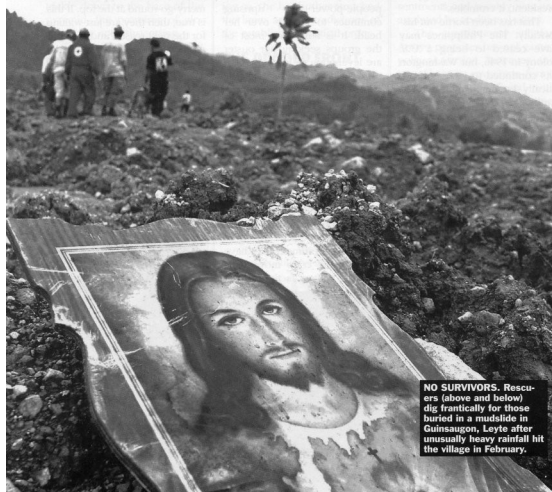


Preparing for Disaster
by **Vinia M. Datinguinoo**
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PREPARING FOR DISASTER



NO SURVIVORS. Rescuers (above and below) dig frantically for those buried in a landslide in Guinsaugon, Leyte after unusually heavy rainfall hit the village in February.

VINIA DATINGUINOO

IN LUGSONGAN, a fishing community on Limasawa island in Southern Leyte in the Visayas, families live in rows of houses along the rocky beach. When they are not in use, small fishing boats are pulled ashore, dotting the coastline. In 1984, Lugsongan was hit by a strong typhoon, which left 23 residents dead and many houses and boats destroyed. In 2001, another typhoon of similar strength struck the village; but by then, the small community of 215 families was prepared. Heeding storm warnings, the 300 most vulnerable villagers along the coast retreated early to the evacuation center and stayed there for two days until the typhoon subsided. No deaths were recorded.

It was after the 1984 typhoon that Lugsongan began a disaster-preparedness program with the help of the Philippine National Red Cross (PNRC). A Disaster Action Team was created, and public meetings were held to identify which households were most vulnerable to natural hazards. During those meetings, the community confessed it feared typhoons the most. But there, the townsfolk learned that they were exposed as well to the possibility of landslides and—equally important as it has profound effects in the long-term—the risks arising from poor access to safe drinking water.

The community then made plans on how to improve their safety, and, using volunteer labor, built an evacuation center on a hill behind the village. The municipal government provided engineering assistance and shouldered transport and other costs. It was that evacuation center that provided Lugsongan residents refuge and saved their lives in 2001, when another vicious typhoon whipped through their village.

Lugsongan is perhaps one of the best arguments for disaster preparedness and of involving communities in such programs. Its story illustrates the wisdom of letting people know what hazards they face, and what they can do before, during, and after a natural disaster to limit damage to their property and keep the casualty count as low as possible.

"People matter the most," says Lilian Carreon, director of the Manila office of the international aid organization Oxfam. "They should be engaged in disaster preparedness." Yet in a country that is highly vulnerable to a host of natural disasters, community-based disaster preparedness remains in its infancy. Still dominant is a centralized disaster-management system that is largely response-oriented, or which springs into action only after a calamity occurs.

This was the system that whirled to life last Feb. 17, almost as soon as the news broke that a landslide had occurred in St. Bernard, Southern Leyte at about 10 that morning. By the time help arrived in Barangay Guinsaugon, however, the village itself was nowhere to be found.

It had taken only moments for Guinsaugon to be wiped out by what geologists call a "debris avalanche" from the rain-soaked Mt. Can-abag, one of whose sides had collapsed in a hail of earth, boulders, and trees. Three million cubic meters of this debris buried the small village—all six hectares of it—where an estimated 1,800 people had lived. In some places, the mud-and-rock mixture was 30 meters deep.

When the search-and-rescue efforts were halted a week after the disaster, only 141 bodies had been recovered. Still missing were some 980 people, 248 of whom were students, teachers, and mothers trapped inside the village school building. Officials estimate that only 400 Guinsaugon residents survived, most of them having been somewhere else at the time of the landslide. Overall, more than 3,200 people, including residents of nearby villages, were displaced.

A DISASTER-PRONE NATION

The Guinsaugon landslide, though, is far from being the worst to have hit the country in recent history. On the morning of November 5, 1991, for example, water from heavy rainfall roared down from the surrounding hills carrying logs and uprooted trees, and engulfed Ormoc in Leyte. Some 6,000 people died from that flood.

More recently, in November and December 2004, landslides and floods resulting from four

consecutive typhoons and storms devastated the eastern coast of Luzon. Over 730,000 families in some 350 municipalities across 35 provinces in the country were affected by that string of typhoons.

Experts say there are many other disasters that escape the news but cause damage to the lives of the poor, locking them even more to the cycle of poverty. This can only be expected in a country that sits on the western rim of the Pacific Ocean—also known as the "Pacific Ring of Fire," which has a belt of active volcanoes and earthquake-generating fault lines. The Philippines also lies within the Pacific "typhoon belt." As a result, the country is particularly vulnerable to natural hazards such as floods, typhoons, earthquakes, tsunamis, volcanic eruptions, drought, landslides/mudslides, and flash floods.

Between 1994 and 2003 alone, an average of 2.1 million Filipinos were affected by natural disasters each year, with about 650 people dying annually because of such calamities. A 2004 World Bank study also says that the country's vulnerability to natural hazards costs the government an annual average of P15 billion in direct damages, or more than 0.5 percent of the country's gross income.

The same study makes the case for an effective preparedness program, saying, "A dollar spent on preparedness saves seven dollars on response."

"Initiatives focused on building community disaster preparedness, and response capacity are particularly important," says the World Bank, adding, "Efforts directed at this level do not necessarily involve great expense, particularly if all stakeholders work together with clear goals, roles and responsibilities."

The PNRC, for its part, cites some examples that show disaster preparedness need not be elaborate productions:

- In Southern Leyte, a river had been eroding the banks and threatened the houses and adjacent rice fields in Barangay Catublian. In 1998, the community improved and expanded a concrete flood control dike along the most critical parts of the river. During heavy rains

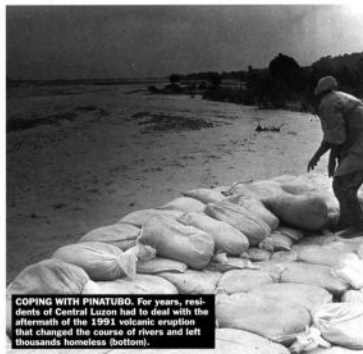
associated with a typhoon in February 2001, the dike prevented the powerful river from cutting further into the banks—protecting an estimated 100 hectares of rice fields and sparing 200 farmers from damages.

- In Gusuran, in the mountainous area of Benguet, the main potable water supply comes from a well. Every year typhoons bring heavy rains to the area, causing wastewater to flow into the well and contaminate the water. The community erected a simple concrete wall to divert the surface runoff so wastewater did not flush into the well. Since the concrete

wall was built in 1996, it has proven effective several times—and the community now has far fewer cases of serious diarrhea during the rainy periods.

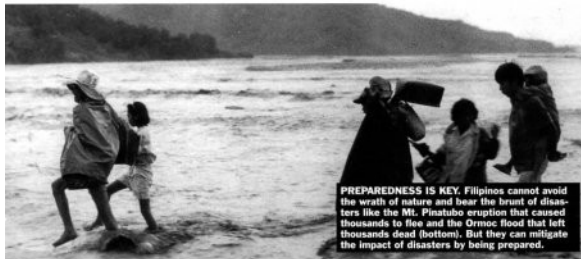
- The construction of low seawalls in Son-ok II and Libagon, Southern Leyte, prevented damage to fragile houses along the beachfront during typhoons in 2001 and 2005.

- On the island of Coron, Palawan, local storm warning systems have been set up. Whenever there is a storm announcement on the radio, Disaster Action Team members go from house to house, giving advice on



COPING WITH PINATUBO. For years, residents of Central Luzon had to deal with the aftermath of the 1991 volcanic eruption that changed the course of rivers and left thousands homeless.





PREPAREDNESS IS KEY. Filipinos cannot avoid the wrath of nature and bear the brunt of disasters like the Mt. Pinatubo eruption that caused thousands to flee and the Ormoc flood that left thousands dead (bottom). But they can mitigate the impact of disasters by being prepared.

how families can secure their homes and organizing manpower to protect the fishing boats. They also convert a local school into an evacuation center.

ACCURATE AND ADEQUATE INFORMATION

Any kind of disaster preparedness program, however, necessitates accurate information about the specific vulnerabilities and risks faced by a community. The municipality of St. Bernard, for example, had been warned that a landslide could occur at Mt. Can-abag, and its officials—as did those of three other towns—had already declared a state of calamity as early as January. The Leyte Provincial Disaster Coordinating Council (PDCC) had also



conducted seminars and “suggested” that villagers evacuate. But while most of the villagers were staying in the evacuation centers during the night, they would go back to their community during the day, most prob-

ably under the mistaken notion that they could easily escape a daytime landslide. (One of the more recent landslides that had occurred in Leyte was the 2003 Liloan tragedy, which happened at night, while most residents

of the town were asleep, and took the lives of at least 150 people.)

It could also be that the villagers thought they would be safe once the rains stopped. At the time of the landslide, the sun was out, unlike previous days that were marked by a monotonous gloom of cloudy skies and incessant rain.

According to the PDCC, there was nothing the local officials could do to stop the villagers from going back to their houses and farms during the day. “*Alangan namang ibondos sila ng mayor* (It’s not as if the mayor could tie them up),” says a PDCC member. The teachers and students also continued to use the school at Guinsaigon, and even the barangay health center there was functioning as if there were no threat.

Claro Jose Manipon of the Mines and Geo-Sciences Bureau (MGB) says that it is not easy convincing people of the hazards they may be facing. He remembers one barangay meeting where the people were playing the card game *tong-it* while he and other geologists of the MGB were discussing the risks in the area. “*Sa tingin ko, bangga! hindi sila namamatayan, hindi sila natatobot* (In my view, they don’t take the threats seriously until these cause a death in the family),” remarks Manipon. In Guinsaigon, though, the problem appears to have been more

WHAT KINDS OF DISASTERS HIT OUR COUNTRY?

Sources: Asian Disaster Preparedness Center; United Nations Environment Programme; Philippine Institute of Volcanology and Seismology

TYPHOONS / CYCLONES

An annual average of 30 typhoons occur in the northwestern Pacific Ocean, of which 20 occur in Philippines alone causing immense damage to life and property. Overall, in the Asian region, the Philippines is one of the top three countries that suffer most frequently from major cyclone events.

STORM SURGES

The irregular coastlines and the numerous typhoons make the Philippines vulnerable to storm surges. High tides coinciding with a storm intensify such surges. Factors contributing to the height of storm

surges are a concave coastline that prevents the rising water from moving laterally, a fast moving storm that does not allow time for the water to spread, and shallow coastal waters. Environmental degradation such as destruction of mangroves, coral reefs and other forms of natural breakwater, siltation of river deltas, bays, and shoreline reclamation also increase the storm surge hazard.

FLOODS

Heavy rains accompanying typhoons usually cause extensive floods. Areas most prone to floods are Eastern Mindanao, Northern Samar, Central Luzon,

and the Bicol region. Flooding in Metro Manila occurs because its low-lying areas have inadequate drainage systems.

VOLCANIC ERUPTIONS

The Philippines has more than 200 volcanoes distributed along five volcanic belts. Of these, 22 are listed by the Philippine Institute of Volcanology and Seismology as active, and another 27 are potentially active. The eruption of Mount Pinatubo alone in June 1991 affected some one to two million people.

EARTHQUAKES

The Philippines lies between two of the world’s major tec-

tonic plates: the Pacific and Eurasian. The Pacific plate, moving northwest, is pushing the Philippine sea plates at a rate of about seven cm a year. The oceanic parts of the Eurasian plate are being reduced along the western side of Luzon and Mindanao at the rate of three cm a year. The country experiences an average of five earthquakes per day, most of which are imperceptible.

TSUNAMIS

Tsunamis have affected Philippines coastal areas up to more than four meters above sea level. The coastal areas of

DISASTER

of inadequate information rather than the absence of fear.

MGB spearheads the mapping of areas according to their vulnerability to what are called geophysical hazards or natural phenomena that could lead to disasters, like earthquakes, volcanic eruptions, and tsunamis. Hazard mapping is considered by experts as key to community-level disaster preparedness, although Oslam's Carreon also points out, "Disaster preparedness has to be seen from a more thorough perspective, and not just a technical one."

PINPOINTING HAZARDS

In any case, St. Bernard had not yet been mapped by February; it is scheduled to be mapped this year since it is among the 400 "priority areas" in the MGB list. "Our field geologists schedule the mapping based on limited time, manpower, and budget," Manipon explains. It is not a simple undertaking, he says, with MGB's annual budget also being eaten up by other tasks.

Manipon admits that as late as "10 or so" years ago, the government's disaster response program had been mostly reactive. Or, as he puts it, "After a disaster happens, that's when we send out our experts to investigate." But he says that with the advent of new sciences and technologies, including satellite imagery analyses and computer modeling,

the bureau has become "more proactive," and has been able to draw up predictive hazard maps. At some point, he says, "we want to train local communities in the reading of hazard maps so they will be involved in preparedness programs."

MGB's hazard mapping is "multilevel," says Manipon: "The first level provides a bird's eye view of the threats in the entire country, pointing out the general susceptibility." The result of this work is what MGB refers to as the susceptibility ranking of provinces. Southern Leyte is ranked number five, with some 82 percent of its land area susceptible to landslides.

Once these areas are identified, more detailed mapping is conducted at the municipal level. "Here we see how the roads

run, how the rivers bend," says Manipon. These maps include as well the identification of areas that can be used for relocating displaced families.

After the series of destructive typhoons that hit the country's eastern seaboard in 2004, the government promised to give the MGB an additional P60 million to complete its mapping.

"After that disaster they realized we need more money if we must do our job," Manipon says. Yet so far, just P16 million or a little more than a quarter of the promised amount, has been released.

Mapping for a municipality costs an average of P100,000. The expenses include the equipment and experts' fees, as well as the actual printing of the maps. "If we have some spare

money," Manipon says, "we can print extra maps for the community leaders and even organize seminars in the barangay." Often, however, the available funds are barely enough to cover the major expenses.

Carreon will not argue over the enormous costs that a proactive disaster management program could entail. "But it should not be that hard," she says. "As long as the government sees it from a development perspective." Besides, post-disaster relief can be as costly, if not more so. "It only makes sense to reduce the risks," says Carreon. She describes the process as a "continuum" that "includes government's preparedness, the economic capacity of the local governments and of the people themselves." ■

INCIDENCES OF NATURAL DISASTERS, 2001-2005

	Incidents	Fatalities	No. of affected people	Damages to property (P millions)
2001	71	511	4,269,777	8,418.82
2002	54	233	4,854,099	1,863.829
2003	97	331	3,935,133	4,870.828
2004	125	1,289	7,803,979	13,657.443
2005	65	107	1,290,555	3,101.218
TOTAL	412	2,471	22,153,543	31,912.14

Source: National Disaster Coordinating Council

Mindanao facing the Celebes Sea are particularly vulnerable. From 1803 to 1975, earthquakes generated 27 tsunamis that affected coastal towns.

LANDSLIDES

The area around Baguio in Northern Luzon with an elevation of 1,460 m is prone to landslides but other parts of Luzon and the rest of the archipelago are also vulnerable. Excessive rainfall frequently leads to landslides.

DROUGHTS

Droughts are not common in the Philippines. The most recent drought occurred in 1989 and resulted in damaging rice crops of about P326 million covering 31,587 hectares of rain-fed and irrigated lands.

TOP PROVINCES AT RISK TO NATURAL DISASTERS

Source: Manila Observatory

Earthquakes

- Surigao del Sur
- La Union
- Benguet
- Pangasinan
- Pampanga
- Tarlac
- Iligao
- Davao Oriental
- Nueva Vizcaya
- Nueva Ecija

Earthquake-induced landslides

- Iligao
- Lanao del Sur
- Sarangani
- Benguet
- Mountain Province
- Bukidnon
- Aurora
- Davao del Sur
- Davao Oriental
- Rizal

Volcanic eruptions

- Camiguin
- Sulu
- Biliran
- Albay
- Bataan
- Sorsogon
- South Cotabato
- Laguna
- Camarines Sur
- Batanes

Tsunamis

- Sulu
- Tawi-Tawi
- Basilan
- Batanes
- Gulmaras
- Romblon
- Siquijor
- Surigao del Norte
- Camiguin
- Masbate

Top 10 provinces most vulnerable to landslides

- Source: Mines and Geo-Sciences Bureau
- Benguet
 - Mountain Province
 - Nueva Vizcaya
 - Kalinga Apayao
 - Southern Leyte
 - Abra
 - Marinduque
 - Cebu
 - Catanduanes
 - Iligao