INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH & DEVELOPMENT

ISSN 2278 – 0211 (Online)

How "Filipino Resiliency" Is Being Used as a Means to Elude Climate Justice and Government Accountability in the Philippines

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Abstract:
Aside from being included in the 'Pacific Ring of Fire' which is an area in the basin of the Pacific Ocean where many earthquakes and volcanic eruptions occur, the Philippines is also located within the typhoon belt. As a result, Filipinos are used to any type of natural disaster and 'resiliency efforts' from such occurrences. According to Wilson, 'the notion of 'resilience' is rapidly gaining ground as both a targeted process of societal development... and may be beginning to replace 'sustainability' as the buzzword of political and policy-making rhetoric.' In the Philippines, 'resiliency' has been a familiar term that is often been used every time something bad happens. This paper examines how the term has evolved into something that accustomed and desensitized Filipinos to the calamities and disasters that have occurred in the country. Despite knowing that the country is in a 'natural disaster-prone' location, the same narrative of 'resiliency' is consistently played out year after year. The research uses theoretical coding in finding out if Filipinos are indeed 'resilient' or are just used to how things are. Results suggest that climate change and typhoons in the Philippines are interrelated in such a way that powerful storms are no longer just 'outliers' or extreme events that happen once in a while. There is a need for the government to build truly resilient communities.

Keywords: *Disaster resiliency, disaster preparedness in the Philippines, risk reduction and management, climate change and typhoons, impact of climate change in the Philippines*

1. Introduction

The Philippines is considered as one of the world's most vulnerable countries to natural calamities [1]. It's one of the world's most typhoon-impacted places with an average of twenty typhoons each year. There also exists strong scientific consensus that anthropogenic greenhouse gas emissions are causing climate change, which results to stronger typhoons [2]. This is due to 'higher sea surface temperatures and higher subsurface sea temperatures, which remove the natural buffer on typhoon strength occasioned when cold water up wells from below the ocean's surface.' [2] These stronger typhoons carry more moisture, move faster and will be made worse by the rising sea level due to climate change. The Philippines has a large and rapidly growing population and it has made the country vulnerable to stronger typhoons. This vulnerability is even more aggravated by localized environmental degradation.

As a result, the Philippines is trying to stay at the forefront of disaster resiliency efforts, but its endeavors have not reflected well in after-typhoon scenarios. Loss and damage from floods and landslides are still prevalent in the Philippines and it is even getting worse as the intensity of typhoons increases. One might think because it happens frequently in the country, there would be some form of strengthened and systematic response before, during, and after any typhoon occurrence. However, as much as there are improved warning systems in place, loss of human lives, economic disruption, and property damage still occur every time disaster strikes. All of which are causing psychological distress to affected people [3, 38].

For many Filipinos, 'resiliency' has been a familiar term that is often been used every time something bad happens. From an ash-drowned town rising from the Taal Volcano Eruption to stricken families escaping the wrath of Super Typhoon Goni (local name: Rolly), headlines and stories will always be filled with the word 'resilient.' The word has emerged as a concept originally well-intentioned to bring hope to the citizens but then evolved into something that accustomed and desensitized Filipinos to the calamities and disasters that have occurred in the country [4]. This brings us to question, 'why do Filipinos have to be resilient in the first place?'

It is already well-known and widely-accepted that the Philippines is a country most prone to natural hazards and the existential risks of climate change. However, despite knowing these predictable threats to the safety of the country, the same narrative of 'resilience' is consistently played out year after year. Instead of any concrete and consistent solutions from the government, donations from other countries or private groups and individuals are the usual scenes that pop up in social media platforms. Are Filipinos really resilient or are they just used to how things are?

2. Purpose of the Study

Resiliency should not only be measured as the set of actions done after the typhoon. It should not only be exemplified by 'how well you recover from a disaster.' Resiliency should be a design that takes 'years of constructive preparedness, engineering and proactive action to be able to fully adapt and mitigate the hazards and disasters brought about by typhoons, earthquakes, among others.' [4]

In recent years, the Philippine government has been taking small but critical steps towards that much-needed 'design.' They even launched Project NOAH (Nationwide Operational Assessment of Hazards). It is a program in the country that aims to provide data for disaster prevention and mitigation. It is the Philippines' primary disaster risk reduction and management program initiated in 2012 and administered by the Department of Science and Technology (DOST). However, Project NOAH has been shut down by the Duterte Administration in March 2017 due to 'lack of funds' [5]. Project NOAH Executive Director Dr. Mahar Lagmay even told Dimacali that 'he lamented the loss of valuable personnel and skilled scientists due to a lack of adequate and timely compensation.' According to Lagmay, despite the expertise of the scientists included in the team of Project NOAH, a number of personnel went without pay for months. [5].

There are agencies such as the National Disaster Risk Reduction and Management Council (NDRRMC) which is tasked 'to prepare for, and respond to, natural calamities, like typhoons and earthquakes. It also monitors human-induced emergencies, such as armed conflicts and maritime accidents.' [6]. However, despite its existence, the country had more than 6,000 deaths and $2.98 billion lost from the onslaught of Super Typhoon Yolanda in 2013 alone. Even today, seven years later, Samar and Leyte are still 'one of the most underserved provinces in the Philippines that are still lacking basic needs such as clean accessible water and reliable energy — still struggling from the aftermath and trauma that should never be forgotten.' [4,38] this reality puts a question if the Philippines has really 'recovered' from all the socio-economic and psychological impacts of disasters.

If comparison is to be made, Japan was not prepared for the destructive tidal wave brought on by a 9.1-magnitude earthquake in 2011. The Great East Japan Earthquake of March 11, 2011, was a complicated disaster that consisted of a large-scale earthquake, tsunami, and nuclear accident. It has resulted in 'more than 15, 000 fatalities, injuries, and missing persons and damage over a 500-km area. The entire Japanese public was profoundly affected... The risk of radiation exposure initially delayed the medical response, prolonging the recovery efforts.'[7] And yet, Mejia states:

When you observe it today, the Japanese city of Ishinomaki in the Miyagi prefecture that the earthquake had devastated is now completely thriving. People have returned home, communities have been rebuilt and Tohoku is as great as it was before, but now more prepared and better.
(2020)

After the Great East Japan Earthquake and the subsequent Fukushima Daiichi Nuclear Power Station accident in 2011, 'there was a strong demand to promote disaster preparedness approaches and health checkups for the prevention of lifestyle diseases' [8]. Due to its proclivity to disasters, the government of Japan has prioritized disaster preparedness as a national agenda. Preparedness education has also been undertaken 'in both formal schooling and lifelong learning settings.' [9]

This should be the definition of true resiliency. Filipino resiliency is shallow and abused. It should not be used as a word that's commonly thrown after harrowing incidents to excuse accountability and liability from people supposedly tasked with preventing such disasters from happening in the first place. As Mejia discusses:

Where are the thousands of displaced Filipinos as a result of the ash fall from the recent Taal eruption? Has anyone asked how they are doing, or does our media only care about the banalities of these stories of resilience? There is imminent danger and a deadlier cost in believing our misconstrued understanding and delusional tale of what it means to be resilient in our country. A term we have yet to redefine and relearn in this urgent and crucial time. We have never truly learned from all the destruction and deaths that have regularly visited our coastal communities and farming towns... We are a battered and traumatized state...
(2020).

The latest destruction brought by Super Typhoon Rolly (Goni) to the Bicol and Batangas regions last week and even the recent Typhoon Vicky in Surigao del Sur proves further proves Mejia's argument. There needs to be a discussion of climate injustice in the Philippines because 'while the Philippines are vulnerable to typhoons augmented by climate change, the Filipino people bear a disproportionately low responsibility for causing climate change.' [2] The narrative after every disaster is about Filipino resiliency when it should be about how the country can improve disaster response and preparedness.

This paper aims to argue that the Filipino people are not really 'resilient' but forgotten and neglected by the government and is just forced to deal with the disasters whenever they strike.

3. Methodology

In providing a sufficient argument to the question of the paper, keywords such as 'how to typhoon-proof the Philippines, 'Filipino resiliency' and 'disaster management in the Philippines' have been used as search terms on Google Scholar, Mendeley Search, and Research Gate. All the references have been read and filtered to identify codes. The codes were based on the abstract or included in the reference lists. The references were chosen based on how much substantive contribution they can provide in meeting the purpose of the study which is to argue about the need for better disaster preparedness and rehabilitation policies due to the abuse on the common narrative of 'Filipino resiliency.'

Using theoretical coding method, this qualitative research specifies 1) situational background 2) problems. To organize the various body of resources, each code was initially analyzed, grouped and put into a larger category. Then, a second analysis was conducted to make sure that there was no redundancy in the first categories. The second analysis is

also necessary to ascertain that revised category from the first cycle of analysis were consistent and focused on the goals of the research.

Finally, to serve as the conceptual framework of the entire paper, the components have been further synthesized to 10 key components. This framework aims to stand as an operational scheme by which future readers can test with empirical data, as well as assist in policy making and planning endeavors regarding improving the disaster management and resilience of the Philippines.

Reference	Date	Subject	C1		C2	C3			C4			C5		C6	C7		C8	C9	C10
Santos	2013	DISRES	1	2		1	2	3	1	2	3	1	2		1	2			
			O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	IHGS	AURPN
Holden & Marshall	2018	DISMAN	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	IHGONS	AURPN
Acosta, et al.	2016	DISMAN	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	IHGNS	AURPN
Mejia	2020	RES	O	O		O	O	O		O	O	O	O	O	O	O	O	IHGONS	N
Dimacali	2017	DISMAN	O	O	O	O	O	O				O	O		O	O	O	IHGONS	N
Bueza	2013	DISMAN	O	O		O	O	O	O			O	O		O	O	O	IHGONS	N
Ishii	2013	DISMED	O		O	O	O	O	O			O	O	O	O	O	O	GONS	AN
Hasegawa, et al.	2018	DISPREP	O			O	O	O	O			O	O	O	O	O	O	IHONS	AN
Kitagawa	2016	DISPREP	O		O	O	O	O	O			O	O	O	O	O	O	ONS	AN
Skoufias, et al.	2020	NAT	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	IHGONS	AURPN
Emanuel	2005	NAT	O		O	O	O	O				O	O		O	O	O	HONS	ANI
Magdaong, et al.	2014	NAT	O		O	O	O	O				O	O		O	O	O	ONS	AN
Duncan, et al.	2016	NAT	O		O	O	O	O				O	O			O	O	ONS	ARPN
Webster, et al.	2005	NAT	O		O	O	O	O				O	O		O	O	O	ONS	AI
Holden	2015	NAT	O	O		O	O	O	O	O	O	O	O	O	O	O	O	IHGONS	AURPN
Bohra-Mishra, et al.	2017	NAT	O	O	O	O	O	O	O	O	O	O	O		O	O	O	NS	AN
Lirag & Estrella	2017	SUS	O	O	O	O	O	O	O	O		O	O		O	O	O	IHG	RPN
Cinco, et al.	2016	NAT	O	O	O	O	O	O	O	O	O	O	O		O	O	O	IHGONS	A
Matejowsky	2015	RES	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	IHGONS	AUPN
Trenberth	2011	CLIM RES	O		O	O	O	O				O	O		O	O	O	ONS	AI
Holden & Jacobson	2015	NAT	O	O		O	O	O	O	O	O	O	O	O	O	O	O	IHGONS	ARPN
Internal Displacement Monitoring Centre	2013	DISMAN	O			O	O	O		O	O	O	O	O	O	O	O	OS	AURPN
Tiburan, et al.	2009	DISMAN	O	O	O	O	O	O	O	O	O	O	O	O		O	O	HGONS	ARPN
Porio	2011	RES	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	IHGONS	AURPN
Holden	2018	NAT	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	IHGONS	AURPNI
Engelman	2010	NAT	O		O	O	O	O			O	O	O		O	O	O	IGONS	ANI
Hoffmann & Muttarak	2017	DISPREP	O	O	O	O	O	O		O	O	O	O	O	O	O	O	HGNS	ANI
Wilson	2012	RES	O		O	O	O	O				O	O		O	O		ONS	AURPN
Matunhay	2018	DISMAN	O		O	O	O	O				O	O	O	O	O	O	HONS	AURPN
Sayson & Yap	2020	NAT	O	O		O	O	O				O	O	O	O	O	O	S	PN
Labarda, et al.	2020	PSYCH	O	O		O	O	O		O	O	O	O	O	O	O	O	IHGON	P
Stephenson, et al.	2018	RES	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	IHGONS	RN
Douglas, et al.	2019	URB	O		O	O	O	O				O	O	O	O	O	O	ONS	URPN
Morella	2018	NAT	O	O		O	O	O				O	O	O	O	O	O	S	N

Table 1

C1.1	The Power of Tropical Cyclones	C5.1	Damage to Property and Loss of Lives
C2.2	Philippines as 'typhoon-prone'	C5.2	Physical, Social, Economic and Psychological Stress
C2	Human Activity and Modern Industrialization	C6	Disaster-Resilient Homes
C3.1	Increased Intensity of Typhoons	C7.1	Human Dimension of Resiliency Planning
C3.2	Irregular Precipitation	C7.2	Disaster Management
C3.3	Unpredictability of route	C8	Disaster Preparedness
C4.1	Geographical Location	C9	Working across human agency levels: Individuals (I), households (H), social groups (G), organizations (O), networks of individuals and groups (N), society (S)
C4.2	Poverty of Filipinos	C10	Working across political-administrative levels and geographical scales (A), Urban areas (U), Rural Areas (R), Regional Territories and Provinces (P), National Territories (N), International (I)
C4.3	Rising Population		

Table 2

4. Situational Background

4.1. Typhoons in the Philippines

Typhoons are formed in the oceans and seas and usually lose power as they move inland. They can carry a tremendous amount of destructive power and can be a huge threat to coastal areas. Tropical cyclones are one of the most devastating natural disasters on earth [3,10,11]

According to the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) which is the National Meteorological and Hydrological Services agency of the Philippines:

Tropical cyclones derive their energy from the latent heat of condensation which made them exist only over the oceans and die out rapidly on land. One of its distinguishing features is it having a central sea-level pressure of 900 mb or lower and surface winds often exceeding 100 knots. They reach their greatest intensity while located over warm tropical waters and they begin to weaken as they move inland. The intensity of tropical cyclones varies; thus, we can classify them based upon their degree of intensity.

To further help in easily identifying the strength of the typhoon, PAGASA adopted this classification of tropical cyclones according to the strength of the associated winds as of 01 May 2015:

Classification	Maximum Sustained Wind Speeds
Tropical depression	61 kilometers per hour (kph) or less than 33 nautical miles per hour (knots).
Tropical Storm	62 to 88 kph or 34 - 47 knots.
Severe Tropical Storm	89 to 117 kph or 48 - 63 knots.
Typhoon	118 to 220 kph or 64 - 120 knots.
Super Typhoon	Exceeding 220 kph or more than 120 knots.
Source: [12]	

Table 3

Based on the National Mapping and Resource Information Authority's (NAMRIA) data, the Philippine archipelago has 7, 641 islands including the previously undiscovered ones. This was also announced by the former Department of Environment and Natural Resources (DENR) Secretary Ramon Paje during the Philippine Environment Summit in February 2016. In 2020, the population of the archipelago was approximately 110 million people spread over roughly 300,000 km² of land area generating a population density of 368 [13]. The seas and all the life close to it are 'integral components of life in the Philippines.'[2] More than 80% of the Philippine population live within 50 km of the coast [14] so a huge portion of the Philippines is 'typhoon-prone' and each year there is an average of 20 typhoons entering the country. 25% of the total number of typhoons in the world occur in the Philippines' coastal waters. According to the National Disaster Risk Reduction Management Council, from the 856 tropical cyclones that entered the country from 1970 to 2013, 322 are destructive. Cyclones have caused landslides and severe and recurrent flooding of lowland areas which have resulted to more loss of life and damage to property than any other natural hazard. The Philippines is situated in a particular geographic location in the western edge of the Pacific Ocean wherein it is visited by the greatest number of storms that are also the most intense. It is one of the most typhoon-ravaged countries in the world. [2,15,16]

Component	Content	References
The power of tropical cyclones	Tropical cyclones are one of the most devastating natural disasters on earth	[3,10,11]
Philippines as 'typhoon-prone'	It is one of the most typhoon-ravaged countries in the world.	[2,15,16]

Table 4

4.2. Climate Change

Climate change is a result of the increasing concentration of greenhouse gases such as carbon dioxide (CO2), methane, and nitrogen oxides, into the atmosphere brought about by human activity [17–20]. Once these gases are released and concentrated in the atmosphere, they trap radiation within the lower atmosphere causing more heat to be stuck instead of it getting radiated back into space. The retained heat are the main drivers of the planetary climate system. It charges the atmosphere and oceans. However, the maximum safe level of CO^2 in the atmosphere is 350 parts per million (ppm). In 2016, the number increased to 440 ppm and is constantly rising by approximately 2 ppm per year [2].

Modern industrialization has been the catalyst for the increase of CO^2 in the atmosphere. The emitted and trapped CO^2 in the atmosphere will have a warming effect for years to come. According to Holden and Marshall:

Gillett et al. (2011) found that even if there was to be a complete cessation of all CO2 emissions in 2100 the impact of CO2 emitted up to then would continue beyond the year 3000. According to Pfeiffer et al. (2016, p. 2), 'CO2 emissions remain resident in the atmosphere for centuries and it is the stock of atmospheric CO2 that affects temperatures, rather than the flow of emissions in any given year.'
(2018).

Component	Content	References
Human Activity and Modern Industrialization	Modern industrialization has been the catalyst for the increase of CO^2 in the atmosphere. The emitted and trapped CO^2 in the atmosphere will have a warming effect for years to come	[2]

Table 5

4.2.1. How Climate Change Results to Stronger, Wetter and Unpredictable Typhoons

There's a considerable amount of scientific literature that indicates that climate change is contributing to stronger, wetter and unpredictable typhoons [2,3,18,21,22]. Climate change generates stronger typhoons because it heats up the world's oceans. The higher the temperature, the more energy is accumulated which is then converted into tropical cyclones. According to Holden and Marshall:

During 2013, for example, sea surface temperatures in an extensive area of the Western North Pacific exceeded 29 °C, providing ample thermodynamic energy for the formation of storms such as Super Typhoon Haiyan (Takagi and Esteban, 2016). The area of the world's oceans with ocean temperatures that favor cyclone development is also expanding… These higher subsurface sea temperatures remove a natural buffer on the strength of tropical cyclones, favor rapid tropical cyclone intensification, and go a long way toward explaining why typhoon intensity from 2005 to 2015 has been, on average, the strongest over the time period from 1955 to 2015 (Mei et al., 2015). According to Mei et al. (2015), by the end of the 21st century, the average tropical storm will increase from being a category 3 (severe tropical storm) to a category 4 (typhoon) and even typhoons of moderate intensity will increase by 14%.
(2018).

In addition to the increased intensity of typhoons due to the higher temperature, typhoons will tend to be 'wetter' as they will carry more moisture and generate heavier rainfall. The warmer the air, the more moisture it holds because these drives increased evaporation. As such, heavy rainfall events are expected as the Earth warms. For every 1 °C increase in temperature, the air holds 7% more water [23]. This means that warmer tropical storms have more moisture which then generates intense precipitation. Furthermore, Trenberth notes that there is 'a distinct link between higher rainfall extremes and temperatures.'

In the Philippines, there are many instances wherein tropical cyclones do not make landfall. However, their sheer intensity still affects the islands either due to their wide cloud bands, or precipitation anomalies which can lead to flash floods, higher sediment influx, and landslides.
According to Holden and Jacobson:

Consider, for example, Typhoon Ketsana (referred to in the Philippines as Typhoon Ondoy), which impacted Metro Manila on 26 September 2009, depositing 341 mm of rain in just six hours. This shattered the previous Philippine precipitation record set 42 years earlier in 1967, when 334 mm fell over a 24-h period.
(2015)

Aside from the increased intensity of strength and rainfall, there's also substantial literature that indicates that typhoons in the Western North Pacific have become more unpredictable. Their usual 'route' of southeast to northwest became an east to west trajectory. For example, in the Philippines, the Mindanao Island is rarely visited by any typhoon but in December 2011, Tropical Storm Washi (local name: Sendong) tracked from east to west over Mindanao, causing severe flooding in the city of Cagayan de Oro and killing one thousand people. The similar incident occurred in December 2012 when Typhoon Bopha (local name: Pablo) tracked from east to west over Mindanao killing a similar number of people and forcing one million people to evacuate their homes [25].
According to Holden and Marshall,

Super Typhoon Haiyan also tracked in more of an east to west trajectory instead of a southeast to northwest trajectory. Takagi and Esteban (2016, p. 218) found that typhoon landfalls between latitudes 10° and 12° North have increased by around 0.02 times per year over the time period from 1945 to 2013. As indicated at the outset of this chapter, Super Typhoon Haiyan was believed to be the fastest storm on record and was traveling at a speed of 41 km/h when it made a landfall; this propagation speed is nearly twice as fast as the average tropical cyclone (Takagi and Esteban, 2016).
(2018)

Fast and unpredictable typhoons pose very serious problems for Filipinos. For one, it reduces the time available for preparation (and evacuation, if necessary). Two, lives of people who were hesitant to leave their shelters initially can be in danger once the strong winds and heavy rains persist outside and destroy their homes. Even if Filipinos are already used with typhoons, the intensity and speed of Haiyan (local name: Yolanda), and its post-landfall storm surge, may explain why so many people died.

Component	Content	References
Increased Intensity of Typhoons	These higher subsurface sea temperatures remove a natural buffer on the strength of tropical cyclones, favor rapid tropical cyclone intensification.	[2]
Irregular precipitation	For every 1 °C increase in temperature, the air holds 7% more water.	[23]
Unpredictability of route	Their usual 'route' of southeast to northwest became an east to west trajectory.	[25].

Table 6

4.2.2. Vulnerability of Filipinos to Typhoons

The Philippines is a country that is highly at risk to the erratic magnitude of natural disasters intensified by climate change. It's one of the most vulnerable countries in the developing world that is consistently suffering from typhoons, flooding, earthquakes, landslides and many other forms of environmental crises [26]. The country is always a victim of catastrophic events and climate change have not only aggravated the condition of the environment, but it has impacted the economy and consequently, the lives of many Filipinos.

In Holden and Marshall's discussion:

According to Alliance Development Works, in its World Risk Report 2014, the archipelago is ranked second only to Vanuatu among the countries of the world most at risk to natural hazards and climate change (Table 24.2). Much of this vulnerability emanates from so many Filipinos living in close proximity to the sea. In terms of coastal population exposure to climate risks, the Philippines has the second largest number of people exposed, behind only China (a country with over 13 times as many people) and the highest percentage of people exposed (Busby et al., 2012).

(2018)

With the continuously increasing intensity of typhoons and rising sea level, the coastal population of the Philippines is highly vulnerable to stronger typhoons. And with climate change exacerbating the current situation, higher storm surges similar to what was observed during Super Typhoon Haiyan is expected. Aside from being included in the 'Pacific Ring of Fire' which is an area in the basin of the Pacific Ocean where many earthquakes and volcanic eruptions occur, the Philippines is also within the typhoon belt. As a result, Filipinos are no strangers to any type of natural disaster. However, this proclivity to disasters brought about by geographic location and intensified by climate change is even more worsened by the poverty experienced by many Filipinos.

According to the data provided by the Asian Development Bank, 16.6% of Filipinos live below the poverty line in 2018. Moreover, the proportion of employed population below $1.90 purchasing power parity a day in 2019 is 2.7% [27]. As mentioned earlier, data suggests that more typhoons will impact the archipelago between latitudes of 10° and 12° north more frequently, and this is where Region VIII is located. Region VIII which includes the provinces of Eastern Samar, Leyte, and Southern Leyte has a poverty incidence of 30.7% among population [28]. This means that their vulnerability will only increase the more exposed they become to stronger typhoons. The large cities of the Philippines, most especially in Metro Manila, are inhabited by millions of urban poor families and they are in a similar position of vulnerability. They tend to live on the most marginal lands, such as riverbanks and coastal lowlands — areas that are prone to flooding.

In Emma Porio's study, she found out that:

The environmental-ecological vulnerability of the low-lying flood prone areas interacts strongly with the social vulnerability of urban poor households, highlighting the effects of climate related changes (sea level rise, increased typhoons, intensity of monsoon rains, floods and tidal/storm surges) on this vulnerable population. Most of the households have low-incomes, live in slum/squatter settlements and do not have adequate access to potable water, electricity, health, sewage and sanitation facilities. About two-thirds of them suffered losses (e.g., income, work, health/sickness, household appliances/ things, housing damage) from typhoons, floods, and tidal/storm surges but only a small portion of them obtained help from formal institutions (e.g., local government units or LGUs, charitable agencies) and informal support networks (relatives/neighbors/friends). Of these, a third of these households appeared more vulnerable and consistently incurred higher losses (e.g., income and workdays) and intense inconveniences (e.g., water source buried by floods, toilets blocked and overflowed with wastes/large worms to their floors) compared to their neighbors.

(2011)

Another factor that contributes to the vulnerability of the Philippines to stronger typhoons is the steady increase of the population. As of December 25, 2020, the population in the Philippines is 110,280,671 [13]. The Philippines population is equivalent to 1.41% of the total world population and it is a growing at a rate of 1.55% a year. There are already studies showing how such high levels of population growth can make adaptation to climate change, and the development of better resilience to its effects, substantially more difficult [21,30–32].

According to Holden and Marshall:

By the year 2063, barring a dramatic decrease in population growth, the Philippines will have a population of roughly 210 million people, with a population density of 700 people per km². Such a large, and densely concentrated, population can only increase the likelihood, and consequence, of disasters, such as the one befalling Tacloban City...

(2018)

Component	Content	References
Geographical location	Aside from being included in the 'Pacific Ring of Fire' which is an area in the basin of the Pacific Ocean where many earthquakes and volcanic eruptions occur, the Philippines is also within the typhoon belt.	[12]
Poverty of Filipinos	According to the data provided by the Asian Development Bank, 16.6 Filipinos live below the poverty line in 2018. Moreover, the proportion of employed population below $ 1.90 purchasing power parity a day in 2019 is 2.7%	[27].
Rising population	There are already studies showing how such high levels of population growth can make adaptation to climate change, and the development of better resilience to its effects, substantially more difficult.	[21,30–32]

Table 7

5. The Problem with Filipino Resiliency

According to Wilson, 'resilience is about the ability of a system to absorb impacts/disturbance and to reorganize into a fully functioning system, and about post-event adaptive processes.' It is the capacity of a system to withstand shocks and be able to rebuild and respond to change [2]. As discussed earlier, the Philippines experiences 20 typhoons every year on average. All of which varies in severity from moderate to extreme. Typhoons bring strong winds, heavy rainfall, and flooding to the Philippines, which causes damage to both land and property and even loss of lives. In the case of severe events such as Haiyan, the damage and destruction was so grave that it prompted worldwide concern and instigated an international aid response to help communities recover from the severity of the event. Despite this 'constancy' and 'normalcy' of the occurrence of typhoons, the same story happens every year—destroyed homes and properties that are flooded or covered with mud, as well as people who will have to spend weeks, if not months, on evacuation centers still exist.

On December 4, 2012, Typhoon Bopha hit 32 provinces in Southern Mindanao. It has affected 249 barangay and 140,552 families in the province. According to NDRRMC, the total costs of damages for infrastructure, livelihood, social and settlements amounted to Php 27,459,000.00 (571,504.17 USD) [34].

This year, just recently, Super Typhoon Goni which slammed into the Philippines on November 1, 2020 have damaged 90% of the buildings in the first town it struck [35]. In the same report, Philippines Red Cross Chairman Dick Gordon said an assessment suggested that in Virac, Catanduanes alone, at least 16 people were killed when Typhoon Goni made landfall. Civil defense officials estimate about 370,000 people have been displaced by the storm and tens of thousands of homes have been destroyed. Moreover, nearly 458,000 people were evacuated mostly in the main island of Luzon, including 177 Covid-19 patients and more than 400 medical staff from 10 quarantine facilities, risking transmission of the virus in an overly-crowded area [36].

Furthermore, according to Sayson and Yap:

Initial damage to infrastructure was estimated at 5.6 billion pesos ($116 million), Public Works Secretary Mark Villar said in a televised briefing. It also destroyed 1.73 billion pesos worth of crops, including 69,411 metric tons of rice, adding to the 2-billion-peso damage from Typhoon Molave last week.

(2020)

Typhoon Goni is the most powerful storm to hit the country since Typhoon Haiyan killed more than 6,000 people in 2013 [37].

If Filipinos are indeed 'resilient,' why do they suffer the same fate every year? It seems as if there is already some form of 'learned apathy' wherein Filipinos rationalize disasters as 'this is how it will always be,' when the mindset should be about ensuring that 'this won't happen again.' Resiliency should be a journey of that conversion and this why this discussion must take place.

As much as there are agencies tasked to ensure that people are safe and evacuated properly even before the disaster strikes or rescued immediately during and after the disaster, there are still deaths, injuries and homeless people every time. Resiliency is not about how people can 'move on' quickly like nothing happened. Research even suggests that 'displacement from one's home after a natural disaster results not only in physical separation from significant others but also in profound disruptions of psychological and social resources such as community support and sense of belonging.' [38] Furthermore, since typhoons happen often, frequent displacement is also a reality and can exacerbate health and mental health problems brought by the disaster, especially among lower-income families in resource-scarce regions [38].

Component	Content	References
Damage to Property and Loss of Lives	Initial damage to infrastructure was estimated at 5.6 billion pesos ($116 million), Public Works Secretary Mark Villar said in a televised briefing. It also destroyed 1.73 billion pesos worth of crops, including 69,411 metric tons of rice, adding to the 2-billion-peso damage from Typhoon Molave last week.	[36]
Physical, Social, Economic and Psychological Stress	displacement from one's home after a natural disaster result not only in physical separation from significant others but also in profound disruptions of psychological and social resources such as community support and sense of belonging.	[38]

Table 8

5.1. Lack of Shelter Resiliency

Failure to consider the effects of natural disasters in an area that is included in both the Pacific Ring of Fire and typhoon belt can be disastrous for a nation. Adaptation to climate change-related impacts is very important for national planning and development. In early 2018, the World Bank estimated that the Philippines loses P15 billion every year to natural disasters like typhoons and floods. This amount represents about 0.7 percent of the gross national product (GNP) [29].

According to Holden and Marshall,

Super Typhoon Haiyan caused between $12 and US$ 15 billion USD worth of damages and resulted in the destruction of 1 million homes (Primavera et al., 2016). Six months after Haiyan, 2 million people remained without secure shelter (Rodgers, 2016). In some locations on the island of Samar, up to 90% of all water wells were inundated with seawater and rendered undrinkable (Cardenas et al., 2015).

(2018)

In a study conducted by Stephenson, et. al., they found out that areas with typhoons and associated flooding in recent years has caused significant damage to houses and livelihoods. This occurrence has led to the 'reconstruction of homes that more often than not reproduce similar structural vulnerabilities as were there before these hazards occurred.'[39] This means that the homes and structures were rebuilt but were not 'typhoon-proofed.' They were not built to last typhoons. As such, when natural disasters occur, the same result happens again. With no way to rebuild homes in more resilient ways, and with no effort from the government to do so, the same aftermath is to be expected. And it is going to happen again and again and again—getting worse year after year after year.

A significant portion of the population lives below the poverty line and live in makeshift structures in slum areas. As such, there is a need to understand the nature of the risks that flooding and typhoons pose to these communities and their homes. There is a need to assess and profile the physical vulnerability of structures. How can you improve rebuilding homes and other infrastructures in such a way that even if typhoons and other natural disasters may occur, buildings will still be well and standing?

The need for disaster-resilient homes is urgent. The country cannot adapt to climate change without resiliency in construction.

Component	Content	References
Disaster-Resilient Homes	Reconstruction of homes that more often than not reproduce similar structural vulnerabilities as were there before these hazards occurred.	[39]

Table 9

5.2. Lack of Community Resiliency

Constant typhoons and flooding in the Philippines have exposed the vulnerability of disaster risk and reduction management of local communities. Not only are there consistent damage to structural assets, but there are also untold miseries and psychological stress with the loss of human lives and economic assets.

According to Wilson:

Global climate change is already threatening survival, especially in areas where agricultural production natural disaster result is jeopardized by increasing frequency of droughts (e.g., Australia, parts of Africa; Adger, 2003; Cline, 2007; Kelkar et al., 2008) or where sea-level rise is likely to destroy livelihoods (e.g., coral atolls in the Pacific Ocean) (Barnett and Adger, 2003).

(2012)

Project management approach has been used in many fields and sectors in the Philippines but disaster management has yet to see its full benefits. There is a need to understand the need for a 'balance of economic, social and environmental processes which shape the contemporary countryside, and the interrelationships between these in particular localities.' [33] There is a need to give more attention to 'the human dimension of resiliency planning by better understanding how a variety of local stakeholders' experience climate-related disasters, perceive the effectiveness of alternative disaster preparedness and community resiliency strategies, and determine their willingness to contribute to ongoing resiliency planning taking place within their community.' [40]

Component	Content	References
Human Dimension of Resiliency Planning	Not only are there consistent damage to structural assets, but there are also untold miseries and psychological stress with the loss of human lives and economic assets.	[40]
Disaster Management	Project management approach has been used in many fields and sectors in the Philippines but disaster management has yet to see its full benefits.	[33]

Table 10

5.3. Lack of Climate and Disaster Management Education

When you stockpile emergency supplies or have a family evacuation plan, you are substantially minimizing loss and damages from natural hazards. Preparing for a disaster can literally be life or death. However, the levels of household disaster preparedness are often low even in disaster-prone areas [32]. If you don't what a 'storm surge' is or when you don't know how climate change influences the intensity of typhoons, it can literally be life or death. For example, during Typhoon Haiyan even though the hardest-hit areas received early warnings, the weather service and other officials later admitted that the victims were unfamiliar with the term 'storm surge.' [41]

There is a need to strengthen resilience to climate-related hazards and understanding the role of education in promoting disaster preparedness is a good first step. In Hoffmann and Muttarak's study, they found that 'formal education raises the propensity to prepare against disasters.' [32]. Education improves abstract reasoning and anticipation skills of people. As such, the more educated one is about preventive measures, the safer and better-equipped the community is. There is no need to first experience the harmful event and then learn later. As much as experience is the best teacher, there must be an effort to promote education for sustainable development and show the positive externalities of education in disaster risk reduction

Component	Content	References
Disaster Preparedness	There is a need to strengthen resilience to climate-related hazards and understanding the role of education in promoting disaster preparedness is a good first step	[32].

Table 11

6. Conclusion

Climate change and typhoons in the Philippines are interrelated in such a way that powerful storms are no longer just 'outliers' or extreme events that happen once in a while. They are a consequence of climate change and something one can expect more as global society progresses and not do anything about it. As such, there is a need to address how the destruction of properties and loss of lives are amplified by climate change. This force (and many others) act together in complex ways to influence development trajectories and, ultimately, resilience and vulnerability of communities. According to the Philippine Statistical Authority, in 2015, 26% of all Filipinos were living in poverty. All of these people, lack resilience in dealing with natural disasters and are highly vulnerable to typhoons when they impact.

The important component of resiliency is learning how to improve the situation the next time it occurs, because as what has been discussed repeatedly in this paper, typhoons and other natural disasters are always bound to happen and they will only get worse and worse each time due to climate change.

There is a need to build truly resilient communities that are characterized by well-developed economic, social and environmental capital.

7. Conflicts of Interest

The authors declare no conflict of interest.

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