DROUGHT

What is it?

Drought is a prolonged period of dry weather, caused by low rainfall and high temperatures, which leads to water shortages. It is a slow-onset disaster, but its impacts can be severe and long-lasting. There are four main types of droughts: meteorological, agricultural, hydrological, and ecological. Meteorological droughts occur when there's a lack of precipitation, while agricultural droughts affect farming due to dry soil. Hydrological droughts impact water resources like rivers and reservoirs, and ecological droughts disturb ecosystems.

Show image drought_intro.png which is a photo of a desert-like biome with dry dirt and a blue sky.

https://www.metoffice.gov.uk/research/climate/understanding-climate/uk-and-global-extreme-events-drought

https://www.rescue.org/article/what-drought-causes-impact-countries-most-affected

The Intergovernmental Panel on Climate Change (IPCC) uses four common types of drought:

- Meteorological drought – when rainfall in an area is below average for the region
- Agricultural drought – when lack of rainfall or dry soil affects farming and crop growth
- Ecological drought – like agricultural drought, but when lack of water affects the local environment as well
- Hydrological drought – when water supplies such as streams and reservoirs are low, which can be caused by low rainfall, lack of snow melt, or other reasons

https://www.ipcc.ch/

Interesting data:

“Water scarcity impacts 40% of the world’s population, and as many as 700 million people are at risk of being displaced as a result of drought by 2030.”
https://www.who.int/health-topics/drought#tab=tab_1

“Between 1970 and 2019 there were approximately 650,000 deaths due to droughts.”
https://wmo.int/topics/drought

Causes
Droughts are worsened by human activities such as deforestation, intensive farming, and climate change, which increase the likelihood of more extreme weather events.
Moreover, climate change is intensifying drought conditions by altering rainfall patterns and increasing temperatures, which in turn accelerates evaporation and depletes water sources. This makes drought a key issue for global food security and economic stability(
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Human causes of drought

- Climate change: Global warming makes extreme weather more likely. It can make places drier by increasing evaporation. When land becomes so dry, an impermeable crust forms, so when it does rain, water runs off the surface, meaning sometimes flash flooding occurs.
- Deforestation: Plants and trees capture and release water into the atmosphere, which creates clouds and then rain. Scientists have observed a relationship between deforestation and drought.
- Agriculture: Intensive farming contributes to deforestation in the first instance but can also affect the absorbency of the soil, meaning it dries out much more quickly.
- High water demand: There are several reasons water demand might outweigh the supply, including intensive agriculture and population spikes. Also, high demand upstream in rivers (for dams or irrigation) can cause drought in lower, downstream areas.

Natural causes of drought:

- Changes in ocean temperatures: El Niño and La Niña are climate patterns that can cause drought in some parts of the world. El Niño is characterized by warmer-than-average ocean temperatures in the Pacific Ocean, which can lead to drought in the southwestern United States and southern Africa. La Niña is characterized by cooler-than-average ocean temperatures in the Pacific Ocean, which can lead to drought in Australia and Indonesia.
- The jet stream: The jet stream is a band of strong winds that flows high in the atmosphere. Changes in the jet stream can cause drought in some areas by bringing in dry air from other parts of the world.

Effects

https://wmo.int/topics/drought

- Flooding can also be a risk in the same geographical areas that suffer from drought, after a prolonged period of dryness, sudden heavy rainfall can lead to hazardous flash flooding. This is because droughts leave the ground hard and baked, with little to no plant cover and low soil quality, which prevents rain from saturating the ground. Instead, when waterfalls in a large quantity and at speed —like in a thunderstorm— it runs over the parched ground.
- People migrating en masse from areas of drought and famine can result in increased political tensions and conflict due to increased competition for resources. There is evidence that drought contributed to the conflict in Syria, for example. People must travel further to find clean water. This usually falls to women and children, who must sacrifice other work and school to carry out an incredibly physical task. Without access to clean water or food, many must permanently leave their homes in order to survive.
- Dry conditions can cause wildfires that burn remaining vegetation and endanger homes. Fires can also impact air quality and exacerbate chronic lung conditions.
- Drought affects vital access to clean drinking water. This can lead to people drinking contaminated water, which brings about outbreaks of diseases like cholera and typhoid. These diseases can also spread in places with poor sanitation, another side-effect of having no clean water.
- Drought causes food insecurity when crops fail. When a substantial part of the population can no longer access food this is known as famine and results in widespread acute malnutrition, disease and death across the affected region.

https://www.rescue.org/article/what-drought-causes-impact-countries-most-affected

Affected areas and Global Projections

Specific cases of droughts affecting various regions and countries around the world, each with its own impacts and challenges:

1. **East Africa**:
    - East Africa is facing its worst drought in over 40 years, with millions of people at risk of famine. The drought has displaced over 1.4 million people in Somalia alone. Over 40 million people in the region are affected, with severe food shortages leading to malnutrition and disease outbreaks. The drought has particularly impacted Kenya, Ethiopia, and Somalia, where many rely on rain-fed agriculture for survival
      https://www.rescue.org/article/what-drought-causes-impact-countries-most-affected

      https://wmo.int/topics/drought

2. **United States (California)**:

- California frequently experiences severe droughts, which strain water resources, agriculture, and ecosystems. The state has been grappling with recurrent droughts, especially in recent years, due to climate change, which has led to reduced snowfall in the Sierra Nevada Mountains, a key source of freshwater. Droughts have led to water restrictions, wildfires, and major economic losses in agriculture
  https://www.metoffice.gov.uk/research/climate/understanding-climate/uk-and-global-extreme-events-drought

  https://wmo.int/topics/drought

3. **Chile (Atacama Desert)**:
   - The Atacama Desert in Chile holds the record for the longest drought, lasting from 1903 to 1918—over 14 years. This arid region is one of the driest places on Earth, with some areas going decades without significant rainfall. Though this was an extreme historical case, Chile continues to experience droughts, which impact water availability for agriculture and urban areas(
     https://wmo.int/topics/drought

4. **Australia**:
   - Australia frequently suffers from drought, particularly in the southern and eastern parts of the country. The "Millennium Drought" (1997–2009) was one of the worst, devastating agriculture and leading to severe water shortages in urban areas. The drought is often linked to climate patterns like El Niño and has pushed the country to adopt water-saving technologies and drought-resistant crops
     https://www.rescue.org/article/what-drought-causes-impact-countries-most-affected

5. **India**:
   - India, especially in its western and central regions, experiences recurring droughts. States like Maharashtra and Rajasthan are particularly vulnerable. In 2019, India saw a severe drought that affected over 44% of the country. This led to crop failures, food shortages, and migration of rural populations. India's reliance on monsoon rains makes its agriculture highly vulnerable to changes in rainfall patterns due to climate change

     https://wmo.int/topics/drought

The IPCC AR6 has reported that the areas affected by drought will increase in size with higher global temperatures. Even if warming is stabilised at 1.5–2.0 °C several regions are expected to experience more frequent and severe droughts.

Regions that are already suffering from a lack of rainfall are expected to further worsen. Under a high emissions scenario, regions affected by meteorological, agricultural and ecological drought could expand as far as Central America and the Caribbean, most of South America, most of Africa, the Mediterranean and central eastern Europe, and southern and eastern Australia. Only a small number of regions are expected to experience a reduction in meteorological drought.

Hydrological drought is most likely to affect regions that rely on snowmelt or are downstream of melting glaciers. However, due to large amounts of uncertainty it is difficult to predict with confidence how river flows will change.
https://www.metoffice.gov.uk/research/climate/understanding-climate/uk-and-global-extreme-events-drought

To show more information about hail hazard in different regions of the world you can use this link:
https://worldview.earthdata.nasa.gov/?v=-104.726292216349,-14.696037770539512,115.31399555343519,84.8664622294605&l=Reference_Labels_15m(hidden),Reference_Features_15m(hidden),Coastlines_15m,NDH_Drought_Hazard_Frequency_Distribution_1980-2000,MODIS_Terra_CorrectedReflectance_TrueColor&lg=false&t=2024-10-05-T09%3A38%3A22Z