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Background briefing

Autumn and winter storms in the UK 2023-24

2024

Contents

Key points

- Rainfall during autumn and winter storms in the UK and Ireland in 2023/24 was made around 20% more intense by human-caused climate change.
- The total volume of rainfall experienced over the October 2023 – March 2024 period increased by about 15% compared to the preindustrial climate.
- Rainfall intensity and volume are expected to continue to worsen unless greenhouse gas emissions are rapidly reduced.
- A range of factors, including health, economic, social, discrimination and geographic features can impact people's level of risk from flooding, with risk of harm especially high in cases where multiple risk factors intersect.
- The Government has not yet set a long-term resilience target for flooding, and policy measures to build resilience have so far fallen short.

In late 2023 and early 2024, the UK and Ireland experienced a very active storm season. The countries were affected by 13-14 severe storms. Storms Babet, Ciarán, Henk and Isha were some of the most damaging in Ireland and the UK, leading to severe floods, at least 13 deaths, severe damages to homes and infrastructure, power outages, travel cancellations, and loss of crops and livestock.

Climate change made storm downpours and total rainfall more frequent and intense

The World Weather Attribution group carried out a rapid attribution analysis of the storm season and concluded that human-induced climate change made the heavy storm downpours and total rainfall more frequent and intense.

Attribution studies combine climate model simulation and analysis of real-world weather data to calculate whether and to what extent a specific extreme event was made more (or less) likely and/or intense because of climate change.

The study focused on Ireland and the UK, and looked at the period from October-March, traditionally the peak of the storm season.

Rainfall frequency and intensity

The study showed that rainfall as intense as that experienced in 2023/24 has become more likely:

- In a pre-industrial climate (before humans started burning oil, gas and coal) it would have been expected **once every 50 years**.

- In today's climate (with 1.2° C of warming), it is expected **once every five years**.
- If warming reaches 2C (expected around 2040-2050 unless emissions are rapidly halted), it is expected **once every three years**.

Climate change has also increased the amount of rainfall in these storms, making them about 20% more intense compared with the preindustrial climate. If warming reaches 2° C, they will become even more intense: about 4% more than the storms experienced this year.

Total rainfall

The study found that climate change had a strong influence on the total volume of rainfall across the October-March season, increasing the amount of total rainfall by about 15%. This had a significant impact on some farmers, where waterlogged fields prevented crops from being planted.

Wet periods such as the 2023-24 season have become more likely:

- In a pre-industrial climate they would have been expected **once every 80 years**.
- In today's climate they are expected **once every 20 years**.
- If warming reaches 2C they are expected **once every 13 years**.

Who is most at risk of harm from storms?

The Environment Agency estimates that in 2022-23 there were approximately 5.7 million properties at risk of flooding in England.

The severity of the impact that people experience from extreme weather events like storms is influenced by their level of *vulnerability* (for example people with limited access to emergency services) and their level of *exposure* (for example if they live on a floodplain). Vulnerability and exposure (V&E) varies as a result of many different factors, including health, economic, social, discrimination or through situational and geographic factors. The Red Cross Red Crescent Climate Centre and the British Red Cross conducted an analysis of the key factors contributing to V&E to winter storms in the UK, identifying the following determinants of the risk of harm:

- **The location of housing**. Properties built in the floodplain or in places with high levels of impermeable surfaces (such as urban areas) can be at greater risk.
- **The nature of the property**. For example, people living in mobile homes on coastal caravan sites have heightened vulnerability, as do residents of basement flats.
- **The level of awareness of flood risk**. Polling by the British Red Cross found that only one in four (25%) of people living in areas with a high social flood risk had a good understanding of the risk in their area. This may affect people's tendency to install resilience measures or take out insurance (see below).

- **The uptake of Property Flood Resilience (PFR) measures**. Such as installing flood doors, waterproofing brickwork or moving electric sockets above floor level.
- **Insurance**. The economic costs associated with recovering from storm damage can be significant. The British Red Cross found that around one in five (22%) of people living in high social flood risk areas don't have insurance.
- **Ability to access emergency services**. For example, people in transient situations – such as asylum seekers – may be less able to access these services.
- **Health conditions**. People experiencing poor physical or mental health can be more harmed by weather and climate impacts. People suffering from limited mobility may require greater levels of support during and after storms.

In addition, the analysis highlighted the fact that people experiencing homelessness are particularly at risk, since they lack shelter and security during extreme weather events.

People living in poverty or on low incomes may be at higher risk for several reasons:

- They may be more likely to live in higher flood risk area owing to cheaper property and rental prices in those places.
- They may be less able to afford PFR measures to make their homes more resilient.
- They may be less able to afford insurance.
- They may be less able to afford the cost of repair and replacement of property, possessions and consumables damaged or lost.
- They may be less able to afford temporary accommodation options and less likely to have friends or relatives able to offer accommodation.

Policy context

Key policy measures to improve resilience to flooding in the UK include:

National Adaptation Plan (England)

The Third National Adaptation Plan (NAP3) setting out adaptation actions in England was published in 2023. An independent assessment carried out by the Climate Change Committee concluded that "NAP3 falls far short of what is needed".

Strategies

In England, the Environment Agency published its Flood and Coastal Erosion Risk Management Strategy in 2020 and Roadmap in 2022. Both the Climate Change Committee (CCC) and National Infrastructure Commission (NIC) have criticised the government for not setting a long-term objective for the level of flood resilience that the government is seeking to achieve. The lack of a long-term resilience target was also noted in the National Audit Office's 2024 report 'Resilience to flooding'.

- The Scottish Government opened a consultation on its Flood resilience strategy in May 2024.
- The National Strategy for Flood and Coastal Erosion Risk Management in Wales was published in 2020.
- The Second Cycle Northern Ireland Flood Risk management Plan 2021-27 was published in 2021.

National Planning Policy Framework (England)

The Framework was most recently revised in 2023 and says: "Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere." Properties built from 2009 onwards are not eligible for the Flood Re scheme (see below).

Investment in flood defences

In 2020, the Government announced a new £5.2 billion investment programme to create new flood and coastal defences. When the scheme was launched, it was anticipated to better protect 336,000 properties in England by 2027. However, an assessment by the National Audit Office published in 2023 found that the forecast number of beneficiaries had been revised downwards by 40% to 200,000 properties.

The NAO also found that the Environment Agency was 'not maintaining its flood defences to a level that optimises value for money'; maintaining only 93.5% of high consequence systems at required condition, compared with the 'optimal' 98%. The Environment Agency assessed that it would need an additional £34m in its maintenance funding for 2022-23 to achieve the 98% level.

Separate investment programmes are operated by Devolved Administrations.

Flood warning systems

The Environment Agency, Natural Resources Wales and Scottish Environment Protection Agency provide flood warnings and alerts for England, Wales and Scotland respectively. Northern Ireland is not currently covered by a flood warning service.

Flood Re

The Flood Re reinsurance scheme aims to make home insurance more affordable for people living in areas at risk of flooding. It is a joint initiative between the Government and insurance companies. The scheme is due to end in 2039.

Financial support for victims of flooding

Schemes to provide financial support to households in cases of severe flooding exist across all four nations:

- the Flood Recovery Framework (England)
- the Scottish Welfare Fund (Scotland)
- the Discretionary Assistance Fund (Wales)
- the Flooding Scheme (Northern Ireland)

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