

'Freak of nature,' not just dams, caused North Luzon floods

Maria Althea Teves and Gemma Bagayaua Mendoza, [abs-cbnNEWS.com/ Newsbreak](http://abs-cbnNEWS.com/Newsbreak) | 10/16/2009 4:08 PM



It was to be expected. Within days after floodwaters engulfed much of Northern Luzon, people started looking for someone to blame. And they latched on a usual suspect: the dams.

At 2 am on October 9, the San Roque dam spilled water at over 5,300 cubic meters of per second into the downstream areas of the Agno river.

On the same day, at 5 am, the Pantabangan dam in Nueva Ecija also released water at a rate of 600 cubic meters of water per second into the Upper Pampanga river. An hour later, the Magat dam in Isabela spilled water at a rate of 3,400 cubic meters per second into the Magat and Cagayan rivers.

Local government officials castigated dam managers for failing to warn the people of the impending floods. Dam operators were also taken to task for waiting until the water level was already at a critical stage, before opening the floodgates.

Flood plains

Geologists interviewed by [abs-cbnNEWS.com/ Newsbreak](http://abs-cbnNEWS.com/Newsbreak), however, told a totally different story.

"They are putting wrong things (like the dams) into this phenomenon," said Carlo Arcilla, Director of the University of the Philippines National Institute for Geological Sciences (UP-NIGS). "It is true that they (the dams) aggravated the situation by releasing water but, even without dam release, there would still be flooding."

The concept of flooding, geologists explained, should be understood as a drainage basin. By nature, slopes, streams and tributaries go the main river. Water converges at lower levels causing flooding. The more water there is, the more the flooded area swells.

Most of the areas that got flooded during Pepeng's onslaught over Northern Luzon are, by nature, flood plains.

Pangasinan is a flood plain. So were areas along the Cagayan river in Isabela and the Upper Pampanga River in Nueva Ecija.

If there is a lot of water, it overflows to the plains, Arcilla said.

And when Pepeng visited Northern Luzon in early October, there was just too much water to spread around. The amount of rainfall that fell on the Pangasinan, in particular, was unprecedented, geologists interviewed by abs-cbnNEWS.com/Newsbreak said.

"It was a freak of nature," according Arcilla.

In naturally flood prone areas, there is also little that forests and grounds could do particularly with the "freak of nature" that happened on the first week of October as forests could only hold so much water and water's velocity and ability to change its shape would make it go downstream and cause flooding.

"Forestry will slow down the velocity of the water," he said. Arcilla added that it would not prevent or avoid flooding.

Unprecedented rainfall

The rainfall data map published on the website of the United States' National Aeronautics and Space Administration (NASA) showed that from October 2 and October 8, 2009, various parts of Northern Luzon accumulated from 100 millimeters (mm) to 700 mm of rain.

Arcilla said that normal rainfall would be 600 mm per month. "With that amount of rainfall in just 1 or even 2 days, you would really expect flooding," he said. He explained that even 200 mm of rainfall in a given day would cause floods and even landslides.

In the map, areas that received the most amount of rainfall were shaded in deep blue, indicating that they had as much as 700 mm of rain. Among these areas were the Cordillera mountain ranges, where many landslides occurred.

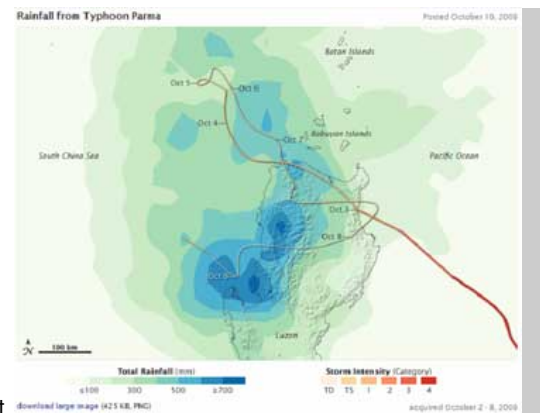
The [analysis of the rainfall](#) [12] posted on the NASA website, however, noted that the "largest area of heavy rain sits over the Lingayen Gulf," in Pangasinan. Data collected by NASA satellites from October 2 to October 8 showed that, during this period, as much as 500 to 700 mm of rain fell on the province.

Because heavy rains were falling in both upstream and downstream areas, it was only natural for flooding to occur, Geologist and former Philippine Volcanology and Seismology Deputy Director Emmanuel Ramos told [abs-cbnNEWS.com/ Newsbreak](#).

Typhoon Pepeng lingered for over a week in various parts of the country but it hovered over Pangasinan on October 9 – the day when most of the flooding happened.

The National Disaster Coordinating Council later reported that between 60 to 80 percent of the province got flooded from October 8 to 9.

Even the Nueva Ecija area, which was not as affected as Pangasinan was, also had around 200 to 300 mm of rain during this period. Nueva Ecija was also affected by heavy rains over tributaries and the upstream area of the Pampanga river.



[12]

[Click image to view larger version](#)

Source: NASA Earth Observatory

Dam managers' responsibility

This is not to say that the dams did not contribute at all to the disaster.

The dams could have been more prudently managed, Arcilla said. "They (dam managers) should have started releasing water earlier."

The San Roque dam hydrograph shows that the dam's water level was already at 284 m as of October 5 from a little over 280 last October 4.

National Power Corporation (Napocor) Spokesperson Dennis Gana however said they did not release earlier because "it did not reach an alarming rate" since the water was still below 285 meters.

This level of water, "doesn't call for higher water release than usual," he told [abs-cbnNEWS.com/Newsbreak](#) in phone interview.

"Until the dam could take it, we want to keep the water." He explained that "water is a resource we should preserve. When we do spilling operations the resource might be gone to waste."

Water from San Roque dam is used by the San Roque Power Corporation to generate electricity for the Luzon grid. It is also used to irrigate farms within the area.

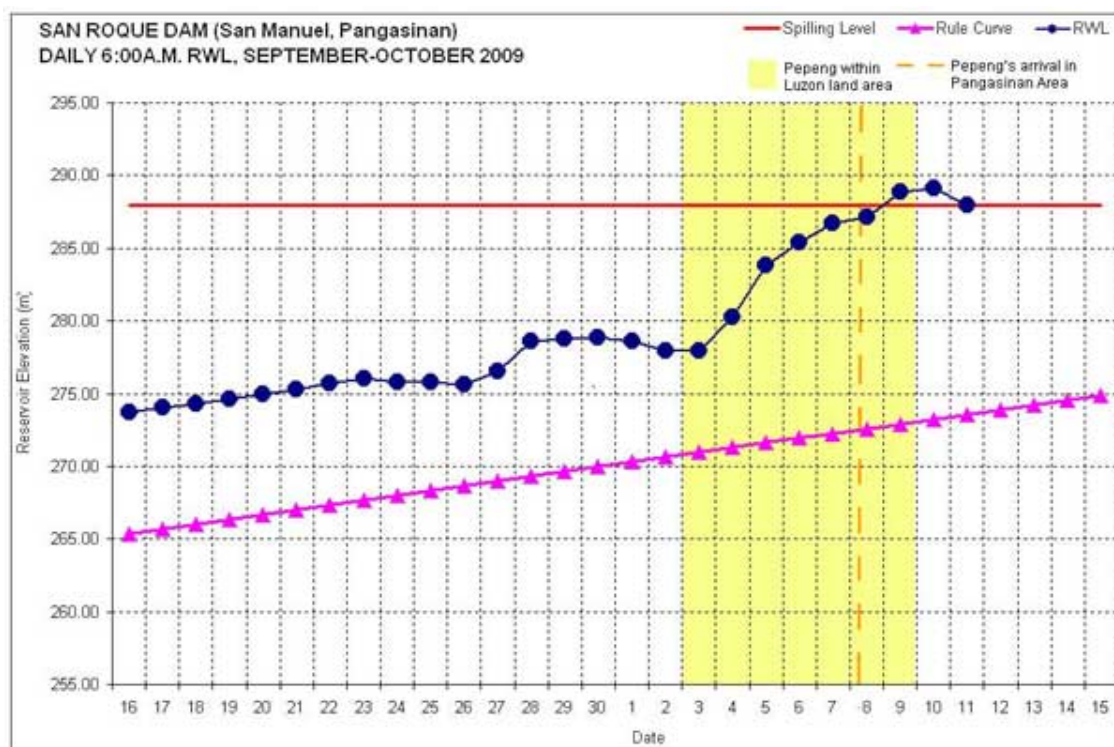
Gana said that the Philippine Atmospheric, Geophysical and Astronomical Services Administration (Pagasa) informed them of the rain, but because typhoon Pepeng was going in and out of the country, also in different directions, they did not release a lot of water early on.

Arcilla pointed out, however, that dam managers should have looked at the rate of increase of water over time inside the dam, not at the stagnant level of water.

He explained that even if the water level is high in the dam, if it does not increase rapidly there is no reason to be alarmed.

In the case of the San Roque dam, the hydrograph showed that the water level started increasing rapidly as early as October 3 to October 5—when Pepeng was not even in Pangasinan yet.

Although the reservoir water level was not close to the spilling level of the dam, "it should have been an indicator that more water will come," he said. (See the [San Roque dam hydrograph](#) [13] below)



Delaying peak flood

NAPOCOR Chief hydrologist Russell Rigor said during the hearing of the Senate committee on climate change that they were trying to delay floods so they released water late.

There is logic behind this. Ramos, who now works for the Ateneo De Manila University and the Manila Observatory, explained to abs-cbnNEWS.com/ Newsbreak that, by holding back water, the dam actually reduces the peak of the flood.

“The dams work like an infinity pool. If there is no dam, the water will be a flat curve.”

Moreover, he said, even if the dams released early, the effect would have been the same since both upstream and downstream areas were under intense rainfall.

More accurate information would have helped the dam managers make proper and timely decisions, Ramos noted. “The dams could have released earlier with Pepeng only if Pagasa gave an intense rain warning which it did not.”

He noted that the Pagasa, which is responsible for giving flood forecasts and weather updates, should not blame the absence of Doppler radar for its inability to forecast rainfall when there is already available satellite data via the Internet that, though regional, “contains such timely rain forecasts.”

He noted as example data from NASA’s [Tropical Rainfall Measuring Mission Satellite](#) [14] which shows real time 3 hourly and 7 day rainfall.

Communication gap

Better coordination between dam managers, weather forecasters and local government leaders could have also helped minimize casualties from floods brought on by dams.

Gana said that they exhausted all means possible to disseminate warning.

However, it seems that the manner at which the advisory was released failed to communicate a sense of urgency.

The written advisory issued by the NAPOCOR last October 6 did not alarm officials and residents, said Butch Velasco, a representative of the Pangasinan Provincial Disaster Coordinating Council.

The advisory read: “October 6, 2009: The San Roque Reservoir is expected to reach the spilling level due to large inflows brought about by typhoon Pepeng. In anticipation of this, the San Roque dam will open 1 of its spillway gates of 1 meter for 24 hours. This is to draw down the reservoir water level while maintaining also the stability of the dam. Please disseminate that due to the release of water, the water level inflow in the Agno River is expected to rise.”

Velasco, however, said that Tony Calaycay, community relations officer of NAPOCOR in the San Roque dam, told PDCC officials in its first warning that residents will be safe.

Source: Pagasa flood forecasting branch

There should also be an emergency task force for every barangay or even in every street.

"If you have your own information, you don't have to wait for anybody," he said. If the gauges read that there is 8 mm of rain per hour that means that there would be floods; if you are living in high areas, there might be landslide, he said.

Each flood prone barangay should also invest in jetskis and allow residents to build five story houses. "Floods will come, we just have to be prepared," he said.

Hazard mapping, the geologists stressed, is also very important. People already know where hazards are in their locales, Ramos noted. Where there are natural hazards, no build zones should be strictly enforced.

"They think that nature forgets. They try to erase traces of rivers, esteros and faultlines by building over them," Ramos said. "But if there is so much rain, the river will reclaim its old channel."

Lesson in humility

Even ordinary citizens have roles to play. "They should start thinking about where they build houses and where they throw garbage," Ramos said.

A former Baguio city resident, he cited the area in the city that got flooded during Pepeng's onslaught. That place, he said, is a depression that is surrounded by limestone rocks. The area, he said, used to be drained by a sink hole that is connected to an underground river. "At some point in time, people used it as a garbage dump. That is why it got clogged and that is why it got flooded."

The best lesson that can be learned from the disasters, Ramos said, is the need for humility. "We need humility in government officials so that they will use available information in the international community such as satellites for better forecasting. And we need humility to accept that nature has to be respected and given its own space." – **abs-cbnNEWS.com/ Newsbreak**

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