typhoon Science

Key officers in the Royal Navy of the Spanish Empire were motivated to develop typhoon prediction and navigation to aid their mariners at sea and for strengthening ports. This pulled Jesuit scientists away from developing the theoretical science of cyclones and toward practical uses of typhoon knowledge, Anduaga argues. Spanish mariners already had a history of encounters with cyclones. Spanish colonial trade ships traveling to Central America, the Antilles, India and the Far East, mariners were aware of the dangers of cyclones, and even made observations and logbooks to help predict their appearances based on time of year or even just as it develops. For example, Spanish navy officer Santiago Patero published a book on some rules to avoid *baguios* (storms) in the Philippines, such as looking for signs like low-flying birds

and deep blue horizon. However, the mariners still struggled with protecting themselves from cyclone destruction. So, the navy found immense value in applying the new science to seafaring practices.

Soon, the Spanish Telegraph Corps were established with weather forecasting as a main objective. In 1867, engineer Jose Battle was commissioned by the government to undertake a massive technological project establishing terrestrial and maritime communications in the Philippines (Anduaga, 2014). After some years, in 1873, three-thousand kilometers of cable were laid in Luzon (the island where Manila is located) and worked in coordination with semaphore stations that guided ships to port.[11] Battle explained that the aims for establishing telegraphy were to unite localities, meteorology, weather forecasting, and coastal vigilance. The telegraph network was such as success that the government was assigned projects to extend cables, even internationally across the sea between China and the Philippines. Cables were later laid connecting other areas of the Philippine archipelago, and between Manila and Hong Kong.

Spanish Empire's Stakes in Typhoon Science

The Spanish Empire became involved with the Observatorio nearly two decades after their first activities with typhoon science. They entered into partnership with the Observatorio particularly to help strengthen certain geopolitical relations with other colonizing powers. In 1884, the Spanish Empire assumed financial backing of the Observatorio by a royal decree. Anduaga explains the circumstances: "…unofficially due to geopolitical reasons and officially as a

[11] Semaphore is a message communication system using hand flags in various positions that represent an alphabetic code.

response to a request for cooperation from the governor of Hong Kong" (Anduaga, 2014, p.506). This opened up exchange of daily weather observations between Manila and Hong Kong. The British government wanted to lay the international cable in order to create meteorological services and stations all over the South China Sea. When the Observatorio became an official governmental institution, it then depended on Spanish funding. The primary objective of the Observatorio then became weather and cyclone forecasting. The government wanted this meteorological service built upon the well-connected telegraph system that was accessible to the military and merchant navies. A directorial board was commissioned made up representatives from the navy, Jesuits and telegraphists. Fr. Faura in some statements showed concern that the services would benefit those in the South China Sea, and there would be no benefit gained for residents of the archipelago.

The Observatorio grew significantly now that it had official government al support. Apart from partnership with the public, typhoon prediction grew by partnership with growing availability of technologies, instruments and engineers to operate them in the later 19th century. Alvarez considered new and well-functioning instruments and technologies as critical to the success of typhoon prediction science in the Philippines (2016). This included communication technologies as well as data measurement instruments.

With the telegraph technology available, already installed by decree from Spanish administration via the royal Navy, there was opportunity to partner typhoon prediction efforts across the Philippines. All substations became part of a massive meteorological research. All substations took weather measurements consistently throughout the day. This data was sent

back to the Observatorio in Manila. By 1900, the Observatorio had 72 substations across the Philippine archipelago

Typhoon monitoring and communication were closely interrelated as meteorology developed in the Philippines. Anduaga argues that part of the major justification for laying a telegraphic network connecting the Philippine islands and even connecting Manila internationally was to push weather communication forward: "Telegraphic communication had to be undertaken because weather forecasting depended on it, and the prevention of disasters depended on weather forecasting. Thus, Battle's aim was to establish, not so much a *telegraphic* service as a *meteorological-telegraphic* service…" [emphasis original] (Anduaga, 2017, p.37). In order to monitor cyclones, barometric pressure readings had to be taken daily from across the archipelago's substations so that the typhoon's path could be observed and predicted. Telegraphy was regarded as supplementary instrument to science for its importance to the observational aspect of data collection.

This section has outlined the major stakeholders in early Philippine typhoon science, and has shown how each partnership shaped typhoon science in a direction beneficial to the stakeholder. Colonial knowledge, in this case, was used to render the Philippine environment manageable, maybe more so than used for managing the people of the Philippines. What is important for me to emphasize here, though, is that in the production of colonial knowledge, the interests of certain populations of the Philippines (colonized people, rural dwellers, economically disadvantaged, women, etc.) are completely unrecognized. As I move through the dissertation, I show that the experiences of typhoon science for residents of San Jose Beach in 2017 is not so unlike the experience of typhoon science might have been for perhaps a poor

Manila dweller in 1870. Typhoon monitoring and warning is not designed with their specific needs in mind. I present this historical perspective to help understand how the relationship between scientific research, communication technologies/media, and goals to make science publicly useful was structured in colonial Philippines continues in similarly in scientific, governmental and infrastructural practices today.

A Partnership between Science and Benevolent Assimilation: American Adoption of Jesuit Meteorology

During the American colonial period in the Philippines, scientific and administrative knowledge and infrastructural development were key to colonization—not only for military power, but also for justifying holding the Philippine colony to American citizens. American colonization in the Philippines operated with the strategy of "benevolent assimilation." Benevolent assimilation was the name of the U. S's proposition to Filipino revolutionary leaders

The worked to make colonial subjects visible for rule, rather than offer any equality (Rafael, 2000; Brody, 2010).

Colonial science and technology were used to manage populations and environments deemed dangerous. President McKinley sponsored a group called the Philippines Commission to create a government for the colony and facilitate its implementation in Congress (Brody, 2010) The commission had an extraordinary amount of control and power to implement technology and infrastructures throughout the archipelago. Roads, bridges, telegraph were all meant to

facilitate the flow of information and goods throughout the colony, and laid the foundations for colonial technologized inter-island connection.

Media in particular helped achieve this goal by making the colony's people and environments visible, and therefore better understood and better controlled. For Brody, media technologies in the colony were often used to establish legitimization, legibility and an opportunity for the American public to participate in colonization of the Philippines. At this time of colonization, "The Orient" was envisioned as a place of exoticism and peculiarity. Certain cultural groups in the Philippines, like the "Moros" gained much attention in theory representations of being "untouched" by Western influence. Furthermore, the landscape was associated with danger, fear and forbiddances. Territories of military procedures and war were made legible to the American public through large scale cartographic projects that contributed to an encyclopedia, and simplified maps published in American newspapers to help readers visualize military operations overseas (Brody, 2010). Brody argues that war and acquiring new colonial territories redefined American cartography. Maps of non-American territories became important ways of visualizing, knowing places for American public—done through encyclopedias and newspapers: "The place-image formed by these maps facilitated empire through a visually mediated cartographic scape where the agents of empire—the popular press, the military, and the anthropologist—defined boundaries of meaning that established the American colony in the Philippines," (Brody 2010: 112).

This shows the inclination of American colonials to deal with people and environments in the Philippines as "savage" and dangerous, or threats, which were met by employing not only military coordination but science and technology in concert with military and administration. This history outlined by Brody falls in line with Scott's arguments that the state made

populations and environments legible and therefore manageable. American cartographic projects immediately set upon colonization of the Philippines how the close investment of science and technology in American military and colonial goals.

The danger of weather and typhoons also became an object of American colonial understanding and control. With the change in colonial hands, the Observatorio changed as a colonial tool. During the 1890s, there was intense international competition over building undersea telegram cable networks (Cushman 2013). When the U.S. colonized the Philippines, Cuba in the late 1890s, they were able to both acquire control over communications going in and out of Cuba and across the South China Sea. This included the weather communication networks directed by Jesuit meteorologists in both Cuba and the Philippines

In November 1898 Fr. Algué met with Admiral Dewey of the U.S. Navy to discuss the possibility of continuing the work of the Observatorio through the change in colonial powers (Warren 2009). Dewey responded positively to a partnership with Fr. Algué that resonated with direct benefits for the navy, military, agriculture and commerce:

> "The government's wholesale appropriation of Jesuit meteorological technologies and science was proclaimed as a significant leap forward in the field of weather prediction—a panacea to solve all the problems facing the colony." (Warren, 2009, p. 510)

Just months later, in January 1899, plans for a Philippine Weather Bureau modeled after the U.S. Weather Bureau were initiated, and Fr. Algué was recommended as director. The Observatorio was assumed under the Weather Bureau as the Manila Observatory. The U.S. government provided funding for Fr. Algué and his team of scientists and technicians to continue and expand the Jesuit meteorology from the past three decades via the organization of the Philippine Weather Bureau. Algué received the latest instruments to take weather data. Because the

observatory already operated by collecting data across the islands through telegraph, U.S. government plans to lay an expanded network of telegraph and cable lines were created in partnership with the observatory's needs. In this way, meteorology entered into partnership with colonial forces such as the navy, department of war, and department of agriculture and commercial interests of the colonial government:

> "The rapid increase in real-time teletechnologies must be understood as a technological development in the name of imperialism. It had particular significance for communication, commerce, and meteorological science, which, in turn, had a profound effect on the production of colonial subjects and the creation of regional networks for the circulation of scientific knowledge." (Warren, 2009, p.509)

By 1903, the Signal Corps had laid 5,355 miles of landline and 1,615 of undersea telegraph cable line that connect 267 stations (Warren, 2009). This created more connection than under Spain across the islands. Cables created a communicative flow between weather stations and the Manila Observatory on weather observations, typhoon warnings, and business communications. The cables also helped "tie America's new island possession together in real time" and bound the colony across the Pacific to the US (Warren, 2009).

Cushman also emphasizes the importance of science and new communication technologies to imperial politics, both of which intersect with storm warnings. At its creation, the head of the US Weather Bureau expressed enthusiasm for meteorology as an opportunity for global scientific power. He laid out plans to President McKinley for aspirations of US hegemony over weather prediction in Western Hemisphere. This was compatible with the U.S.'s aspirations for expanding a trans-Pacific telegraph network along with imperial expansion. In 1902-03 a massive undersea cable connecting US governed territories across the Pacific was laid. Telegraph became a powerful technology for connecting not just the Philippine islands territory, but also the American empire.

Algué's research progressed rapidly with funding and demand coming from the colonial government. He presented at international conferences several times per year over the following decades, and published award-winning books on meteorology:

> "While the professed objective of Algué's scientific weather research was human welfare, the Jesuit practice of modern meteorology both reinforced and upheld a colonial economic system based on exploitation, profit maximization, and ac - cumulation." (Warren, 2009, 510)

Fr. Algué's became well-known, and something of a representation of the benefits of colonization in the Philippines with focus on scientific development. He became an important communicator of the benefits of colonial science to the American public when he was asked to build an exhibit on the Manila Observatory's work at the 1904 World's Fair in St. Louis.

Typhoon Science Wins Over at the 1904 World's Fair

The Manila Observatory fit well into the American colonialist narrative of science, technology, progress associated with expansion. The 1904 World's Fair in St. Louis, was intended to showcase and celebrate achievements from each state and several other countries—technological, artistic, commercial, etc. Technological achievements were made more meaningful, though, when juxtaposed with conquered "savage" cultures. The opening paragraph from the Philippine Exposition Pamphlet sums up the visitor's intended experience:

> "About the time the World's Fair City is waking up at early morning, one hundred bare-limbed Igorot often sacrifice and eat a dog on the Philippine reservation. At the same hour, scarcely two hundred yards away, a bugle sounds reveille, and four hundred well-trained soldiers in the blue of the United States Armey hustle from their tents. These are the Philippine Scouts…All of these people live on the same island in the Philippines. The Igorot represents the wildest race of savages, the scouts stand for the results of America rule—extremes of the social order in the islands" (Newall, 1904).

The “extremes of social order” refer to the results produced by American intervention and assimilation of native people into American ideals through military (and educational) discipline and training. The Philippine Scouts’ disciplined and American morning activities displayed to the American public the achievements of American colonization, while the “race of savages” and their morning activities were meant to represent the lack of intervention. The exhibit adhered to ideas like Manifest Destiny and Social Darwinism (Kennedy, 1998), and validated those ideas with colonial science.

As patrons crossed the main bridge over a lake and into the Philippine Exposition, they first entered a replica of the Spanish walled city of Manila, and then could continue straight to the Observatory, then onto a large courtyard encircled by large, white American style buildings containing displays of education, fine arts, commerce, government, forestry, agriculture, mining and ethnology. The geography of the Philippine exposition communicated the power and control of the American government over the Philippines through knowledge and centralized organization. The departments of education, government, forestry and commerce formed an impressive square in the center of the Philippine exposition, while the Spanish colonial and “native” exhibits were spaced out along the peripheral areas.

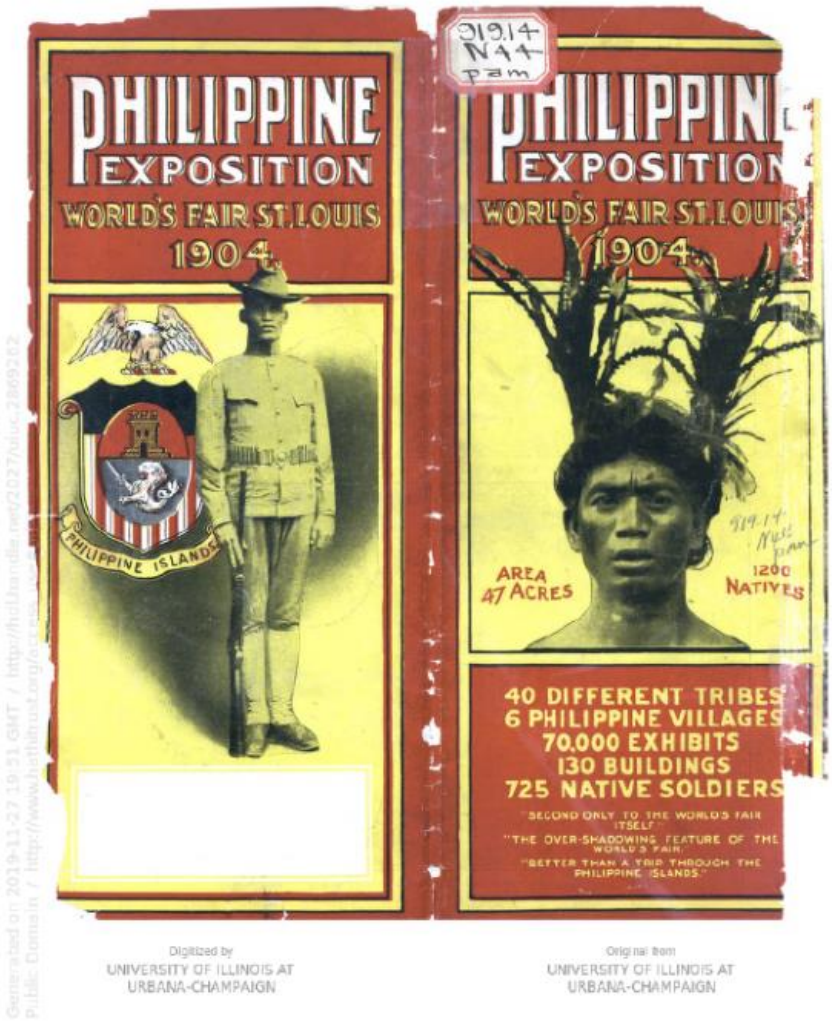

Figure 1.2: The cover of the Philippine Exposition at the St. Louis World's Fair in 1904, which shows a man from the Philippine Scouts display, and a man from one of the Philippine Villages displays. Retrieved from: https://catalog.hathitrust.org/Record/101643158.

The activities and accolades associated with the Manila Observatory, also referred to as the Philippine Weather Bureau, were proudly presented to the American public at the 1904 St. Louis World's Fair. The Weather Bureau exhibit consisted of two components: a 33 x 33-foot building with an observatory tower, and a 100 x 65-foot outdoor relief map of the entire

Philippine archipelago. The outdoor relief map was molded from concrete, and showed the locations and elevations of all 7,000 islands. It could be studied from all sides atop a viewing gallery (Repetti, 1948). The building displayed even more relief maps (Mayon and Taal volcanoes, Manila Bay and a 110 x 75-foot map of the Philippines Islands) prepared by the Weather Bureau. It also displayed the latest meteorological instruments—this included one of the earliest seismographs used in the United States—and other scientific representations of the environment through tables and curve maps of air pressure.

Fr. Algué spent nine months in the U.S. preparing the exhibit, and interacting with visitors. He did much to garner support for meteorology in the Philippines. Fr. Algué received the Grand Prize for his two meteorological instrument inventions and three Gold Medals for other contributions of the exhibit, the Philippine Weather Bureau received Grand Prize for Meteorologico-Seismic Station of the First Order, and the Manila Observatory won Grand Prize for the large and accompanying relief maps, and one Gold Medal and four Silver medals award to other involved staff (Repetti, 1948).

The exhibit was successful at convincing American politicians and many in the American public that the Philippine colony was thriving under American rule: “the Weather Bureau exhibit showcased the ‘civilizing’ and ‘modernizing’ effects of American rule in the islands.” (Warren, 2009, p.511). In particular, the display of technologies and its uses in developing the urban center of Manila created a great image of success: “The Manila-centered, teleconnected, meteorological network projected a daily image to American politicians and the public at large of the Jesuits scientifically ordering the geographies and cultures of an archipelago considered inherently disordered and violent” (Warren, 2009, p,517).

The enduring importance of meteorology and weather warning to colonial power

McNeill argues that in addition to a "triple assault" of European colonial tactics that included military, commercial, and cultural components, environmental sciences could be added to that list (McNeill, 2009). While environmental sciences were not an institutional discipline at the time, sciences that would fall in this discipline such as botany, scientific forestry, meteorology, sanitation were highly invested endeavors during American colonization in the Philippines. McNeill argues that "imperial environmental sciences" in the colonies changed the character of imperial science afforded by extended duration of stay in the field available through occupation. Meteorology underwent institutionalization during American colonization in a way it had not under Spanish colonization:

> "…the transformation of nature so as to make empire financially sustainable required something more, something more permanent and ongoing. It required the institutionalization of imperial environmental science and management." (McNeill, 2009, p.476)

By the 1920s, the American government replaced the Spanish Jesuit leadership of the Weather Bureau with American Jesuit leadership (Udías, 1996). By 1926, typhoon warnings were regularly sent to all weather stations across the archipelago, and too operators at key colonial stakeholders (mostly around Manila) such as to naval stations, the Bureau of Ports, military forts, the Manila railroad company. Regular warnings were also sent internationally, across the Southern China Sea to observatories in Tokyo, Shanghai, Taihoku, Phulien and the American Consul at Hong Kong. Typhoon warnings were expanded to governors of provinces where no weather station existed only in extreme danger. With this expanded telecommunications network, this was the first time typhoons could be tracked simultaneously

or in “real-time,” and technicians could give early warnings by tracking distant weather occurrences.

With the change in colonial hands, the observatory changed as a colonial tool. Then, the observatories changed hands again with independence. By the 1950s, most of the Jesuit observatories closed in formerly colonized territories because meteorological studies began to be taken on by local governments and universities (Udías, 1996). The observatories across the world, former colonial institutions, therefore, morphed into government and university institutions run by the post-colonial independent states. Through these institutions, carried one through several governments, these are lasting impacts (enduring and ongoing impacts) of colonial science and colonial institutions built on science. As Silva notes, in the 100 years since 1904 display of forestry, only 15% of the Philippines’ pre-American era forest remain (Silva, 2013). It creates a vivid demonstration of the ongoing effects of colonial vision for the Philippines over 100 years after colonization. And it forces us to think what other results have occurred as a consequence of that lasting colonial vision for scientific legibility of the Philippines. Such as: How does typhoon prediction and warning continue to carry colonial perspectives in the Philippines today?

Conclusion

This chapter considers an extended history the techno-politics of typhoon prediction and warning in the Philippines—through Spanish colonization and American colonization—to set a ground for understanding later time period’s use of typhoon science in the Philippines. I have shown in this chapter that typhoon prediction and communication in the Philippines has roots in colonial science stretching to the mid-19th century. In the next chapter, I show how these

colonial institutions—the Observatorio transitioned into the Philippine Weather Bureau—was later transitioned into PAGASA in the Philippine post-colonial government. PAGASA continues as the state meteorological service in the Philippines today.

Disaster communication in the Philippines has roots in the simple experimentations in the pigeon wing of the Jesuit missionary college in Manila. Jesuit scientists were concerned with fulfilling religious goals to understand the natural world and educate others with their research. Additionally, their world was centered within an international (though European-centered) network of Jesuits rather than Spanish colonial goals. However, as others in the colony recognized value in their work for their various needs (commercial, military, seafaring, agricultural, geopolitical, etc.) the directions of the observatory work became influenced by their funders. This history shows how different stakeholders in typhoon science shaped the direction of its development.

With the change in colonial rule, American colonists found an easy partnership with Jesuit science, which shared American colonial goals in the name of human progress. Scientific knowledge and technological inventions of the observatory were incorporated into the American colonial rule. The observatory was featured in the St. Louis World's Fair to convince the American public of American presence in the Philippines in terms of progress. As with Spanish colonial rule, typhoon science built up to use as a tool to serve certain stakeholders—in this case for colonials to justify rule—rather than a public service.

While Anduaga describes colonial typhoon prediction as "multidirectional," Alvarez sees colonial typhoon science as a "point of convergence." Both authors recognize that typhoon prediction attracted the interest of many sectors of society that made up colonial Philippines.

And that typhoon prediction efforts opened a unique opportunity to collaborate among many societal perspectives including: universities, the military, colonial administration, telegraph engineers, Manila merchants, international imperial governments, However, it is evident that many perspectives were excluded—urban poor, women, rural dwellers, those outside major administrative area of Manila, probably non-Spanish speaking immigrants (like Chinese and Indian immigrants).

CHAPTER 2

Nationalizing Disaster

"*NOW, THEREFORE, I, FERDINAND E. MARCOS, Commander-in-Chief of all the Armed Forces of the Philippines, and pursuant to Proclamation No. 1081 dated September 21, 1972, as amended, in order to achieve the Government's avowed objective of providing environmental protection and utilizing scientific knowledge as an effective instrument to ensure the safety, well-being, and economic security of all the people, and for the promotion of national progress, do hereby order and decree that the "Atmospheric, Geophysical and Astronomical Science Act of 1971", as follows, with some modifications, shall be as it is hereby adopted, approved and made part of the law of the land*." - President Ferdinand Marcos, December 8, 1972

Typhoon science and warning underwent significant transformations several decades after colonization under the nationalistic aims of President Ferdinand Marcos. While the last chapter considers the lingering structures of knowledge and power in Philippine typhoon science and warning systems, this chapter looks at how typhoon knowledge was used to foster Philippine nationalism. Similar to the last chapter, I ask: Who does typhoon knowledge serve in this political context, and who does it not serve?

In 1935, the American government transitioned the Philippines to commonwealth status with the Tydings-McDuffie Law in which independence would eventually be granted independence after a ten-year transitionary period with the U.S, in which Filipinos were "mentored" to assume roles in a U.S style democracy. For the first time, the entire Philippine archipelago was to be considered as a single nation. Prior to American colonization (1898-1942) and Spanish colonization (1521-1896), the islands were home to hundreds of different societies with unique cultures and languages. These lingual and cultural diversities persisted throughout 350 years of colonization. So, recurring questions with independence and nation-building were:

who are the Filipino people, and what is the Philippine nation? This question permeated many aspects of the new government and citizens, through the creation of a national language, standardized history and educational system, homogenized cultural heritage, and the social contract between Filipino citizens and the governing state. I argue that the question of Filipino identity extends into national disaster response. Though environmental hazards and disasters are common experiences shared by people across the islands, they are not often integrated into the idea of what makes up the Philippines as a nation. So, I extend the line of inquiry on national identity and nationalism to disaster: How can disasters be understood within a history of nation-making? The foundations to this question lies in the national identity building activities in the decades after independence, and continue as the Philippine government has struggled throughout each decade to successfully prepare for, mitigate, and govern disasters.

Bankoff notes that natural disaster is often left out of works of history, but that these events should be included because there is a correlation between this history of disasters and the political structure, economic system and social order (Bankoff, 2003). In time after independence was granted and after the end of World War 2, Filipinos themselves had control over designing disaster response systems to serve the public, but no administration dedicated time to put forth a firm vision for disaster governance until the early 1970s. The first effort to establish a national disaster response plan was in 1941 when the National Emergency Commission was established. The commission was meant to control and coordinate citizens' participation in disaster response. However, several post-war administrations neglected developing the organization further. Disaster mitigation reached a turning point 30 years later in the 1970s with former President Ferdinand Marcos' people-centered and development-oriented ambitions for a Philippine "New Society." Marcos enacted several major reorganizations, and

attempts to modernize the country's disaster response policies, including P.D. 1566 also known as the Strengthening the Philippine Disaster Control, Capability and Establishing the National Program on Community Disaster Preparedness. This decree acknowledged disaster management as a state responsibility, and centralized disaster response into national agencies. The Philippines experiences more disasters throughout subsequent decades that forced politicians to revise disaster response strategies in the Philippines.[12] For the purposes of this paper, however, I focus on Marcos' nationalistic philosophies and efforts to reorganization of the former American colonial Weather Bureau into PAGASA (the Philippine Atmospheric, Geophysical and Astronomical Services Administration). I discuss these major landmarks during Marcos' presidency and later dictatorship (1968-1986) in disaster mitigation as they relate to nation-building.

This chapter builds off the themes in Chapter 1. I focus on science, knowledge and technology as state tools for dealing with the environment, typhoons in particular. However, with the establishment of a national democratic government, disaster mitigation for the first time became a concern about protection of "Filipino" lives and property—rather than only colonial military and commercial interests. Scholars have drawn connections between media, politics and disaster—that consider the three in a mutually constituting relationship (Benthall, 1993; Bankoff, 2003). However, there has not been a line opened into disasters as a part of post-colonial nation building. I build on these connections to investigate the significance of

[12] Another turning point in disaster governance occurred in the 1990s when several major disasters occurred in the early 1990s, including the famous eruption of Mt. Pinatubo. These events were heavily mediated, and the media made recovery actions (inaction and mis-action) visible to most people in the nation. As worldwide concern grew over intensifying and increasing environmental and social disasters in the 2000s, the Philippines participated in international efforts to prepare governments for the effects of climate change.

disaster to nation-thinking in the Philippines. Since scholarship about the new nation—nation-building, national identity, and nationalism—are important to understanding the Philippines in the post-independence period (especially 1945-1980s), understanding how disaster articulates with these theories is important.

The concept of a Filipino people is central to how I argue people are marginalized by disaster governance. I earlier put Filipino in quotations to note that the concept of a Filipino people only appeared during the revolutions against Spain in the late 19th century, and was still a concept being defined, adopted by residents of the archipelago in independence. Scholars have argued that the concept of a Filipino identity has homogenized and marginalized many people living within the national boundaries (Claudio, 2013). With this perspective in mind, I argue that governmental projects to serve the Filipino people likewise homogenize citizens' needs and marginalize the needs of many populations.

The relationship between disaster and nation-thinking lays certain political conditions for managing disaster. First, nation-thinking about disaster homogenizes the experience of disaster. Second, national disaster management projects form a political relationship between citizens and state. This relationship is characterized by expectations: that citizens participate, cooperate and help themselves in disaster mitigation, and that the state assumes responsibility and leadership in disaster. This relationship, or social contract, therefore forms an additional way of imagining the nation.

Conceptualizing the Philippine Nation

Scholarly discussion of nationalism and national identity has typically focused on education, media, performance, tourism, and other forms social organizing but disaster is not

usually included. In this section, I build on existing theories on nation-thinking to apply to disaster.

One of the foundational theories of conceptualizing the nation is Benedict Anderson's "imagined communities." Anderson argues that media—mass produced and distributed through print-capitalism—set the means for communication and idea-sharing between vast amounts of people, such as those within a single nation. While it may be impossible for each person of a nation to meet all the others in person, mass distributed stories in newspapers, and creative ideas in literature helped people imagine themselves as part of a shared community. Anderson was interested in the rise of nationalism and the idea of a political nation in the late 1800s, as connected to the growing availability of the printing press. Anderson argues that print media produced in mass quantities and distributed across a large area (like an entire nation) enables people to identify with others they've never met. Reproducible media influenced the need for a single national language, helped consolidate common morals and ideologies, and influenced a sense of shared identity that exists in the imagination on a mass scale that did not require person to person contact. Anderson refers to the writings of Dr. Jose Rizal in the Philippines to illustrate this point. In the Philippines, the concept of a Filipino people as a unified category was first thought up by the educated elite—mostly through the writings of Dr. Jose Rizal and other members of the *Illustrado*—and used by anti-colonial revolutionaries at the end of the 19th century when they revolted against Spain (Anderson, 1998).[13]

[13] Illustrados were a gathering of the European-educated elite in the Philippines who worked to build a movement for a Philippine nation and Philippine independence.

Media and national consciousness

Scholars of media and cultural studies use “mediatization” as a concept to understand the relationships between changes in media and changes in culture and society (Couldry & Hepp, 2013). Scholars working from a “mediatization” perspective find relationships between, “the role of particular media in emergent processes of socio cultural change” (Couldry & Hepp, 2013, p.197). This is a co-constituted relationship rather than a technologically deterministic relationship. Hjarvard argues that the media is so embedded in modern society that, “the media have become society’s most important storyteller about society itself” (Hjarvard, 2008, p.13).

Within a mediatization framework, it is interesting to consider how disasters are constructed as social reality. Scholars of the Philippines have noted the special relationships between disaster and media. Bankoff, for example, brings attention to the relationship between the media and political response during disaster in the Philippines. He analyzed, referring to the media coverage of the Mt. Pinatubo eruption in 1991, that ‘Political concern with the victims of natural disasters tends to follow the same ebb and flow as that of the media: much concern and many promises during the first days of rescue and relief but waning political support during the hard years of reconstruction and rehabilitation that follow’ (Bankoff,2003, p.407). Studying the politics of Typhoon Meding (1970), Warren (2013) argues that politicians found opportunity in media coverage of the disaster to display their relief activities and thus governmental efficacy. Conversely, he notes, the media was a means to for the public to critique inadequate response to disaster by the government, and demand for relief services. Media play an important role in constituting the social reality of disaster in the Philippines. I analyze how that social reality of disaster might also be a shared national or Filipino reality.

By looking at disaster, I add another dimension to thinking about the social ties that bind in imagined communities, and the relationships between media and society through mediatization. This essay considers the co-constitutive relationships between environmental disaster, media and governmental disaster response in creating a national/Filipino social reality of what disaster is.

Hegemony in Filipino national identity

The literature Anderson reviews by Jose Rizal was intended for Spanish-speaking audiences—the educated elite in the Philippines (typically with *mestizo* colonial ties) and Spain (Anderson, Lisandro). His original use of the term Filipino in historical context referred to Philippine-born Spanish *mestizos*, as opposed to *peninsulares* (Philippine-born Spanish) and *indios* (native-born population with no ethnic ties to Spain). When Rizal's works were translated into English and Philippine languages, and incorporated into the national education system after independence in the 1950s, Rizal's historically-specific meanings were modified in translation to appeal to young readers and fit into "official nationalism" (Anderson, 1991, p.83). Dr. Rizal has become a symbol of the Philippine nation and national identity that is interpreted differently again and again throughout history to support certain nationalistic ideals of the times. Rizal is a name well-known to every Filipino citizen, as he is considered the "national hero" of the Philippines. His vision of a Filipino nation is taught in grade school, and his image is memorialized as a statue in many town squares across the Philippines. Rizal is considered as a symbolic and sometimes literal "first Filipino" for his ideas that the archipelago should be a self-governing nation. His writings are re-taught and re-interpreted through time to instill/maintain/reproduce a sense of shared Filipino identity across the islands. However, as a

European-educated, Spanish-speaking member of the *mestizo* elite from Manila, Dr. Rizal, does not represent the diversity of people living in the Philippines. I use the example of Rizal as a consideration for Filipino nationalism/national identity and the exclusion that many people face when thinking nationally in the Philippines.

The idea of a unified and definitive Filipino nation and identity has been used to define the past, present and future directions of the Philippines, but some find the concept of a Filipino identity is too well accepted or taken for granted. Historian Lisandro Claudio reviews the nationalistic motivations in some famous Filipino historiographies that take for granted the idea of the Filipino nation. Lisandro critiques that the "fissures" in nationalism should be recognized (Claudio, 2013). Following Hobsbawn (1977; 1992), Lisandro argues that nationalisms should be understood in their historical moment. The nationalistic histories of the Philippines that Lisandro analyzes were created in a certain historical moment after independence during anticolonial and indigenization academic movements to rewrite history and social science to serve the Filipino population rather than foreign interests. Some examples analyzed include widely recognized works like Teodoro Agoncillo's, *The Revolt of the Masses: The Story of Bonifacio and Katipunan* (1956), Zeus Salazar's, Pantayong Pananaw psychological school of thought, and Reynaldo Ileto's, *Pasyon and Revolution* (1979). Many scholars recognize the origination of contemporary leftwing nationalism as stemming from Agoncillo's *The Revolt of the Masses: The Story of Bonifacio and Katipunan* published in 1956. In this book, Agoncillo essentially retells the story of Filipino revolution against Spain as led by the masses, or lower classes, rather than the *Illustrado* elite. In doing so, he defines Philippine nationalism as tied to the masses—the lower classes. Two decades later, Zeus Salazar, a University of the Philippines professor with roots in history and anthropology, formulated the Pantayong Pananaw school of thought in the context of

martial-law era nationalism. Salazar was influenced by indigenous psychology projects he collaborated on with its founder, Virgilio Enriquez. His work, therefore is based on the idea that there is a certain Filipino psychology or way of thinking, that applies to all within the islands/or all who can be identified as "Filipino." In the 1970s, former President and dictator Ferdinand Marcos commissioned a project to rewrite Philippine history for the Filipino people. *Tadhana: The History of the Philippine People*, was a nationalistic project that tied directly in o Marcos' education development programs. Claudio critiques these works of nationalist historiography as works that do not serve the Filipino people as intended because they, "privilege nationalist unity over thorough examinations of disjunctures produced by class difference" (Claudio, 2013, p.45), and "serve as means to implicitly justify localized acts of class oppression" (Claudio, 2013, p.45). Thinking nationally, therefore, has the power to obscure the diversity of perspectives and experiences of (most) people in the Philippines. This is so especially in the time of Marcos' New Society, and the special privileges given to particular scholars to reframe Filipino national identity to fit within the vision of the New Society.

These discussions on the idea of a Filipino national identity reveal first that a sense of national identity changes through time, and though some national symbols remain, their interpretations change and reflect the ideas of nation/national values of the time. Second, they show that just beneath the surface, pinning down the idea of a singular sense of Filipino national is a slippery task. The incredible diversity in cultures, languages, beliefs, ways of living (rooted in pre-Spanish times and also growing with migrations) challenges the task of adequately defining the Filipino, or the Philippines. This is the theme of this chapter: that attempts to "nationalize" the Philippines, its people, and infrastructures—specifically disaster mitigation—create the

conditions for neglecting the diversity of experiences and needs in preparing for and mitigating disaster.

Modernization projects involving technological development in insular Southeast Asia have focused on the importance of connecting and unifying a disparate and diverse citizenry. Beyond reproducible media that Anderson argues connects nation, technology can also provide a means for imagining a unified and connected nation. This extends to the adoption of foreign media technologies, such as the case of the satellite in Indonesia. Barker analyzes the Palapa satellite in Indonesia as a symbol for national unity (Barker, 2005). In 1976, President Suharto broadcast on television and radio the first calls made by satellite—these were made to government officials at the most distant points on the map of Indonesia. This display was meant to show the meaning of efforts to strengthen national connectivity through calls. And, it was meant to impress the idea of Indonesia as modern and technologically advanced or developed nation, since they were the first country in Southeast Asia to obtain a satellite. Focusing not only on the major politicians and Indonesian entrepreneurs involved, but also on certain hidden figures of satellite age in Indonesia, Barker finds that each actor along the chain (from engineers, government officials, and entrepreneurs) had different nationalistic motivations for accomplishing the satellite dream. For him, these are “techno-political visionaries” who believed in the satellite's ability to carry out nationalistic dreams of unity, and had a high impact on how the satellite came to be interpreted. They became advocates for the satellite and gave it meaning. Barker also makes the interesting comparison that much like spirit mediums, these figures mediated the difference s of development and underdevelopment, traditional and modern through the satellite to the populace. However, the narrative of telecommunications and modernity stems from colonial times, and these figures adjusted it for the satellite.

I use this literature to link consideration in the Philippines during the post-colonial government that sought to revise and construct a particular way that citizens may imagine the nation. In the case of Indonesia in the New Order, “techno-political visionaries” labored to make technology and infrastructure meaningful to the idea of Indonesia as a modern and connected nation. In this chapter, I review how Marcos’ New Society visions/hopes for typhoon monitoring and warning likewise became a major techno-political project in the Philippines. PAGASA—was created out of the total reorganization of the Weather Bureau—a gesture of putting science and technology in service of the Philippine people. National disaster management projects have been showcases of technological modernity for not only Marcos’ administration, but subsequent administrations.

In *Red Tape*, Gupta (2012) also contributes to our understanding of how the nation is conceptualized through encounters between citizen and state bureaucrats. However, he focuses on the experiences of unequal treatment in bureaucratic processes and argues that “red tape” should be considered as state violence. He questions, for example, why the deaths of impoverished and other marginalized people (like women, girls, the elderly, etc.) are normalized and not considered a tragedy as other deaths might. In making his point, he makes clear how natural disaster are more visible and therefore more addressed by the Indian state: "How does one account for the enormous gap between the Indian state’s indifferent response to poverty on the one hand and its much more proactive responses to natural disaster and liberalization on the other?" (Gupta, 2012, p.6). This question makes the point that some national concerns are given more urgent attention than others, and that the distinction between which emergencies and which deaths matter is political. This example communicates, in my interpretation, how disaster is valuable as a politically meaningful project. These observations point to a

consideration of nation-thinking that is focused on making disaster response politically meaningful. The state is not merely saving lives, but reinforcing faith in their administration through disaster management.

Through the above considerations on nation-thinking, national identity and nationalism, I look to encounters and relationships between state and citizens in disaster to find insight on why disasters are important to imagining the nation and building the nation. Nation-thinking in relation to disaster is important to consider various dimensions of the state-citizen relationships. These are an expectation for response—for the government to claim responsibility for the country in disaster, and an expectation for citizens to comply, engage in *bayanihan* (communal work), and more recently, to survive (Gepuela, 2016). As military, technology and science became the standard response to disaster on the part of the government, government efforts to "modernize" technology, equipment, response techniques became offerings for citizens as assurances of their protection. On the part of citizens, there was an expectation for timely, effective response to disaster without political corruption. It is the discourses on governmental negligence and corruption in particular that facilitated through media that shape a way of imagining the nation. These experiences with disaster governance become ways of imagining the Philippine nation.

In the next sections, I analyze certain key times in which disaster management became important to national political discourse within Marcos' nationalistic leadership as President (and later as dictator). I look at the novel institution of a national plan for disaster management as an important contract between the Philippine democratic government and Filipino citizens. I also analyze the Mt. Pinatubo eruption in 1991 as an important moment for experiencing disaster together in "real time" through media. Both these examples show how hazardous

environmental events came to be treated as disasters to the Philippine nation and its citizens. The pressure for governments to respond to catastrophic events is what pushed administrative reorganizations and policy changes within the national government.

Marcos' New Society, the Triplet Typhoons and PAGASA

Ferdinand Marcos' presidency and later dictatorship over the Philippines is remembered as one of the most nationalistic periods in Philippine history. In 1966, Ferdinand Marcos was elected president of the Philippines on a campaign for leadership that uplifted poor and rural Filipinos through development—specifically economic and infrastructural development. Marcos' administration was oriented by cultivating an anti-colonial nationalism—leadership based on cultivating a sense of national identity, belonging and commitment. Marcos' sense of nationalism centered on anti-colonial goals to recompense inequities in Philippine society that were legacies of colonization, and to integrate Filipino values into the new democracy. For example, he focused on breaking down plantation lands and redistributing the land for common folk to own and farm. He also restricted some governing structures by introducing the *barangay*, a pre-colonial demarcation of land led by a single person (*datu*), as the smallest governing unit.[14]

In the early years of his presidency, Marcos focused on development tied to Philippine nationalism—an effort made in partnership with the Philippine people and their government. Marcos' second State of the Nation address in 1967 entitled, "The Epic of Nation-Building," highlighted the accomplishments of the administration's first year in office, and emphasizes the

[14] In pre-Hispanic Philippines, many societies were referred to as a *barangay* or *balangay* lead by a *datu*.

future directions of the administration which were focused on economic development in agriculture, public works, and community participation in the nation's development. He endeavored to rewrite a sense of Philippine legacy rooted in revolution and warriorship into a national identity based on diligence and hard work for the benefit of the nation:

> In a moment like this, it is always fruitful to consider our relationship, and perhaps our relevance, to our own history… our history unfolds as a modern epic filled with the heroic deeds of our people. Today, this great epic is being written no longer with valorous exploits in arms, or with golden-tongued patriotic oratory. It is being written with a thousand acts of courage and faith from day to day—in our barrios and in our cities… (Marcos, 1967)

In this address, Marcos called upon individual participation in order to make a government that is truly successful for the people. He both asked the people to subscribe to the idea of Filipino acts of heroism, and also individual Filipino will and ability for industriousness.

Marcos' fourth State of the Nation address made in 1969 continued to draw on civil participation in development, however the spirit of the Filipino, or bayanihan was also used as central to the nation's success. This address, entitled, "The New Filipinism," was quite a bit more revolutionary in tone. Marcos connected the *illustrado* aims of Jose Rizal to the fulfillment of Rizal's vision of an independent republic of the Philippines 100 years from the revolution taking place in the 1890s.[15] Marcos requested participation and support of the Philippine citizenry in the spirit of communal building using the idea of bayanihan to foster communal participation and cooperation with citizens: "The people's support and participation are essential to democratic progress. We have, therefore, revived the community development program which had become moribund under the previous administration…We have sought to awaken the

[15] Dr. Jose Rizal is regarded as a key hero of Philippine independence. He outlined his vision of an independent Philippine nation in a series of essays called, "Filipinas dentro de cien años" ("The Philippines a Hundred Years Hence") in 1889-1890.

bayanihan spirit in our people. Their response over a wide part of the country has been spectacular" (Marcos, 1969). Bayanihan can be translated as communal work or "communal cooperation" (Pertierra, 2002). The root of this word, "bayan," can be used to refer to any community of belonging: one's residential neighborhood or town, or even one's nation. The term originates in uses specific to agrarian communities—the classic image of bayanihan is several men gathering to lift and relocate an entire house—but has now for the past several decades been used politically to encourage civic participation in government projects of development and public welfare by calling upon citizens to enact individual responsibility for the wellbeing of their fellow Filipinos.[16] By calling upon the bayanihan spirit, Marcos situated his aims as something deeply Filipino (read as not related to colonial culture and governance), and relevant both on the small community and nationwide scales. I elaborate on Marcos' use of bayanihan here because in my research, I have noticed that the term has special relevance to disaster in the Philippines. The concept of bayanihan has been widely used to this day in language of news, etc. about disasters within the Philippines, which I will address in more detail later.

The previous paragraphs have discussed Marcos' idealisms for the Philippines. Here, I show how he materialized these ideals into nationalistic projects, and the relationship of his rapid development to increased need for disaster governance. In his first years in office, Marcos and his wife Imelda set out fulfilling development initiatives within both Metro Manila and rural areas. Some of the major infrastructural and programmatic changes in these first years of presidency were: inter-island bridges, health centers, affordable and accessible banking, moving

[16] See the famous painting, "Bayanihan," by Carlos Francisco: https://httppinoyartshub.wordpress.com/2018/01/07/bayanihan-by-carlos-botong-francisco/

rural farmers from land tenancy to land ownership, and more. Rapid development was initiated partly to meet the needs of mass population growth due to post-war migrations from rural areas into urban areas, especially Metro Manila in the 1950s and 1960s (Warren, 2013; Boyce, 1993; Broad & Cavanagh, 1993). The city could not accommodate affordable housing for the large numbers of rural poor to the city, and so the migrants were forced to build their homes as informal settlements around unused lands and even infrastructures like along the banks of canals and sides of railways. Marcos administration development was also initiated to "modernize" Manila to make it more appealing for tourism and foreign business exchange. This meant improving the international airport, hotels, and cultural/heritage sites like museums and public parks, and facilitating conveniences like grocery and pharmacies near tourist areas. Meanwhile, "crony capitalists" often built without regard for safety codes and building ordinances (Warren, 2013), which complicated efforts to keep the city's infrastructures functioning as planned. In the political ecology perspective on disaster, disaster due to natural hazards like typhoons are better understood as man-made rather than natural disaster (Oliver-Smith, 1999; Bankoff, 2003) because of the built conditions of infrastructure, etc. that endanger people living nearby. These rapid development projects of the late 1960s resulted in creating the conditions for the now infamous Manila floods that occur with regular monsoon rains and typhoons. While Marcos set about fulfilling promises to Filipino citizens, he was also setting the conditions for intensified and recurring disasters, especially due to flooding.

In 1970, four years into Marcos' presidency, Manila suffered serious flooding and other hazards from a series of typhoons including the infamous "triplet" super typhoons which crossed the Philippines within a few weeks of each other. Typhoon Meding struck Luzon on September 2, 1970, and caused widespread damage in greater Manila. Over the several weeks

of recovery following, Marcos made quick, decisive decisions to deal with the relief needs, and grandstanded his efforts with public appearances and announcements in relation to recovery. Warren notes that discussions about the upcoming presidential election and the disaster recovery stayed in media for a month. He observes: "Marcos took pains to ensure that his 'political' intervention caused by Meding's impacts lasted until the elections" (Warren, 2013, p.9). As Typhoon Yoling, the final of the "triplets," approached Manila on November 20, 1970, President Marcos and Metro Manila Governor Imelda Marcos were entertaining the Burmese General Ne Win and Madame Ne Win, and decided to bring the couple out of the metro area to play golf. The Marcos' absence during crucial moments for recovery in the time and immediate aftermath of disaster, significantly delayed needed response. President Marcos put the Executive Secretary and Assistant Executive Secretary in charge of the typhoon response rather than dealing with it directly himself, He then belatedly declared a state of calamity in several affected cities in Metro Manila—which was too late to prevent government workers being stranded at their offices, and administratively delayed recovery.[17] Residents were dissatisfied with the Marcos' delayed and indecisive response. It was with this background that Marcos acted decisively when Typhoon Gloring approached Manila on July 1972.

In 1972, after Typhoon Gloring heavily affected Metro Manila, disaster became a major issue requiring government response. Typhoon Gloring was the final straw for Manila residents after a series of strong typhoons in 1970 (Typhoon Meding and Typhoon Yoling) that caused massive flooding, infrastructural shutdown, trade and shipping disruption, displacement, death, viral outbreak and property destruction in across the Philippines. As the typhoon approached,

[17] The State of Calamity declaration opened up governmental funds to respond to affected areas more rapidly than through non-state-of-calamity governmental procedures.

Marcos immediately declared a state of calamity and set about several recovery efforts including: releasing assistance funds, seeking for foreign relief funds and goods, making aerial surveys of affected areas, announcing that raised prices for essential goods would be penalized, converting part of the presidential residence Malacañang Palace into an emergency hospital, temporarily transferring the government outside Metro Manila to Pampanga, and activating four agencies to directly help typhoon-affected people: the departments of National Defense, Health, Social Welfare and Public Works.

Through the rest of the year 1972, the structure of disaster governance—as well as national government—changed radically. Just two months after Typhoon Gloring, on September 21, Marcos declared Martial Law in the Philippines. The declaration of martial law has typically been framed as a response to a string of politically motivated bombings by around Metro Manila. However, some argue that Typhoon Gloring also provided a means for declaring martial law (Tiglao, 2017). Two months after that, on December 8, Marcos pushed through a total reorganized of the Weather Bureau, which had not changed much since American colonial administration. He reorganized the Weather Bureau offices into the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)—an acronym that forms the Tagalog word for “hope.” Marcos signed in the Atmospheric, Geophysical and Astronomical Science Act, which established PAGASA as a new governmental agency within the Civil Defense.[18] The act was announced in Presidential Decree no. 78. The degree stated that PAGASA was made as an "urgent" need to protect the Philippine people from calamity. Within the announcement, there is an emphasis on serving the people, and utilizing science for this

[18] The Atmospheric, Geophysical and Astronomical Science Act of 1972 was publicly announced in the Official Gazette of the Philippines in Presidential Decree no.78

purpose: “It is hereby declared to be the policy of the State to provide protection against natural calamities and utilize scientific knowledge as an effective instrument to insure the safety, well-being, and economic security of all the people, and for promotion of national progress” (Marcos, 1972). PAGASA was founded along with several other crisis coordinating offices.

The act lists six points of policy in which PAGASA shall serve the public. These cover intensified research, efforts to reduce natural calamity impact, awareness through educational outreach, make data useable to the public and other organizations, promote cooperation with other data taking organizations, and establish weather stations in strategic places throughout the country. Since 1970, Marcos in partnership with Weather Bureau director, Dr. Ramon Kintanar, worked to make PAGASA an impressive agency in service of the Filipino peoples’ most pressing needs for disaster mitigation. PAGASA was treated as a modernist project and so heavily invested in their technologies, with 10 million pesos (over 70% the allotted budget) designated for equipment updates. PAGASA transitioned to digital meteorological techniques, using such digital technologies as satellite transmissions and computer-generated models. PAGASA Revised the exiting storm warning signals adopted by the Weather Bureau in the 1950s that were originally intended for use by mariners at sea. This was a warning scale of Public Storm Warning Signal (PSWS) 1-10 based on wind speed? (Cayanan, 2015).[19] PAGASA adopted the World Meteorological Organizations typhoon warning signal categorization into 3 categories:

PSWS #1: Tropical Depression (windspeed <63 kph)

PSWS #2: Tropical Storm (windspeed 64-117 kph)

[19] These warnings were communicated by visually by hoisting red cones in the daytime, and shining white lights at night.

PSWS #3: Typhoon (windspeed >118 kph)

These are just some of the major re-organizations to weather service in the Philippines made in the name of service to the Filipino people. Specifically, Marcos presented this service to the Filipino as gifting modernization through science and technology.

Warren observes that these major changes in policy concerning disaster management reflects a shift in how Filipino citizens and the state had to accept disaster as both recurring and changing: "It is set against this background of President Marcos attempting to radically transform the political system after 1972 that Filipinos could not afford to think about the climate and recent weather phenomena as necessarily unchanging or 'normal'" (Warren, 2013). It becomes clear during this period that there is an intimate relationship between disaster and politics with mass media as an intermediary becoming common within the Philippines. This relationship shows the growing expectation that government should prioritize disaster to protect citizens' wellbeing as a project of "national defense." Disaster management and weather monitoring services became a service to all Filipino people—a tool of equality. However, in conceptualizing disaster management in terms of the national, the diversity of needs that come with diverse experiences of disaster based on location, socioeconomic status, and more get factored out of the conversation. This becomes an issue that later administrations face, particularly in the 1990s, after the eruption of Mt. Pinatubo opened eyes to the need for local governments to become the main responders in disaster.

Mt. Pinatubo and a sense of endemic catastrophe

The years following Marcos' ousting in 1986, the Philippines entered a time of growing concern over the trend of increasing frequency of natural disasters and magnitude of impact

that natural hazards were having on the Philippine population. Several high impact and widely reported disasters took place during this era. These disasters are important to national history and remain "household names" to this day including the eruption of Mt. Pinatubo (1991), the Ormoc flash floods (1991), the Baguio earthquake (1990), and Typhoon Ruping/Mike (1990).

These disasters became media spectacles—especially Mt. Pinatubo—which was a novel way for the entire nation to experience disaster in real time whether they were located near the event or distant. The names of these disasters persist in common knowledge and consciousness to this day, and so form a historical landscape of large-scale disasters affecting Filipino communities. The high-intensity, destructiveness and heavily mediated events in the early 1990s—the Mt. Pinatubo eruption in particular—were the foundation for a continuing experience of viewing disasters in real time in the Philippines. In this section, I focus on Mt. Pinatubo to demonstrate the role media played in developing a sense of national consciousness of disaster in the Philippines.

Mass media in the Philippines

I want to first give context to mass media in the Philippines—the conditions that made mass, real-time viewing of disasters possible. During the American colonial period, the first public radio stations were set up in the Philippines (Anastacio & Badiola, 2000; Enriquez 2003 & 2008). Only more economically well-off households, however, could afford to own a radio. After independence, during the 1950s and 1960s, the number of radio owners grew, as did the amount of radio stations content in the Philippines, and the first televisions appeared in Philippine homes. In the 1960s and 1970s, mass media like radio, television and print became more available and accessible in the Philippines, and more content produced in the national

language, Filipino, as well as local Philippine languages. Very few people owned television sets in the early years of television (1950s) because of their expense. However, if someone in the neighborhood had a television, it was common that many neighbors would fill the house at 6pm to watch the broadcast. Many more people had access to a radio than television. So, stations often reached a broader audience through "simulcasts" on both mediums. Television content grew from radio content, and the number of stations grew through the 1960s. By the late 1960s, the Philippines was equipped to broadcast international content via satellite. It was this time that news broadcasts became regular for television. Philippine journalism operated on a democratic, free media principle, and they regularly reported on, questioned, and exposed politicians.

Marcos recognized the unique power source of power media held. So, when Marcos declared Martial Law on September 21, 1972, he also enacted a media blackout. Media were cited as an enemy of the administration. Marcos' first Letter of Instruction in Martial law was to take over all media agencies to prevent communist propaganda—these included all television, radio and newspapers that were not controlled by Marcos. The president of the major television station, ABS-CBN, was even imprisoned. Journalists who spoke against the administration risked imprisonment, violence and death.

While Marcos controlled the media, he made certain exceptions to broadcast spectacular and international events, such as the 1974 Miss Universe Pageant and Mohammed Ali fight, and 1981 visit of Pope John Paul II. In 1983, however, the nature of media and political power flipped when Marcos' political rival, Ninoy Aquino was assassinated. Filipino citizens were outraged because only 10 minutes of coverage were given about the news. This was the start of Marcos' slip on media control. The EDSA revolution was a series of non-violent demonstrations

of hundreds of thousands of people along one of Manila's largest and longest highways to protest mainly violence and corruption of the Marcos dictatorship. Media played a key role in making this happen. The mass protest was coordinated over radio by different religious groups. Then the protest was broadcast from 5 satellites placed on top of the Manila Hotel, over which Marcos had no control. The whole world could watch the EDSA revolution. Marcos fled the country after the mass demonstrations, and the free press was restored with the new administration. This is the context of mass media that brings us to the importance of journalism and live reporting to experiencing and understanding the Mt. Pinatubo eruption in 1991.

Mt. Pinatubo

In 1991, while the country was still recovering from a series of typhoons and the Baguio earthquake, Mt. Pinatubo located in the Zambales mountains in central Luzon began to show signs of activity. There were five days of activity culminating with a massive eruption on June 15. At the advice of PHILVOLCS (The Philippine Institute of Volcanology and Seismology), the government coordinated mandatory evacuation alerts and assistant sites for those in the immediate areas of the volcano. The most damaging hazards of the eruption process were localized to 21 towns nearby the volcano. However, Mt. Pinatubo eruption affected a wide area of the Philippines with falling ash all across Luzon. The immediate areas around the volcano experienced lahar flows of accumulated mud, ash and debris on the volcano's slopes. Triggered by heavy rains, the lahar descended quickly onto surrounding farmlands, forests and ponds. This immediate lahar flow was estimated at 10 percent of what was on the slopes. The rest gradually came down over the next decade. These flows became a hanging threat over 21 nearby towns that the lahar could submerge. This happened unfortunately four years later when 70 people

when Barangay Bacolor of Pampanga was covered in lahar flows triggered by intense rains of Typhoon Memeng.

The Mt. Pinatubo eruption gained intense focus as a media event. Many journalists from Metro Manila rushed to Mt. Pinatubo to cover the event, and stayed for extended periods, providing continual media updates. The radio station, PBS-Radyo ng Bayan, set up a satellite station in affected area to relay news back to the main station in Manila. However, the satellite station also provided multiple services to the local area and affected people by broadcasting updates locally, hosting interviews with the PHILVOCS director, communicating the needs of victims themselves, and monitoring the quality of infrastructural reconstruction. In a report, PBS recounted their activities during the disaster: "Our reports then come from the victims themselves, represented by their leaders. One unique feature of the sustained coverage was the close monitoring of infrastructure projects being set up, like dike reconstruction, to ensure the quality" (Manalili, 1999).

The PHILVOCS director became a trusted personality appearing on media and explaining the situation and communicating the need for evacuation, and his frequent media appearances helped build credibility for the PHILVOCS research, warnings, and other information (Leone & Gaillard, 1999). According to Janda et al., media attention began to focus on key players, like the PHILVOCS director, and reviewing credibility rather than on deliberating over the information itself—this arose especially when conflicting information was given by different agencies (Janda et al., 1996). PHILVOCS recognized the value in media as an intermediary between PHILVOCS and the public. They set up special training and field trips to educate media on lahars so that they could better communicate the information to their audiences (Janda et al., 1996).

Janda et al., a team of scientists who responded to the Mt. Pinatubo eruption, recognized that education and training for media, policy makers, and citizens was key to handling the long-terms components of the eruption—lahar flows that were projected to threaten surrounding areas for the next 14 years.[20] Janda et al. make it clear that education and training was done not only the raise awareness, but also to facilitate the flow of scientific communication between scientific organizations and their audiences:

> Use of the term "lahar" was vigorously promoted on June 15, 1991, and in subsequent days by two of us (K.S. Rodolfo and J.V. Umbal), who were concerned that the previously introduced term "volcanic mudflow" misrepresented the material transported (mostly sand and coarse debris rather than mud), and, for that reason, gave people a dangerously understated sense of the threat (a similar concern was raised by Voight, 1988, 1990). Another purpose of introducing the term "lahar" was pedagogical: a catchy, unfamiliar term might (and did) get special attention. Indeed, the term lahar has now received so much attention that it has become a metaphor for practically any disaster in the Philippines. (Janda et al., 1996, p.6)

Lahar was used to pique the public's interest and form a new image of threat associated with volcanic disaster. In particular, the new term, lahar, was used to disrupt another term already commonly used—"volcanic mudflow"—which the agencies believed did not adequately communicate the full danger people faced with lahars. The agencies rolled out multiple communication campaigns to promote the term and attach certain meanings and understandings to it. They targeted three groups for "special education": news reporters, public officials (including civil defense officials and engineers), and police and army personnel assigned to lahar watch posts on the slopes of Mount Pinatubo. They found that they needed to provide

[20] Scientists from PHILVOCS, the U.S. Geological Survey, and the Department of Geological Sciences and the University of Illinois at Chicago

additional instruction to the news media in the course of day-to-day interviews and field trips, "as reporters struggled to understand lahars" (Janda et al., 1996, p.6).

Several sites of communication were made available for media participation: informal group interviews with scientists, scientists' briefings at emergency meetings of public officials, and some formal press conferences:

> Formal press conferences on lahars were rare (perhaps, too rare); one-on-one and informal group interviews with scientists were common, as was press coverage of scientists giving briefings to emergency meetings of public officials. Most press contacts were at PHIVOLCS' Main Office in Quezon City; in Zambales with the Pinatubo Lahar Hazards Taskforce; and in San Fernando, the site of many emergency meetings for public officials. Most interviews were with the chiefs of PHIVOLCS and PLHT, though a number of PHIVOLCS and PLHT staff served as spokespersons when needed. (Janda et al., 1996, p.7).

Disaster coverage was not just a few days of footage documenting the volcanic eruptions. Because of the extended timeline and multiple long-term hazards and recovery issues presented, media coverage drew on more months, unlike with other previous disasters, such as with typhoons. As the stories got repetitive, the media found other ways to make the event fresh (Bankoff, 2003). The media in the Mt. Pinatubo event also became a means for facilitating donation funds (Bankoff, 2003). The media was used for political grandstanding for politicians appearing with affected people, handing out goods, and more. However, the media also exposed stories of misuse of disaster funds. The media broadcast different aspects of the disaster in the months and even years following the eruption, as recovery took place and scandals and critique of relief response. Media attention did wane as the story got repetitive and new events like typhoons became reportable (Bankoff, 2003). Public interest ebbed and flowed alongside media attention on the event. The media was in control of peoples' interests and emotional, social and monetary investments in the disaster.

Media covered stories about evacuated people, relocated people, government responses, government critiques, citizen complaints, available relief services, repairs to infrastructures, developing threat of lahars, and facilitating national donations to relief efforts. Button argues that media coverage of disaster reminds us that, “disasters are not merely material phenomena, but are grounded in the intensely political world of social relations" (Button, 1999, p.114). Through this extended, multi-perspective coverage, through multiple media, the Mt. Pinatubo disaster became not just a story, but an experience for audiences in the Philippines distant from the volcano. Some of the defining qualities of this media experience, was the real-time, and multi-perspective coverage of events and issues as they unfolded. Button argues that in disaster, the media does not simply provide news, but rather they participate in the construction of reality (Button, 2010). The mediatization of Mt. Pinatubo resulted in a constructed reality of the event. This shows the co-constitutive relationships between environmental disaster, media and governmental disaster response in creating a national social reality of disaster.

Mt. Pinatubo also challenged the government’s construction of a centralized, national disaster management organization as the way to handle disaster. Citizens and authorities recognized the efficiency in placing disaster response as the responsibility of the local government. In the late 1990s, Community Based Disaster Risk Management (CBDRM) became an official means of disaster management—allowing for communities (defined as cities) to take the lead and become the authorities on disasters occurring in their location. However, the national government was (and still is) looked upon to resolve disaster. The national government also looked upon to facilitate relief with international community. Until now, with international, national and local responses, there is both more opportunity for detailed response, but also

more potential for duties and communications to get lost along the multidirectional chains of command.

Conclusion

The history of disaster governance in the Philippines can be understood as an evolving contract between government and citizens to defend the nation against disaster. This chapter considers how disaster communication and management transitioned through postcolonial Philippines. I show how disaster communication and management was "nationalized" through nationalistic politics and widespread use of mass media as a way to both experience disaster together in real-time, and a way to critique failed government responses. The colonial-established organization of the Philippine Weather Bureau continued largely unchanged until the 1970s when former President Ferdinand Marcos re-organized national weather services into PAGASA. Marcos attached weather service and disaster management to his nationalistic politics, and made PAGASA into an agency with the purpose of service to the Filipino people. After Marcos, in the early 1990s, the Philippines experienced several environmental disasters separated only by a few months. The most famous of these was the Mt. Pinatubo eruption. I focused on the Mt. Pinatubo eruption to show how disaster was nationalized through mass media. Mt. Pinatubo became a real-time, and months long experience for the whole nation because of the extensive media coverage. Disaster, politics and media have a co-constitutive relationship (Benthall, 1993; Bankoff, 2003), and I have shown has this was the case in the Philippines. This relationship was evident in different ways. In one example, disaster events raised awareness of the need for more involved governance. Subsequently, policies and laws for better disaster management were pushed forward after major failures on the part of the

government. In another example, disaster coverage by the media became platforms for politicians to grandstand to their supporters.

Nationalistic politics and mass media "nationalized" disaster management in post-colonial Philippines. However, using scholarship that critiques Filipino nationalism, I argued that nationalizing weather homogenizes weather service for a public that has very diverse needs. In the 1990s, the government found that a centralized disaster management could not effectively respond to locally-specific needs. In the next section of the dissertation, I carry through this perspective that disaster management strategies continue to overlook diverse and locally-specific needs.

This chapter adds to the dissertation's overall understanding of disaster communication and governance in the Philippines by providing the context of the history disaster governance in independent Philippines, and what the stakes were at those points in history. Disaster governance in the Philippines is complex and ever-evolving as next generations come upon new challenges and new meanings for disaster, and new ways of understanding what disaster means for Philippine society. Disaster governance at the time of this dissertation reflected these historical building blocks, yet also reveal the areas where change is needed and yet to come.

INTERLUDE BETWEEN SECTIONS

Typhoons in an Uncertain World

In response to Typhoon Yolanda, there were multiple infrastructural changes to how disaster was managed in the Philippines. Just three years earlier (2010), President Gloria Macapagal-Arroyo signed into law the Philippine Disaster Risk Reduction and Management Act (DRRM Act). This act repealed Presidential Decree (P.D.) No. 1566 signed by President Ferdinand Marcos in 1978, and transitioned the way the Philippines approached disaster management: from "disaster control" to "disaster risk reduction and management" (Lucido, 2014). The DRRM Act's central policy was to, "uphold the people's constitutional rights to life and property by addressing the root causes of vulnerabilities to disasters, strengthening the country's institutional capacity for disaster risk reduction and management and building the resilience of local communities to disaster including climate change impacts." (DRRM Act of 2010). This was a profound shift in the way the Philippine government conceptualized their role in disaster—from response after the event to preparation and risk reduction before the anticipated event. The DRRM Act operated on a philosophy of national participation from both individuals and organizations. The "risk reduction and management" philosophy was organized on national and local scales with the National Disaster Risk Reduction and Management Council (NDRRMC), and multiple City Disaster Risk Reduction and Management Offices (CDRRMOs). Individuals' participation in the "risk reduction and management" philosophy was also encouraged through local trainings and demonstration, and through public school education.

This conceptual change in dealing with disaster derived from the Philippines' membership and participation in the international The Hyogo Framework for Action.[21] The Hyogo Framework was the first international plan which organized a common system of coordination for institutions responding to disaster (governments, international agencies, disaster experts). The plan was based on action strategies that reduce underlying risk factors, build resilience to all levels of emergencies, and prioritize preparation and early warning. The Philippines agreed to the Hyogo Framework in 2010, and took their most significant action according to the Framework with the DRRM Act. Disaster Risk Reduction strategies gained a little traction in 2011 and 2012. However, after Typhoon Yolanda, DRR gained significance as a way to deal with the possibility of future supertyphoons because any took Yolanda as a harbinger of increased danger due to climate change. After Yolanda, many sectors of national and local government and domestic NGOs in the Philippines poured energy into Disaster Risk Reduction strategies.

The experience of Typhoon Yolanda marked a shift in how the Philippine government and partner agencies dealt with disaster—strategically and conceptually. Adopting the Hyogo Framework, the Philippine government reconceptualized management of disaster as pre-emptive (risk reduction), rather than only responsive. In chapters 3-5, I consider the re-conceptualization of disaster management as risk reduction in the Philippines, and the various experiences of DRR for people in SJB. Important to SJB experiences of DRR are the multiple encounters and relationships with DRR entities of authority such as government and NGO

[21] The Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters (HFA) was based on meetings at the World Conference on Disaster Reduction held in Kobe, Hyogo, Japan in January 2005 (UNDRR, n.d.). The plan was created to substantially reduce disaster losses (lives, property) by 2015 (PreventionWeb, n.d.). 168 Governments adopted the plan in January, and the United Nations General Assembly endorsed the 10-year plan in 2005.

workers, PAGASA information and their own neighborhood governance and neighbors. Finally, I consider the temporalities of experiencing disaster through the lens of DRR.

Figure 3.0: Mural painted along the main highway running through Tacloban City, 2017. Photo by author. The entire mural depicted different scenes of Typhoon Yolanda disaster. This shows a tent city like the one SJB residents lived in for a year after Yolanda.

In these ethnographic chapters, I refer to three key participants by alias names, Karmen, Mano Fidoy, and Ate Jel, whom I introduce in this interlude. For all other participants mentioned, I refer to them with a generic address:[22]

[22] There are many more specific addresses a person may use depending on their relationship, and their personal choice such as: Iday (‘Day), Idoy (‘Doy), Tita, Tito, Nanay (‘Nay), Tatay (‘Tay), Lola, Lolo, Mam, Sir, Boss, and more.

- Mana: an address for female encountered via her work, or known via her work in the area. For example, I refer to the owner of a sari-sari store in SJB, and female HOA officers as Mana.
- Mano: an address for male encountered via his work, or known via his work in the area. For example, I refer to older male fishermen, and male HOA officers as Mano.
- Ate: an address meaning "older sister," that can be used with any female both older and younger than yourself to express respect.
- Kuya: an address meaning "older brother," that can be used with any male both older and younger than yourself to express respect.

Karmen

I never tried to make appointments with people in SJB. It never worked out. Walking down the main passage of SJB, I ran into Karmen's sister hanging around her porch, talking with someone out on the main passage, as I usually found her. I asked her where her sister was, and went to fetch her from the beach, where many in the neighborhood hung their laundry to dry. Karmen walked back toward her house where I was waiting—a large solar powered radio under one arm, and a plastic basin full of cleaned laundry. We sat together outside her home to interview while she rested from her morning's work.

She grew up in SJB, and worked in the market when she was still a single woman. Now, in her mid-twenties and married, she stayed in the home to take care of her 2-year old daughter and the house needs. She and her husband lived off a modest but steady income from his work as a jeepney driver. Even though Karmen did not make income, she volunteered in the

neighborhood Home Owner's Association in the role of bookkeeper for the communal fund, which was used for medical emergencies, repairs to shared infrastructures like the water pump or common CR (comfort room/bathroom).

Her family all still lived in SJB. Her sister, brother-in-law and niece lived in the house next door, and her parents lived in the house just opposite. They were always in flow between one another's homes, bringing over food, dropping off children, watching TV together. They watched TV at Karmen's house because she had the TV. Karmen said every night she "opens her house" at 7:30 pm to her family and neighbors. There are usually eight to ten adults plus children all watching together the end of the national news, and the "drama" series that comes on after. She told me she bought the TV six months earlier.

"Why did you decide to buy it?" I asked her.

"I don't know," she laughed. "I just want to forget about Yolanda, so I want make a new, a new life. Move on about Yolanda. Because, when you don't have a work, even when you are lay down to the bed, you are always thinking about Yolanda. Because you don't have anything (inaudible). I buy a TV because when I was sad, I just look in the TV."

Kamíngaw: A poem I wrote after a conversation with Karmen

> kamíngaw: tigngaran (noun), tigtulidong (modifier). loneliness; silence; stillness; nostalgia. (Oyzon, Fullmer, & Cruzada, 2013)
>
> *Kamíngaw*: There was a time I went to MacArthur Park. It was a beautiful Saturday, and high school kids were gathered on the grass together, singing along with a guitar under the shade trees. I stood at the back of the MacArthur Landing monument, and looking

out to the sea, I failed to imagine that historic moment happening in this place. Standing there, alone–apart from the tourists, apart from the high schoolers, apart from feeling the significance of history, and facing an open sea: kamíngaw.

Kamíngaw: There is the buzz of an electric fan twisting back and forth. It is the only sound in this moment of midday rest. The shopping is done, and the laundry is drying. Your body is tired. And your thoughts rest on the child who floated away on the flood. You lay down and face the still, open house: kamíngaw.

Mano Fidoy

Mano Fidoy was a fisherman before Yolanda, but his livelihood changed after the disaster. He did a lot of work with NGOs, clearing debris, and collecting bodies in the weeks afterward. He made friends with his international volunteer colleagues, and became so involved with the NGO work that a resettlement village in the Northern Barangay run by an NGO offered him a permanent job helping to manage the village. He made the 45-minute commute by jeepney there every day, and so spent long days away from his wife who worked as a nurse and their two young children.

Although he could relocate his family to the village he works at, he wishes to remain in SJB, his home. He is in his mid-40s, and is regarded as a leader in SJB, though he does not hold a role in the HOA. His abilities to communicate with NGOs and nearby businesses have expanded SJB networks of help, especially for typhoon evacuation assistance.

When Mano Fidoy opened up communication with the regional electricity company, however, the relationships unexpectedly turned against him. The company wanted make claims

on their land because of their undocumented residency. Mano Fidoy, along with another middle-aged fisherman from SJB, and an NGO liaison led several meetings with the SJB community addressing the possibility of losing ownership of their homes. I once sat in on a two-hour meeting in which the situation felt urgent. The NGO liaison was pushing to relocate the whole community, and the fisherman was pushing to stay and fight for their homes. Mano Fidoy did not say anything the entire meeting until the very end when the NGO liaison asked for his comments. He briefly weighed the two options, then finished with, "Whatever we decide, it should be together as one." The bonds of the community to him were the most important above where the community took root.

Waiting for the Wave: A poem I wrote after a conversation with Mano Fidoy

You hear rain fall like rocks,
Upon your metal roof,
You imagine they gather into an army,
An army of water,
The wave that could arrive at any time,
And push you from your home,
Push you all the way downtown,
Under the San Juanico Bridge.

The army of water can push you anywhere,
Like the people who once helped you,
Now push you from their neighborhoods.

And you are here waiting,

For the wave,

For the people,

For the rain to stop.

Ate Jel

Ate Jel lived on the "main passage" near the SJB main entrance at the highway. She was retired, so most days that I visited SJB, I greeted her while she talked with neighbors standing in the main passage, or sitting together on their stoop, or eating together at the barbeque stand. She was particularly active at building community with the other women in the neighborhood through daily *chismis* (chitchat/gossip), giving guidance to younger women, and minding their children a bit when they wandered over to watch her TV. I noticed when I asked around for a particular person, many people might not know who the neighbor was, but Ate Jel could always point out the house.

She grew up in a middle-class area of Tacloban, went to university, married and raised six children. She and her husband separated, and she remarried her current husband, a fisherman. She says she married this time for love. She knew ahead that he was poor, and she knew she would make sacrifices for it, but she said she chose to live with poor people. "We are all the same. Poor."

She has a role in the HOA as secretary, and she is also the local Coordinating Officer for a micro-loan NGO. She wants to help herself and her neighbors stabilize their incomes with small businesses.

CHAPTER 3

Producing Uncertainty in Emergencies

In the days after Yolanda struck, people recognized that many lives—thousands of lives—could have been saved if the storm surge warning had been adequately communicated to the public. Areas under Signal 4 alert, like Tacloban City, braced for 220 kph winds predicted to tear the roofs off homes and send debris battering into walls. However, most people did not know that they should prepare for the 5-7 meters of water that inundated coastal areas.

On November 7, 2013, PAGASA released a Severe Weather Bulletin that detailed what type of hazards to expect and their severity per region of the Philippines. The two-page report was distributed directly from PAGASA to the Office of the President, regional governing units and medias in the Philippines. It was then forwarded on within the national and regional governments to smaller and smaller local governing units. It was expected that all the public received the PAGASA information passed through this "tree branch" communication structure. They might have seen warnings through Presidential announcements to the nation, LGU announcements and liaison visits, and through mass media. For those with internet access, PAGASA also posted the bulletin to their website for the public with internet access to download. However, there was no real way to ensure that every citizen had been updated, and that they were able to apply the information to their own locations and living situations.

Updates traveled in one direction through the "tree branch" communication structure with few opportunities for the public to clarify and discuss. Typhoon alerts were sent through several "severe weather bulletins" produced by PAGASA. PAGASA released 12 severe weather bulletins updating the public on Typhoon Yolanda as it traversed the Philippines Area of

Responsibility (PAR). Severe Weather Bulletin #4 was released at 6:00 pm on November 7, 2013, ten hours before landfall, and alerted the public to prepare for a Signal 4 supertyphoon. The bulletin was a two-page update on Yolanda through representations of scientific knowledge—measurements and images. The first page outlined the details of the storm: a map image showing the typhoon's predicted path across the Philippines, and a satellite image showing the aerial view of its size. Under these images was a table displaying the typhoon's latest recorded location, windspeed, direction of movement, and predictions of the typhoon's progression over the next four days, when it was expected to exit PAR. The second page included a table that displayed the parts of the country under warning levels #1-#4. At the very end of the report, there were three bullet points announcing additional information. First, the estimated rainfall amount. Second, that sea travel will be risky. Third, the following text: "Residents in low lying and mountainous areas under signal #4, #3 and #2 are alerted against possible flashfloods and landslides. Likewise, those living in coastal areas under signal #4, #3 and #2 are alerted against storm surges which may reach up to 7-meter wave height." This was how the most destructive aspect of Yolanda was communicated—a bullet-point line of text at the end of the bulletin. The bulletins went out to government officials, the media, and the public. However, most of the public received this information via their local government and media. The report did not indicate to government officials and media of what was the most important information to get to the public for their safety. So, even if it was communicated that 7-meter storm surges were possible, government officials and media did not necessarily know what this meant and they therefore did not transmit its meaning on to the public. The true message behind this information—that people near the coast were in danger of being engulfed by seawater—never successfully got out.

A DILG (Department of the Interior and Local Government) Regional Information Officer shared with me in an interview that even though he handled the bulletin and read it directly, he did not interpret that the storm surge would rise on land like huge wave. His life and his family's lives were threatened by this inadequate communication. He was waiting out the typhoon in his home near the coast with several other family members including elderly adults and infants. They had to rush upstairs to the upper levels of their home while the storm surge water rushed into the house and filled the ground floor within minutes. Even Tacloban City Mayor Alfred Romualdez told CNN reporters that even he did not understand the severity of the storm surges and that he and his family almost died while the water inundated their home. He reflected that they (the city government) should have told people that a tsunami was coming. The city conducted regular tsunami evacuation drills, and 80% of residents evacuated on time in those drills. If "tsunami" had been used to warn people instead of "storm surge," people would have referenced back to those evacuation drills.

Directly after Yolanda, PAGASA faced criticism that forecasts were inaccurate—the storm had actually arrived three hours before predicted, and Yolanda was upgraded to Signal 5 retroactively, and not at the time people were preparing (Zoleta-Nantes, 2013). PAGASA did not admit any fault, and publicly declared that all necessary public forecasts were delivered. In a press briefing organized by disaster response advocates, however, PAGASA's Assistant Weather Services Chief, Ma. Cecilia Monteverde, countered PAGASA's official position and stated that more could have been done to explain the magnitude and gravity of the storm surges (Bernal, 2013). She argued that PAGASA communications about Typhoon Yolanda focused on the typhoon signal level, and distributing warnings, but not on explaining what certain terms like storm surge meant. Previously, PAGASA had conducted information and education campaigns

(IEC) with LGU personnel about PAGASA weather terminology and how to interpret their reports. However, they discovered that many LGUs sent personnel to the trainings who were not directly involved with DRR, and the knowledge was not passed to smaller governing units (barangay level). For her, another core problem with communicating the Yolanda alert was that the information in the PAGASA bulletin was communicated onwards to other government officers and to the public without any interpretation.

This shows how disaster communications can produce uncertainty, and in this case to a catastrophic outcome. Multiple people—SJB residents, other local survivors, even local government—stressed to me that they did not know what storm surge meant when it was used in the Yolanda alerts. No one else in their lives knew either. Certain communication failures set the grounds for uncertainty to emerge: missing interpretations of scientific terms and information, dysfunctional education programs prior to the typhoon, and the assumption that the public were familiar with the term, "storm surge." This demonstrates how people are reliant on communications but that communications may fail, and how communications—though meant to help people make decisions to manage their risk—may actually produce uncertainty.

Making preparatory information available to the public is key for effective disaster risk reduction. This chapter shows how typhoon information is communicated in media, PAGASA reports, radio, and more. SJB residents receive typhoon information in multiple languages, from multiple news agencies, and through multiple media technologies. I argue that these communications are produced with certain assumptions: 1) That all publics will interpret information (especially scientific information) in ways that scientists and meteorologists intend, 2) that people will have equal access to communications, and 3) that the government functions as planned during a disaster. I show how in the case of SJB, citizens are marginalized by the

disaster communication infrastructure based on these assumptions, and therefore that communications produce uncertainty.

In this chapter, I aim to convey how people make use of different types of information from different sources to decide what actions they will take during a typhoon. Most residents of San Jose Beach got PAGASA updates through the scripts of radio and TV broadcasters, or through conversations with family and friends rather than directly from the severe weather bulletins. I aim also to convey the many literacies needed to interpret weather information communicated to the public in the Philippines. I use "literacy" in the sense beyond language, and to include becoming literate in reading scientific representations of typhoons such as maps, measurements, radar images, graphs. People in San Jose Beach receive weather information in three languages, oral and written: English, Tagalog, and Waray-Waray.[23] When monitoring typhoons, people interpret scientific representations of typhoons such as through terminologies, measurements, graphs, maps, and radar images.

Taking Action in Uncertainty

Scholars have recognized distinctions between risk and uncertainty since the 1920s (Chibnik, 2011). Beck (1992) sees uncertainties as "manufactured" and "fabricated." Uncertainty and "risk consciousness" figures into his concept of a "world risk society." In Beck's conception of the "world risk society," industrial society has transitioned into a risk society—from the production and distribution of goods to the production and distribution of "bads" or dangers

[23] Tagalog and Waray-Waray are structurally different enough that they considered separate languages rather than dialects. Some Tagalog heard on TV and radio can also be described as Taglish—significant amounts of English and Tagalog combined.

(Beck, 1992; Lash & Wynn, 1992). He also refers to risk society as "reflexive modernity," in which people question back at the modern—particularly scientific forms of knowledge. He explains that risks are a scientific construction that must be believed by the broader population to make them a reference for thought and action:

> Thus, risk consciousness is neither a traditional nor a lay person's consciousness, but is essentially determined by and oriented to science. For, in order to recognize risks at all and make them the reference point of one's own thought and action, it is necessary on principle that invisible causality relationships between the objectively, temporally, and spatially very divergent conditions, as well as speculative projections, be believed… (Beck, 1992, p.72)

Beck makes the point that in risk consciousness, there is not even a second-hand experience from scientists to public, but rather there is "second-hand non-experience." Neither scientists nor the public can experience the potential hazard, and individuals in the public must assess their own risks based on this situation of knowing through belief and trust. This perspective is very applicable to the situation of typhoon monitoring in the Philippines. Typhoons are detected through scientific instruments, and their effects can never be fully anticipated per location in the Philippines by those measurements (windspeed, size, direction etc.). Many people I interviewed had experienced the frustrations of trying to determine their personal and locational risk through the scientific alerts being broadcast. Their uncertainty was produced through these situations of depending totally on science, and often feeling not completely sure whether they derived the correct information or interpretations. In an example in this chapter, I show how after an earthquake, some people kept checking the news for hours after to make sure there truly was no consequent tsunami alert.

Whitington (2018) also describes uncertainty as a relationship to knowledge and determining action from that knowledge. He recognizes that there is a tendency to conceive of

uncertainty as the opposite of knowledge. He argues instead that uncertainty and knowledge have, "a constitutive relationship that acknowledges the role and value of knowledge to projects of living" (Whitington, 2018, p.6). He defines uncertainty: "*Uncertainty* describes a tactical relation to knowledge, a condition for action or of not knowing how to act, as well as a predicament of disenfranchisement in the material conditions of infrastructure and environment" (emphasis original) (Whitington, 2018, p.6). He clarifies that relationships to knowledge in uncertainty is not like with risk. For him, uncertainty is understood more qualitatively, which risk can be understood quantitatively. Risks are distributed across a society, and are measured. Uncertainties, on the other hand, are a reaction to the quality of knowledge:

> More than a simple future-oriented anticipation, uncertainty is experienced as an ecological predicament with biopolitical stakes, as an understanding that existing knowledge is *not good enough*, and from practices that, whether they want to be or not, are open to that predicament. Ultimately, uncertainty is a relation that indicates the value of knowledge. (emphasis original) (Whitington, 2018, p.6)

Peoples' assessment of the value of knowledge is a culmination of their value for the source of that knowledge. Whitington treats uncertainty as both threat and opportunity. Working through risk can open opportunities for certain technological entrepreneurship. He argues, therefore, that technological entrepreneurship depends on uncertainty—even the production of uncertainty: "Sustainable hydropower development engages a form of technical practice that relies on, accentuates, and actively engages in the production of uncertainty" (Whitington, 2018, p.9).

While Whitington's focus is on the experts, scientists, and managers working between technology and the environment, I find his perspectives on uncertainty useful for this dissertation. His definition of uncertainty encompasses the relationships of knowledge, technology and the environment: the dam itself produces social and ecological uncertainties.

This is also important in consideration of typhoon monitoring. What uncertainties about the typhoon are produced when PAGASA declares it a "Category 5"? What uncertainties are produced when a barangay representative fails to meet with their designated Home Owner's Association? Most importantly, the limits of knowledge are Whitington's focal points for understanding knowledge and its relationship to uncertainty. Whitington cites examples where experts and managers confront their limits of knowledge, and then produce uncertainty by obscuring their answers, or making assumptions. Whitington says that these "untenable expert assumptions" are a point of controversy dam managers must confront at every meeting, new report, and intervention. In this chapter, I look at the certain assumptions not necessarily about typhoons, but about how people communicate about typhoons. Assumptions on the part of experts and managers—scientists and politicians—produce uncertainties especially for certain populations in the Philippines monitoring typhoons for their own safety.

In disaster, affected people face multiple uncertainties—not only the uncertainties in the typhoon's arrival, for example, but also what they will have to face and decide after. Button points out that uncertainties do not just exist—they are produced (Button, 2010). One way that uncertainties can be produced is through multiple communications from the organizations involved in disaster (government, media, scientists, environmental groups). Uncertainty is made in the "cacophony of communications" that are often conflicting. Button frames uncertainty in terms of communication, particularly between "laypeople," experts and corporations. Certain narratives win out over others in meaning-making of a disaster: "Whose voices are heard and whose voices are denied become essential to the contestation over the meaning attached to the disaster" (Button, 2010, p.13). He says that experts often do not understand the uncertainties of laypeople. Because uncertainty is not as measurable as risk, it is often dismissed by analysts,

policy-makers and politicians as a, “free-floating anxiety” (Button, 2010, p.15). It is clear in his examples that uncertainty occurs in relationships between laypeople, experts, corporations and policy makers. However, the voices behind science are often privileged, though there is uncertainty within science as well. Button finds science mutes other perspectives and knowledges, and he asks: “Beneath the contestation over the status of science lurks the larger question: Just how much should we allow science to influence the political process?” (Button, 2010, p.14). Button brings up the dynamics of power in society that are helpful to this chapter. He also sets up a dialogue for understanding uncertainty in disaster situations, “as a lived experience and phenomenon that is culturally and socially constructed and shaped by many political, economic and social factors” (Bator, 2012, p.93). In this chapter, I examine how not only scientific ways of knowing are privileged, but also how scientific ways of communicating are privileged as well.

Typhoon monitoring and uncertainty: What is monitored

I want to clarify that residents monitor tropical cyclones at multiple stages of its formation. A tropical cyclone forms in the Intertropical Convergence Zone (ITCZ), which is a band of the Pacific Ocean near the equator where northern and southern air masses converge. If a Low Pressure Area (LPA) appears in this zone, the air masses can flow into the low pressure pocket from multiple directions, and fall into a clockwise motion.[24] This is the beginning formation of a tropical cyclone. The cyclone grows in windspeed and diameter over several days. PAGASA categorizes a cyclone through several stages of its growth—the categories are based on

[24] For more information on how typhoons are formed through the Coriolis Effect, please refer to What the Physics!? (2018).

windspeed. The LPA is upgraded in (terminology) as it grows: Tropical Depression, Tropical Storm, or Typhoon Levels 1-5 (see Figure 3.1 below). From the time an LPA forms in the ITCZ to the time it makes landfall in the Philippines (whether grown into Tropical Depression, Tropical Storm, or Typhoon Levels 1-5) can be a matter of days to weeks, depending on the speed in which the cyclone progresses toward the Philippines. During that time, PAGASA monitors how a cyclone grows and moves towards the Philippines, and communicates this information to the government, media and public through weather bulletins.

So, the public, including SJB residents, monitor the news to keep updated on the progression of the cyclone—how much it is intensifying in windspeed, when it is predicted to make landfall, and where it is predicted to make landfall. They start monitoring when there is news of an LPA forming, and follow its progression over the next several days to see if they will need to secure their households and evacuate. Things can change quickly. LPAs do not always grow into intensity. Often, the LPA dissipates, and people no longer monitor. If that LPA intensifies into a cyclone, this can happen at different rates. As the cyclone approaches the Philippines, conditions can change within hours. For example, a cyclone might slow down over the Philippines, drenching the land in prolonged rains. This creates flooding hazards. Or, the cyclone can change course, which shifts the alert level per location in the Philippines. Or, the cyclone can intensify in windspeed suddenly. This was the case with Typhoon Yolanda, which was announced as Category 4 to the public, but retroactively recategorized as Category 5 when windspeeds at land fall were recorded.

Public Storm Warning Signal	Windspeed	Hazards and PAGASA/Government Actions	SJB Actions
Low Pressure Area (LPA)			Monitor development through media updates
Tropical Depression		Hazards: weak wind, moderate rain and flooding.	Monitor development through media updates
Tropical Storm		Cyclone given international and local names; e.g., Tropical Storm Karen (Sarika). Hazards: moderate wind, heavy rains and flooding.	Monitor development; make some preparations for if the cyclone will advance to a typhoon.
Typhoon[25]			
Typhoon Level 1	30-60 kph	Hazards: wind, gusts, heavy rains and flooding.	Some families decide to evacuate. Others board up homes and continue to monitor updates.
Typhoon Level 2	61-120 kph	Hazards: light wind damage, storm surge possible at coast, gusts, heavy rains and flooding.	Many families decide to evacuate.
Typhoon Level 3	121-170 kph	Mandatory evacuations [26] Hazards: moderate wind damage wind, gusts, heavy rains and flooding.	It is planned that all will evacuate
Typhoon Level 4	171-220 kph	Mandatory evacuations. Hazards: heavy wind damage, storm surge 2-3 meters possible, gusts, heavy rains and flooding.	It is planned that all will evacuate
Typhoon Level 5	>220 kph	Referred to as a super-typhoon.[27] Mandatory evacuations. Hazards: very heavy wind damage, storms surges more than 3 meters high possible, gusts, heavy rains, and flooding.	It is planned that all will evacuate

Figure 3.1: Table showing PAGASA categories of cyclone development and the actions of SJB residents. Information compiled from field research and http://bagong.pagasa.dost.gov.ph/learning-tools .

[25] Different alert levels (1-5) are raised across the Philippines according to predicted location to center of typhoon.
[26] Level 3 was the highest level of typhoon alert for several decades.
[27] Level 5 was added in 2014 because of measured windspeeds of Typhoon Yolanda that did not fit the categorization of Level 4.

Cyclone warnings do not always correspond with the present or experienced weather conditions at the time of alert. Many people remarked about how the day before Typhoon Yolanda made landfall, it was a hot, sunny day with clear skies. One survivor recalled to me that even though mandatory evacuations were in place, many people were drinking, singing karaoke and enjoying the day. The urgency to evacuate was not communicated by the government nor the weather conditions.

In SJB, and around Tacloban City, I heard people update each other on the progression of cyclones. For example: "May LPA na" (There's an LPA now), and "Uy, bagyo na" (Wow, it's a storm already). Sometimes, during an interview, the weather was rainy and cloudy. If I asked the interviewee if this was a storm, the interviewee usually had ana answer, whether it was just "bad weather" (maraot na panahon)—nothing to be concerned about—or a storm (bagyo)—something we may need to be concerned about. For example, I once asked nervously, "May bagyo?" (Is there a storm?) gesturing to the dark clouds, wind and rain that had started during an interview, and Mana responded with a wave-off gesture, "Diri, maraot na panahon la" (No, it's only bad weather).

As of this research, PAGASA averaged 20 tropical cyclones entering PAR (the Philippine Area of Responsibility) per year, nine of which on average make landfall over the Philippine islands. While this number of monitoring is already high, it does not account for LPAs. LPAs are the first sign of a potential cyclone formation. Most people already start monitoring weather updates vigilantly when there is news of an LPA. If the number of LPAs that people monitor were added to the average of 20 tropical cyclones per year, we would better see just how much people are monitoring for typhoons, even outside the manifestation the actual of a typhoon. LPAs may never develop into cyclones, in which case, PAGASA and the media will report that it is

no longer a concern and stop monitoring it. Or, they may develop into cyclones which can grow in windspeed intensity from Tropical Depression to Tropical Storm to Typhoon (Categories 1 – 5). I raise this to show the amount of monitoring people do, especially in the typhoon prone months (October to January). During this time, I experienced weather reports monitoring an LPA that developed as a typhoon was approaching the Philippines. There was not even a day lapse in the need for us to monitor for typhoons.

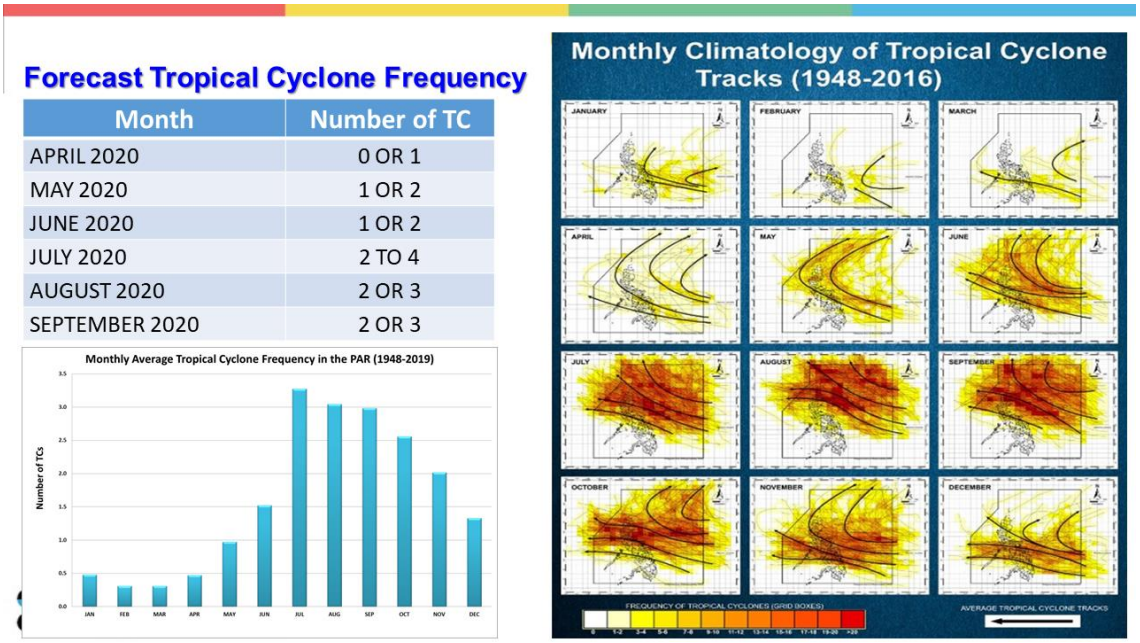

Figure 3.2: Frequency of tropical cyclones in PAR, and predicted number of tropical cyclones to affect the Philippines in 2020. Image courtesy of PAGASA: http://bagong.pagasa.dost.gov.ph/climate/tropical-cyclone-information

Typhoon Monitoring and Uncertainty: Types of alerts and how weather is monitored

In this section, I want to account for the main sources of typhoon information that residents of SJB encountered. There were several main sources of typhoon information: radio, TV, cellphone, internet, LGU and radio. Radio and TV tended to be used more frequently, for general monitoring if an LPA develops. Cellphone, internet, and the LGU became especially important if there was an imminent need for evacuation. They were best to find out recommended preparations and actions for their specific location. Going source by source, I first describe how typhoon information is delivered, then account for SJB residents' perspectives on the source's usefulness, and then analyze how uncertainty was produced in these communications.

Radio

In SJB, residents listened to two local AM stations mainly for the news and weather updates: DYVL Aksyon Radyo and Bombo Radio. People explained that FM stations were more for music and entertainment, though there were some that have started to cover the news a bit. Many people preferred radio for typhoon monitoring because they offered the earliest available news programs, more frequent news updates throughout the day, local stations and Waray-Waray language news which counted for trustworthiness for some people, though not for all. Compared to television, in which people found weather updates in the evening news, AM radio offered several rotating talk shows throughout the day in Waray-Waray. When I listened to these talk shows, each addressed national and local news and weather updates at some point. Additionally, local residents could call in and get questions answered—creating more of a dialogue about typhoon information, rather than broadcast. Many households in SJB had access

to a radio, whether it was owned, shared or borrowed. Also, those without radios often listened together with those who did. Many people visited a friend or family member to listen to a radio program together, if they did not have a working radio at home.

Many mornings, I tuned in to my radio contact's show, Sulibangko Pare, at 7:00 am. As an example of how people may learn about typhoon updates, I will share my experience listening one day in November. The host, Ionnes, and his co-host, Jimmy, discussed the local news in a conversational style as in talk shows. Ionnes read a new headline and story, and he and the co-host commented on it. Their dialogue reflected the jovial characteristic of their co-host relationship—maybe jokes, laughs and sound effects to lighten the mood of the news. They made a weather update in the middle of the show. They spent 15 minutes on updates about an LPA that had grown into a tropical depression. In this segment, they called the local PAGASA representative for an interview on what precautions should be taken locally in Tacloban. Ionnes said they would continue tracking "Marce" (the name of the tropical depression.) As they talked, the co-host Jimmy stumbled and called it "Martin," and they spent a few minutes making jokes about it. Periodically throughout the broadcast, Ionnes checked his phone for text messages from listeners. Some people had greetings to announce (e.g., "Happy Birthday"). Others had questions about the local happenings in Tacloban, or the pending typhoon. He read their questions aloud, and answered on air. Then, at 8:30 am, the station transitioned to a new program, "Operation Bulig" ("Operation Help"). The host, Louie, used her show to amplify the needs of Tacloban residents. Her show that day focused on the needs of those in the Yolanda resettlement villages. Later in her show, though, she also gave an update on Tropical Depression Marce.

I described this morning of radio programs to offer a better understanding of how typhoon information was delivered by radio. For one, there was more time dedicated to weather than in TV. The weather information was discussed, rather than just announced. Listeners could participate also by texting in questions to help them clarify news or terminologies, or ask about preparations needed for their specific location. The radio used well-established relationship with the local PAGASA office to get these questions answered. In this way, typhoon information was interpreted—a crucial step after reading the update. Each host, though, may offer different interpretations. Finally, weather updates could be received during several programs throughout the day.

One woman, for example explained to me that she catches the morning and afternoon news on the radio because there was different news already:

> SG: Why do you use the radio at your house? (Kay ano ginagamit ka an radyo ha iyo balay?)
>
> Mana: For the radio…to listen, to know the news, the news, what's happening in the world, when there will be a storm, or…like that. Or if there's a tragedy coming. That's the use of the radio, the news. (Para, yung radyo, para marinig, malaman ano, yung balita, sa mga news, kung ano nangyayari sa buong mundo, saan may bagyo o ganoon o may trahedya darating. Ayan ginagamit an radyo sa mga news.)
>
> SG: About how many hours? (Mga pira nga oras?)
>
> Mana: Around maybe three hours or four hours. (Mga, ano, mga three hours or four hours.)
>
> SG: In the morning? Or… (Ha aga? Or..)
>
> Mana: In the morning, afternoon. (Ha morning, afternoon.)
>
> SG: Afternoon. Ok, why morning? (Afternoon. Ok, kay ano aga?)
>
> Mana: In the afternoon, there is different news. (Sa hapon, iba balita.)

Responding to my interview question, “When is a good time to get weather updates?” (Ano it maupay nga oras para makuha han mga weather update?) Some people responded that it was best to get information on radio news to learn about distant weather:

> Respondent 1: The night also. We listen to them on the radio (inaudible) for the distant weather. At 1:00 also there is news already. (Mga gab-i gihap iton. Nagkokoan hira’t nararadyo (inaudible) hiton para malayo panahon. Mga, ano, mga a la una gihap may balita na.)

> Respondent 2: The morning is good. To listen to what the distant weather is. (Maupay hit aga. Pamati ano sa malayon panahon.)

In other words, radio was good for getting the earliest sign of cyclone because people did not have to wait for the evening news on the television, but could get updates closer to the time PAGASA released them.

Figure 3.3: Simulcast of radio show, Sulibangko Pare, on local TV. Image retrieved from: https://www.facebook.com/aksyonradyotaclobandyvl819khz/

Radio offered many avenues for potentially resolving uncertainty that arose through other communications. This is because radio offered more frequent updates, two-way communication, news in local language, and localized interpretations of danger.

Television

At the time I began interacting with residents at SJB, there were few TVs in the purok. People acquired radios and cellphones to fulfill immediate communication needs in the months after Yolanda. TVs took longer to acquire because they had to be saved up for. For Yolanda survivors in SJB, who had to regain all their lost and destroyed possessions, several had only been able to purchase their TV shortly before I met them. So, for these households, it took three years to be able to obtain a TV. TV was used communally, even more so than radio, because most residents did not have a TV in their household. Many responded in my interviews and surveys that they watched TV at a family member's, friend's or neighbor's house. TVs opened up social spaces of enjoyment because TVs were used to play "videoke" at gatherings and celebrations in the household.[28] Singing videoke was a popular pastime on the weekends, and a way to create a festive atmosphere during parties. People also hosted gatherings to watch special broadcasts together, such as an important game in the Philippine basketball league. One of the main purposes of getting a TV, as many responded though, was to have access to the news.

The most watched news broadcasts were TV Patrol Tacloban at 5:30pm, a Tacloban-based broadcast in Waray-Waray that covered local and national news, and 24 Oras at 7:00 pm,

[28] Videoke means video karaoke.

a Manila-based broadcast in Tagalog that mostly covered news of the National Capital Region with other highlights across the country. People might watch both these programs back-to-back. Both programs included “weather update” segments. Without the presence of a possible cyclone or typhoon, these segments lasted no more than two minutes. Some people waited intently through the hour and a half program for the weather segment, which often came in the middle to last half of the program. One woman recounted in interview that she watched the news with her children and husband. The children helped notify their parents when the weather segment comes on by calling out, “Ma! ‘Weather-weather’ na!” (Mom! It’s ‘Weather-weather’ now!”)

Weather updates were broadcast on television more frequently as the potential threat grew. As an LPA developed into a Tropical Depression or Tropical Storm, the weather segment went into more detail about the rate of growth, windspeed intensity, current location of the cyclone, and anticipated direction and landfall over the Philippines. The host interacted more with green screen weather maps, and showed more maps with more animations and information to communicate the nature of the impending storm. As a Tropical Depression, Tropical Storm, or Typhoon approached landfall, news teams covered full stories from the affected locations, showing footage of wind damage, waves, and flooding. They also covered stories about local government preparations to inform affected populations where and how to receive assistance.

Figure 3.4: Live news coverage of typhoon showing ground conditions (November 6, 2020). Retrieved from: https://www.gmanetwork.com/news/video/stateofthenation/545057/lakas-ng-hangin-na-dala-ng-isang-super-typhoon-maaaring-magdulot-ng-storm-surge/video/

For these reasons, Karmen preferred to receive storm information through the TV. TV may not have always been her first alert of a cyclone, but it was her final say, or deciding factor on how to prepare for a storm. In response to a survey question, “How do you get storm information? Karmen answered: “We get news from the TV so we can be sure if there is still a typhoon” ("Naghuhulat kami hit Balita ha tv ki para sigurado kami kon may ada pa Bagyo.”) I followed up with her in an interview about how she prefers to get typhoon information. Did she prefer radio, TV, cellphone? She responded:

> TV. Because you see really, you already see the, the how many person. You not only read, you not only hear how, how’s the typhoon so very strong. You can really see

> because what is really is the wind like, how many kilometers (inaudible), and when really, you will really see where the storm is because, uh, they have a monitoring, so…The news will really explain.
> ("TV. Because you see talaga, you already see the, the how many person. You not only read, you not only hear how, how's the typhoon so very malakas. Kitang talaga kasi nandoon anong talagang yan hangin, ilang kilometro na (inaudible), tapos kun saan talaga, makikita mo saan talaga it iyong bagyo kasi uh they have a monitoring, so….I-explayn talaga ng, ano, ng news.)

Karmen explained how she found the television powerful for verifying and clarifying typhoon information that was unclear on the radio. For her, clarification came from being able to see TV images of how strong the wind was—the windspeed measurements and also recorded footage of wind affecting an area. The TV also helped her see and understand the location of the storm. She prioritized finding the measurements of the typhoon (windspeed, location) to better understand whether to evacuate. She expressed trust in the national TV stations ability to share accurate forecasts because they had a "monitoring"—which I interpret as typhoon monitoring equipment and personnel. She privileged the TV over radio for their perceived abilities to scientifically procure the most accurate predictions on storms.

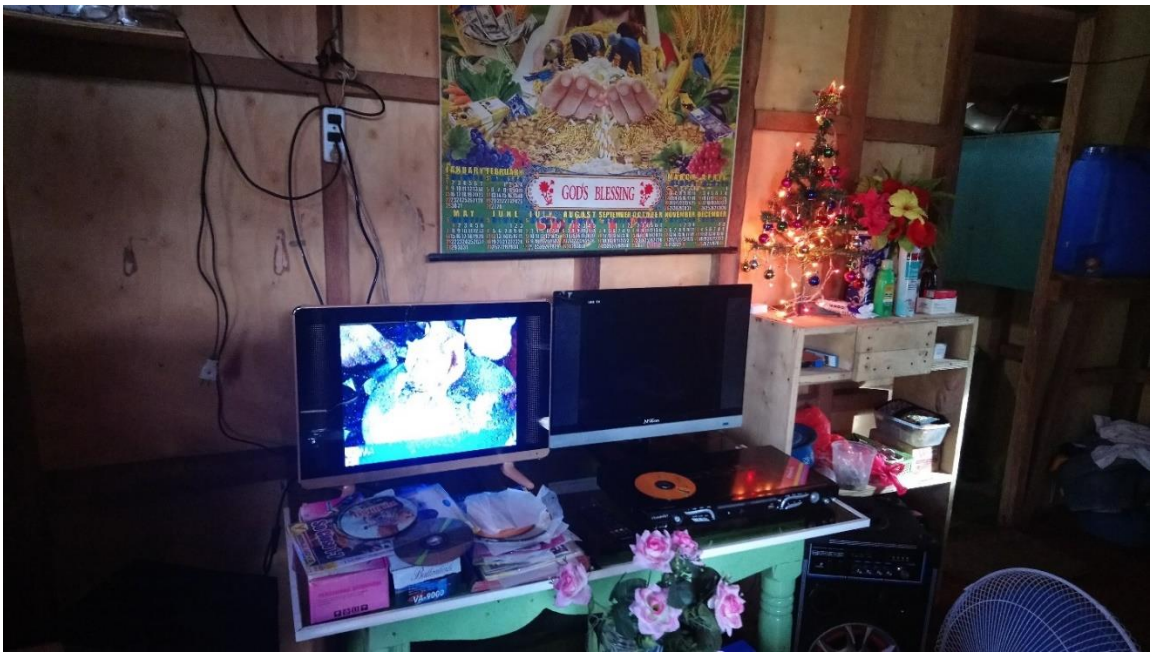

Figure 3.5: SJB resident's TV set up in home, 2017. Photo by author.

While Karmen trusted TV updates the most, others found that TV weather updates went too fast. So, although they could see the maps and graphs, they were gone before viewers could absorb the information. Additionally, some people did not find these Manila-based and Manila-satellite TV stations trustworthy compared to local radio. This was different from radio because radio offered typhoon information in the form of dialog and two-way communication with listeners. TV was purely a broadcast, with no allowance for audience clarifications.

I want to note here that when I asked people, "What is the best way to get typhoon information," every respondent answered either with radio or with television. Sometimes, they compared the two to explain why one was better over the other. No one ever answered that cellphones were the best source typhoon information.

Cellphone

Most people I surveyed in SJB had access to a cellphone. Most respondents owned their cellphone and primarily used it alone. Many also used one cellphone to a household rather than one cellphone per person. Sometimes, older people owned the cellphone, but asked younger family members to operate them. In typhoon situations, the cellphone was used to receive free emergency alerts from the NDRRMC, and to exchange information with friends and family. No person I interviewed subscribed to a data plan on the phone. So, the cellphone was not a resource for looking up information in the internet.

A year after Typhoon Yolanda, NDRMMC started a mass communication partnership with mobile service providers in the Philippines. This program automatically enrolled all cellphone users to emergency communication texting from NDRRMC. Because NDRRMC is also a national agency, these texts mirrored the language of PAGASA, and were exclusively in English or Tagalog. For example, here is a text message sent to all cellphone service subscribing phone numbers from NDRRMC at 6:28 pm on November 24, 2016:

> Signal #1: TD#MarcePH slight danger over Leyte, Southern Leyte, Bohol, Cebu including Bantayan and Camotes Islands, Siquijor, Negros Oriental, Negros Occidental, Iloilo, Capiz, Aklan, Antique and Guimaras w/in 36hrs. Slight damage, be aware, take action.

In theory, this was when the local government steps in to provide more detailed information about whether SJB needs to evacuate. A barangay liaison's role was to remain in direct communication with the HOA leaders, or go door to door talking to each household, letting residents know whether they should evacuate or not. According to the residents I spoke to, however, this almost never happened. Sometimes the HOA leaders got communications from the barangay, and then called a meeting with all residents to update them on the barangay's

recommendations. Sometimes, the HOA leaders went ahead and called a meeting even with no update from the barangay.

The text message did the job of alerting the public that the listed areas were under Signal #1. However, it also left the public with questions, and uncertain ways to follow up on those questions. The directive to "take action," for example, was not specific. SJB residents who must decide whether to evacuate or stay and board up the windows, needed more information than that to make their decisions. So, that is the time people engaged in their known resources and communication networks to get clarifications, recommendations for their specific location. The decision to evacuate was made with much care because evacuations took considerable time, resources and energy. Evacuations included not only hours of packing and closing down the house, but also the time spent overnight in uncomfortable setting, usually just on a mat on the floor of the local school surrounded by strangers, all while worrying that their home might be looted or destroyed while they are away. So, people spend time gathering information before deciding that they really must evacuate.

Tacloban City also developed its own texting-based emergency communication system, called CCGR (Community Climate Guide and Response). The project was one of recently elected Mayor Christina Romualdez' projects directed toward achieving a "sustainable" and "resilient" Tacloban after Yolanda. CCGR was a free text messaging subscription service that sent out daily weather updates via text message. I once talked with the Vice Mayor of Tacloban about the city's typhoon warning system. He urged me to focus on CCGR. He said that people in Tacloban used their cellphones for weather updates, and not so much the radio. A few months after CCGR "went live," the program won an international award for innovative community-based solution for disaster communication. When I asked people in SJB over the next year, however, no one

had ever heard of the program, much less signed up for its service. This was another sort of assumption that resulted in producing uncertainty—the government assumed certain media use patterns across all of Tacloban, and invested time and finances into a solution that may have ended up helping some, but certainly not residents of SJB. Also, the government shrugged off radio as useless for weather updates, but from my experience with SJB residents, it was the most used ways of getting typhoon updates.

Figure 3.6: CCGR billboard posted in SJB, 2017. Photo by author. Billboard advertised types of emergency information the program covers, and registration instructions through text messaging. Mayor Romualdez' image and the city seal mark the ad as part of an official city program.

Texting was the most commonly used feature, followed by calling. For most people I talked to, texting was more frequently used because it was less expensive than calling. Some other used features on the cellphone were Facebook Free and radio capability of some cellphones. A few people mentioned using the Facebook Free program that rolled out in the Philippines in 2013.[29] Facebook Free did not require a data plan. Users could see text on Facebook, but not photos or videos. It was therefore a convenient and affordable way to keep in touch with friends and family via textual messages, posts and comments.

No one I spoke to subscribed to an internet data plan. I wish to point out that the rhythms of collecting information were different for those without the on-demand information available over the internet. SJB residents still sought additional information in between TV and radio broadcasts, and they did this by talking to friends, family, neighbors, and in some cases reaching out to the City Disaster Risk Reduction and Management Council (CDRRMC). So, cellphones were used more facilitate information and get official orders for evacuation from the national government.

Laptops and Computers

Laptops and computers were rarely used in SJB. Of the people I surveyed and interviewed, only a handful used a laptop or computer. One woman said she used a computer at an internet café. Another woman used the computer and internet access at her employer's home, where she worked as a housekeeper. Two people owned laptops—a man in his 50s and a woman in her 60s. The woman did not use the laptop, and rather let her daughter use it when

[29] Facebook Free is a program that provides mobile users free access to Facebook text content only. The user cannot access photos and videos, but can read their accompanying text.

she visited. The man, Mano Fidoy, used a laptop both at home and at work. However, he only had internet access at work. Mano Fidoy preferred looking up typhoon updates on the internet because he found information directly from international monitoring stations, such as Japan Meteorological Agency (JMA), were the most trustworthy. Japan, like the Philippines, is also affected by tropical cyclones that form in the intertropical convergence zone, and so they monitor the same formations. Mano Fidoy trusted their information and equipment more than PAGASA's. Additionally, he said that he had a European made while working together during the Yolanda relief friend who messaged him when he heard news of a typhoon. Mano Fidoy trusted the news his friend received in Europe over the Philippine news.

Like Mano Fidoy, another woman in her 40s preferred to use the internet for typhoon updates. Mana used it in her employer's home, but did not have a home subscription herself. She did not monitor the weather daily as many others did. If the weather looked bad, she would go to the PAGASA website and other to check for updates. She said she preferred the internet for weather updates because she could go back and read the information until she understands it. Unlike in TV, where the information was displayed only briefly. At the time of Yolanda, she actually called PAGASA in Tacloban and asked what storm surge meant because she heard it on the TV and didn't understand it. She criticized the answer. The worker said that it was about 5 feet of water from the sea, and Mana interpreted that it was not something to worry about. She decided not to evacuate during Yolanda, and so she had to survive the storm surge.

Local Governing Unit (LGU)

SJB residents recognized three resources for typhoon information within the local barangay leadership and other local government offices. First, the local barangay would send

out announcements for evacuation via megaphone van that drove through the barangay, or by sending a contact person to relay the announcement to the residents themselves (but often only the HOA leadership would get the visit). They did not respond if SJB reached out for information. It was explained to me that SJB and the barangay were not on speaking terms, and many complained that they did not receive the assistance their government should provide.

Second, residents called the CDRRMO for information. Karmen shared her experience of calling the office for information when Typhoon Ruby (2014) approached Tacloban. She said that they offered the call-in service, but it took a long time to get a hold of someone. People also visited the office in person to get information—which had more success than calling, but just as long wait times.

The local governing unit often failed to function as expected, and residents were left without information. The uncertainty produced through the LGU was from inaction and negligence. In the next section, I present a situation that shows how LGU negligence, paired with other emergency updates created fear and uncertainty for SJB residents during a 6.5 magnitude earthquake on Leyte island in July 2017.

Production of Uncertainty: Leyte Earthquake, July 6, 2017

On July 6, 2017, at 4:00 pm Leyte island experienced a 6.5 magnitude earthquake with epicenter located just in the mountainous center of the island. I was in a café when the earthquake happened. My mug started rattling as the lights went out, and the hanging light fixture above me started swinging back and forth. The shaking felt long (even by my California native standards)—about 20-30 seconds. Another café patron and I just stared at each other during the shaking, unable to make a comment, and not knowing what to do. The earthquake

was so strong that it immediately damaged and shut down the entire island's grid electricity system, which took almost two weeks to repair. I went the next day to SJB to learn peoples' reactions and responses to the earthquake. On arrival, I saw Ate Jel sitting on the stoops of her neighbor's house, talking with two other women. I asked if they were alright after the earthquake. They were alright, but still nervous and shaken up. In SJB, there were no injuries or deaths from the earthquake, but there was great fear of a tsunami following on the heels of the earthquake.

Ate Jel's first reaction to the earthquake was to run outside the house because she was nervous. She found that her neighbors were also out. "What did they say?" I asked. She told me: "*Chismis* (chit-chat*). Chika ng chika* (gossip). They said relax; nothing will happen. Pray." She listened to her battery-operated radio for half an hour—hearing updates of damages in one city and landslides in another—until she received a text from NDRRMC saying there is no threat of tsunami. Her neighbor-friend interjected here and said she received the text after 20 minutes. Ate Jel continued talking with her neighbors until 9:00 pm when she went to sleep. Even then, the day after the earthquake, I saw she was talking nervously with her neighbors still. She told me: "We survive again. We cannot take it any longer. Hopefully, I will die first. The earthquake, the typhoon…and they say *daw* we have 20 typhoon coming." She made a half-joke that she and I would not meet again.

Inday told me the lights went out first, and she was shocked. She had a TV, but no battery-operated radio. So, she went to her neighbor's house to listen together for any news on her battery-operated radio. She called her children's school, and then went to pick up her four children. She then went back to her neighbors' house, and listened to the radio with her, and two other neighbors like her in need of information, for hours until 7:00 pm. Then, she went

home and packed her family's things by candlelight in case they needed to evacuate. Her husband was working in the neighboring island, Samar, at the time. So, all the stress and pressure to prepare for a tsunami fell on her shoulders, combined with the physical dizziness from the earthquake, and lack of sleep made her head ache into the next day. She said she could not sleep the whole night. But, she did not go back to her neighbor's house to get updates from the radio because her neighbor and family were already sleeping. Parents alone caring for their children experience extra stress, and especially need the help of family, friends and neighbors in an emergency.

I encountered another male in his late 20s who had befriended be during my weekly English lessons. Idoy said he was working when the earthquake happened, and he felt dizzy and confused for a while. He was afraid he would die. He got the NDRRMC text that there was no threat of tsunami 15 minutes after the shake. Then, he headed home to SJB where he lived with his uncle. About 6 family and neighbors listened to their solar radio for news. Idoy was a youth program organizer in Tacloban, and was particularly passionate about SJB's needs from the local government. He related

> The question is about [the government's] update. There should be guidance from the city government. Or the barangay. Like, they should go around [the neighborhood] directly following [the earthquake]. It's like, they, the city government or the barangay's captain responsible are around on the barangay that they remind us that, be careful…and they remind us that if there was an earthquake, you were going to be careful with yourself and your family and all that. So, it was like we were left in the dark. They didn't go around. We were dependent on the radio, dependent on the TV, dependent on the cellphone. They should have…they were missing for like reminding us. That's it, what they should do is…ask everyone at each house. Accompany them in their situations. They were just not here. That is the big question: where is the barangay captain, where is the barangay community, where is the city government?
>
> (*Yung tanong lang, yung (inaudible), parang ma-update nila. Dapat, guide sa city government. Or, sa barangay. Umikot na…ganito magalop padayon. Parang, they, the city government or the barangay's captain responsible are around on the barangay that*

> *they remind us that, be careful…and they remind us that if there was an earthquake, you were going to be careful with yourself and your family and all that. So, parang gabi. Hindi umikot sila. Umaasa sa radyo, umaasa sa telebisyon, umaasa sa cellphone. Dapat, missing sila parang mag-remind. Yan yun dapat… itanong sa kanila isa't-isang bahay. Nakaupod sila sa kanilang mga pwesto. Hindi nandito la sila. That is the big question: where is the barangay captain, where is the barangay community, where is the city government)*

Idoy stressed that media updates should be secondary to direct communications with barangay officers. He indicated they were dependent on TV, radio and cellphone when they these should have only been supplementary sources to barangay in-person visits. Idoy's statement showed to me how uncertainty was produced for him through delayed and differing media updates from multiple sources, and from the barangay government's lack of leadership for those affected in SJB. For him, the government should have helped them make sense of the media updates, told them what they recommend officially, and asked what the peoples' needs are.

Overall, media helped to ease uncertainty in their own different ways. Yet, they also, together with the failure of the barangay to communicate with SJB residents, produced uncertainty. With the NDRRMC text messages, the inconsistent times that people received updates made vital differences. When a tsunami is on the way, a fifteen-minute warning as opposed to a ten-minute warning as opposed to a one-minute warning can be the difference between life and death. The radio programs provided helpful information, such as reminding the public to be careful of aftershocks, not to panic, and if they decided to evacuate, to do it calmly and safely. This shows how disaster communications, although meant to be helpful infrastructures for risk reduction, actually lose effectiveness by producing uncertainty, or increase risk by ineffectively communicating dangers.

Experiencing Uncertainty: Typhoon Marce, November 2016

SJB residents' knowledges on typhoon monitoring, as discussed above, were the result of years of learning about which media are the best sources, and how to pair information from different sources in order to decide what actions to take. Here, as a point of comparison, I recount my first experiences of uncertainty during a typhoon, and trying to interpret weather information to make decisions on how to prepare for the typhoon. I present this to show just how much effort goes into learning to understand how to use typhoon information during an actual event.

In October 2016, just into my first month of fieldwork, I had my first experience with being alerted to an approaching cyclone. I had registered to the city's update text subscription service, Community Climate Guide and Response (CCGR), that "went live" four months earlier. For the first few weeks of my registration, I received texts every day or two forecasting sunny weather, or clouds, or thunderstorms, like this message received October 11th: "Oct 11, 2016: Mostly cloudy with widely separated thunderstorms…" On October 12th, however, I woke up to an alert I felt unable to fully decipher though it was in my native language of English: "Oct 12, 2016: At 5AM today, the Low Pressure Area was located 650km East of Borongan City. ITCZ affecting Palawan, Visayas, and Mindanao." I understood from the changed tone of the message that it was not business as usual today. A weather develop was being monitored, and that meant something—though I could not tell what exactly that meant for me. Did this mean I should reschedule my plans tomorrow to travel with a local radio host to a resettlement village? (He had in fact canceled our plan to do this last week for fear of a coming storm.) I opened up the PAGASA website on my laptop browser to get more clarification. I found, however, that the

CCGR text message had been copied verbatim from the PAGASA website update. The only meaning I could take at this point was: stay tuned, and stay alert.

The next day, I received an alert that the LPA was instead referred to as Tropical Depression Karen: "Oct 13, 2016: Tropical Depression "Karen" was located 640km East of Catarman, Northern Samar. Max winds: 45kph. Gustiness: 55kph. Moving NW at 11kph." Until then, it had been cloudy but not windy or raining. It did not seem like a Tropical Depression with 45kph winds and 55kph gustiness was on the horizon. A few hours later, the radio host texted me to cancel our travel plans. On October 14th, the signs of a storm finally appeared. The text for that day read: "Oct 14, 2016: Tropical Storm "Karen" was located 335km East of Virac, Catanduanes. Max Winds: 75kph. Gustiness: 95kph. Moving Northwest at 13kph." The air had been heavy with humidity and heat all afternoon, and as I started my walk to meet a friend at a nearby café, a light rain settled over the streets. Pedicab drivers pulled over at once, and rolled down the plastic coverings to the passenger cab. People walking covered their heads with their bag or clothing, and dashed for the nearest overhanging structure that would provide shelter from the rain. They read the sign that a downpour was coming, and I followed suit. I ducked into a pedicab stop shelter just as the downpour begins to fall like buckets of water. The rain came down so hard, that it splashed up onto my pants even though I was sheltered, and the sound of falling rain on metal roofs was all I could hear for about 7 minutes. I checked my Facebook messenger and saw my friend canceled our meetup because the jeepneys could not pass the flooded highway in the nearby town of Palo, where she lived.

I share this experience as my introduction to decoding weather alerts in the Philippines, and making decisions from that information. Everyone around me seemed to know what to do, and when to do it—when to cancel plans, when to hide from the rain. I had almost no

knowledge of how to process those alerts for my own safety. It was my first introduction to the amount of knowledge (and different types of knowledge) needed to decode weather alerts, environmental signs, and act on the information. In the 1.5 years I lived in Tacloban City, I experienced more LPA warnings than I can estimate. In certain typhoon prone months, especially November and December, we experienced new LPA and cyclone warnings every week. Close to the end of my stay, in late December 2017 to January 2018, we experienced back to back cyclones. So, while this story recounts the uncertainties encountered during my first typhoon experience, I later learned that experiencing uncertainty in typhoons can be intensified with full months being on watch for the next LPA.

Conclusion

In this chapter, I have shown how residents of SJB use media like TV, radio, cellphones, and computers to gather typhoon updates. Checking in with the news is a daily practice, and checking up specifically for typhoon updates becomes a priority for watching the news in several months of the year, when typhoons are likely to cross the central Philippines. While SJB residents rely on media to stay informed during an emergency, many believe that it is the duty of the local barangay government to directly communicate with residents in urgent situations in which residents need both to clarify information and support to evacuate or take some other responsive action. In emergencies, uncertainty is produced not necessarily through certain messages, and not necessarily through behavior, but rather through an emergency communication system built upon certain assumptions. These assumptions are: 1) That all viewers will interpret information (especially scientific information) in ways scientists/meteorologists intend, 2) that people will have equal access to communications, and

3) that the government functions as planned during a disaster. I have shown how, in the case of SJB, citizens are marginalized by the disaster communication infrastructure based on these assumptions, and therefore that communications produce uncertainty. SJB residents managed their risk to disaster from the margins of available mitigation infrastructures.

CHAPTER 4

"Prepared na kami" (We are Prepared)

In my early round of interviews, I asked people about how they got typhoon updates, and how they decided what to do when there was a typhoon warning. I remember that one woman smiled proudly, and said, "Prepared na kami" ("We are prepared now/already"). The phrase struck me as sounding awkward, but significant in how it was used. The phrase sounded awkward because she used the English word "prepared" in a Waray-Waray sentence. Her use of "prepared" seemed to reflect the language of NGO and governmental campaigns for Disaster Risk Reduction (DRR). The phrase sounded significant to me because she used "kami," the exclusive form a "we/us," which communicated to me the idea that she identified her preparation not individually but linked communally as part of SJB, and possibly the Philippines, and possibly even in the identity of a disaster-prone or disaster-affected people.[30] I thought this phrase was appropriate to highlight in this chapter in which I consider how SJB residents work together across networks of family, friends and neighbors to mitigate disaster. SJB residents rely on family, friend and neighbors in disaster. These networks are more important than designated disaster mitigation and communication infrastructures because, too often, they are not assisted by the local government as they expected they would be.

[30] Using "kami" excludes me as the listener from how she was identifying, so she could have been using kami to set off her identification from mine in one, two or all of these contexts, depending on how she viewed my identity (as an American, my place of residence, my socioeconomic status, etc).

The phrase represented both SJB interactions with NGO-led disaster preparedness trainings and philosophies, as well as a sense of group identity based on disaster preparedness. Preparation, however, is an English word, and an international concept of DRR. This leads me to ask: how do SJB residents achieve a sense of preparedness through NGO and governmental constructions of DRR, and through their own sense of what is needed to prepare for disaster?

The residents of San Jose Beach experienced Typhoon Yolanda and the ensuing recovery period through myriad relationships and encounters with governing and infrastructural entities. After Yolanda, the road to recovery involved months of temporary relief services offered through international and domestic NGOs, and the national and local offices of the Philippine government followed by the transition to local government handling recovery process alone. In the immediate relief after Yolanda, hundreds of international NGOs and thousands of international volunteers arrived in Tacloban City to provide services in partnership with Philippine NGOs and governmental organizations. Relief services included medical, food and water, shelter, monetary donations, social services, children's assistance, communication, rebuilding, and DRR planning. SJB residents navigated ways to find the services they needed through multiple organizations, and through friends and family as well. All these many relationships and encounters are important considerations for how disaster preparation, event, relief and recovery were experienced by SJB residents.

In my time researching, SJB residents accessed multiple networks to ensure that their needs were covered. This sometimes looked like, for example: accessing media for typhoon updates, government services for evacuation updates, family networks for monetary assistance and advice, and purok (neighborhood) strategies for group evacuation. Based in part on experiences with government failures during the Yolanda recovery, SJB residents did not rely

solely on the government to prepare for disaster. Their core strategies instead integrated government services with other solutions built among fellow neighbors, members of the SJB Home Owners' Association, friends, and family. I argue that these multiple and overlapping networks were necessary for SJB residents because they were marginalized by certain governance practices and infrastructures, even though these were intended to fully serve all Filipinos.

This chapter analyzes how SJB residents manage disaster from the margins of infrastructure, and how SJB residents overcome this shared circumstance by working together. By margins/marginalized, I refer to how SJB residents access infrastructures minimally, and not always in ways infrastructures were intended to be used. I argue that their use illustrates that they are using infrastructures not necessarily designed for them, but rather designed for particular consumers. For example, using a television to access information requires regular electricity access. Or, finding PAGASA updates posted online requires an internet or cellphone data subscription. Furthermore, effectively using weather update information requires a certain level of familiarity with scientific terminology, or benefitting from government programs requires a good working relationship with local government officials. In many of these and more available resources for preparing for or responding to disaster, SJB residents encounter varying experiences of marginalization.

However, this chapter is equally about the "work-arounds" that SJB residents create to increase their ability to prepare for and respond to disaster. For example, if someone does not have regular electricity access to watch the evening news on TV, they might visit a family member with electricity and a TV and watch the program together. Or, they might call the CDRRMO to ask for the latest PAGASA and government recommendations if they do not have

access to the latest updates posted online. They might text a radio show host to interpret some weather information, if they did not understand the terms. They might participate in Home Owners' Association plans for group evacuations if they do not trust that the barangay government will help them evacuate. I consider how SJB, as a community both affected by disaster and in continual preparation for disaster, come together to work around marginalization from disaster communication and other risk reduction strategies and infrastructures.

Disaster Infrastructures and Emergent Groups

Social science researchers of disaster find that more attention should be given to the structures of inequality and experiences of marginalization that make experiences disaster deeply varied for different populations (Hilhorst & Bankoff, 2004; Oliver-Smith & Hoffman, 1999). Oliver-Smith (1999) stresses the importance of understanding environmental disaster as something that occurs between what we typically consider as two separate realms: society and nature. As he puts it, disaster occurs in societies, and not in nature; they "emerge from societal environmental relations and the institutionalized forms those relations take" (Oliver-Smith, 1999, p.28). Disaster is entwined with the way our societies conceptualize and relate to the environment, and also entwined with the institutions our societies have created for managing their environments. If disasters are a part of society, its organization and institutions, then social inequality is also a part of disaster. Oliver-Smith argues for a political ecology of disaster which considers the historical pattern of vulnerability in societies. He argues that, "A disaster is made inevitable by the historically produced pattern of vulnerability, evidenced in the location, infrastructure, sociopolitical structure, production patterns, and ideology, that characterizes a

society" (Oliver-Smith, 1999, p.29). He refers here to patterns of vulnerability from human effects on the environment like degradation and resource extraction, and also the patterns of who in our societies are most negatively affected by these actions.

Hilhorst and Bankoff (2004) also engage with the concept of vulnerability as a way to understand unequal experiences of disaster. They explain vulnerability as, "the way in which human systems place people at risk in relation to each other and to the environment" (Hilhorst & Bankoff, 2004, p.2). Vulnerability for them, while concerned with the present or future, is a product of the past. In practice, the term vulnerability has been used as if it is something an individual, household, community and society possess. Hilhorst and Bankoff, however, argue that vulnerability is rather something experienced, and is dynamic— "embedded in complex social relations and processes"—rather than static (Hilhorst & Bankoff, 2004, p.5). So, while vulnerability is a concept typically applied to disaster contexts, disaster scholars have teased out some ideas in the concept of vulnerability that are really connected to wider historically rooted, complex social relations and processes. This is a main direction in which I take this chapter. I show how within some Philippine populations, there are certain overlooked or unseen marginalization from the infrastructures needed to prepare for disaster—typhoons and earthquakes especially.

Because I focus specifically on certain infrastructures used in DRR, I also bring some perspectives on infrastructure and experiences of inequality and difference. Ethnographic approaches to studying infrastructure consider infrastructure as relational—a form of human organization, and as messy and problematic as any other human organization (Susan Leigh Star, 1999). In her definition of infrastructure, Susan Leigh Star explains that, "infrastructure is a

fundamentally relational concept, becoming real infrastructure in relation to organized practice" (Star & Ruhleder, 1996; Star, 1999, p. 380). She gives the example that to a cook, the city water infrastructure is integral to making dinner, for the city planner is a planning process, and for the plumber it is a target for repair. Infrastructure can be many things to many people, and in different circumstances. She suggests that our image of infrastructure becomes complicated when we examine the situations of those who are not served by a particular infrastructure. She shows the importance of identifying the "master narrative" of infrastructures, which in turn reveal the "others." Master narratives create a monolithic agenda, or "a single voice that does not problematize diversity" (Star, 1999, p.384). She also raises the need to surface invisible work. These might be type of work or workers themselves who are invisible. This gives a different view from what we might typically conceptualize as infrastructure. Rather than purely technical and separate from society, infrastructures are intensely integrated into how societies are structured, social relationships, and meanings. As within societies, therefore, there are inequalities experienced through infrastructure—through the master narratives, and the invisible work, for example.

Infrastructural breakdowns are an example of these marginalized or invisible experiences of infrastructure. Schwenkel (2015) analyzes how tenants of a housing block in Vinh City (Vietnam) form solidarities through a "collect ethos of maintenance," but also moral disagreements around shared infrastructural maintenance. Tenants faced regular breakdowns within the aging buildings, and little assistance from the local government. Infrastructural breakdown as a part of life shaped social relations with neighbors and the local government: "Breakdown as routine meant a certain routine of breakdown—one that could generate endless innovation and improvisation but that also marked a state of increasing disaffection toward

local government and its negligent maintenance that led to unsafe living conditions in many of the apartment blocks" (Schwenkel, 2015, p.520). Some of these innovations and improvisations included: collecting monetary contributions from each household for stairwell repairs, women awakening at 11:00 pm to haul water upstairs from the pump, and using a poster to cover mold that the landlord would not eradicate. So, in breakdown, people improvise their needed infrastructures, and even become the infrastructure through their own participation and actions. Simone (2004) also observed that in the ruined urbanization in the inner city of Johannesburg, people used a "highly urbanized social infrastructure." Simone connects the idea of infrastructure to peoples' activities within cities, which are flexible, mobile, and provisional, "without clearly delineated notions of how the city is to be inhabited and used" (Schwenkel, 2015, p.407). Those with limited means, and unequally accessing infrastructures find ways to otherwise get use out of infrastructures, not just individually, but through social relationships: "This infrastructure is capable of facilitating the intersection of socialities so that expanded spaces of economic and cultural operation become available to residents of limited means" (Schwenkel, 2015, p.407).

This leads into connections I want to make with literature on community/social relationships that arise in disaster. Stallings and Quarantelli (1985) argue that little consideration is given to the role of citizen groups that emerge to respond to the needs of a disaster. They define these "emergent groups" as, "private citizens who work together in pursuit of collective goals relevant to actual or potential disasters but whose organization has not yet become institutionalized" (Stallings & Quarantelli, 1985, p.94). They are not public bureaucracies, and not individuals converging on the same problem. They are groups that have a new structure (social relations) and a new function (goals and tasks): "the relationships among the individuals pursuing the

collective goals are new (the group has an internal structure that did not exist before) and the tasks being undertaken in pursuit of these goals are new for individuals so joined" (Stallings & Quarantelli, 1985, p.94).

The idea of emergent groups is similar to Solnit's observations of the citizen groups that come together in disasters and form communities of assistance and inter-dependence, or "disaster utopias." Solnit (2010) brings together many examples of how citizens affected by disaster, lacking media and electricity, came outside their homes and talked to each other instead. They gathered in candle-lit bars, or used defrosting food from power outages for open barbeques. They operated outside of or in absence of formal responses to the disaster: "Without orders or centralized organization, people had stepped up to meet the needs of the moment, suddenly in charge of their communities and streets" (Solnit, 2010, p.5). Solnit finds that there is a "disruptive power of disaster" that topples old orders and brings new possibilities (Solnit, 2010, p.16). She argues that the small percentage of tragic accounts of disaster eclipses the many more stories of people in "undamaged but profoundly disrupted situations" (Solnit, 2010, p.16). She observes also that there is a tension when it is time for the disaster utopia to relinquish to regular structures of living and old orders of authority: "In the moment of disaster, the old order no longer exists and people improvise rescues, shelters and communities. Thereafter, a struggle takes place over whether the old order with all its shortcomings and injustices will be reimposed or a new one, perhaps more oppressive or perhaps more just and free, like the disaster utopia, will arise" (Solnit, 2010, p.16). I find that SJB residents organize their disaster preparation and risk reduction together outside of old orders that continue to fail them, and instead together held together by bonds not only surviving Yolanda, but also shared risk of the next big typhoon.

Browne (2015) analyzes how people connected and formed ties and networks to respond and recover from Hurricane Katrina. Her ethnography centers on an extended family from St. Bernard Parish, Louisiana but shows not only how the family network became the central means for dealing with disaster, but also other surrounding social ties. She notes that "weak ties" (colleagues, acquaintances, etc.) were just as important, if not more important, than "strong ties" (close friends and family) for meeting needs after disaster. As she puts it: "When people with a lot of weak ties need something, the possibilities provided by their networks can quickly multiply, as each weak tie connects to other weak ties, making information, new contacts, and resources available that weren't there before" (Browne, 2015, 32). Like Solnit observes, disaster can reconfigure and even deepen social relationships to neighbors, local business owners, police, and government. This is an occurrence that I focus on in this chapter. What are the social ties between residents of SJB (and with local businesses, government, NGOs) that are put to work in the threat or event of disaster? These ties are shown in the many work-arounds SJB residents make in response to infrastructural marginalization.

Margins and Work-arounds of Media

In this section, I discuss they ways SJB residents accessed formalized infrastructures such as electricity, media and governmental resources. I show how different modes of access allow for different experiences of marginalization from those infrastructures. Here, I start with media. In Chapter 3, I showed how SJB residents are not served by disaster communication because the government and media make certain assumptions about their audiences that disserves certain populations in the Philippines. Here, I show some of the ways, outside of disaster contexts, that SJB residents were marginalized by media and communication

infrastructures, and some of the work-arounds they used to enhance or fill-in their media experiences.

Cellphones

Cellphone experiences vary across the Philippines depending on what type of subscription access a person purchases. At the time of this research, the most expensive plans were "post-paid" plans billed monthly, which general cost from 599 – 2999 pesos ($12 - $60 USD) per month, depending on the subscriber's use for the month. These plans came with options for all features: call, text, and internet data use. To subscribe, a person must first meet financial requirements such as regular paychecks and a bank account to avail of this option. Most cellphone users in the Philippines, therefore, used instead "pre-paid" subscriptions, which were generally purchased for 15-100 pesos ($0.30-$2.00 USD) as needed. There were dozens of promotional ("promo") options within pre-paid subscriptions. A 15-peso subscription, for example may give the subscriber three days of unlimited in-network text messages, and 60 minutes of in-network calls.[31] A 50-peso promo subscription could purchase, for example, three days of unlimited all-network text messages, 90 minutes of in-network calls, and 2 gigabytes of internet data use. All residents of SJB I spoke to that used a cellphone availed of pre-paid subscriptions. Many used Talk N Text service, which offered more calling and texting promotions rather than internet data subscriptions. The country's two main mobile subscription services at the time, Globe and SMART, catered separately to subscribers who could afford monthly

[31] There are multiple mobile service providers in the Philippines. "In-network" means that users may text and call with partnered brands. For example, Talk N' Text is a service of SMART, so subscribers are considered "in-network" to eachother.

subscriptions, and those who could afford pre-paid subscriptions generally in the amounts of 15 pesos. For pre-paid subscribers, “load” could be purchased at many sari-sari stores, grocery or convenience stores.

Figure 4.1: Banners hung at a sari-sari store advertising mobile service company promotional specials, or “promos,” 2017. Photo by the author.

I find this important to highlight because it shows how different media access and experiences were attached directly to peso amount. The mobile communications infrastructure made cellphone use highly accessible to almost all Filipinos for text messaging primarily. However, extensive calling and internet data use were much less accessible because of cost. Most in SJB live on daily income earned through jobs such as fishing, marketplace vending,

jeepney driving, etc. Therefore, cellphone subscription depended on income of the day or within the past few days.

One work-around for cellphone use was to use text messaging for non-urgent communications, and reserve calling for urgent communications. One woman in her sixties, told me that was her use of the cellphone. She truly held off on the calls for emergency. She related a time she was scared that there might be typhoon because the weather was bad. She still decided to text her sister about it, rather than call. Another woman, a mother in her 40s, said she kept her cellphone available for communications from the school. She affords this by loading 10 pesos ($0.20) to her account every two to three days.

Sharing cellphone access was another work-around to marginalization from the mobile communication infrastructure. As mentioned in the previous chapter, levels of income/poverty were not uniform in the purok. Sharing access to media technologies was one of the most common work-arounds to this. Cellphones were one of those shared technologies. However, they were mostly just shared within a family. One participant told me that she shared a cellphone with her husband. Her husband worked as a jeepney driver, driving downtown and back, and she stayed at home with their young child. She typically kept the cellphone with her at home throughout the day. However, if there was a typhoon alert, her husband kept the phone while driving the jeepney so he could keep in contact what was happening at SJB.

Most people had access to a cellphone in SJB, most often adults either had their own cellphone, or shared one with their spouse. These included both more affordable smart phones, and the more basic phones. I asked one woman why she used her cellphone. She answered, “para ma-komunite,” while tracing with her finger a horizontal circle in the air— “to participate

in/be part of/make community." She was circling everyone around her—her family and her neighbors, her community.

Radio

Radio was one of the most commonly used and easily accessible forms of media in SJB. Radios could be purchased inexpensively downtown, and required little energy to operate compared to TVs. Several households used solar-powered radios. Solar radios were attractive because they did not require a paid energy source. However, people encountered other challenges in using a solar radio. One participant who used a solar radio encountered the issue of unreliable solar charging. She told me: "But it does not always turn on because when it is not receiving the…the sun is the only thing that charges it. When there's sun, there's charge." [*Pero hindi palagi kay mag bubukas kasi kay pag hindi, hindi maano ang ano, yung araw na la charge iya. Hindi… Pag may araw, may charge siya. Para, para lulumulat din.]*

Many more people owned or had access to a battery-operated radio. However, these were often reserved for emergency use because the batteries were so costly. During my surveys and interviews, when I asked if the participant used a radio, many times I heard the response, "We have a radio, but no batteries." One woman who responded this, for example, said that she had a radio but it had no batteries, but she still listened to radio news every morning from 5:00 am to 7:00 am at a friend's house. This, paired with the woman's response above about the unreliability of solar charge, made me realize that I could not really talk about media use in SJB without also addressing electricity use. I address this later in this chapter.

Another participant, a young woman in her early 20s, and a newly-wed, did not own any media. She and her husband lived very basically, while building their income and possessions.

They did, however, open their window to listen to the radio programs emitting through their neighbors' window. They could gain typhoon updates this way, as well as enjoy musical entertainment.

A group of three women in their 50s got together in one home every afternoon to listen to the 1:00 pm drama. The drama was in Waray-Waray and followed the joys, despairs and conflicts of one family. The drama gatherings became a time for resting after the morning's work, and making *chismis* (gossiping/catching up). So, although the women were not using the radio always to catch up on the news, they had a solid network for sharing the technology as well as information sharing through chismis that met daily.

Radio was one of the more important media for participating in Tacloban in a sense of community-making. Radio in Tacloban is a valuable tool for communications between citizens and local government, facilitated through radio hosts. So, exclusion from radio meant exclusion from the Tacloban "public sphere" (Habermas, 1989). As explained to me by a local university professor, local radio was linked to politics. People called in to lodge complaints against barangay leaders. There were two main radio stations, she said, and the City/Mayor owns one, while the Governor owns the other. People called the governor-owned radio to complain about the City and vice versa.

Although radio was highly accessible, people still had varying experiences of marginalization using radio. Solar radio charging and energy use had to be carefully planned to ensure their energy was expended to tune in to a particular broadcast. Also, charging in stormy conditions was unreliable. Some people had access to a radio, but could not afford the batteries to power it daily. People found work-arounds to be able to use radio. Some listened together in

groups. Others listened through the neighbor's window. Some reserved energy (battery purchases) for emergency use only.

Television

Less people owned televisions in SJB than owned cellphones or radio. But, television was the most shared media technology in SJB.

I once went to do a follow-up interview with a woman who lived along the "main passage," very near the beach. Unlike in other homes, hers was very bare and did not have a display of things I found in others houses, like a table with photos, calendar, Santo Nino altar, other housewares and decorations. The woman, in her 60s, had access to a cellphone which she received recently as a birthday gift from her husband. However, she had no TV in the house, and her radio needed batteries. She noted, though, that she lived across the "main passage" from relatives, and watched television with them.

I went across the main passage to the house she referenced, and it turned out to be the house of the HOA President. When I went back later to interview the HOA President's wife, I found a stark contrast to Mana's house across the passage. The family had built up extensions around the NGO-supplied single-room shelters that everyone in SJB owned. On one far end of their property they had a fenced-in garden that they said was the community garden in which some residents elected to participate in as a co-op. In between the house and the garden, they had built up support beams and constructed a few additions: a sari-sari storefront, a kitchen area, and a semi-outdoor seating/living room area with benches that was covered with a roof overhead, but had dirt floors. This was where the TV and radio were.

The radio was large, and a type I had seen on sale in the department store downtown called Gaisano. The TV was new, she said, only purchased two weeks earlier. It was Centrix brand 19-inch flat screen TV. There was a "drama" (soap opera, or other dramatic television series) playing, and she kept the TV on as we interviewed. She kept one eye on the drama's progression as we talked. She said that the TV was used in groups frequently—mostly at night time. Many people—family, friends and neighbors—came over to watch movies together, and televised basketball games. (Basketball was the most popular sport in the Philippines, and people like to watch both the Philippines and American league games.) I give this description of two women's' media access paired with apparent socioeconomic status to show how people in SJB did have very different experiences of access and non-access to media, but that work-arounds to media access could be found within some forms of community. In this case, the house of the HOA President was also a place of community gathering for many in SJB, and the family found ways to share their abundance in terms of media with others around them.

For typhoon monitoring, television viewing worked well in a group. One participant, for example, related to me how she mostly used the television to watch the evening news (2.5 hours), and about a half hour of a drama after with her husband and children. She watched both the local Waray-Waray news, TV-Patrol Tacloban (5:30 – 6:30 pm), and a national news program, GMA 24 horas (6:30 - 8:00 pm). This was her only window of time to view the television between preparing her 4 children for school in the morning and bed at night, and working as a house helper during the day. She felt television was the best way to get weather news, and did not even buy batteries for her radio which was stored up on a shelf. Her main frustration with the news weather update, though, was that it is only 5 minutes of the whole news program (in regular programming without storm warning), and if she was preparing

dinner, she might miss the update. Her children, however, helped in this aspect. They watched the news, and called out to their parents when the weather update came on: “Ma, weather-weather na!” Collecting weather information, even if viewing that same media, was still a shared activity/responsibility.

Mana expressed a sense of responsibility, too, toward media sharing with her neighbors. She received the television as a gift from her employer after the temporary homes were constructed in SJB. Therefore, she was in one of the first homes to have a television. She said that if there is something important on TV (she gave the example of President Duterte’s recent visit to Tacloban), she will invite her neighbors over to view the coverage. It is not just that people ask their neighbors and friends to share media access, but that some media owners offer access.

It was not clear to me how much of media sharing and other work-arounds were reflective of life before Yolanda. However, it was clear that everyone in SJB lost all their media technologies, save for a few surviving cellphones and radios, and all had to rebuild back the media technologies they lost. Some households built back their resources quicker than others, and these became the main places media was shared and used communally. Media sharing happened between family, friends and neighbors, often centered around certain programming—watching the news together or televised events.

Margins and Work-arounds of Electricity

In my conversations, accessing media was often spoken of in conjunction with access to electricity. Individuals had different strategies for acquiring and consuming electricity. Electricity was not uniformly accessed in the purok, and that relates to how media is likewise not uniformly

accessed among those in the purok. Electricity could be acquired through registered grid hook-up with the regional electricity supplier, Leyeco. Grid electricity in the Philippines has been quite unaffordable for low-income households. It has been common in the Philippines that low-income households do not have access to grid electricity—often due to financial or registration barriers such as holding the required financial documents to register for the service. Many chose to hook up illegally. Without grid power, some individuals relied instead on technologies that run on battery power. Several NGO organizations working in the Philippines have recognized the possibilities for low income households to receive power outside of the grid electricity system. They have worked to bring alternative power sources, such as solar power to low-income households. These were the possible electricity sources open to residents at SJB, but electricity access and consumption varied between houses.

I offer a description here of electricity access in SJB to contextualize peoples' experiences of accessing media, which is dependent on an energy source. In the purok, there was only one registered electric grid line connector, which was shared between 15 households. The houses divided the costs of monthly bill, but tensions tended to arise as to how the bill should be split, and who used more electricity. Some households had refrigerators, and some only used electricity for a fan. The rest of the households found other means for accessing energy. Residents alluded that several households hooked up illegally to the electric grid. Only a few people openly shared with me that's what they did. In 2016, SJB was the recipient of an alternative power focused NGO program that worked to customize solar power units for the "urban poor." RE-Charge Pilipinas (RCP) program within the Institute for Climate and Sustainable

Cities (ICSC) is a Philippine NGO based in Metro Manila.[32] The organization seeks power solutions that are specific to peoples' living circumstances.

In SJB, RCP introduced small, portable, single-household solar units to be obtained on a "pay-to-own" system. My first introduction to SJB was actually through RCP staff as I accompanied them on a solar unit demonstration meeting at the purok. When I returned to SJB to meet and survey residents over the following month, I noticed several households had acquired the solar units. They were often left charging in the day—solar panel on rooftop. While the program worked well for some, others expressed difficulties keeping up with the periodic payments. And although they wished to retain and make use of the units, their unstable or insufficient incomes prevents them from continuing the program.

Lastly, residents availed of other portable energy sources like batteries, or crank flashlights. As explained to me by Karmen, batteries were only good for emergency situations, though, because they are costly and do not last very long. When Tacloban City was out of electricity for the four months following Typhoon Yolanda, Karmen used batteries to keep her portable radio running to keep information incoming because that was the only flow of dependable information and entertainment, but also to counter to silence of a destroyed city then. The batteries, however, only lasted a couple days like this. The batteries could cost 250 pesos ($5 USD) which was the cost of a family's groceries for 2-3 days. Many battery and solar powered radios that people used also had a built-in flashlight. These radios were designed for emergency situations when radio communication and electric light source are important. So,

[32] See https://icsc.ngo/rcp/

many people used the solar radio as an alternative light source as well—whether they were saving on electricity cost, or did not have access to grid electricity.

The context of energy use in SJB, therefore, was that no household in SJB operated on a private grid electricity hookup. This already was a marginalization from how many media were intended to be used—switched on when needed, at any time of day, without concern for budgeting use between neighboring households. About 30% (15 of 50) of households had access to grid electricity. However, this access was only through a single Leyeco hookup for which all 15 households needed to decide together what portion of the bill they were responsible for. An unknown number of households accessed grid electricity informally, without a documented and billed Leyeco hookup. These households risked legal and financial repercussions. Roughly, 15 - 20% of SJB households participated in RCP's solar program. Apart from the RCP program, around 20% of households accessed solar energy through solar-powered radios—radios designed for emergencies, which may also include a flashlight, personal fan, and hand crank. Almost no households used battery power in daily needs—batteries were only used when absolutely necessary because of high expense. I show this overview of SJB electricity use not to enumerate practices, but rather to set the grounds for showing how electricity use in SJB was very much a social or communal interaction. I have discussed earlier how people found ways to share media use, and share information garnered from various media they were able to access. However, besides media, people were sharing electricity access as well—electricity needed to get to the media content.

How Media Access Figured into Electricity Consumption Strategies

While SJB residents had these power sources available—grid electricity, solar energy, batteries—they used differing strategies for consuming them based on balancing priorities. For example, peoples' electricity use in the day was different from at night. Many households restricted their electricity use at night, when electricity was necessary for them—lights to see, and fan to be able to sleep without getting hot. There are no city infrastructural electric uses such as street lights. Therefore, the streets of SJB are dark at night. Individuals expressed they felt unsafe for themselves and their children. They carried portable lights like flashlights when walking at night. Some neighbors at their own expense strung up solitary light bulbs to provide some street light.

Many also used the television in the evening for the news and popular TV drama: Waray-Waray news 5:00 pm- 6:30 pm, Tagalog news 6:30 pm – 8:00 pm, and Ang Probinsyano 8:00 pm-9:00 pm. After the "drama" ended at 9:00 pm many people put the children to bed, and put the lights out. Many in SJB wake up before sunrise to prepare for the day. Fishermen left for the sea around 3:00 am- 4:00 am. The mothers I spoke to cooked breakfast and prepared their children for school before 6:00 am, the time of sunrise. Throughout the day on weekdays, I typically only saw women in SJB, and some fishermen done with the fishing and selling their catch. The women used no electricity for house chores. They cooked with open fire or propane stoves. They purchased fresh groceries from the market rather than use a refrigerator. They did laundry by hand, sometimes in groups with the solar radio playing. Everyone took *tabo* baths with a basin, that required no electricity.

Occasionally, people ran electricity during the day in limited quantities, such as an elderly couple who liked to watch Eat Bulaga, a popular gameshow that aired every day at noon.

On the weekend, people might run their karaoke machine in the day, but it usually came on after sunset. When looking at electricity use, it became apparent what was important enough to reserve for electricity: light, fan and communication. It also became apparent that electricity was reserved for certain times of day, and not used consistently throughout the day. The lights were needed at night, the fan was needed to sleep (and not generally used in the day), and media technologies were turned on for specific programs, and not left on.

Margins and Work-arounds of Government

Several residents voiced regularly that the barangay did not meet their needs, both in disaster management, recovery and other infrastructural or governance services. As mentioned in Chapter 3, SJB residents felt they were neglected by the local government in emergency situations. Mano Fidoy expressed that residents themselves could not get the barangay to work with their needs. He said only the help of the NGO UPAid (Urban Poor Aid) liaisons would make them listen: “But if we are direct communicate to the LGU, there’s no…we have no power to communicate. But the, in the NGO the any kind of NGO to communicate you to the City Hall, they will [listen].” A woman in her 60s, who was the previous HOA President in SJB, did not agree with relying on UPAid for what should be offered to them from their barangay government as Filipino citizens. She explained that she felt unsatisfied with UPAid because they were doing programs for “self-governance” and “self-sustaining communities.” She believed that instead of self-governance, the government should “give them more help.”

HOA Governance (A work-around)

One Saturday afternoon, I arrived at the community hall to lead a weekly English lesson for the purok children. The UPAid liaison and a few other adults were already conversing in structure. Joseph, the UPAid liaison asked if I could hold the lesson later. They had scheduled a community meeting for 3:00 pm, and he invited me to stay.

The community hall was an open-air wood structure with nipa-style roof. Built-in benches lined three waist-high walls. The fourth wall held a large chalkboard and multiple HOA organizational charts, showing the layout of houses in the purok, and the names of residential members serving on various committees, including the committees of the Community Disaster Risk Reduction group. The community hall, like the basketball court, was an integrated feature of the purok when it was being planned by the NGO that constructed the temporary housing. I often saw the building being used not just for meetings, but to house livestock during rain, or as a loom for weaving fishnet. A resident went to the cylindrical metal bell about one foot in length hanging from the rafter of the building, and banged a hammer against it for about a half minute. The sound was loud enough for the whole purok to hear. This was the *banting-banting*—the bell to call people over when a meeting was being held or when church service began.

Residents began gathering at the community hall. Some people sat in the rows of plastic chairs facing toward the chalkboard, where Joseph stood waiting. Others sat along the wall on the built-in wooden benches. As seating filled, others gathered around the outside of the structure, leaning against the low wall.

Joseph started the meeting when about 40 people had gathered. He was originally from another area of the Philippines, so he often addressed the group in Tagalog and used Waray-Waray where he could. He updated the group on a meeting he had held with officers at Leyeco,

the regional electricity company. Joseph, along with two other residents, had gone to Leyeco to ask for more electric hookups because there was only one hookup currently in SJB that 15 houses shared. Leyeco used the meeting to bring up a different issue. As explained to me later by my participants, there had been a longstanding issue about land ownership in SJB.

Joseph wrote on the board in capitals: RELOCATION. The meeting had turned from debriefing to decision-making. He explained that a decision needed to made by March 2018, only 4 months away, whether they would "mass transfer" to resettlement villages in the Northern Barangay, or try to fight for the land and stay. The meeting had been going for about 20 minutes at this point. One middle-aged fisherman, who had accompanied Joseph to the meeting with Leyeco, was angrily urging his neighbors to fight Leyeco and stay on the land. The group mostly seemed to be considering the situation, but did not join the fisherman's anger. Others, mostly men, voiced their opinion to the group. Even though it was a dire situation, some cracked jokes about the situation, and about the Leyeco authorities to which the group laughed. As the flow discussion slowed, Joseph started passing around a sign-in sheet, and asked Fidoy, who had not yet made a comment, to address the group. Fidoy had also accompanied Joseph to the meeting with Leyeco officers. Fidoy spoke after a few moments of hesitation, in a calm tone, he made it clear that he favored staying on the land because they are fishermen, and that's where their livelihoods as fishermen were. He urged his neighbors to think over the decision, and talk it over with each other. "Whatever we decide," he finished, "It should be together as one."

This meeting took place on November 4, 2017, just four days before the 4-year memorial of Typhoon Yolanda. Four years after the typhoon, SJB were faced again with the complete disruption of their neighborhood, homes and lives. This meeting shows how SJB

residents came together to navigate events in which their share impact, such as the fragility of their homes and communities in long-term recovery from disaster, and the preparation for future disasters. Their work together was organized in part by UP Aid, through their designated liaison, Joseph in which they are classified as a Home Owner's Association (HOA), partly under local government as a purok, and partly through their own coordination (neighbors, fellow fishermen, friends, family, local businesses). I explain here how SJB disaster response works with these organizing options in SJB.

UPAid organized the SJB HOA into a Community Based Disaster Risk Reduction Management Council (CBDRRMC). SJB had 11 teams filled by 33 residents on a volunteer basis. The CBDRRMC teams included 3 people on each for: monitoring, communication, transportation, rescue, relief distribution, security, supply/logistics, evacuation, health, damage/assessment, and solar scholars. I was very interested to learn more about how SJB carried out their CBDRRMC—did they meet often, and go through trainings? When I asked members, however, it was apparent that these roles were not carried out regularly. The volunteers met every 3-4 months with Joseph. Residents assumed these roles in interaction with UP Aid—trainings, meetings, etc.—but not independent of UP Aid.

What seemed more important and more used by residents were the roles people did not sign up for on a roster, but that were just fulfilled in the moment, or as the need arose. When I asked people about typhoon preparation plans, many referred me to speak with Mano Fidoy. Mano Fidoy worked as a fisherman before Typhoon Yolanda. During disaster recovery, though, he worked with Tzu Chi Foundation clearing debris for pay. Because he was able to communicate in some English, he developed friendships with some of the international NGO workers and volunteers. At the time of the interview, he worked as staff at one of the relocation

villages in the Northern Barangay, and also periodically worked as a fisherman. Although he was not the HOA President or Vice President, I could see that many people regarded him as a community leader in SJB.

In an interview, I asked him how the CBDRRMC group works. He told me about the need for a community disaster plan that arose during Typhoon Ruby—a Category 4 typhoon that hit Tacloban just one month after Typhoon Yolanda. SJB was then a tent city. Hundreds of families lived in foreign donated camping tents. So, when news came that Typhoon Ruby would landfall in Tacloban, those living in tents worried about where they would find shelter. Mano Fidoy called the city Disaster Risk Reduction Management Center, and got information about the typhoon and the evacuation recommendation, but not any other assistance in carrying out the evacuation. They were the only DRR office serving a city of more than 240,000 people, and they were busy. So, Mano Fidoy went to the Philippine Army stationed at the airport and asked them to help transport people to an evacuation center. The army sent several trucks to transport people to a school downtown, about a 20-minute ride away. Typhoon Ruby and Mano Fidoy's actions to create solutions for the entire community set the basis of SJB community disaster response. In a way, this response was shaped by the expectation of government failure or marginalization. Mano Fidoy created a disaster response network independent of the LGU, who were supposed to be the first line of help. This action was representative of how SJB was forged together as a community in their need to work together to manage disaster, when the expected government network does not serve them.

At the time of the interview, Mano Fidoy and SJB had still retained the Philippine Army as an evacuation resource. He also reached out to the business owner building a new hotel nearby, and the owner agreed that SJB residents could evacuate to the higher levels of the hotel

during a typhoon or tidal wave. They created a contract of ground rules for those evacuating. Besides expanding evacuation networks for the community, other services were volunteered within the purok. Mano Fidoy and other fishermen took shifts patrolling the shoreline overnight if there is a typhoon warning. He explained that the tide went far out during Yolanda, which was a sign of the storm surges coming later.

Figure 4.2: A school in Barangay San Jose that operates as an evacuation center during typhoons, even though it is located in a storm surge prone zone, 2017. Photo by author.

During warnings of severe typhoons, an LGU contact has visited the HOA leaders to recommend evacuation. Other residents have not gotten communication time with an LGU contact, so communication within the purok was an important part of dispersing government

recommendations. The LGU has also sent a truck with megaphone to announce evacuations. These were only one-way communications, though, and residents often expressed how they wish they could speak with someone and get their questions answered. In a way, the announcements left people with even more questions. That is why inter-communication within the purok was an important part of managing disaster.

If the HOA leaders were advised by the LGU contact to evacuate, then they called a meeting with the purok by ringing the banting-banting at the community hall. This was like the community meeting that I described earlier. Residents got together, and discussed their options. They made a plan then and there, together, of how to go about evacuating. As Mano Fidoy expressed in the meeting on possible relocation, they decided "together as one." Working together when the need arose was how they got through emergencies.

Conclusion

In this chapter, I have shown how SJB residents navigated marginalization from disaster communication and governance by finding work-arounds that often involved tapping in to family, friend and neighbor networks. Disaster puts people in situations and in contact with unfamiliar organizations and individuals (Browne, 2015). Disaster also puts people into new or revised relationships with the infrastructures they are familiar with. Post-Yolanda, SJB residents encountered infrastructures and governing authorities in new ways. Part of these relationships was continual marginalization from certain infrastructures (electricity, media, LGU) that created the contexts for marginalization from DRR infrastructures—such as the ability to access news updates in the times needed, and the ability to access expected government assistance in an emergency. I use literature on infrastructure and communities that arise in disaster to give

perspective on the significance of SJB residents' infrastructural work-arounds to achieve DRR. To illustrate, this chapter has highlighted some of the specific challenges SJB residents face in experiencing marginalization from certain infrastructures necessary to their own version of DRR actions. However, SJB residents have used work-arounds to make sure they avail of existing DRR infrastructures as much as possible, and even form their own infrastructures with local businesses, organizations and NGOs. It is evident that work-arounds are not perfect substitutions for fully availing of infrastructures as they were intended to be used. Many residents complained especially that they did not receive the level of service from their LGU that they expected. Through these stories of marginalization from infrastructure and work-arounds, I hope to provide a picture of how SJB residents received delayed updates and delayed assistance via their marginalized relationships to infrastructures—if they receive these at all—that affected their sense of security and confidence in taking action. I think it is important to understand how people are actually using media to fit their situations. This can lead to more comprehensive design in technology or communication to include more Filipinos. The marginalization I review in this chapter are not necessarily within disaster events, yet periods typically considered non-disaster or non-typhoon can also be understood as important times to prepare between typhoons. I consider the temporalities of living between typhoons in the next chapter.

CHAPTER 5
Typhoon Temporalities in Climate Change

> *Let me assure you: we know that we cannot allow ourselves to be trapped in a vicious cycle of destruction and reconstruction. We know that it is more efficient to prioritize resilience now, rather than to keep rebuilding. This is why we are going to build back better. Over and beyond this, I ask you to confront what I believe will be the rising challenge of our times: the increasing risks posed to all of us by global warming and climate change.* (President Aquino, address at Yolanda Reconstruction Assistance Plan briefing, December 18, 2013)

> *I would rather die first. I will not survive another Yolanda.* (Ate Jel, San Jose Beach Resident)

In the above quote, I reference a speech given by President Aquino just one month after Typhoon Yolanda to domestic and international partners working to rebuild affected areas. Aquino framed Yolanda and subsequent rebuilding in terms of living in a reality of climate change. He invoked certain key terms and phrases like "resilience" and "build back better" that reference back to international perspectives on governance and action plans to face uncertain futures in climate change.[33]

Many SJB residents subscribe to the government proposed resilience and "build back better" optimism of facing a reality of increased hazards, yet they also resisted that optimism based on their first-hand experiences of environmental disaster and subsequent government-born disasters of recovery. The second quote at the opening of this chapter is the response of one distraught SJB resident, Ate Jel, the day after experiencing a 6.5 magnitude earthquake and subsequent tsunami scare. It was clear to me that climate change and its connotations of

[33] See the international agreement, "Hyogo Framework for Action (2005-2015): Building the resilience of nations and communities to disasters." Retrieved from https://www.undrr.org/publication/hyogo-framework-action-2005-2015-building-resilience-nations-and-communities-disasters

intensified and unimaginable hazards hovered over people day to day, and in their sense of the future. How people responded to that constructed reality, though, differed—especially between the optimism projected by governing agencies, and the fatalism/or sense of fated future many SJB residents expressed. Often, I encountered instances where SJB residents both subscribed to the preparation strategies in DRR and felt that the future was not in their control.

In this chapter, I consider certain temporalities of disaster in DRR and SJB residents' temporal experiences of disaster as they form experiences of vulnerability. I also consider how people experience disaster vulnerability through multiple temporalities of disaster, and how the media's role in constructing those temporal experiences. I take disaster risk reduction (DRR), the mainstream/ government and NGO conceptual framework for disaster at the time of this research, and consider the sense of temporality within this conceptual framework. This includes specifically DRR-oriented ways of viewing the anticipated future of the Philippines through climate change adaptation, "resilience," and "build back better." I compare the DRR sense of disaster temporality with SJB residents' use of or refutation of these ways of facing the future. I found that while DRR frames climate change related disaster as a somewhat distant, not-yet-tangible possibility, disaster-affected people in San Jose Beach understand the next extreme weather event as a visceral, immediate reality. In this chapter, I integrate anthropological literature on disaster and climate change to analyze how SJB residents experience temporalities of typhoons in an era of uncertain future due to climate change. Last, I reflect on some times in which some sign of danger, like and LPA warning or heavy rain, set off the need to think in terms of the more immediate future, or what I call the "urgent future."

Disaster literatures also speak to the idea of disasters as existing outside the spatial and temporal bounds of the onset event (Oliver-Smith, 1999; Lakoff, 2010; Nixon, 2011). Disasters, rather, can be seen as having "life histories" that begin before and go on after the event (Oliver-Smith, 1999). I consider here how for SJB residents this is true—that they did not just once experience disaster, but that they had already been Yolanda prior to November 8, 2013, and they continue to be in Yolanda today. These concepts construct a reality in which disaster is always looming in the near future. They construct a reality in which preparation, hazards, recovery do not happen in distinct timelines, but are always happening together in various ebbs and flows. This chapter considers both these temporalities—the anticipation of future disasters and the unboundedness/ life histories of disaster events–in SJB residents' experience of disaster, as survivors.

Temporalities of Disaster

Anthropological scholarship about disaster has focused on a political ecology approach which analyzes "natural" disaster as a social construction, and considers inequalities in how disasters are experienced across populations. The social scientific study of disaster argues that "natural" disasters are a social construct (Klinenberg, 2002; Kosek, 2006; Oliver-Smith, 1999; Oliver-Smith & Hoffman, 1999; Robbins, 2012). Vulnerability to disaster likewise becomes a social construction, and demarcates lines of uneven risk to hazards (Allison, 2013; Bankoff & Hilhorst, 2009; Oliver-Smith, 1999). Social scientific studies of disaster have commonly focused on phases of disaster arranged by timeline such as the on-set event, relief and response, and recovery. I have found through my research, however, that this dissertation requires a push away from conceptualizing SJB residents' experiences in terms of distinct phases of disaster. The

Yolanda disaster was not fully experienced in the supertyphoon's landfall—it encompassed also the years of recovery, the sense that full recovery was not going to happen, the mismanaged communications trainings in years prior, etc. This dissertation, therefore, follows literature that considers the disaster as spatially and temporally unbounded (Oliver-Smith, 1999; Lakoff, 2010; Nixon, 2011) Some hazards are so far spread spatially and temporally that they are incalculable—climate change is one example (Lakoff, 2010). Other hazards have traceable histories, such as the effect of Agent Orange chemical released in the 1960s and 1970s on people and environments in Vietnam decades years later (Gammeltoft, 2014). In this perspective, it is more important to conceptualize the "life history" of disasters (Oliver-Smith, 1999).

Life Histories of Disasters

Anthony Oliver-Smith argues that consideration of temporality in disaster is essential for understanding disaster in co-constitutive relationships between society and environment:

> The society and the destructive agent are mutually constituted and embedded in natural and social systems as unfolding processes over time. Both societies and destructive agents are clearly processual phenomena, together defining disaster as a processual phenomenon rather than an event that is isolated and temporally demarcated in exact time frames…I suggest that the life history of a disaster begins prior to the appearance of a specific event-focused agent." (Oliver-Smith, 1999, p.30)

Oliver-Smith breaks us from conceptualizing disaster as bounded to certain exact time frames. He suggests that disasters have "life histories" that deserve critical attention as much as what we see as the disaster event. Oliver-Smith also asks us to understand disaster as something that develops as a process through time between societies and the environment. In this chapter, I

consider DRR as a glimpse into one aspect of those co-constitutive relationships between environment and society.

Rob Nixon also works with the concept of disaster as an unfolding process. and other injustices experienced as "slow violence." In *Slow Violence* (2011), Rob Nixon brings attention to environmentalism in relations to the less perceptible disasters that occur because their effects accumulate slowly, and are therefore not a spectacle. For him, "slow violence"—like that caused by increased vulnerability to environmental or long-term exposure to man-made hazards—is comparable to structural violence.

> …we urgently need to rethink—politically, imaginatively, and theoretically—what I call "slow violence." By slow violence I mean a violence that occurs gradually and out of sight, a violence of delayed destruction that is dispersed across time and space, an attritional violence that is typically not viewed as violence at all…We need to account for how the temporal dispersion of slow violence affects the way we perceive and respond to a variety of social afflictions—from domestic abuse to posttraumatic stress and, in particular, environmental calamities. (Nixon, 2011, p.2)

While "slow violence" occurs by invisibility of slow or long-compiling hazards and abuses, it also occurs by the invisibility of communities that are affected.

Nixon, with slow violence, disrupts what we typically think of as violence. We typically consider violence to be sudden and bounded outlier events. However, Nixon pushes us to re-conceptualize violence by reimagining the temporality of violence, seeing violence as occurring outside a neatly bounded timeframe. He phrases violence in this way as a "contest over time," and he remarks environmental violence as especially in need of this perspective: "Violence, above all environmental violence, needs to be seen—and deeply considered—as a contest not only over space, or bodies, or labor, or resources, but also over time" (Nixon, 2011, p.8). Specifically, Nixon considers how violence plays out in our perceptions of time in geological and

technological experiences: “My concept of slow violence thus seeks to respond both to recent, radical changes in our geological perception and our changing technological experiences of time” (Nixon, 2011, p.12).

Nixon notes that we do not perceive the attritional aspect of disaster. “Attritional catastrophes” overspill clear time and space boundaries, and are characterized by displacement—temporal, geographical, rhetorical, and technological. Displacements of people and time make way for “amnesia.” He gives the example of the Marshall Islands that were used as the site vigorous U.S. nuclear testing. These displacements are the unseen or overlooked areas by corporate media.

Time and violence are especially important considerations when thinking about media and political handling of violence. Nixon observes that (since 9/11) corporate media represents violence as events through images that are, “spectacular, immediately sensational, and instantly hyper-visible,” and bound to a particular/short timeframe. He also notes that because of their short office services, politicians must prioritize violence, and so respond to immediately pressing forms of violence (if the response benefits their public reception), but more long-term and complex forms violence must be deprioritized. He refers to this as a “representational bias against slow violence” (Nixon, 2011, p.13). Nixon stresses slow violence not as opposed to the sudden-onset spectacle violence we are used to viewing in media, but a part of it—the part that we often render invisible. Time gives meaning or importance to events, especially through the perceptible connection between cause and event.

Vulnerability, Resilience, and Time

Within the anthropology of disaster, the concepts of vulnerability, resilience and adaptation have been used to analyze experiences of governing, mitigating and preparing for disaster.

Vulnerability takes a central importance in Oliver-Smith's description of political ecological approaches to studying disasters. More specifically, Oliver-Smith points to a "pattern of vulnerability" produced historically as the potential focus for political ecological disaster studies:

> A disaster is made inevitable by the historically produced pattern of vulnerability, evidenced in the location, infrastructure, sociopolitical structure, production patterns, and ideology, that characterizes a society. The pattern of vulnerability will condition the behavior of individuals and organizations throughout the life history of a disaster far more profoundly than will the physical force of the destructive agent. (Oliver-Smith, 1999, p.29)

In this perspective, disasters are inevitable rather than coincidental, and they are structured into society through various social activities. Oliver-Smith adds that the question of time and historical process is fundamental in understanding vulnerability to disaster: "I suggest that the life history of a disaster begins prior to the appearance of a specific event-focused agent" (Oliver-Smith, 1999, p.30). The "event-focused agent" is only a part of the disaster's entire historical process.

The book, *Mapping Vulnerability: Disasters, Development and People*, takes an interdisciplinary approach to understanding vulnerability as differentially structured into society (Bankoff et al., 2004). Social scientist Dorothea Hilhorst and historian Greg Bankoff, in their introduction to the book, describe the various uses and understandings of vulnerability in

disaster research. They argue that vulnerability can provide a conceptual link in understanding relationships between disasters, development and people (Bankoff & Hilhorst, 2004, p.3). The book explores the evolution of critical notions of vulnerability in the 1990s (evolving from the 1980s), and how recently climate change has especially changed understandings of vulnerability. One change, they say, is that the authors in the volume move beyond treating vulnerability in terms of power relations only, and take peoples' agency into account. Bankoff and Hilhorst want to push the concept of vulnerability as non-static, and something that is not "owned" by people or communities. They favor the perspective that vulnerability is the outcome of social relations, and can be continually changing:

> Vulnerability is often regarded as property and not as an outcome of social relations. However, the measure of vulnerability should not be regarded as static. Rather, vulnerability expresses changing social and economic conditions in relation to the nature of hazard and is part of a dynamic, evolutionary and accretive process. (Bankoff & Hilhorst, 2004, p.2)

This concept of vulnerability as shifting and not static especially helps eliminate assumptions of who experiences vulnerability based on other identifying criteria, such as poverty. Since the book pays special attention to linkages between disaster, development and people, the authors mention ways of conceptualizing poverty in relation to vulnerability. For them, vulnerability is better understood as a lens by which to understand disaster.

Greg Bankoff and Dorothea Hilhorst provide a specific case study where vulnerability perception becomes useful for better understanding reactions to disaster in their article, "The Politics of Risk in the Philippines: Comparing State and NGO Perceptions of Disaster Management" (Bankoff & Hilhorst, 2009). They are looking at NGOs and state organizations in their different constructions of vulnerability to disaster after the seismic activity at Mount Mayon in Albay, Philippines which occurred between May 1999 to March 2000. Alert levels

progressed gradually from 1 to 5 over this period, and people were evacuated gradually over this period as well beginning at first with 6,546 people at level 1 alert, and ending with 68,596 people at level 5 alert. Evacuations were carried out by the state, but NGOs were also involved in the continued disaster preparation and relief process. The article focuses on a comparison between state and NGO disaster response plans make up the ideological comparison in this article. The Philippine state sees disaster as an abnormal and unforeseen event. For the state's purposes, disaster is a temporary and unfortunate interruption to development activities, and so their reaction rests on an emphasis on returning to normalcy—the existing social structure prior to disaster's interruption. Bankoff and Hilhorst intentionally use James Scott's notion "seeing" in their comparison between state and NGO "sight" (Scott, 1998). They are referring, therefore, to the idea that certain phenomenon are perceived in such a way that makes it legible to control or manipulation. In contrast to the state, NGOs "see" disaster as constructed into impoverished segments of society. They see disaster as a "symptom of mal-development" and a result of bad governance (Bankoff & Hilhorst, 2009, p.688). The authors demonstrate here that disaster is a highly political concept, and that there is a clash in the "politics of risk" between state ideologies and NGO ideologies. The authors make the point that vulnerability is not an objective perception, but rather it can be perceived quite differently, depending on who is doing the perceiving:

> People weave their own narratives to explain the relations between hazards, vulnerability and disaster. These narratives are composite social constructions drawn from scientific insight, political interest and cultural patterns. Risk is not an objective condition waiting to be perceived by individuals or calculated by analysts: rather, societies selectively focus on certain risks that reflect their beliefs, values, social institutions and moral behavior. (Bankoff & Hilhorst, 2009, p.686)

The authors make the distinction that peoples' reaction to disaster are not just a matter of their perceptions of disaster risk, but also an understanding of social order and social relations (Bankoff & Hilhorst, 2009, p.686). Within the Philippines, this is a difference that is reflective of historical and ideological competition between the state and national democratic movements (Bankoff & Hilhorst, 2009, p.689).

Vulnerability as a concept is linked to time. For Bankoff and Hillhorst, is a description of peoples' shifting relations over time to environmental hazards and each other. Oliver-Smith finds that vulnerability is "patterned" into a society over time and by location, infrastructure, sociopolitical structure, production patterns, and ideology. As Oliver-Smith says, vulnerability conditions the behavior of people and organizations more throughout history than the single physical event.

Adaptation to Climate Change

Beck argues that whether we agree or disagree that climate change exists, it is undeniably a social catalyst in the world today (Beck, 2016). For example, anticipation of future disasters has opened new avenues for state power and nation-building through disaster infrastructure projects in some countries (Choi, 2015). In this chapter, I build on how anthropologists have considered the ways that climate change figures into societal understandings and perceptions time—anticipation of uncertain futures, past disaster experiences, for example.

Oliver-Smith (2016) recognizes the use of several key terms in anthropology as well as policy language. For Oliver-Smith, anthropologists have long studied "adaptation," as adopted from biological sciences, to study how societies engage the environment for long-term survival.

For him, “vulnerability” and “resilience” are subsidiary concepts that frame the conditions for adaptation. Adaptation, vulnerability and resilience, he adds, all address the question of risk (combinations of hazards, exposure and vulnerability) (Oliver-Smith, 2016, p.58). These terms and concepts overlap, work together or work in contest to one another in our attempts to conceptualize how societies and individuals orient themselves to current hazards and uncertain futures. Adaptation is not necessarily an action, but a “complex constellation”: a “…complex constellation of interacting variables on multiple spatial and temporal scales for a wide variety of adaptive agents (individuals, families, communities, and so on), each with differing values, priorities, and goals…” (Oliver-Smith, 2016, p.59).

Development studies scholar Terry Cannon and geographer Detlef Müller-Mahn (2010) consider differences between how vulnerability and resilience are perceived. Their basis of comparison, however, is between motivations for development and motivations for economic growth. In their article, “Vulnerability, Resilience, and Development Discourses in Context of Climate Change,” the authors focus on the term, “adaptation,” which has recently shown up in development discourse as a reaction to climate change. The authors find a close connection between adaptation and the two terms most commonly applied to disaster studies—vulnerability and resilience—in terms of development thinking. However, adaptation is being applied specifically to concepts of vulnerability and resilience in the context of climate change. They argue that discourses of vulnerability and resilience within climate change are indicative of shifting conceptions of these two terms more generally:

> In other words, climate change is having an effect not only on the object of development practice (people, natural resources and other assets, livelihoods) but also on the way that the development process is conceived and translated into policy by the subjects of those processes. In particular, there is a need to

> bring clarity to the concepts used to negotiate these discussions. This is especially the case in order to understand in what ways adaptation is (or is not) related to the two concepts that are most often used in the analysis of disasters: resilience and vulnerability. (Cannon & Müller-Mahn, 2010, p.622)

The authors follow up this idea with a comparison between plans for adaptation and plans for development in reacting to climate change as a threat. The authors argue that adaptation differs from development. Adaptation, as a directive for action against climate change, does not address existing patterns of socioeconomic vulnerability. Adaptation is concerned with anticipating hazards. Development, on the other hand, is concerned with progressing toward a higher standard of living, or progress. There are underlying notions of justice, equality and human rights in development philosophies. The authors find a shift occurring from vulnerability reduction to resilience thinking that also changes objectives, which overlook addressing vulnerabilities of impoverished communities and instead focuses on anticipating hazards and addressing the event:

> While vulnerability is focused on people at the grassroots level whose exposure to risk is a product of social processes, the resilience approach is in danger of a realignment towards interventions that subsumes politics and economics into a neutral realm of ecosystem management, and which depoliticises the causal processes inherent in putting people at risk. (Cannon & Müller-Mahn, 2010, p.p.632-33)

Since the shift is prompted by natural science perspectives, they question whether the shift might weaken social science perspectives and commitments to the idea of a social construction of hazards and risk.

In Cannon and Müller-Mahn‘s research, vulnerability, along with resilience, are bundled into the concept of societal “adaptation” to climate change. We see an alignment here between adaptation or resilience with the “return to normalcy” strategies promoted by the Philippine state in Bankoff and Hilhorst’s example. There is an alignment also between a focus on

vulnerability with desires of NGOs in the Philippines to emphasize structural and social inequalities rather than reaction to environmental hazards. Cannon and Müller-Mahn find depoliticization of disaster occurring in a shift to the use of the term "adaptation" rather than vulnerability.

A final consideration to time and climate change is generation. Oliver-Smith references adaptation in its adopted use from biological ecology, as the processes of developing or enhancing characteristics (structural, physiological, behavioral) to improve chances for survival and reproduction, and passing on those characteristics to succeeding generations (Oliver-Smith, 2016). For Hastrup (2009), climate change is perceived on a "generational time scale" for certain populations who observe changes through their relation to the environment. She gives the examples of elders Greendlandic traditional communities who work within fishing and hunting timescales that anticipate not only the procurement of the hunting or fishing, but also anticipate the movements of the animals over seasons and decades. This presents a different way of anticipating the future in climate change as through generations and their ability to survive.

Confronting the Future with Disaster Risk Reduction

In this section, I explore how DRR is constructed through the government and how DRR is communicated to the public. I find that DRR uses campaign language and programs that construct a disaster-future mindset. "Resilience" and "resilient," for example, became used widely after Yolanda to not only to reinforce a sense of Filipino inner strength and survivability. The terms were also used in political campaigns to positively address Yolanda-related issues and needs: for example, "Resilient Tacloban." After the Yolanda, the phrase "build back better," began popping up as the leading philosophy in many development programs. These concepts,

originated from international conceptions of climate change and climate change response were adopted by multiple organizations in the Philippines and applied in various ways and situations. I argue that these key phrases and the accompanying projects orient the public to a reality of an uncertain future.

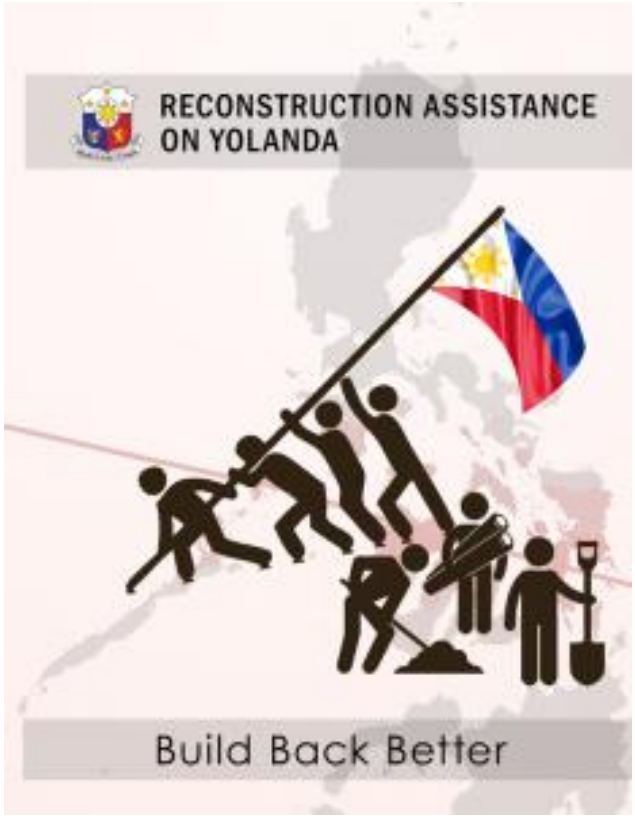

Figure 5.1: The cover of the Reconstruction Assistance on Yolanda (RAY): Build-Back-Better government strategic plan published by NEDA, December 13, 2013. Retrieved from Facebook.

I started this chapter with a quote from President Aquino's address at the briefing for development partners at the Yolanda Reconstruction Assistance Plan. This briefing was just one month after Yolanda. The Philippine government began to coordinate the help of multiple international agencies to start the rebuilding process after Yolanda. In this section of his speech, Aquino frames development as a response to or resistance to the "abuse of the environment":

> Let me assure you: we know that we cannot allow ourselves to be trapped in a vicious cycle of destruction and reconstruction. We know that it is more efficient to prioritize resilience now, rather than to keep rebuilding. This is why we are going to build back better.
>
> Over and beyond this, I ask you to confront what I believe will be the rising challenge of our times: the increasing risks posed to all of us by global warming and climate change. In the aftermath of Yolanda, what we must build is a partnership borne not only of necessity, but also of the realization that helping all those in need—all those who suffer—must be accompanied by reducing the risks that allow this need and this suffering to arise. Now, more than ever, we must work together to mitigate the abuse of the environment that has resulted, and continues to result, in tragedy, especially for the more vulnerable peoples of the world. (Aquino, 2013)

Aquino uses key terms "resilience" and "build back better" to rally partners in the direction of DRR. "Resilience" and "build back better," as used here conjure the ethos of DRR as a worldview—a way of seeing the roles, actions and behaviors of Philippine society in a reality of climate change.

In 2009, the Philippines passed the Climate Change Act, which established a legal structure to incorporate climate change considerations into governance. Some believe the act was prompted by the effects of Typhoon Ketsana, which severely affected Metro Manila in 2009, killing 700 people and in causing $1 billion in damages (Climate and Development Knowledge Network, 2012). The Climate Change Commission, under the Office of the President, was appointed to carry out strategies to achieve climate change governance. Just one year before Yolanda, 2012, the commission finalized the National Climate Change Action Plan (CCAP) (Climate Change Commission, n.d.). This plan established the key link between national and local governments to together implement localized DRR strategies. In the framework of national climate change governance, LGUs were cited as the "front lines" of climate change. Before Typhoon Yolanda, however, LGUs were still receiving training in the CCAP, and did not prioritize

the new legislation. A devastating typhoon (Ketsana) helped establish official climate change governance, and Typhoon Yolanda, four years later, sealed the need for all LGUs to adhere to the Climate Change Action Plan. Typhoon Yolanda was talked about across the media as a product of climate change because of its unprecedented scale. Spectacular weather events attached climate change paired with recent lawmaking on climate change made climate change a reality for the Philippines. Disaster risk reduction, resilience, and "build back better" became the main responses to climate change touted to the public.

The first major response to Yolanda with resilience was the city plan to develop lands 10-20 km north of downtown Tacloban into a new "resilient and sustainable" barangay to resettle 90,000 affected people (KRILL, n.d.). In May 2014, the Tacloban Recovery and Sustainable Development Group proposed the Tacloban Recovery and Rehabilitation Plan (TRRP) to the national government (Tacloban Recovery and Sustainable Development Group, 2014). The plan was developed in partnership with international organizations including architecture firms, the United Nations, and multiple NGOs. The plan incorporated resilience in a localized understanding or meaning of the term, which they defined as the following: "We will have the capacity to 'bounce back' from disaster impacts; We will be able to manage the unavoidable (e.g., typhoons); We will be able to accommodate and adapt to new development demands." In the public presentation, they repeated the use of "We will…", which gave the effect of building resiliency into Tacloban identity, and not just a plan.

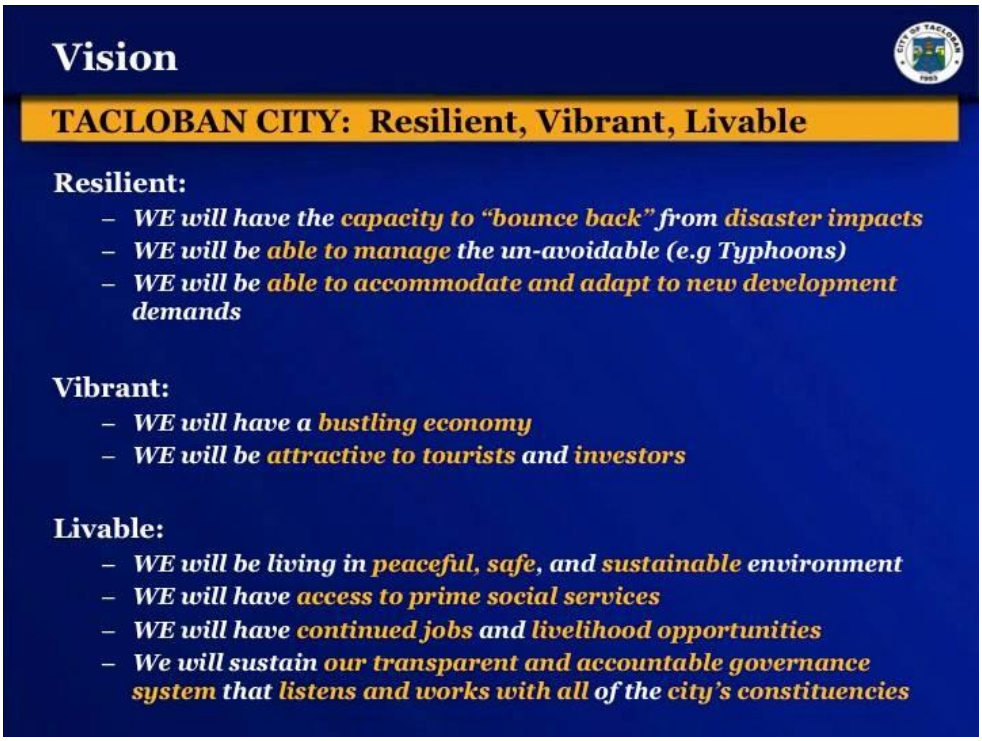

Figure 5.2: Tacloban Recovery and Rehabilitation Plan (TRRP) proposed to the national government the Tacloban Recovery and Sustainable Development Group, May 2014. Retrieved from Facebook.

Figure 5.3: An advertisement for Tacloban's annual Sangyaw festival themed as a resiliency festival, 2015. Retrieved from Facebook.

Resiliency was not just language used exclusive in internal government operations. Resilience popped up in government communications and projects directly involving the public. Resilience was also used outside of developments and disaster risk reduction contexts. Resilience was attached over time not just to government projects of anticipation for the uncertain futures, but also attached to disaster-affected people. For example, the annual Sangyaw Festival and parade is a city-sponsored celebration of Waray regions and cultures, and the city's patron saint that includes activities throughout the month of June that attract Waray people and other visitors every year. The 2015 festival, the second Sangyaw after Yolanda, was attached to resilience by being advertised as a "Resiliency festival." The effect was that resilience became attached more and more to Taclobanon identity. The meanings associated with resilience depart here from those in the Tacloban RR Plan. The sense of resilience here is more a rallying cry to affected people to participate along with the city in a sense of overcoming Yolanda. Resilience through communal celebration.

By asking people to participate in their own resilience—to be resilient—government also took focus away from failures. Mayor Christina Romualdez continued to localize the use of resilience. Tacloban City underwent elections in May 2016. At this time, Yolanda recovery and rebuilding was still a major issue. Thousands of residents still awaited construction to complete on resettlement villages so that they could move up the waiting list, or possibly receive an offer. Yolanda was the main and nearly only topic concerned in politics. Rebuilding (seawalls, infrastructures, places of business) and construction of resettlement villages were main focus of the local government in partnership with NGOs at this time. A second focus Mayoral candidate, Christina Gonzalez Romualdez used the concepts and specific term "resilience" in her campaign to brand a politics as Yolanda-focused yet also focused on preventing another Yolanda. She cast

the slogan, “Clean, Green, Resilient Tacloban,” which was designed to match her initials (CGR). The slogan carried over into her time as elected mayor, and could be seen on billboards, and city tents.

With Romualdez’s direction, resilience and sustainability became a major vision of how Tacloban would both recover from Yolanda and prepare its infrastructures and residents for next environmental hazards. Mayor Romualdez conducted city projects such as tree restoration, weather communication alongside city government, local government (barangay) and city residents under the repeated messages of resilience. The term resilience was picked up across other city departments, barangay government, and media. Resilience became a simple, clear and unified governmental response to Yolanda, and to a future that might present more Yolandas. Here, resilience took on the meanings of strength and recovery in both a communal and individual community member (Taclobanon) sense. However, it also communicated the grounds of state-citizen relationship within the context of climate change and intensified environmental hazards. Engagement with the concept of disaster resilience became a conceptual frame to the city and the nation facing environmental hazards in climate change. The Community Climate Guide and Response (CCGR) innovation (discussed in Chapter 3) was a part of this main goal to build back a resilient Tacloban. CCGR provided Tacloban City residents localized updates through free text messages directly from the city government and CDRRMO (City Disaster Risk Reduction Management Office).

Many cities in Philippines embraced DRR strategies to confront anticipated disasters in the future, particularly associated with climate change. The government of Tacloban City repeated key DRR concepts like “build back better” and “resilience” as the city and its people went through the recovery processes in the years after Yolanda. Government use of these terms

reflected an optimistic future that is attached to current developmental works, and behavioral change in citizens—embracing climate change and anticipation of uncertain future as reality.

San Jose Beach Experiences of DRR

In the government, constructions of DRR were future-oriented. Anticipating the population's experience of uncertain futures. In SJB, these conceptions were both accepted and internalized, yet also resisted. I argue that SJB residents resisted positive outlooks responses to uncertain futures, such as "build back better," because they had also experienced how these plans already fell short.

Figure 5.4: "Typhoon Preparedness Guide" mural painted on a wall by a busy street in Tacloban, 2017. Photo by author. The mural depicts five stages in preparing for a typhoon: listen for weather updates, prepare supplies needed for evacuation, listen to local government evacuation warnings, secure house, and evacuate the whole family to an evacuation center.

When I arrived in Tacloban in September 2016, issues around the resettlement villages in the Northern Barangay were in the news every day. After Yolanda destroyed thousands of homes along the coasts of Tacloban, and left these families displaced, the local government planned to relocate those who lost their homes to the Northern Barangay. This term, the "Northern Barangay," was not previously in use.

Most residents of SJB were on the waiting list to move to a resettlement village in the Northern Barangay, however they some were not sure they wanted to move if offered a house. The community meeting about Leyeco negotiations and possible relocation (Chapter 4) added an extra later of uncertainty to SJB residents' futures. The next day after meeting, I found Karmen and asked her for her reactions. She told me that she did not want to relocate. She said that Leyeco is planning relocation spots for SJB residents, and they can pick between three options. She said she would choose one, Pope Francis Village, over the others because the others were poorly constructed. She said: "When you knock on the wall, it sounds hollow." This reminded me of another story I had learned from an engineering researcher studying the resettlement village constructions. Once, after a bout of heavy rains, intense pressure from collecting mudflows and water broke open the bottom portion of some houses' walls in one resettlement village. The occupants found that the walls had been constructed of hollow concrete blocks filled with garbage. Karmen told me that she would be afraid if an earthquake happened while she lived there. At least, she added, if there were an earthquake while she was in SJB, she knew her plywood home would not harm her if it fell with her inside.

Karmen could not face an uncertain future with a "build back better" plan that could not deliver the reduced risk promised. She would rather stay in SJB and plan to evacuate days ahead of a typhoon in case of storm surge than risk being crushed by concrete walls. For her, the

government's plan for risk reduction—the resettlement villages—carried more risk than her current situation.

Resilience and *bahala*

In reinforcing the idea of resilience people were also being asked to participate in and subscribe to the idea that they could overcome unknown disasters in the future. Sometimes people did express this optimism and sense of being resilient, being able to manage their own survival. For example, SJB resident expressed to me "Prepared na kami" (We are prepared already) and another time an SJB resident told me they are "doble prepared" (doubly prepared). Other times, it was difficult to imagine a future in which they were asked to survive again.

I mentioned in chapter 3 that the 6.7 magnitude earthquake on Leyte island in July 2017 sent SJB residents into a hollow of uncertainty, and anxiety of the unknown danger that might be urgently upon them. When I talked to Ate Jel the following day about her experiences of the earthquake and afterward, she was still very distraught. In contrast to the urgent unknowing of just after the disaster, however, Ate Jel talked to me also about the unknowing of the future hanging before her—not too distant, yet not yet urgent. The future in which a deadly event will likely happen, but there is no sign yet of what or when that will be.

Ate Jel told me half-jokingly: "Perhaps we will not meet again." It struck me as a very serious comment, though—a very real worry of hers. She said: "I would rather die first. I will not survive another Yolanda." Her use of survive meant to me to mean physically, mentally, and emotionally. And her use of Yolanda meant to me the hazards as well as the lengthy and exhausting aftermath of a completely altered life. She framed her statements—as she had done in conversations before—within her beliefs in the Catholic faith. She said that if it is "my time"—

in the sense that God has fated her time in life—she accepts that it is her time to die. However, she was overcome with distress at the thought of being asked to survive again. “Bahala na,” she finished.

Bahala is a phrase use across many languages in the Philippines to express that something is out of their control. Paired with a pronoun, bahala can signify the control is with someone else. “Bahala ka,” for example, means “It’s up to you.” Bahala used alone without a pronoun however, signifies that something is out of the speaker’s control, and it is up to fate, or up to God. Ate Jel was expressing that her she was accepting the future as determined by fate or God.

The government often went to a common response of “resilience” when faced with the possibility of another supertyphoon. Yolanda survivors often went to “bahala” when faced with the possibility of another supertyphoon. I heard bahala used often, often as a closing thought. It communicated to me a sense of acceptance of the future and what it holds for their personal experience. While the response of resilience seemed to be a resistance of what might be scripted into the future, or an optimism that society can overcome the dangers of supertyphoons. SJB residents often expressed both reactions to the idea of future disaster. They subscribed to DRR and resilience— “Prepared na kami”; “Doble prepared” (“We are prepared already”; “Doubly prepared”)—and they also framed the future in terms of being left to God/fate— “Bahala.”

The use of both resilience and bahala as common responses to climate change and an uncertain future of hazards can be seen as tension, and as co-existing perspectives. Sometimes government, NGOs and media expressed frustration with the public when they expected behavioral changes in line with DRR. In these instances, there was tension between the

potentiality of science, and fated-ness of religious or non-science worldviews. Accepting one's fate slowed the momentum of trying to meet the future with preparedness and resilience. Reaction to the "urgent future" of the earthquake in the hours after, and the next day a reaction to the more distant anticipated future of other unknown hazards that will come with climate change. I relate these two sense of futures related to environmental hazard and climate change to the experience of typhoons in the next section.

SJB residents witnessed through their friends and family who had relocated the egregious and long-standing failures of the Northern Barangay. They, too, had their experiences of recovery failure in SJB. They lived still in the plywood houses meant to be temporary shelters and had been on the relocation waiting list for over three years with no updates, and the barangay rarely if ever carried out the DRR communications in they were supposed to. Many expressed they felt they had been forgotten by recovery organizations, governmental and non-governmental, and the media. Attention was on the Northern Barangay and other places, but not there. If "build back better" was failing now, how would it withhold unknown disasters in the future?

Typhoon Temporalities and the "Urgent Future"

These examples have shown the shape of a sense of anticipation toward an uncertain future. The international conceptions of climate change and resilience that came with that construction. This has also shown the role of DRR as executing these perspectives through future-oriented risk reduction projects. Next, I discuss other temporalities experienced by SJB residents specific to experiencing typhoons.

I once asked Karmen if she could tell me a story of a time when she was afraid there might be a typhoon coming. What did she do? She told me the story of a recent typhoon scare. Karmen woke up to her father shaking her urgently. It was 5:30 am, and he, a fisherman who works early, had been listening to the morning news on the local radio station. The broadcaster warned that the LPA that PAGASA had been tracking for the past two days was just designated a Signal 1 typhoon. He asked his daughter: "Do you think we need to evacuate?"

She told her father that she will first check the television, Channel 2 ABS-CBN or Channel 10 GMA, for the national news. Then, they will together decide how imminent the danger is—whether evacuation is needed. If the family decides to evacuate, they will all leave together.

Karmen's husband and young daughter were still sleeping there on the floor mat. Her sister at the darkened house next door was also sleeping with her husband and child. Her mother waited in the house across the pathway for news from her husband's visit to Karmen. Only nine meters away, the sea was black and soundless. Karmen and her father both remember, though, how that now peaceful water could swell over the whole neighborhood.

Unlike the distant, uncertain future of climate change that DRR speaks to, this story tells of the ways in which and uncertainty hangs in the immediate, urgent future. DRR and disaster preparation activities speak to an extended sense of future uncertainty. The Signal 1 alert, on the other hand, raises uncertainty into the more immediate future—the next hours, even next few days; And, depending on the extent of destruction of the coming typhoon, uncertainty in recovery the next weeks or more. However, the sense of urgent future is set off by the possibility of coming danger which warrants urgent response.

Karmen and her family project into this urgent future to decide whether to evacuate, how many days of food and clothing to pack, where to evacuate for an extended stay, or for an

overnight only. The urgent future seems distinct to the anticipated future. Yet, the urgent uncertain future is tied to the distant, uncertain anticipated future. The projected and prepared for event that has become real. This sense of urgent future also had a communal base. For her, that temporal experience was tied to shared experience.

In another example, the anticipated future was tied to memories of experiences in Yolanda. I visited Mano Fidoy for an interview one Saturday morning, his day off from his busy work schedule. As I prepared to travel to SJB, the sky was bright grey, and forbode of possible rain. It had been raining on and off since evening. These things factored into the way I dressed, and how I packed before I left the house. I wore flip-flops so that they wouldn't be ruined in the rain, and I could take them off easily when entering a home so as not to muddy the place. I packed my gear into the shoulder bag that fits wholly underneath the cover of my umbrella, first wrapping my paper notebook in a plastic bag. I wore my black pants made of quick-dry sports material so that I could both appropriately cover my legs and reduced the amount of rain absorption. This was the way of being rain prepared in the city that I had learned in the few months since my first monsoon rains and storms in Tacloban.

We sat on his porch to talk. I had prepared an interview about SJB community typhoon preparedness plans, but we eventually got onto the subject of Yolanda. He referenced Yolanda in his reasoning for patrolling the shoreline during a typhoon.

"What is it…storm surge?" he asked me. He showed unfamiliarity in handling the word, even three years after its introduction to the public in Typhoon Yolanda. "We did not know what storm surge meant. If only we had known that we would be swimming. We would go to evacuate days before."

The sky had turned a deep grey over the course of our conversation. Suddenly, the rain poured hard, like buckets tipped directly above. Mano Fidoy smiled and made a comment, but I could not hear it above the noise of water pounding on the house's corrugated metal roof. Inside the house, Mano Fidoy's 6-year-old daughter began to cry. He excused himself from the porch for a minute to comfort the little girl. He set up a laptop on top of a chair just inside the doorway, and put on some cartoons, turning the volume high. He positioned his daughter there in the doorway, where she could have easy view of both the cartoons, and her father. "My children get frightened when it rains," he explained to me. "Whenever it rains, they ask me' 'Papa, is it another Yolanda? They have trauma."

I carried on the conversation practically shouting over the roar of raindrops. The rain stopped everything in the purok. People ran to the nearest covering from the rain—a tree, a patio awning, a restaurant. The dirt road splattered into mud and grew widening puddles. I asked if it was a storm. He said, no it was just bad weather. Within just 10 minutes, the rain had lightened to a sprinkle, and we could hear each other once again.

This vignette shows how Mano Fidoy, his children and I all experienced rain differently. Yolanda was not just November 8, 2013, Yolanda comes back in every hard rain, every LPA warning. "Yolanda" has taken on a meaning of its own. In some ways it means a deadly typhoon. In other ways it means a previously unimagined horror. In other ways it references back to experiences I have not known. Yolanda is present for survivors outside of November 8, 2013.

Last, Yolanda carries on differently through the generations. For Mano Fidoy, who monitored typhoon updates and decades of experience with non-storm rains, the sudden downpour was not a surprise. For his children, however, who's earliest memories of hard rain are associated with Yolanda, the rain warranted a different reaction. This opens up questions of

the concern over uncertain futures as a generational experience as well. This vignette touches upon some of the themes of temporality and disaster I consider in this chapter. What are the temporal experiences of disaster—in continual recovery projects, DRR campaigns to secure the future, and across generations that have differently experienced Yolanda? Additionally, what are the temporal experiences of typhoons that several times per year develop with the potential to grow into another Yolanda?

Conclusion

In this chapter, I have considered different temporal constructions of disaster. I first recognize specifically temporalities attached to climate change as conceptual frame. In the Philippines, resilience is a conceptualization of the future in which the islands and people can proactively reduce their risk to anticipated intensified hazards due to climate change. This is a proactive and optimistic response to climate change is carried out among the Philippine public through DRR laws, policies and development projects. SJB residents both subscribe to DRR outlooks of control over one's own destiny (resilience), and also refer to belies of fated-ness and lack of control over the future (bahala). The future hovers over SJB residents in different senses of immediacy. I have used "urgent future" to refer to an uncertainty of future hazards in a time where an event (monitored LPA; felt earthquake) has happened—the threat of immediate danger. I have compared this to the uncertain futures felt in anticipation of the hazard's attendant with climate change. However, the two are connected. One represents more of a belief of future hazards in the making, and the other is the actualization of that hazard.

I first provided examples of how DRR projects among the government and non-profit agencies construct the anticipated future of Filipino residents affected by extreme weather due

to climate change. DRR projects of resiliency construct the anticipated future as affected by climate change with proactive preparations and optimism that cities can better fortify and strategize against increasingly extreme weather. The Tacloban City Mayor, for example, won her office directly after the typhoon on a campaign that centered on resiliency and "build back better." She spent her time in office on projects, like the Community Climate Guide and Response, that contributed to Tacloban City residents' ability to survive the next disaster. I then provided examples of SJB residents' experiences senses of future in preparing for disaster. For example, Ate expressed fatalism rather than optimism that she will not survive the next disaster. Her perspective stemmed from her direct experience with an extreme weather event, Super-typhoon Yolanda. San Jose Beach residents in this way encounter the DRR sense of anticipated future due to climate change in the unmarked future, and also a more urgent sense of extreme weather they expect will affect them again in their lifetimes.

I focus much on sense of future in climate change. But I also adhere to the point made in disaster literature that disasters have "life histories," (Oliver-Smith, 1999) and are not bound to the onset event. In this sense, Yolanda, as a disaster, was in the making (or rather already began to exist) long before November 8, 2013, with ill-executed DRR training in LGUs, failed communication strategies to the public, etc. Yolanda, as a disaster, continues to exist in the scars that survivors have from government failures to help them recover, and in the fear and lessons remembered every time an LPA is detected or bad weather arrives. This shows how SJB residents are not exactly done with disaster, but are always in some iteration of disaster.

CONCLUSION

"To confront slow violence requires, then, that we plot and give figurative shape to formless threats whose fatal repercussions are dispersed across space and time." (Nixon, 2011)

This project has asked: How do people experience the disaster communication infrastructure differently/unequally? How does infrastructural inequality affect the ability of families and neighborhoods to respond to and survive a typhoon? Because the Philippines is the most active site for tropical cyclones, these questions (are relevant) to the experiences of millions of people. In this dissertation, I have shown how residents of the Philippines experience disaster communications unequally. Vulnerability and inequalities are not only experienced in disaster, but are also created in the space of disaster and media infrastructure. In many respects, disaster media has created the conditions for death, injury and property loss.

The chapters of this dissertation have considered from different angles how vulnerability and inequalities created in the space of disaster and media infrastructure. One main argument is that disaster media infrastructure not designed around needs of several populations. Colonial and postcolonial foundations that show how typhoon alerting designed for business people, navy, urban Manila, but leaves out consideration of several populations in design (rural, women, education level, language competency). The creation of vulnerabilities within disaster and media, therefore, has roots in the Philippines' colonial history. This project has considered media technologies and disaster communication as specifically colonial inventions, and considers what continues in the colonial afterlife of the structure of disaster communication and media technologies.

Based on ethnographic research with residents of SJB, I have shown how low-income residents of the Philippines experience marginalization in the disaster communication infrastructure, and that the disaster media infrastructure is built on certain assumptions that do not account for these experiences of low-income coastal populations like in SJB. People experience limited access to media technologies. This influenced what sources of information they obtain—typically, free broadcasts through radio and television, and to a much lesser extent, through internet. People also experienced limited or unreliable access to electricity. This factored into peoples' decisions of when to expend electricity on the TV or radio. People also experienced a communication gap when scientific terms were used but not explained in alerts. Finally, people experienced minimal communications and assistance from their local government during disaster. State disaster communication strategies assume: 1) That all publics will interpret information (especially scientific information) in ways that scientists and meteorologists intend, 2) that people will have equal access to communications, and 3) that the government functions as planned during a disaster. These assumptions are a reason that disaster communication actually often produces uncertainty during disaster.

SJB residents, however, worked around their marginalizations from disaster communication infrastructure. SJB residents built communication networks of social relations (with friends, family and neighbors) to share information they had gathered from their various preferred sources. People also processed this information together with social relations. I find that these were crucial parts of disaster communication—the multi-directional conversations about weather alerts that happen after uni-directional media broadcasts. SJB residents also made decisions based on gathered information together in a neighborhood meeting.

Households would evacuate together using transportation and sturdy buildings that they together had designated for themselves to evacuate.

I also considered how people experience disaster vulnerability through multiple temporalities of disaster, and how the media's role in constructing those temporal experiences. People, like the residents of San Jose Beach, who currently experience vulnerabilities to storm surge during typhoons experience. I compare DRR sense of disaster temporality with temporalities expressed and experienced by the disaster-affected people I worked with. I found that while DRR frames climate change related disaster as a somewhat distant, not-yet-tangible possibility, disaster-affected people in San Jose Beach understand the next extreme weather event as a visceral, immediate reality.

As each year has passed since Typhoon Yolanda, the awe and horror of the disaster as an internationally and even nationally remembered moment (and media event) has faded. However, the individual trauma to the survivors, the lessons learned within Tacloban, and continuing efforts toward both recovery and preparation remain. One of the challenges in conceptualizing disaster as it applies to all people affected, is the long-lasting timeline and cycles of recovery and preparation. In many ways, this dissertation has been about reactions to a quick-onset events, like typhoons, that result in disaster. Overall, however, this project is really in response to the "slow violence" experienced by certain populations who are unequally factored into typhoon risk reduction strategies and other essential infrastructures needed to carry out typhoon response. In the six years since Typhoon Yolanda (and since I began this study), there have been a multitude of crisis events across the Philippines: landslides, catastrophic floods, earthquakes, drought and famine due to El Nino/La Nina weather patterns, warfare in Mindanao, and President Duterte's "War on Drugs." Government, NGOs, and citizens

are all working to improve their abilities to reduce risks across the Philippines. However, this work tends to benefit some populations in the Philippines over others. PAGASA, for example, has in the past few years totally revised their website and came out with a new app. These innovations allowed for more user friendly direct to public rather than press releases to local media for them to interpret to their audiences. However, users must be able to access the internet, and be able to decode scientific measurements, maps and terminologies to fully use them as intended.

This dissertation has considered how vulnerability and inequalities are not only experienced in disaster, but are also created in the space of disaster and media infrastructure. After the completion of this project, I wonder if the disaster communication infrastructures constructed and maintained by governments, non-profit agencies, and media can ever really serve the general populations of the Philippines, as promised. I believe that if disaster communication is designed around the specific needs of affected people, like San Jose Beach residents, then it can better serve them.

Recommendations

1. Design disaster communication around certain vulnerable populations
    a. Consider unreliable electricity access
    b. Build upon multi-directional communication networks od social relations
2. Prioritize media technology assistance programs
    a. Provide media technology donations and charging stations
    b. Provide maintenance workshops

Based on this research, I offer some recommendations on how the disaster communication infrastructure in the Philippines can become more inclusive for all populations of the Philippines and their differing needs. I first recommend that PAGASA, national and local government, and non-governmental disaster relief agencies pose this question: What would disaster media infrastructure look like designed around low-income coastal dwellers? There could be an answer that factors in peoples' need to conserve electricity, or that builds upon the multi-directional communication networks of social relations.

I also recommend that disaster relief and recovery project prioritize assistance programs for communication and media access. Communication is equally as important as food, water, shelter and medicine. However, agencies often face difficulty funding media and communication programs. As I mentioned in this dissertation, SJB residents lost all their media technologies in Typhoon Yolanda, and they had to purchase their radio, TV or cellphone over time. Even 3 years after Yolanda, only a few households had TVs. Programs that provide radio, TV, cellphone and Internet donations, charging stations, and maintenance workshops would greatly enhance peoples' abilities to keep themselves updated on life-saving alerts.

As I make these recommendations, I find it useful to reflect on Scott's recommendation to undo homogenization created by "seeing like a state." Scott makes the case that rather than rely on homogenized/flattened policies produced by state governments, he finds there is an, "indispensable role of practical knowledge, informal processes, and improvisation in the face unpredictability" (Scott, 1998, p.6). These recommendations for integrating practical knowledge with scientific knowledge, relying on informal processes and improvisation form a useful direction that SJB residents would benefit from, based on what I found in my research.

I want to make the connections clear of how this research can support disaster mitigation and communication strategies elsewhere. Yet, I do not want to say that these recommendations apply to every community on the coast, or every impoverished and disaster-prone community, or every Philippine community.

I started this project in the middle of the first term of my graduate program, as warnings of a massive typhoon on unprecedented scale was due to cross the Philippines—the country I had lived in the past year, and I had only left three months earlier.

As I finish writing this dissertation, is it April 2020, and the world is experiencing the COVID-19 (Corona Virus) pandemic. For me, and perhaps most people, it feels like and unprecedented experience, and the uncertainty of my future in the COVID pandemic in the next several months hovers over my plans and decisions. I reflected on my own anticipation of an uncertain future as I finished writing Chapter 5, dealing with the same topic.

There were many observations and analyses I made in this dissertation, that I could not help but reflect on with my own experience with COVID. Scientific terminologies were integrated into the way we talk about our lives in COVID. “Peak,” “social distancing,” “herd immunity,” and “flatten the curve” became terms associated with epidemiology that entered the media and the way we talked about the situation at hand. I tuned in to Governor Newsom’s public addresses every week, which he always sealed with the message that, “We’re in this together.” I found myself subscribing to this perspective, and repeating to friends, family, grocery store workers. Yet, I also found myself frustrated when I heard it as a blanket response from the Governor, Los Angeles mayor, and other politicians. Because we are in it together, but we are experiencing it unequally. Just recently, protests have broken out, demanding that businesses be allowed to re-open. In the City of Los Angeles, the Angeleno Card program

website crashed because 50,000 people logged on to fill out assistance applications in its first 10 minutes of opening. The program was created to assist residents of Los Angeles who already receive income below the poverty line, and have now lost 50% of their income due to COVID. We are all in this together, yet people across national lines, state lines, poverty lines, racial lines, gender lines and age lines are facing very different disasters.

I find myself wondering how residents in SJB are faring. COVID for them comes within the context of continuing recovery after Yolanda of finances, belongings, and livelihoods. COVID also comes for them in a time of uncertainty over their own residences. When I finished research in early 2018, the purok was still facing possible eviction if Leyeco won the land dispute, and resettlement to the Northern Barangay. In my visits to Tacloban later that year, and through 2019, however, SJB and residents were still there. In this way, then, Yolanda continues on in COVID, and COVID is connected to roots in Yolanda. I have already heard stories that sound like a repeat of SJB residents' biggest fears—that in a time of disaster, the government will again fail them. No monetary assistance has arrived for most people in the Philippines, even though all business and work has been locked down since March. I hope that this dissertation project does inform studies on how many people in the Philippines experienced COVID. And, that it is not categorized only as part of Yolanda research, or part of typhoon research.

It harkens back to the reality that disasters evolve over life histories. In future disaster research, is it possible to incorporate disasters into the life histories of other disasters? Not just case study on COVID, and not separately a case study on Yolanda—but taken together? Following the concept of disasters without spatial and temporal bounds, I question further how we can consider disasters without bounds drawn between other disasters. What happens if we study disasters not neatly, not constricted to the disaster's name.

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