



Counting The Cost 2022

A year of climate breakdown

December 2022



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Introduction

- Economic impacts are always higher in absolute terms in high income countries - the economic value of infrastructure and homes tends to be higher, living costs are greater and more is covered by insurance - and therefore calculable - in financial terms. On the other hand, the death toll is usually higher in poorer countries.
- Most of these figures are estimates of insured losses. The real cost is always higher and includes elements which are harder to quantify (eg losses in crop production, delays in trading). As we see more climate impacts, researchers are trying to understand how to measure and address 'non-economic' losses from lost school years to lost or damaged culture.
- The first table below shows the 10 biggest climate events by financial cost, based on available data. The second table summarises impacts from other climate events which are significant but where cost data is either lower due to the market conditions or harder to estimate.
- It is important to note that the impacts and costs of climate events fall disproportionately on those living in poverty in lower income countries. This is because they will have fewer assets, less insurance and generally poorer access to comprehensive public services. This makes the recent decision at COP27 to establish a Loss and Damage fund vital - so that the economic impacts of such losses can be addressed. But the fund needs to be activated and provided with sufficient money.¹
- Even with more ambitious mitigation actions - sadly not agreed at COP27 - there will be more intense and frequent weather events in coming years and decades. These will entail higher costs. It is therefore vital that countries agree to limit global heating to 1.5C maximum as per the Paris Agreement, adapt to climate change - particularly through finance and other support to those vulnerable to significant climate impacts in lower income countries - and work out how to address climate Loss and Damage. The agreement to have a fund is a positive starting point but as our analysis shows, people around the world are already experiencing financial fallout from climate impacts and should have access to funding to get back on their feet now.

Recommendations:

- To prevent further disasters, countries must urgently cut greenhouse gas emissions. Very few countries have sufficiently ambitious plans and even fewer are on track to meet their goals. Urgent implementation must be a top political priority.
- Richer countries need to provide more funding to support vulnerable communities living in poorer countries to help them adapt and build resilience to the impacts of climate change. These countries have done the least to cause the climate crisis but suffer its effects disproportionately.
- Following the historic agreement at COP27 to establish a Loss & Damage fund, governments need to work out how the fund will be governed and who will contribute funding and at what levels. The 'polluter pays' principle should be the cornerstone.
- The new Loss and Damage fund needs to provide money to those affected by climate impacts. Governments need to recognise that insurance approaches - including the Global Shield - will never represent a holistic approach to dealing with Loss and Damage.
- All governments must invest in the energy transition to renewables. Richer countries should support developing countries so they can leapfrog the fossil fuelled development path taken by richer nations. Poor consumers need to be protected to make energy transitions just and sustainable.

Date	Event	Type	Location	Deaths	Displaced	Cost (USD)
MOST EXPENSIVE						
14-19 Feb	Storm Eunice	Extratropical cyclone	Belgium, Germany, Ireland, Netherlands, Poland and the UK	16		+4.3 billion
23 Feb to 31 Mar	East Australia floods	Floods	Australia	27	60,000+	+7.5 billion
8 to 15 Apr	KwaZulu Natal & Eastern Cape floods	Floods	South Africa	459	40,000+	+3.0 billion
14 June to Sept	Pakistan floods	Floods	Pakistan	1,739	7.0 million	+5.6 billion
June to September	China floods	Floods	China	0	239	+12.3 billion
June to Sept	European drought	Drought	Europe			+20 billion
14 to 28 Sept	Hurricane Fiona	Tropical cyclone	Caribbean, Canada	+25	13,000	+3 billion
23 Sept - 2 Oct	Hurricane Ian	Tropical cyclone	Cuba, US	130	+40,000	+100 billion
All year	Brazil drought	Drought	Brazil	0	0	+4 billion
All year	China drought	Drought	China	0	0	+8.4 billion
OTHER NOTEWORTHY EVENTS						
16 Dec-19 Jan	Malaysian floods	Tropical depression	Malaysia	54	70,000	
22 Jan-5 Feb	Back-to-back storms in Southeast Africa	Tropical storms and tropical cyclones	Madagascar, Mozambique & Malawi	366		
20 Jan-16 March	Tierra del Fuego wildfire	Wildfire	Chile	0	0	
15 Feb	Petropolis floods	Floods	Brazil	231	1,400	
18 March	Arctic & Antarctic heatwaves	Heatwave	Arctic & Antarctic regions			
March and Apr	India & Pakistan heatwave	Heatwave	India & Pakistan	90 reported (the real figure is probably orders of magnitude higher)		
Oct	West Africa floods	Floods	Mali, Cameroon, Nigeria & Niger	+600	1.3 million	
Oct	Cyclone Sitrang	Tropical cyclone	Bangladesh	35	1 million	
Oct	Tropical Storm Nalgae	Tropical storm	Philippines	162	850,000	
All year	Horn of Africa drought	Drought	Somalia, Ethiopia, Kenya		36m people 'affected' according to OCHA	

Most expensive climate disasters of 2022

Here are the ten most expensive climate disasters of 2022 in chronological order, as defined by their cost in dollars. This list leans towards high income countries which often contain infrastructure and homes with greater economic financial value and more of it covered by insurance.

1: Storm Eunice, Europe



In February, a strong extratropical cyclone named Eunice hit northern and central Europe. The storm caused large material damages in Belgium, Germany, Ireland, Netherlands, Poland and the UK, and killed at least 16 people.²

In the UK, the winds of Eunice set a new speed record, of 122 miles per hour (196.3 km/h).³ The damage caused by the wind and the rain left tens of thousands without electricity.⁴ Flights and ferries across the Channel were cancelled or delayed.⁵ In Germany, where the storm was called Zeynep, long-distance and regional train services had to be interrupted in the north of the country.⁶

Climate change causes the atmosphere to be warmer, which allows it to retain more water, leading to more intense downpours.⁷ Also, as the planet warms, the probability of strong cyclones occurring outside tropical areas increases. The latest IPCC report notes that extratropical storms are shifting polewards (Chapter 11)⁸, meaning they can now happen in places increasingly distant from the equator. A preprint study released this year suggests that while the total number of extratropical cyclones will decrease by 5% by the end of the century, the number of extreme cyclones will increase by 4% in the northern hemisphere winter⁹, meaning there will be fewer cyclones but more intense. Another study estimates that the rainfall associated with extratropical cyclones in Europe could increase by almost 20% if greenhouse gas emissions are not reduced.¹⁰

The European Union is responsible for around 18% of all human-caused greenhouse gases in the atmosphere.¹¹ The region has pledged to reach net-zero emissions by 2050, but according to Climate Action Tracker, their current climate plans are “insufficient”.¹²

2: East Australia flooding

Between late February and early April, intense rains caused floods over large parts of Eastern Australia.

In March, the regions of southern Queensland and northern New South Wales received in a week a year's worth of rainfall.¹³ And in early April, Sydney experienced a massive rainfall event, receiving a month's worth of rainfall in a single day.¹⁴

Brisbane, Queensland's capital, received 800mm of rain in three days¹⁵, breaking the previous 1974 record of 600mm.¹⁶ In southern Queensland, more than 20,000 houses and businesses were flooded.¹⁷ In New South Wales, more than 40,000 people had to be evacuated.¹⁸

The Millennium Dome and o2 Arena damaged by the high winds on storm Eunice. Close up view of the damage. London - 19th February 2022

Brisbane, Australia - Feb 27, 2022: Roads flooded and car under water after the heavy rain in West End suburb, flood



A study published last year, when similar floods affected the region, notes that conditions leading to these kind of intense precipitation events will become up to 80% more likely by the end of the century if carbon emissions are not reduced to keep global temperature within the goals of the Paris agreement.¹⁹

Australia's climate targets are rated as "insufficient" to meet the Paris Agreement by Climate Action Tracker²⁰. Its energy sector still relies heavily on fossil fuels, with 54% of the country's electricity coming from coal-fired power stations. Australia is also by far the world's biggest exporter of coal²¹ and liquefied natural gas.²² Coal is the fuel that contributes the most to global warming and gas is mostly made of methane, one of the most powerful greenhouse gases, meaning even small leaks can have a great impact on global warming.²³

3: KwaZulu-Natal and Eastern Cape floods

In April, several days of intense rainfall caused floods and landslides in different parts of South Africa. On April 18, president Cyril Ramaphosa declared a national state of disaster. The most affected regions were KwaZulu-Natal and Eastern Cape, in the southeast of the country. At least 459 were killed and more than 40,000 people were displaced.²⁴

The floods forced the closure of the Durban port, one of the most important on the continent. The disruption affected the supply chain of many industries in places as far as China. The port is a hub for African exports like metal and agricultural commodities, and imports such as fuel.

Local industries were also affected. Around 45,000 new cars at the Toyota factory in Prospecton, an industrial area near Durban, were damaged by the floods and had to be scrapped.

Santam, one of the country's largest insurance companies, said the floods were "by far the largest natural catastrophe that our company has faced in over 104 years".²⁵

A study on the floods conducted by the World Weather Attribution group concluded that greenhouse gases and aerosol emissions were partly responsible for the increases in rainfall observed in the region.²⁶

South Africa is Africa's largest greenhouse gas emitter,²⁷ mostly due to its large reliance on coal, the most polluting fossil fuel. The country has pledged to peak emissions between 2020 and 2025. Its climate targets, as per the Paris Agreement, are currently rated as "insufficient" by Climate Action Tracker.²⁸

The Dutch Reformed Church during a flood in the town of Bushmans River in the Eastern Cape of South Africa.



4: Pakistan floods



From mid-June to the end of August, Pakistan experienced very intense rainfall, coincident with the monsoon season. The month of August was the wettest since 1961. Rainfall that month was 37% higher than the average for the whole monsoon season.²⁹ As a result of these intense rains, large parts of the country were underwater.

Pakistan's Prime Minister Shehbaz Sharif said: "For 40 days and 40 nights, a biblical flood poured down on us, smashing centuries of weather records, challenging everything we knew about disaster and how to manage it."³⁰

The floods killed 1.1 million livestock and destroyed an estimated area of 9.4 million acres of crops.³¹ The World Bank estimated that the floods could drive up to 15 million people into poverty³². Pakistan is the 8th most vulnerable country due to climate change, according to the 2021 Global Climate Risk Index.³³

While insured losses were estimated by AON at \$5.6 billion, the total economic losses were much larger.³⁴ An assessment by the World Bank concluded that the damages from the floods and the economic losses exceeded \$30 billion, and that the country needs more than \$16 billion for its reconstruction.³⁵

A study conducted by the World Weather Attribution group concluded that climate change likely increased the abnormally high monsoon rain over Pakistan that led to the floods.³⁶

Pakistan has only contributed about 0.3% of all the greenhouse gas emissions³⁷. The country updated its climate targets in 2021, pledging to reduce by 50% its projected emissions by 2050, provided the country receives international funding.³⁸

Destruction due to stagnant rainwater causing of poor sewerage system creating problem for commuters and residents after flood flowed in area on July 26 2022 in Hyderabad

5: China floods

During China's 2022 rainy season, many parts of the country experienced intense floods leading to large economic and human losses. Insured damages passed the \$12 billion mark and there were at least 239 casualties.

In June, floods in the southern province of Guangdong affected almost half a million people, impacting the industrial city of Shaoguan, where factories had to halt production. Water levels in the region reached a 50-year high.

In July, flash floods in the provinces of Sichuan, in the southwest of the country, and Gansu, in the central north region, forced authorities to evacuate thousands of people. In the city of Lognan, in Gansu, rainfall in two days was almost double that the July average.

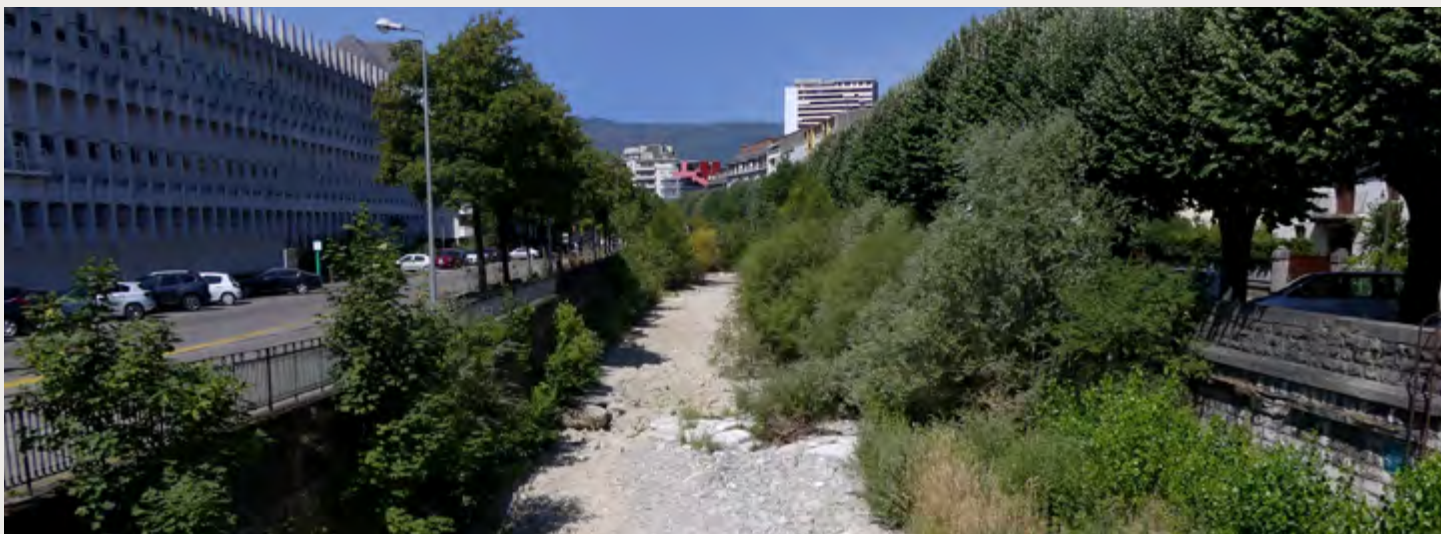
Flooded Han River, August 2022



In August, destructive rains were reported across the country, including the northwest province of Qinghai, the northern province of Shanxi, the southwest province of Sichuan and the northeast province of Heilongjiang. Floods and landslides caused by the heavy rain left dozens of dead and destroyed houses and roads.

As the planet warms due to climate change, a greater proportion of China's rain will fall as more concentrated downpours³⁹. Also, a 2016 study found that China is the country with the highest risk of floods in the world - a situation that will worsen if carbon emissions continue to rise unchecked.⁴⁰

6: European drought



High temperatures and drought conditions affected large parts of Europe during the 2022 summer months causing wildfires, agricultural losses and more than 20,000 excess deaths.⁴¹

This summer was the hottest on record in Europe.⁴² Temperature records were set in weather stations across Europe, including Portugal (Pinhão, 47.0°C), Spain (Pamplona, 42.3°C) and Scotland (Floors Castle, 35.1°C).⁴³

In the UK, temperatures passed the 40°C mark for the first time ever, a milestone that would have been “extremely unlikely” without human-induced climate change, according to an attribution study conducted by the World Weather Attribution group.⁴⁴

Low water levels in European rivers, including Germany's Rhine, France's Loire and Italy's Po, reduced agricultural production, affected the activity of energy plants and caused disruption in shipping. In parts of Spain, water reservoirs were at 30% of their 10-year mean levels.

The drought reduced the yields of many harvests, driving up prices. Animal-derived products such as meat and milk were also affected, increasing their prices by about 12%.⁴⁵

The contribution of climate change to the drought was analysed and quantified by the World Weather Attribution group, which estimated that climate change made the 2022 summer drought in West Central Europe 3-6 times more likely.⁴⁶

The European Union is responsible for around 18% of all human-caused greenhouse gases in the atmosphere.⁴⁷ The region has pledged to reach net-zero emissions by 2050, but according to Climate Action Tracker, their current climate plans are “insufficient”.⁴⁸

Sight, during the drought of July 2022, of Leysse dry river at the east of Chambéry, Savoie, France.

7: Hurricane Fiona, Caribbean, Canada



On 18 September, Hurricane Fiona hit Puerto Rico, leaving 90% of the island without electricity⁴⁹ and killing eight people. Fiona then impacted the Dominican Republic, where 13,000 people were displaced, 40,000 people were affected by power outages and nearly 1.2 million people experienced water supply issues. It later moved to the Turks and Caicos islands, reaching Category 4 before hitting Bermuda and moving towards Canada.

Hurricane Fiona was the most intense tropical cyclone ever to hit Canada, with winds of over 187 kilometres per hour. The hurricane caused an intense storm surge, with waves 12 metres tall. Hundreds of thousands of people were left without power in Nova Scotia and other regions.

Insurance companies said Hurricane Fiona was the costliest extreme weather event ever in Atlantic Canada and one of the 10 most expensive disasters in Canadian history⁵⁰.

Climate change is making tropical cyclones carry more water.⁵¹ A study published this year estimated that human-induced climate change increased the extreme 3-hourly storm rainfall rates of hurricanes during the 2020 Atlantic hurricane season by 11%.⁵²

According to analysis by Carbon Brief, Canada has contributed around 2.6% of all carbon emissions, making the country one of the ten top cumulative emitters.⁵³ Considering its relatively small population, Canada is among the worst carbon polluters on a per capita basis. The country's current emission reduction targets are considered "highly insufficient" by Climate Action Tracker.⁵⁴

Caribbean nations, on the other hand, have contributed little to global warming, but are some of the most vulnerable to the impacts of climate change.

8: Hurricane Ian, Cuba, USA

On September 26, Hurricane Ian made landfall in western Cuba as a Category 3 storm, bringing heavy rains and dangerous storm surges. Three people died and more than 30,000 had to be evacuated. Two days later, the storm became more intense and reached southwestern Florida as a Category 4 storm, with winds over 150 mph (241 km/h) - tying the record for the fifth-strongest hurricane to hit the US ever.

With at least 130 casualties, Hurricane Ian was the second-deadliest hurricane in mainland US in the 21st Century, second only to Hurricane Katrina⁵⁵, the deadliest in Florida since 1935, and the costliest in Florida since 1992. More than 40,000 people were displaced.

An aircrew from Coast Guard Air Station Borinquen conduct an overflight of Puerto Rico in the aftermath of Hurricane Fiona. The Coast Guard is using flights like this to assess safe port conditions and pollution concerns left in the wake of the storm. (U.S. Coast Guard photo)

Hurricane Ian Response 2022
Florida Fish and Wildlife's Division of Law Enforcement responded to areas of the state hardest hit by Hurricane Ian; late-September and early-October 2022.



Just before making landfall, Hurricane Ian underwent rapid intensification, a process by which tropical cyclones gain wind speed and strength in relatively short periods of time, and which is becoming more frequent due to climate change.⁵⁶ In the Atlantic basin, research found that for the 5% most intense storms, 24-hour intensification rates are now about 10 mph (16 km/h) stronger than they were 30 years earlier.

There has been an increase in the number of named storms in the Atlantic ocean since 1980⁵⁷. Also, climate change is causing tropical storms to have stronger winds and cause more intense downpours.⁵⁸

The US is the largest cumulative greenhouse gas emitter and thus the country that has contributed the most to global warming. The country temporarily withdrew from the Paris Agreement, but re-joined after the election of president Joe Biden. Despite having pledged to reach net-zero emissions by 2050, the country's current emission targets are considered "Insufficient" by Climate Action Tracker.⁵⁹

9: Brazil drought



Lack of rain and high temperatures have caused large agricultural losses in Brazil this year. Brazil is one of the world's breadbaskets and agriculture amounts to nearly 7% of the country's annual GDP. It is a top-5 producer of 34 commodities and the world's largest net agricultural exporter⁶⁰. This is the third consecutive dry year in the country, meaning some of the impacts are cumulative.⁶¹

During the first quarter of the year, Brazil's agriculture GDP dropped 8%, largely driven down by poor harvests of soy and corn caused by drought. Coffee yields were also impacted and are expected to be the lowest since 2014 - Brazil being the world's largest coffee beans producer.⁶²

The most affected states by the drought are the main agricultural producers, namely Mato Grosso do Sul, Paraná, Rio Grande do Sul and Santa Catarina. In this last state, 42% of the municipalities declared a state of emergency due to lack of water. The lack of rains has also caused economic damage in other parts of the country. In the North, low water levels in the Amazon river and its tributaries in the second half of the year put several municipalities on alert, disrupting fishing and other activities. Drought has also affected energy production in the country. Brazil relies heavily on hydropower, which is responsible for about two thirds of the country's electricity generation.⁶³

Low level of water is measured by a gauge at the Cantareira Jaguari dam during a severe drought in Sao Paulo state, Brazil.

Dry conditions in Brazil are linked to La Niña, a meteorological, cyclical, atmospheric phenomenon that affects climate conditions in many parts of the world, including South America. The world has experienced three consecutive La Niña years, an unusual coincidence that has caused massive economic losses in Brazil and Argentina.

However, human-induced causes are also partly responsible for the drought. Deforestation in the Amazon forest has been linked to reduced rains in other parts of the continent due to the disruption of the so-called “flying rivers” - humid air currents that transport humidity from the Atlantic ocean to Argentina, Paraguay and central Brazil.⁶⁴

Climate change can also contribute to drought by driving up global temperatures and altering rainfall patterns. A recent report by the United Nations noted that human-induced climate change is increasing the risk of drought and could force 216 million people across the world to migrate by 2050 due to reduced crop productivity, water scarcity and other climate impacts.⁶⁵

While Brazil's fossil fuel consumption is relatively low for the size of the country and population, the country is the fourth largest contributor to total greenhouse gas emissions in the atmosphere due to its historical high rates of deforestation.⁶⁶

According to Climate Action Tracker, Brazil's current climate targets are “insufficient” to keep global temperatures within the Paris agreement⁶⁷.

10: China drought

Throughout the year, high temperatures and scarce rains have put large parts of China under dry conditions. Low levels in the Yangtze river, China's largest river, have affected hydropower generation and halted shipping. The city of Sichuan, which gets around 80% of its energy from hydroelectric power, had to limit or suspend power supply to local factories, as well as rationing public electricity. And in central China, the province of Jiangxi declared a water supply “red alert” for the first time ever, as the water levels of the nearby Poyang Lake reached record low levels. Rainfall in the region between July and August was 60% lower than last year.

A report⁶⁸ published last November by Rice University's Baker Institute for Public Policy warned that the drought in China “could have devastating consequences for global food security, energy markets and supply chains”.⁶⁹

A study published this year by the World Weather Attribution group noted that climate change played a role in the 2022 drought in Northern Hemisphere, including China. The analysis estimated that human-induced climate change made the drought 5-20 times more likely.⁷⁰

China is the world's most populous country and currently the world's largest emitter. Its climate targets are classified as “highly insufficient” to meet the Paris Agreement by Climate Action Tracker.⁷¹ The country has committed to peak its greenhouse gas emissions by 2030 and to become carbon neutral by 2060.

Other notable climate disasters of 2022

Climate change affects the world in different ways, with many of the most harmful impacts not registering on the top 10 list for economic damage.. Here we list 10 other notable disasters which may not have got the same headlines but are devastating lives around the world.

A) Malaysian floods

Starting in late 2021 and lasting until 19 January, extreme rainfall hit parts of Malaysia, causing at least 54 deaths and forcing more than 120,000 to leave their homes. Tropical depression 29 brought more than 300 mm of rain in 48 hours to the city of Kuantan, in Pahang State, and 229.8 mm of rain in 24 hours to Mersing, in Johor.⁷²

The ministry's secretary general, Zini Ujang described the episode of massive rainfall as a 1-in-100 year event. Some weather stations in Kuala Lumpur received in a single day more rain than the usual average for the whole month⁷³.

The government has estimated that the total losses from the floods amount to \$1.46 billion, with most of the economic damage located in Selangor, the country's richest state.

As the planet warms, the atmosphere is able to accumulate more water, which can lead to more intense downpours.⁷⁴ Also, tropical cyclones and tropical storms are becoming more intense due to climate change.⁷⁵



A flooded area in Klang during the January 2022 Malaysian floods.

B) Back-to-back storms in Southeast Africa

In early 2022, Madagascar, Mozambique, Malawi and other neighbouring countries experienced severe flooding after a series of extreme back-to-back rainfall events that hit the region.

On January 22nd, Tropical Storm Ana formed in the Indian Ocean and moved towards Southeast Africa, hitting Madagascar, Malawi and Mozambique. Just a few days later, on February 5th, Tropical Cyclone Batsirai made landfall in Madagascar, impacting the districts of Nosy Varika, Mananjary and Manakara with wind gusts of up to 230 km/h. Over the following weeks, the region was also hit by Tropical Storm Dumako (February 14th), Tropical Cyclone Emnati (February 22nd) and Tropical Cyclone Gombe (March 7th).

The consecutive storms caused enormous human and material losses. Extreme rainfall, landslides and floods killed around 366 people and destroyed houses, schools and infrastructure, with economic losses amounting to \$300 million in a region that is already extremely vulnerable to extreme weather events.

A study conducted by the World Weather Attribution group concluded that climate change increased the amount of rainfall associated with the storms, contributing to the damage they caused.⁷⁶



Tanker Tresta Star stranded on lava shore in Reunion island after Batsirai hurricane

C) Tierra del Fuego wildfire, Chile

Starting in January, wildfires destroyed more than 1,200 hectares in Tierra del Fuego, Chile, in the southernmost tip of the American continent. The fire started in the municipality of Timaukel and threatened the Karukinka Natural Park, a protected area located in the island of Tierra del Fuego, in Patagonia.

Tierra del Fuego is home to some of the world's largest concentration of peatlands, a type of wetlands which are rich in carbon. Preserving the integrity of peatlands is critical for the future of the planet.⁷⁷ They take up large amounts of carbon from the atmosphere, contributing to mitigating climate change. However, when they are damaged or destroyed, all the accumulated carbon is released back into the atmosphere, further contributing to global warming. Peatlands are the largest natural terrestrial carbon store, and despite representing only 3% of the land coverage, they accumulate 44% of all the carbon in the soil.⁷⁸

D) Petropolis, Brazil floods

On February 15, extreme rainfall fell in the city of Petropolis, in the southeast Brazilian state of Rio de Janeiro. The city received 260mm of rain in six hours, 20mm more than the average monthly rainfall for February. The massive rains led to flash floods and landslides. 231 people were killed, including 44 children.

A preprint study noted that the average rainfall for Petropolis in February 2022 was the highest on record since 1932, but that in addition to extreme rainfall, unplanned urban growth and the removal of vegetation also played a role in the disaster.⁷⁹ According to a report commissioned by the city government in 2017, more than 15,000 houses were at risk from heavy rains and landslides.⁸⁰

Just a few weeks after the floods, the city was hit again by extreme rainfall, with 415mm of rainfall in just 10 hours. Landslides and floods destroyed parts of the city again, and authorities reported five deaths and four people missing.

While the contribution of climate change to the Petropolis floods has not been estimated, global warming is already affecting heavy rainfall events in Brazil. For example, an analysis on the floods that impacted the Brazilian state of Pernambuco last May concluded that the rains that caused the floods were made more likely and heavier by climate change.⁸¹



Due to the impact of Cyclone Sitrang, water accumulated in many areas of Barisal city due to heavy rains.

E) Arctic and Antarctic heatwaves

On March 18, record-breaking heatwaves were simultaneously recorded in both of the globe poles, with temperatures 30°C and 47°C higher than normal in the Arctic and the Antarctic, respectively.⁸²

While the fact that both heatwaves happened at the same time might be a coincidence, scientists worry that extreme weather events might be becoming more extreme at a higher rate than previously thought.⁸³ Both the Arctic and the Antarctic regions are warming faster than the rest of the globe.

In Antarctica, sea ice content in March was 26% below average, the second-lowest value ever recorded.⁸⁴ And a few days before the heatwave, a large floating ice platform in East Antarctica known as Conger's ice shelf collapsed.

In the Arctic, heatwaves and high temperatures are thawing the permafrost, a frozen layer of soil which has been permanently frozen for tens of thousands of years. This soil contains large amounts of carbon, which is released when the permafrost melts, further contributing to global warming.



Antarctic landscape with broken ice on water and frozen mounts



Ghaziabad, Uttar Pradesh, India- May 12 2022:

Children fill drinking water in to plastic container from road side pipeline leakage.

F) India & Pakistan heatwave

India and Pakistan experienced extremely high temperatures in March and April. March was the hottest in India since records began 122 years ago⁸⁵. And in Pakistan, temperatures reached 47°C in some parts of the country.

The heatwave had a large impact on agriculture. Wheat yields in the north of India were reduced by 10-35%.⁸⁶ High temperatures also favoured fall army and whitefly pest infestations and viral infections to crops and livestock, according to a report by the Indian Council of Agricultural Research.

While the official death toll of the heatwave is 90 people, it is very likely that this is an underestimation, as heat-related deaths are usually hard to quantify.⁸⁷ A recent report by the World Bank warns that from 2030 onwards, between 160 and 200 million people in India could be exposed to lethal heatwaves every year.⁸⁸ The report also notes that about 34 million people could lose their jobs due to decreases in productivity caused by heat stress.

Similarly, the economic cost of the heatwave has not been officially estimated, but a recent report said that the 2021 heatwaves cost India \$159 billion, equivalent to 5.4% of the country's GDP.⁸⁹

As the planet warms, heatwaves are becoming more frequent and intense.⁹⁰ The number of heatwave days in 2022 in India was five times greater than in 2021. An analysis conducted by the World Weather Attribution group concluded that climate change made the India and Pakistan heatwave about 30 times more likely.⁹¹

Also, a 2017 study already warned that the “most intense hazard from extreme future heat waves is concentrated around densely populated agricultural regions of the Ganges and Indus river basins”, including India and Pakistan.⁹² The same study noted that if greenhouse gas emissions remain unabated, temperatures exceeding human survivability will be exceeded in the coming decades in many locations of South Asia.

G) West Africa floods

In October, heavy rainfall and floods caused the displacement of 1.3 million people and killed more than 600 in Nigeria and other parts of West Africa. In Nigeria, the floods affected 33 of the country's 36 states.

Nearly 110,000 hectares of farmland were destroyed by the floods. The floods also disrupted the transport of food and fuel.

In the aftermath of the disaster, lack of drinking water forced residents to use floodwater, despite the risk of catching waterborne diseases such as cholera.⁹³ According to UNICEF, the floods left more than 2.5 million people in need of humanitarian assistance, more than 60% of them children.⁹⁴

According to a study conducted by the World Weather Attribution group, climate change made the extreme rainfall worse, contributing to the floods.⁹⁵

H) Cyclone Sitrang, Bangladesh

On 24 October, tropical cyclone Sitrang made landfall in Bangladesh killing at least 35 people. More than 2 million people were affected, half of them children. Thousands of houses were damaged and over 8 million people were left without electricity.

In Dhaka, capital city of Bangladesh, one weather station recorded 434mm of rain in 48 hours, five times more than the average rainfall for the month of October. The cyclone also destroyed 6,000 hectares of croplands and 1,000 fishing enclosures.

Climate change is increasing rainfall rates associated with tropical cyclones, as higher temperatures allow the atmosphere to accumulate more water.⁹⁶



Barisal, Bangladesh - October 25, 2022: Due to the impact of Cyclone Sitrang, water has accumulated in many areas of Barisal city due to rains throughout the day.

I) Tropical Storm Nalgae, Philippines

On October 29, tropical storm Nalgae brought heavy rains to the Philippines, causing floods and landslides. The rains affected four million people, caused the displacement of one million and killed at least 154 people. In the Philippines, the storm was named Pangae.

Cotabato, in the island of Mindanao, was devastated by floodwater, with authorities stating it was the worst flood in the region's history. In Kusiong, a coastal village also in Mindanao, landslides destroyed many houses and a chapel where many locals had sought refuge.

As the planet warms, the atmosphere is able to accumulate more water, which can lead to more intense downpours.⁹⁷ Also, tropical cyclones and tropical storms are becoming more intense due to climate change.⁹⁸



Flood Rescue Operation in Barangay San Jose Gusu due to Typhoon Paeng or Tropical Storm Nalgae.

Source: Flood Rescue Operation

Author: Bro. Jeffrey Pioquinto, SJ from Dublin, Ireland, Philippines

J) Horn of Africa drought

The Horn of Africa, a region in East Africa encompassing parts of Kenya, Somalia and Ethiopia, is enduring a four-year long drought. 36 million people affected in the region, according to the UN Office for the Coordination of Humanitarian Affairs (OCHA)⁹⁹. The drought has been described as “the worst in 40 years”.¹⁰⁰ The ongoing lack of rains have caused crop failures and the death of more than 3 million livestock.¹⁰¹

The crisis in the region results from a combination of causes, including armed conflict, political instability and weather shocks.¹⁰² Meteorologists point that the lack of rains in the region is largely driven by La Niña, a meteorological, cyclical event which determines weather conditions during the year in many parts of the world. In the case of the Horn of Africa, La Niña years are often associated with lower levels of rains. 2022 is the third consecutive year where this phenomenon occurs.¹⁰³ In addition, some experts note that climate change could be amplifying these effects.¹⁰⁴ A report issued later last year by many international organisations points out that high temperatures in the western Pacific ocean caused by climate change have caused a reduction in East Africa rainfall since 1998 - and that these reductions are more intense during La Niña years.¹⁰⁵

Karamaro was displaced from his home, as a result of flooding. He now faces severe drought and hunger, and resides in an IDP camp.

The community is experiencing climate extremes like never before. He is one of many displaced community members living in the camp, with his two wives and 17 children.

Christian Aid/Meseret Abiy



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