

Climate breakdown 2024

6 months of climate
chaos since COP28

June 2024



christian
aid

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Cover photo: *The Brazilian city of Canaas inundated by floodwater in May 2024. Photo: Ricardo Stuckert*

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Executive Summary

In the six months since the last UN climate conference, COP28 in Dubai, a series of extreme weather events have hit the world. According to official figures these events caused at least \$41bn damage, likely a major underestimate.¹² As the world hits the 12th consecutive month with record-high global temperatures, it is no surprise that there have been so many extreme weather events.³ Nor is it surprising that, when studied scientifically, many of them were found to have been made more likely and more intense by climate change, predominantly caused by burning fossil fuels.⁴ Climate attribution studies have been used for twenty years to assess whether climate change made particular weather events more intense or more likely, and more than 400 attribution studies have now been done.⁵

This report focuses on four of the most destructive recent events for which climate attribution studies exist: the floods in southern Brazil, Southwest Asia, and East Africa, and the extreme heat waves that hit large parts of Asia. These four events combined affected millions of people and official figures put the death toll at 2,539 (again, likely a huge underestimate). The science is clear: all four of these events were made more likely and/or more intense by climate change. If we continue to burn coal, oil, and gas, these sorts of disasters will become more common and even worse.

"Last week my country of Bangladesh was struck by Cyclone Remal, killing people and wrecking livelihoods. More than 150,000 homes have been damaged or destroyed. This is the kind of climate chaos we've been experiencing this year."

- Nushrat Chowdhury, Climate Justice Advisor, Christian Aid Bangladesh

Introduction

In Brazil, in April and May, the worst floods on record killed at least 169 people⁶, with 56 still missing. 600,000 people were displaced and 3.2 million affected⁷. Fatalities from waterborne illnesses are spreading due to the floods.⁸ The floods are estimated to reduce Brazil's GDP by \$7 billion this year, as costs to rebuild exceed billions of dollars.^{9,10} This event was made at least twice as likely by climate change.¹¹



The Brazilian city of Canoas was deluged including roads and the local airport. Photo: Ricardo Stuckert

Heavy rainfall in Southwest Asia in April killed at least 214 people.^{12 13 14} In the United Arab Emirates, a year's worth of rain fell in just 24 hours in Dubai.¹⁵ Insured losses are around \$850 million¹⁶. The rainfall across UAE and Oman was made more likely by climate change.¹⁷

Record-breaking heat waves from east to west Asia killed at least 1,500 people in Myanmar¹⁸, 61 people in Thailand¹⁹, 28 in Bangladesh²⁰, 13 in India²¹, and three in occupied Palestinian territory²². The heat forced school closures, wilted crops, worsened the situation for displaced Rohingya people in Bangladesh and Palestinians in Gaza, and lowered voter turnout in the world's largest elections in India²³. The heat wave is expected to cause higher inflation and slow GDP growth²⁴. The heat wave in the Philippines would have been impossible without climate change, while in west and South Asia, it was made at least five times more likely by climate change.²⁵ The heat waves were also made hotter by climate change.²⁶

In East Africa, heavy rainfall in May caused landslides and flooding. At least 559 people died, over 400,000 were displaced and 1.6 million affected.²⁷ The floodwaters are exacerbating waterborne

disease outbreaks. Food production was hit hard, with over 12,000 livestock killed and nearly 48,000 acres of cropland flooded in Kenya alone²⁸. Historic water levels in Lake Victoria forced Uganda to open dams and allow floodwaters to drain into South Sudan, which is experiencing its fifth consecutive year of flooding, worsening the situation for the 2.2 million internally displaced people and the 60% of the population that is food insecure²⁹. This rainfall was worsened by climate change.³⁰

As well as these major weather disasters driven by climate change, other weather events from floods to fires caused billions of dollars worth of damage and tens to hundreds of deaths in countries including the USA, Chile, and the Democratic Republic of Congo³¹. Deaths tend to be higher in lower income countries, with economic damage higher in richer ones, partly because insured losses are more measurable. Due to lower household incomes and under-funded and under-equipped public services, the human impact of climate-related disasters tends to be much higher in lower-income countries, especially when fewer people have insurance.

Many of the most climate-vulnerable countries are lower-income, and historically responsible for burning less fossil fuels than higher-income countries. In recognition of this, a fund for “Loss and Damage” was established by the United Nations. This fund aims to galvanise countries which have cumulatively burned more fossil fuels to support lower-income countries to deal with the impacts of climate change. These impacts hit every aspect of life, from health to ability to work and from education to cultural traditions. These cannot all be compensated for financially, but money can help communities to adapt and respond to the changing climate.

Unfortunately, of the current estimate by the UN of \$290-580 billion needed for loss and damage in 2030 onwards, so far only \$600 million has been delivered.^{32 33} The 60th Bonn Climate Conference (3-13 June 2024) aims to operationalise the Loss and Damage Fund. Rich countries which have burned fossil fuels for centuries need to step up their funding, to help the world deal with the disasters that are here and those yet to come.

Flooding in Brazil



President Lula observes the result of May's floods in Brazil. Photo: Ricardo Stuckert

In late April and May 2023, a series of storms over Rio Grande do Sul, Brazil's southernmost state, caused torrential rains for several weeks, with the National Institute of Meteorology (INMET) issuing numerous alerts for heavy rain and severe storms over the period.

This triggered record flooding across the region. In the state capital, Porto Alegre, the Guaíba river reached 5.3m on May 5th, surpassing the historical flood of 1941, which reached 4.76m. 46 out of 96 neighbourhoods were flooded. Other cities also suffered record flooding, such as Lajeado and Estrela³⁴.

State governor Eduardo Leite called the event "the worst disaster" in the history of Brazil, the country that will host COP30 in 2025. There have been more than 169 confirmed fatalities³⁵, and a surge in waterborne disease caused by the floods has affected a suspected 800 people and killed four so far³⁶. At the time of writing 56 people are still missing³⁷, 600,000 people are displaced, and in total 3.2 million people are affected.³⁸

Rebuilding after the floodwaters recede is likely to cost many billions of US dollars³⁹. Most of the direct losses came from damages within the housing sector, but notable damages were also incurred in agriculture, livestock, industry, local businesses, and other services⁴⁰. Accounting for 6.5% of the country's GDP, Rio Grande do Sul produces over two-thirds of its rice and also grows

tobacco, soy, wheat, and livestock. Economists estimated the catastrophe will reduce Brazil's GDP by 0.3% in 2024⁴¹, ie, about \$7 billion.

It is not the first time this region has been affected by large-scale flooding. Similar weather systems were associated with floods between September and November 2023, as well as major floods in 1997 and 1983⁴². This state is particularly vulnerable to droughts and flooding, as tropical and polar atmospheres meet above it⁴³.

As the climate warms, warmer air holds more moisture, leading to more intense precipitation events. This event was fueled by climate change, as shown by two different studies. Researchers from Climameter concluded that climate change and El Niño increased the rainfall by 15%⁴⁴, while the World Weather Attribution estimated that climate change made the floods twice as likely⁴⁵. Scientists think that with further warming, similar extremely intense rainfall will happen increasingly often⁴⁶. The latest climate models predict that the risks of intense rainfall in this region, of the kind that causes flooding, are substantially higher than previous climate models suggested⁴⁷.

Flooding in South and Southwest Asia



Dubai: Extreme rainfall in the COP28 host city of Dubai caused flooding, flight cancellations and school closures in April. Photo: Francois Nel

South and Southwest Asia were hit by extremely heavy rainfall in mid-April, impacting COP28 host country the United Arab Emirates, as well as Oman, Afghanistan, and Pakistan.⁴⁸

This event killed at least 100 people in Pakistan⁴⁹, 90 in Afghanistan⁵⁰, 20 in Oman⁵¹, and four in UAE⁵². The floods damaged or destroyed at least 3,500 houses in Pakistan and 2,000 in Afghanistan. More than 23,000 people in Afghanistan were affected⁵³. Subsequent flooding in the region killed hundreds more⁵⁴.

Most deaths in Afghanistan were due to buildings collapsing under the weight of the floodwater⁵⁵. Farmers in Pakistan and Afghanistan were also killed by lightning when attempting to save their wheat crop⁵⁶. At least 600 km of roads were destroyed, nearly 11,000 livestock killed, and 23,000 hectares of agricultural land damaged in the country^{57, 58}. Around two-thirds of provinces in Afghanistan experienced extreme rainfall⁵⁹. Afghanistan and Pakistan had experienced an unusually dry winter, meaning that soils were hard and unable to absorb the intense rain⁶⁰. Unseasonably warm conditions also melted snow in the mountains, adding to the floodwaters⁶¹.

Dubai experienced its heaviest rains in 75 years⁶², with more than 14 cm of rainfall in 24 hours, equivalent to a year of typical rain and the heaviest on record since 1949⁶³. Flooding at the Dubai International Airport led to over 1,200 flights being cancelled. All forms of

transport were disrupted, with an estimated \$8 billion in aircraft assets exposed on the tarmac⁶⁴. The deluge forced authorities to close schools and businesses, and destroyed commercial real estate and luxury cars. The floods between April 14-17 have resulted in estimated insured losses of up to US\$850 million, with an estimated 30,000 to 50,000 vehicles affected in the UAE alone, predominantly in Dubai.⁶⁵ While \$545 million was pledged by authorities to rebuild damaged houses, the funds are only available to UAE citizens and not to foreign residents⁶⁶.



*A flooded road in the city of Muharraq, Bahrain, April 2024.
Photo: Droodkin*

The rainfall on April 15 was made more likely by climate change, also accounting for the fact that this rainfall happened in a hotter El Niño year⁶⁷.

Asia heatwave



Hundreds of heat-related deaths have been reported in India and other Asian countries. Photo: PradeepGaurs

The world hit a record 11 hottest months in a row in April, and from Lebanon to the Philippines, large swathes of Asia suffered under heatwaves in April and May⁶⁸. Hundreds of millions of people experienced temperatures above 40°C for many days. China sweltered under its highest ever April temperature, 43.4°C in Yuanyang, Yunnan⁶⁹. Thousands of temperature records were broken across the continent in what has been described by a weather historian as “by far the most extreme event in world climatic history”.⁷⁰ While heatwave deaths are typically under-reported, hundreds of heat-related deaths were recorded across Palestine, Bangladesh, India, Thailand, Myanmar, Cambodia and the Philippines⁷¹.

Across South and Southeast Asia, labour productivity was reduced by the heat⁷² and thousands of schools had to close due to the heat, further disrupting the education of children from low-income

families who suffered under schools' Covid lockdowns^{73, 74}. Even when schools stay open, students perform worse in hotter temperatures, and 15% of government run schools have no electricity at all⁷⁵. While heat deaths are notoriously underreported, the reported deaths show how deadly the heat was⁷⁶.

Southeast Asia suffered a particularly long and severe heatwave, with record-high temperatures triggering urgent health warnings across the region⁷⁷. The city of Chauk in Myanmar hit a record-breaking 48.2°C, while the country's second largest city, Mandalay⁷⁸, hit a scorching 44°C. There were 1,500 fatalities from heatstroke in Myanmar in April alone⁷⁹.

The Philippines experienced a heat index score of 53°C (a heat/humidity "feels like" temperature) in Iba⁸⁰. The Department of Labor and Employment called on employers to implement flexible working arrangements when possible⁸¹, and in-person classes were suspended in all public schools for two days⁸². The sweltering weather also led to fears of water shortages, power outages and damage to crops.

In Thailand, Bangkok's heat index soared above 52°C in late April⁸³. In the south, hundreds of thousands of fish died in a reservoir that dried up after water was discharged from it in an attempt to save crops downstream, but farmers still struggled to keep their crops alive⁸⁴. A similar situation was seen in Vietnam where the heatwave and poor water management were blamed for mass fish deaths in a reservoir⁸⁵. This drastically reduced crop yields, including durian fruit, one of Thailand's most lucrative exports⁸⁶. 61 heat deaths have been reported from Thailand this year, mostly between April and May, far more than the 37 reported from the entire year of 2023⁸⁷.

Laos broke its all-time national temperature record, with 43.6 °C measured in Tha Ngon and Seno⁸⁸, with the weather bureau warning against outdoor activities.

In South Asia, much of Bangladesh experienced temperatures over 40°C for 24 days in April, shattering a 76-year record. Crops suffered and yields are expected to fall. Chillies, pulses, sunflowers, almonds, and rice were among the crops damaged by the searing heat and drought conditions.⁸⁹ Rohingya refugees in structures made from tarpaulins suffered temperatures of 42°C, the hottest temperature in 35 years in the area⁹⁰. Many refugees suffered heat stroke, with many children developing heat rashes. 28 people are reported to have died from the heat in Bangladesh⁹¹.

As India suffered severe early heatwaves for the third year in a row⁹², eastern India struggled with its hottest April ever⁹³. The heat across the country is being blamed for low turnout in the world's largest ever national elections^{94, 95}. As the scorching heat continued into May, the state of Maharashtra banned public gatherings until the end of the month, despite the election

campaigns⁹⁶. At least 37 places in India hit 45°C on May 26th, and Rajasthan recorded temperatures of 50°C as air-conditioning use pushed the country's electricity supply to the limits⁹⁷. At least eleven heat deaths were reported from West India and two from Kerala^{98, 99}.

In West Asia, heat worsened conditions in conflict zones. Tel Aviv suffered under temperatures of 40.7°C, breaking a temperature record set 85 years ago¹⁰⁰. At least three people in Israel were treated for heatstroke¹⁰¹. In Rafah, Palestine, the temperature was 14°C above the average for that date¹⁰². The heat increased health risks for the approximately 1.9 million refugees in Gaza (85% of the population)¹⁰³. Many Gazans are now living under plastic tarpaulins that trap heat and with less than a litre of water per day to drink, wash, cook, and clean - just 7% of the UN's recommended "emergency" level daily water ration^{104,105}. At least three Gazans, all aged 18 or under, died directly from heatstroke, and there are fears that the heat will exacerbate the risks of water shortages and disease¹⁰⁶. The combination of war and climate change is causing a compounding humanitarian crisis for people in the occupied Palestinian territory¹⁰⁷.

The economic cost of these heat waves has not been estimated yet, but it's likely to be very high, considering the manifold impacts of extreme temperatures to different areas, including agriculture, outdoor labour, energy consumption and health, among others.

The heat wave will hit Asian economies hard, leading to higher inflation and a slowdown in economic growth¹⁰⁸. Higher power use for cooling and lower agricultural output both cause higher inflation¹⁰⁹. In India, food and beverage inflation overall in April was nearly 8%, with vegetable prices at 30%, pulses at around 19%, and spices at 13.5%¹¹⁰. Unpredictable weather caused significant inflation in the country even before the heatwave, with garlic prices hitting 110% inflation, ginger 54.6% and potatoes 53.6%, with tomatoes hitting 41.8%¹¹¹.

According to a study published in 2021 in *Nature*, the excess heat and rainfall in Southeast Asia in recent years is "far outside" historical climate norms¹¹². The 15-day heatwave in the Philippines in April would have been impossible without climate change, and the heat in West Asia was five times more likely due to climate change, according to a climate attribution study¹¹³. Observational analysis suggests that the heat in South Asia was made 45 times more likely and 0.85°C hotter¹¹⁴. Under the current and already warmed climate, this type of extreme heat could now happen every 10 years in West Asia, every 20 years in the Philippines (or every ten years with El Niño) and every 30 years in the wider South Asia region¹¹⁵. The heatwave in West Asia was made about 1.7°C hotter by climate change, with no detectable influence of the current El Niño¹¹⁶. In the Philippines, climate change made the heatwave about 1.2°C hotter, and the current El Niño added a further 0.2°C¹¹⁷.

Flooding and landslides in East Africa



Flooding and landslides caused death and destruction near the town of Maai Mahiu in Kenya. Photo: Kipchumba Murkomen

The main rainy season, which typically lasts from March to May in East Africa, was expected to be amplified by El Niño. Then in early May, Cyclone Hidaya hit the Tanzanian coast, followed by another, Cyclone Ialy¹¹⁸. Many countries were affected, including Kenya, Tanzania, Burundi, Ethiopia, Somalia, Rwanda, South Sudan, and Uganda^{119, 120, 121, 122}.

The resulting rainfall led to rivers overflowing and landslides in highland regions, killing 559 people, displacing over 400,000, and affecting more than 1.6 million^{123, 124}. The heavy rains and flooding killed over 12,000 livestock and destroyed nearly 48,000 acres of cropland in Kenya alone¹²⁵. In Burundi at least 19,000 homes and 200 classrooms were destroyed, and 10% of the farmland flooded^{126, 127}. Somalia suffered over 10,000 cases of cholera so far, including 120 deaths, an epidemic exacerbated by the flooding¹²⁸. In Uganda at least eight health centres, 16 schools and 147 water facilities were damaged¹²⁹. The water levels in Lake Victoria were the highest recorded in over a century¹³⁰.

Due to extreme flooding, Uganda was forced to release floodwaters from dams around Lake Victoria into South Sudan, which will likely cause further flooding when it reaches the country in July^{131, 132}. In South Sudan, more than 60% of the population is expected to be food insecure this year¹³³. Two million people in the country are internally displaced, with hundreds of thousands

more entering the country to avoid conflict in Sudan¹³⁴. Five consecutive years of flooding in the country have caused widespread damage to homes and farmland, leaving some areas flooded year-round, causing disease outbreaks, and driving conflicts as farmers seek grazing for their livestock¹³⁵. Around 20,000 refugees in Kenya and 900,000 in Burundi have also been impacted by the flooding¹³⁶.

Flooding hit major East African cities, particularly impacting informal settlements such as those in Nairobi, Kenya. The rapid growth of the city has not been matched by a similar expansion of the infrastructural system, and in the latest floods sewers have overflowed, causing a health hazard¹³⁷. At least 64 health centres and 419 water and sanitation facilities have been damaged in the country¹³⁸.

Poor urban planning and deforestation contribute to the scale of flooding in the region, according to a climate attribution study¹³⁹. However, this rainfall event was also made more frequent and intense by the climate change that has already happened¹⁴⁰. There is no evidence that El Niño added to the likelihood or intensity of these floods. This year's floods came after a three-year drought in the region, which was also hit by extreme rainfall in October and November 2023 - two events already found to have been made more severe due to climate change.¹⁴¹¹⁴²¹⁴³

Other extreme events since COP28

Alongside the disasters in South America, Asia, and East Africa, that have been specifically attributed to climate change, other extreme weather events around the world caused significant damage. Below is a summary of ten of the most economically costly events between COP28 and May 2024, which caused approximately \$28.7 billion worth of damage and killed 319 people.

Ten of the costliest events Dec 2023-May 2024

Events and location	Fatalities ^{144,145}	Economic losses ^{146,147}
Severe Convective Storms USA (Dec-Apr)	22	\$11.5 billion
Winter weather USA (Dec-Mar)	89	\$4.35 billion
Flooding in USA (Dec-Feb)	23	\$4.1 billion

Storms in China and Japan (Feb)	11	\$2.7 billion
Floods and storms in Europe (Jan-Apr)	33	\$1.5 billion
Drought in Brazil (Jan-Mar)	unknown	\$1.3 billion
Wildfires in Chile (Feb)	131	\$1 billion
Flooding in Germany, Netherlands, Czech Republic (Dec)	0	\$950 million
Cyclone Jasper Australia (Dec)	0	\$675 million
Severe convective storm Australia (Dec)	10	\$625 million

See appendix below for calculation of the \$41 billion in losses. Other events, such as multiple flooding events in Afghanistan in May which have so far killed at least 464 people (in addition to the April floods) and flooding and landslides in the Democratic Republic of Congo which killed 317 in two months, did less economic damage but were far more costly in terms of human life. Together 10 of the deadliest events in this time period killed 854 people and did over \$6 billion of damage.

Ten of the deadliest events Dec 2023-May 2024

Event and location	Fatalities ^{148,149,150}	Economic losses ^{151,152,153}
Flooding Afghanistan (May)	464+	unknown
Flooding Congo DRC (Jan)	240	unknown
Wildfires in Chile (Feb)	131	\$1 billion insured losses

Flooding and winter weather Afghanistan, Pakistan (Feb and March)	105	millions
Landslide Papua New Guinea (May)	100+	unknown
Landslide in the Philippines (Feb)	98	negligible
Winter weather USA (Jan)	86	\$4.95 billion
Flooding, landslides Congo DRC (Dec)	77	unknown
Flooding in Bolivia (Dec-Mar)	66	\$10s of millions
Flooding in Indonesia (Mar)	51	\$25 million

Recommendations

The Bonn climate talks represent a halfway point between the last COP and the upcoming one, COP29. In Dubai at COP28, countries agreed to take action on the climate crisis. However, action and implementation remains slow despite the worsening effects of climate change. The countries most vulnerable to climate change cannot afford further delays to deliver COP pledges. At Bonn, countries must agree specific and urgent action to support countries impacted by climate change on adaptation, mitigation and energy transition efforts as well as Loss and Damage.

The ongoing use of fossil fuels and the resultant climate change are contributing to an increase in the frequency, intensity and destructiveness of extreme weather events around the world.

1. End all investment in fossil fuels to reduce climate impacts

Immediate and sustained action is required to transition away from the use of oil, gas, and coal to reduce ongoing impacts. Beyond UNFCCC negotiations, governments and multilateral development banks like the World Bank and the African Development Bank need to stop any new investments in coal, oil and gas.

At the same time, they should massively scale up investment in decentralised renewable energy that has a track record of bringing electricity to energy poor communities more rapidly and cheaply than grid extensions, and provides long-term energy security.¹⁵⁴

2. Get the Loss and Damage Fund up and running

A large share of the damage caused by extreme weather, both human and economic, is impacting people in some of the countries that have contributed the least to this situation.

Rich countries, responsible for the lion's share of the greenhouse gases that are heating the atmosphere and fuelling extreme events, should recognise their historic responsibility and step up their funding to the Loss and Damage Fund to help other countries cope and recover from extreme weather.

They must ensure that financing comes on stream immediately and that the Loss and Damage Fund is accessible to local communities and those directly impacted by loss and damage due to climate change.¹⁵⁵

3. Provide climate finance at scale to respond to the climate crisis

By COP29 countries need to agree the New Collective Quantified Goal (NCQG) for Climate Finance that is needed for all areas of climate action across mitigation, adaptation and Loss and Damage beyond 2025.

Climate finance is an obligation of developed countries under the UNFCCC, to deliver equity and justice based on principles of common but different responsibilities and capabilities (CBDR-RC) and fair-shares.

Tax justice can deliver an ambitious quantum via fair and progressive taxation, including wealth taxes and taxation based on the polluters pay principle, which should be explored in detail under Article 2.1c. Public grants, not loans must be the bulk of the NCQG. The NCQG should prioritise grants first, then highly concessional finance, over non-concessional loans.

Appendix

To calculate the figure of \$41 billion in damages we took the sum of insured losses from December 2023 and the first quarter of 2024 minus earthquakes^{156, 157} added the economic losses to the Brazilian economy and the insured losses from the floods in UAE. There are still events, like the landslides and flooding in East Africa, where insured losses are either not available or in places where communities are unable to get insurance cover, which is why the \$41 billion figure is likely to be an underestimate.

Costs in millions (\$)

SUM from Dec 2023 minus earthquakes, volcanoes	5810
SUM from Q1 minus earthquakes	27,390
Hit to Brazil economy	7000
Insured losses UAE	850
SUM	41050

Endnotes

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