

= Typhoon Imbudo =

Typhoon Imbudo , known in the Philippines as Typhoon Harurot , was a powerful typhoon that struck the Philippines and southern China in July 2003 . The seventh named storm and fourth typhoon of the season , Imbudo formed on July 15 to the east of the Philippines . The storm moved generally west @-@ northward for much of its duration due to a ridge to the north . Favorable conditions allowed Imbudo to intensify , gradually at first before undergoing rapid deepening on July 19 . After reaching typhoon status , Imbudo strengthened further to peak 10 ? minute sustained winds of 165 km / h (105 mph) on July 20 . The typhoon made landfall on northern Luzon near peak intensity on July 22 , but quickly weakened over land . Once in the South China Sea , Imbudo re @-@ intensified slightly before making its final landfall in southern China near Yangjiang on July 24 , dissipating the next day .

In the Philippines , Imbudo was the strongest typhoon in five years , causing widespread flooding and power outages in the Cagayan Valley for weeks . Damage was heaviest in Isabela province near where the storm struck . Most of the banana crop was destroyed , and other crops sustained similar but lesser damage . Imbudo disrupted transportation across much of Luzon . Nationwide , the storm damaged or destroyed 62 @,@ 314 houses , causing P4.7 billion (PHP , \$ 86 million USD) in damage , mostly in the Cagayan Valley . There were also 64 deaths in the country . In Hong Kong , strong winds killed a man after knocking him off a platform . In China , damage was heaviest in Guangdong where the storm struck . Thousands of trees fell , and 595 @,@ 000 houses were wrecked . Hundreds of canceled flights stranded travelers across the region . In Guangxi , high rainfall increased water levels in 45 reservoirs to warning levels . In Guangxi and Guangdong , collectively 20 people were killed , and damage reached about ¥ 4 @.@ 45 billion (CNY , \$ 297 million USD) .

= = Meteorological history = =

The origins of Imbudo were from a disorganized area of convection near Chuuk in the open western Pacific in mid @-@ July . With weak wind shear , the system slowly became better organized . On July 15 , the Japan Meteorological Agency (JMA) estimated that a tropical depression formed . The next day , the Joint Typhoon Warning Center (JTWC) issued a tropical cyclone formation alert (TCFA) , noting that outflow had increased due to an upper @-@ level low to the northeast . At 1800 UTC on July 16 , the JTWC initiated advisories on Tropical Depression 09W about 665 km (415 mi) east of Yap . A subtropical ridge near Okinawa steered the nascent depression to the west @-@ northwest for much of its duration . With warm waters and favorable upper @-@ level conditions , the depression quickly organized , and the JMA upgraded it to Tropical Storm Imbudo on July 17 .

After becoming a tropical storm , Imbudo passed about 35 km (20 mi) north of Yap . The JMA upgraded Imbudo to a severe tropical storm late on July 18 , around the same time that the JTWC upgraded it to a typhoon . An increase in outflow to the south and to the north from a tropical upper tropospheric trough (TUTT) caused a 36 ? hour period of rapid development beginning on July 19 . During that time , the JMA upgraded Imbudo to typhoon status , the Philippine Atmospheric , Geophysical and Astronomical Services Administration (PAGASA) began issuing advisories as the storm approached the Philippines , and a 30 km (20 mi) wide eye formed . At 1200 UTC on July 20 , the JMA estimated peak 10 minute sustained winds of 165 km / h (105 mph) . At the same time , the JTWC estimated 1 minute sustained winds of 240 km / h (150 mph) , making it a super typhoon . By late on July 20 , the typhoon had developed concentric eyewalls , and the TUTT was moving away , thus diminishing outflow . Imbudo maintained peak winds for about 12 hours , before the innermost eye contracted to a diameter of 11 km (7 mi) in the midst of an eyewall replacement cycle . At 0300 UTC on July 22 , Imbudo struck northern Luzon , with 1 minute winds estimated at 205 km / h (125 mph) by the JTWC .

Rapidly weakening over land , Imbudo emerged into the South China Sea about six hours after landfall . The JTWC estimated winds had decreased to 150 km / h (90 mph) , although the agency estimated Imbudo quickly re @-@ intensified to a secondary peak of 165 km / h (105 mph) in 1

minute winds . Dry air prevented convection from redeveloping significantly , and the eye had become large over open waters . At 0300 UTC on July 24 , Imbudo made its final landfall west of Macau , near Yangjiang , Guangdong . It was the strongest to hit the province since Typhoon Sally in 1996 , striking China with 10 minute winds of 140 km / h (85 mph) , as estimated by the JMA . The storm rapidly weakened over land while moving over southern China . Late on July 25 , Imbudo dissipated near the border of China and Vietnam .

= = Preparations = =

Before Imbudo struck , officials evacuated over 14 @, @ 000 people to at least 60 shelters . Government offices were closed along the typhoon 's path , and schools were closed in the capital , Manila . PAGASA issued a number 4 warning signal , the highest level , for three northern provinces , indicating the imminent threat of a powerful storm . Despite the warning , a post @-@ storm survey in Isabela province indicated that 34 % were unaware of the storm 's arrival , while others believed the typhoon would not be as strong . In Manila , four flights were canceled at Ninoy Aquino International Airport , and the Manila Light Rail Transit System was shut down for two hours . Travel by ship and bus were halted in some areas . On July 22 before the storm struck , the Philippine military was put on red alert , increasing security at the presidential palace . The military stated it was due to the typhoon , although newspapers suggested it was to prevent a coup attempt ; a failed coup ultimately did occur on July 27 in what would become known as the Oakwood mutiny .

The Hong Kong Observatory issued a number 8 warning signal , indicating the potential for gale force winds within the territory . At Hong Kong International Airport , at least 100 flights were canceled or delayed . Most ferry and some bus lines were temporarily suspended . The threat of the storm caused 16 flights to be canceled and another 54 delayed at Guangzhou Baiyun International Airport . On Hainan island , 32 canceled flights stranded about 1 @, @ 500 travelers . The threat of the storm forced British Prime Minister Tony Blair to shorten a trip to the territory . The Hong Kong Stock Exchange opened 30 minutes late as a result of the typhoon . On the mainland at Yangjiang , more than 30 @, @ 000 people evacuated ahead of the storm .

= = Impact = =

= = = Philippines = = =

Typhoon Imbudo was the strongest typhoon to strike Luzon since Typhoon Zeb five years prior , and was the fifth storm in eight weeks to affect the country . The typhoon left widespread areas flooded for several days . Cagayan Valley was largely isolated after a bridge was damaged in Ilocos Norte . Damage was heavy in the region , totaling P2.2 billion (PHP , \$ 40 million USD) , and over 80 @, @ 000 people were displaced by the storm . Damage was heaviest in Isabela , where damage was estimated at P1.9 billion (PHP , \$ 35 million USD) , mostly to crops and killed livestock . There , winds and rain knocked down trees and caused a province @-@ wide power outage . Most trees less than three years old fell during the high winds . In Isabela province , the banana crop was almost entirely destroyed , and most of the corn and rice crops were heavily damaged . The high damage caused the gross regional product , or overall economy of the Cagayan Valley , to decrease by 0 @. @ 3 % than what would have happened without the typhoon .

Power outages affected Metro Manila , and several billboards were damaged in the city , although there was minimal flooding in the capital . Adverse conditions caused the Manila Light Rail Transit System Line 1 to close for two hours , stranding hundreds . High winds knocked over a 12 m (40 ft) tree that killed five on Romblon Island . The rains brought the Magat Dam on Luzon to capacity . Landslides blocked a national highway in Nueva Ecija with debris and fallen trees , which were quickly cleared within a few days . On Mindanao , flash flooding from the outer periphery of the storm affected 18 towns , killing 11 people . In Maguindanao in the southern Philippines , flooding washed away 50 houses , forcing over 2 @, @ 000 people to evacuate . Damage extended as far

south as the Western Visayas . Across the Philippines , Imbudo damaged 62 @, @ 314 houses , of which about 20 % were destroyed . Housing damage was estimated at P1.2 billion (PHP , \$ 22 million USD) , most of which in the Cagayan Valley . Overall damage in the country was estimated at about P4.7 billion (PHP , \$ 86 million USD) . Of the total , about P1.9 billion (PHP , \$ 35 million USD) was in agriculture damage . Imbudo killed 64 people in the Philippines , mostly in Cagayan Valley , and injured another 154 .

= = = Elsewhere = = =

Early in its developmental stages , Imbudo affected portions of Micronesia , particularly Ulithi . There , a weather station measured a peak wind gust of 85 km / h (53 mph) ; winds of similar intensity were reported in Yap . Rainfall from Imbudo in Micronesia peaked at 226 mm (8 @. @ 89 in) over a six @- @ hour period on Yap . The rainfall from the passing tropical cyclone caused \$ 75 @, @ 000 in property damage and \$ 25 @, @ 000 in agricultural and crop @- @ related damage .

Before Imbudo struck mainland China , it passed south of Taiwan , dropping heavy rainfall reaching 137 mm (5 @. @ 4 in) in Taitung County . The outer rainbands reached as far as Okinawa , where 2 mm (0 @. @ 079 in) was reported .

Peak rainfall in Hong Kong was 53 @. @ 5 mm (2 @. @ 11 in) at Kwai Chung , only a day after Tropical Storm Koni dropped rainfall in the territory , and the highest storm surge was 1 @. @ 13 m (3 @. @ 7 ft) at Tsim Bei Tsui . As the storm passed to the south , Imbudo produced winds of 101 km / h (63 mph) on Cheung Chau , the highest in the Hong Kong territory , although a gust of 164 km / h (102 mph) was observed at Tai Mo Shan . High winds killed a man after knocking him off a platform . The winds knocked down 83 trees , injuring 11 people . Rough waves injured 34 people traveling by boat near Lantau Island . In the territory , ten boats were damaged or sank , and one fishing pier was damaged .

At its final landfall in Guangdong , Imbudo produced strong winds , with a peak gust of 200 km / h (124 mph) measured at Shangchuan Island . At Yangjiang , gusts reached 159 km / h (99 mph) , causing eleven boats to sink . There , over 10 @, @ 000 trees fell due to the strong winds , more than half in the city , and 7 @, @ 649 homes were damaged or destroyed . In Zhanjiang , the storm damaged power lines and water pumps , leaving residents without access to water . Imbudo spawned tornadoes in Luoding and Zhanjiang , damaging dozens of houses and killing 6 @, @ 000 chickens . Throughout Guangdong , Imbudo destroyed 595 @, @ 000 houses and caused ¥ 1 @. @ 9 billion (CNY , \$ 230 million USD) . There were at least eight deaths in the province .

In Hainan island to the south of the storm track , rainfall reached 230 mm (9 @. @ 1 in) in Ding 'an County . Imbudo caused flooding in the capital Haikou , and several houses were wrecked . The typhoon affected most of the population , causing an estimated ¥ 55 @. @ 35 million (CNY , \$ 6 @. @ 7 million USD) in damage . Heavy rainfall spread across southern China , peaking at 343 mm (13 @. @ 5 in) at Hepu County in Guangxi province , which increased water levels in 45 reservoirs to warning levels . The Nanliu River in Bobai County rose to 50 @. @ 21 m (164 @. @ 7 ft) , or 0 @. @ 71 m (2 @. @ 3 ft) above flood stage . In Guangxi , 12 people died from storm damage or drowning , and at least 130 livestock were killed . Imbudo destroyed 4 @, @ 950 houses , 3 @, @ 170 of which in the city of Yulin , causing ¥ 499 @. @ 6 million (CNY , \$ 60 @. @ 3 million USD) in damage in the province . Across southern China , the typhoon damaged over 10 million hectares (25 million acres) of crop fields .

= = Aftermath = =

Immediately after the storm , the Philippine Air Force were mobilized to help deliver supplies and aid in search and rescue missions . On July 24 , President Gloria Macapagal @- @ Arroyo declared that the National Disaster Coordinating Council would provide assistance to citizens affected by the typhoon . The president requested P134 million (PHP , \$ 2 @. @ 5 million USD) for farmers to buy new seeds , and P35 million (PHP , \$ 650 @, @ 000 USD) to rebuild the hard @- @ hit Cagayan Valley , where Arroyo visited days after the storm struck . The government ultimately spent about

P24 million (PHP , \$ 435 @,@ 000 USD) in emergency aid for relocating storm victims , search and rescue operations , and assistance . In Mindanao , officials prepared 800 bags of rice and various other food supplies due to the storm . Power and water outages persisted across Luzon for up to three weeks , causing many factories otherwise undamaged to close . In Isabela province , 25 Tzu Chi volunteers provided supplies to 2 @,@ 873 houses . The Philippine government provided rice , sardines , and coffee to many affected houses . Damaged houses were supposed to receive 1 @,@ 000 pesos , although few received the monetary aid . In the town of San Mariano in Isabela province , most farmers incurred more debt and continued their same general farming practice , despite sustaining heavy losses from the storm .

In 2004 , the World Meteorological Organization retired the name Imbudo and replaced it with Molave . The PAGASA name Harurot was replaced with Hanna for the 2007 season .