



ANALYSIS

# Climate change impacts on food and migration

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June 2025

# Summary

At more than 1.3°C of global temperature rise, climate impacts are becoming more dangerous and costly. Everywhere, worsening extremes threaten our food supplies as excess heat, drought, flooding and fires hit harvests, leading to shortages and rising prices from global markets to local supermarkets.

In the UK, we import two fifths of our food; 15% of that comes from countries which are the most vulnerable and least resilient to climate change.

Climate impacts don't just threaten crops, but also the people growing them. Climate-fuelled disasters are increasingly forcing people to move.

In 2024, nearly 123 million people in total were forcibly displaced worldwide, by disasters, conflict and violence. That's more than twice the number a decade earlier (59 million) and three times the number in 2004 (40 million), amounting to one out of every 67 people living on the planet. If each country was affected equally, that would equate to around one million Brits – or almost the entire population of Birmingham – displaced in the UK.

Over 83 million of those people (68%) were *internally* displaced, i.e. forced to leave their homes and live elsewhere within their own country.

Disasters accounted for nearly 70% of last year's internal displacements, with storms and floods responsible for 97% of that. An increase in the frequency and intensity of extreme precipitation, storms and floods are expected in a warming climate. As climate change progresses, these and other disasters like heatwaves, droughts and fires will drive further internal displacement of people.

New analysis, putting food import data alongside the stories of those forced to leave their homes by climate change, shows how people fleeing rural, agricultural areas can compound the threat already posed by climate impacts to our food security. Last year, the UK imported £3 billion worth of food from the 20 countries with the highest numbers of internally displaced people. Until we get to net zero emissions, to stop climate impacts from getting worse, both crops and farmers will become increasingly threatened as people are forced to abandon their farms and move to safety.

Pakistan is a case in point. Its economy is heavily reliant on agriculture, which accounts for a quarter of its GDP and about 70% of exports, directly employing nearly two fifths of the population. Despite this, the number of people living in urban areas in Pakistan has quadrupled over 45 years.

A major driving force of this is increasingly extreme weather, with studies suggesting lower crop yields caused by worsening impacts – both sudden onset disasters, like floods, and slower onset, like seawater intrusion – are driving increased migration from rural to urban areas in Pakistan.

In [2022](#), devastating floods [killed 1,700 people, displaced millions more and wreaked havoc on the agricultural sector](#). The [communities most affected](#) were rural and agricultural. In the wake of the floods, [up to nine million](#) Pakistanis slid into poverty, and [crop yields were hit](#).

In 2023, Pakistan had the second highest number of people internally displaced by disaster anywhere in the world, at 1.2 million. In 2024, there were still 203,000, [putting them at number 11](#).

Last year, we imported 236 million kilograms of food from Pakistan, two thirds (65%) of which was in the form of 154 million kilograms of various types of rice worth £121 million. Pakistan is [one of the top 10 rice producers globally](#) and our second biggest supplier after India.

Pakistan was hit by several devastating climate impacts in 2022. From March, it – along with India – was gripped by debilitating heat that scientists say was made [30 times more likely by climate change](#). This was then followed by the floods.

From 2022 to 2023, the average price the UK paid per kilo for Pakistani rice rose by a third (33%). The average price we paid per kilo for Indian rice also rose by 10%. [According to the Rice Association](#), 88% of British households buy rice.

Our second largest food import from Pakistan is mangoes, guavas and mangosteens; they supplied almost a tenth (9%) of our imports of these fruits last year, or £7 million kilograms worth £26 million. [Mangoes are the fifth most cultivated fruit in the world](#) and, [according to YouGov](#), the 12<sup>th</sup> most popular in Britain.

[The World Bank has said that](#) rates of warming in Pakistan are considerably higher than the global average. Most models and observations show that [intense rainfall has become heavier](#) as the country has warmed, with [climate projections indicating](#) there will be an increase in the frequency and severity of extreme weather. This includes river and coastal flooding, meaning events like those in [2022](#) will become more common. The increasingly precarious nature of their livelihoods may cause [more farmers and their families](#) to simply give up and migrate to cities to seek more stable jobs.

We cannot grow rice or mangoes, guavas and mangosteens at commercial scale in the UK so are completely dependent on imports from places like Pakistan. This is true for many commodities from many countries.

Alongside halting climate change to avoid even worse extreme weather, support via overseas development assistance and international climate finance can be, for nations like the UK, an increasingly important investment in global stability and national food security, with [recent evidence](#) also showing how it addresses factors driving people to move.



## Climate change – people and food

The UK imports two fifths of its food, growing the rest at home. However, climate impacts are ramping up everywhere, meaning no part of our food system is safe.

### At home and abroad

In the UK, winter 2023/24 was one of the wettest on record, with scientists saying that storm rainfall was made 10 times more likely and 20% heavier by climate change. The knock-on effects this had on planting, growing and harvesting meant that the UK had its third worst harvest, and England its second worst on record, last year.

This came at a time when back-up imports of key UK-grown commodities – like oilseed rape, wheat, potatoes, sugar beet, cauliflowers, broccoli and onions – were also being hit by climate impacts overseas, like severe drought in the Mediterranean.

In 2024, 15% of the UK's food imports – 6 billion kilograms worth £8 billion – came directly from nations with low climate readiness, i.e. those that are highly exposed to climate impacts but also lack the capacity to respond and adapt. These are commodities, like cocoa and bananas, that we cannot grow at commercial scale here because they are not suited to our climate and soils. Without farmers growing these crops overseas, often in highly vulnerable developing countries, UK consumers would not have access to them.

2023 was the hottest year ever recorded...until 2024 overtook it. Already, experts are predicting that 2025 will be in the top three hottest years alongside them. The resultant extremes in heat and rainfall – as well as diseases turbo-charged by the changes in climate – continue to hit harvests, leading to shortages and higher prices.

### Climate impacts: people

Climate impacts don't just threaten the crops themselves, but also the people growing them. Worsening climate impacts are increasingly forcing people to move, alongside conflict and political upheaval. In 2024, nearly 123 million people were forcibly displaced worldwide – more than twice the number a decade earlier (59 million), and three times the number in 2004 (40 million). That is one out of every 67 people living on the planet. If each country was affected equally, that would equate to around one million Brits – or almost the entire population of Birmingham – being displaced in the UK.

The Internal Displacement Monitoring Centre (IDMC) reported that, at the end of 2024, this included a record 83.4 million people (68%) who had been **internally displaced**, i.e. had been forced to leave their homes and were living elsewhere **within their own country**. That number is more than twice the number the IDMC reported in their first global report a decade ago.

Of 66 million<sup>1</sup> internal displacements in 2024, nearly 70% (45.8 million) were caused by disasters – as distinct from conflict and violence, which are the other main driver of displacements. These were mostly in the form of storms and floods (44.3 million), which

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<sup>1</sup> An 'internal displacement' is an individual instance of forced movement of a person within a country. Internally displaced people (IDPs) are those who are internally displaced at time of counting. The number of internal displacements may differ from the number of IDPs as it depends when counting occurs, plus some people are affected by multiple instances and must move several times, therefore staying 'internally displaced' for longer. [See here](#) for more details.



accounted for 97% of all disaster-related internal displacements, alongside wildfires (425,000), landslides (397,000), droughts (387,000) and other weather-related hazards (21,000). A much smaller proportion resulted from earthquakes (153,000) and other geophysical hazards (75,000), neither of which are exacerbated by climate change.

Of the 83.4 million people who were internally displaced as at the end of 2024, nearly 10 million (9.8 million) – 29% more than in the previous year – were people who had been internally displaced by disasters, across 94 countries.

Whilst it is not straightforward to calculate the exact percentage of internally displaced people who subsequently choose to move to urban areas, studies tend to agree that most choose to head to towns and cities in pursuit of better access to basic services and living conditions than they would find in rural areas. There is evidence that many will then choose to remain in the areas to which they were displaced, though this is often in poor, informal settlements, which can help create dividing lines between 'host' communities and internally displaced people.

### Climate impacts: food

As the IPCC warns of worsening climate impacts threatening food production in many parts of the world, the UK's Climate Change Committee found that., overall, a fifth of the value in our critical supply chains for goods and services originate in areas of particular climate vulnerability – something that is true for half of our food supply chains.

The top 20 countries<sup>2</sup> with the highest number of people internally displaced by disasters accounted for more than 9 million of the overall 9.8 million people displaced by disaster at the end of 2024. Last year, the UK imported 2 billion kilograms of food worth £3 billion from these countries. All of them have medium to low resilience to climate change according to the University of Notre Dame's ND-GAIN index.

Among the commodities we import from these countries are rice, tea and fresh and dried tropical fruits. For example, in 2024 we got over a quarter (28%) of our rice from Pakistan, almost three quarters (70%) of our black tea from Kenya and Malawi and a tenth (9%) of our mangoes, guavas and mangosteens from Pakistan and Bangladesh. None of these commodities are suited to our climate and soils, meaning we cannot grow them at commercial scale in the UK and are completely dependent on imports.

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2 Afghanistan, Chad, Philippines, Ethiopia, Somalia, Democratic Republic of the Congo, Turkey, Niger, South Sudan, Nigeria, Pakistan, China, Kenya, Bangladesh, Iraq, Mayotte, Mozambique, Malawi, Zambia and Myanmar.

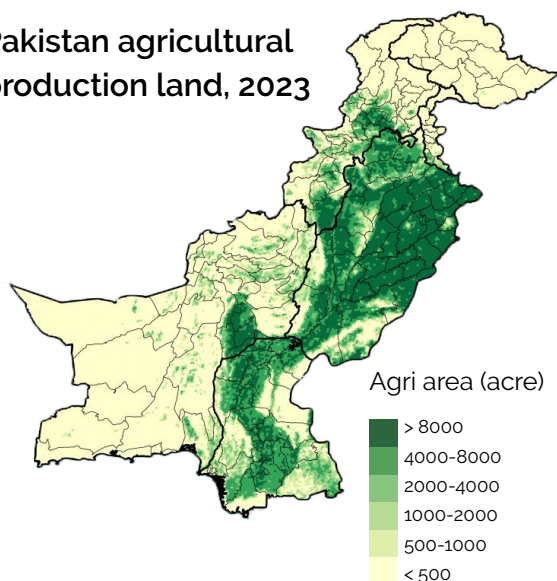


## Case study: Pakistan

### People

In 2023, Pakistan had the second highest number of people who had been internally displaced by disasters in the world, at 1.2 million (of the nearly eight million people worldwide who had been internally displaced by disasters that year). In 2024, there were still 203,000 (out of nearly 10 million globally), putting them at number 11 on the [Internal Displacement Monitoring Centre's list](#).

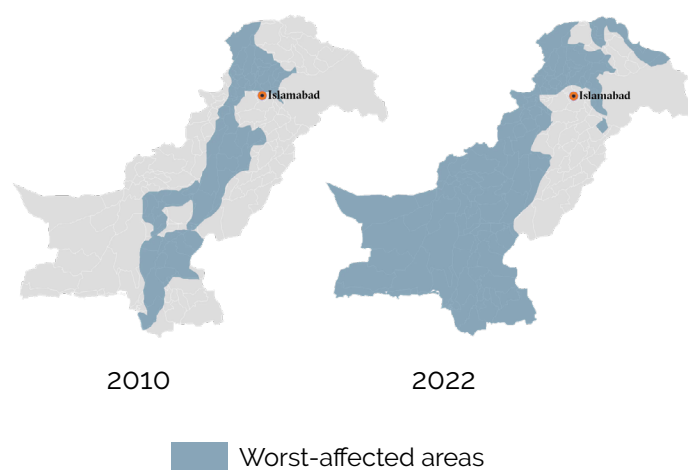
#### Pakistan agricultural production land, 2023



Muhammad Mohsin Raza

<https://www.datawim.com/post/mapping-cropping-area-pakistan/>

#### Comparing the 2010 and 2022 floods in Pakistan



In the [ten years from 2014 to 2024](#), Pakistan experienced 204 weather-related disasters, causing more than 11 million displacements. A notable example was 2022, when [massive floods killed 1,700 people and impacted 33 million](#). The [communities most affected](#) were rural and agricultural. In the wake of the floods, [up to nine million](#) Pakistanis slid into poverty, and [crop yields were hit](#).

As extreme weather events become increasingly frequent, [rural communities face displacement](#), migrating away from their homes, often to cities or other parts of the country seeking alternative livelihoods. This migration is, in effect, adaptation to worsening climate change impacts. Thos can be rapid onset, like flooding, or slower onset such as [seawater intrusion into coastal agricultural areas](#), as ocean levels rises.

Studies suggest that the lower crop yields caused by these worsening impacts are [driving increased migration](#) from rural to urban areas in Pakistan.

Reporting after the 2022 disaster suggested that, with homes and livelihoods literally washed away, [shortages of basic services, rampant water-borne diseases and rising food prices](#), many agricultural workers displaced by the devastation abandoned rural areas for what were perceived as more reliable jobs in cities. Rural communities, hit by the loss



of agricultural land, were therefore further hit by the loss of workers migrating to urban areas.

Pakistan's economy is heavily reliant on agriculture. The sector directly employs nearly two fifths of the population, while around half the population is directly or indirectly reliant on it. It accounts for nearly a quarter of Pakistan's GDP, yet 80% of Pakistanis experience food insecurity.

Despite the importance of the agricultural sector, the number of people living in urban areas in Pakistan has quadrupled since 1980 (from 21.9 million to 87.8 million in 2025), with the proportion rising from 26.6% to 34.4%. The Asian Development Bank forecasts that this proportion will rise to over 40% by 2030, with nearly 100 million people living in urban areas.

Pakistan is one of the most climate-vulnerable countries in the world, receiving an ND-GAIN score of just 40.3 out of 100, which is low. For context, the lowest score globally is Chad – the country with the second highest number of people internally displaced by disasters last year, after Afghanistan.

Scientists at World Weather Attribution observed that Pakistan had three times its usual rainfall in August 2022, making it the wettest August since 1961, and for two provinces the wettest on record. They concluded it was 'likely' that climate change had played a role in driving extreme monsoon rains, with multiple models suggesting it increased rainfall intensity by up to 50% during a 5-day period in the two worst-hit provinces (Sindh and Balochistan, which received seven and eight times their usual August rainfall totals respectively). They also concluded that the devastating impacts were driven by the proximity of infrastructure and agricultural land to flood plains.

According to the World Bank, rates of warming in Pakistan are considerably higher than the global average. Most models and observations show that intense rainfall has become heavier as the country has warmed, with climate projections indicating there will be an increase in the frequency and severity of extreme weather. This includes river and coastal flooding, meaning events like those in 2022 will likely become more common.





The 2022 floods damaged agricultural land and caused crop losses that sank many farmers into debt. As climate change progresses, the World Bank predicts a continuation of this trend, with yield declines expected in many key Pakistani food and cash crops like cotton, wheat, sugarcane, maize and rice.

Whilst many people who are displaced by disasters return to their homes afterwards, the increasingly precarious nature of rural livelihoods may cause some farmers and their families to simply give up and migrate to cities to seek more stable jobs. Modelling suggests that Pakistan could see the number of people displaced by climate impacts within its borders reach 2 million by 2050. Its population is already moving to cities at a rate of between 2.5% and 3% per year, higher than the global average of 1.7% per year, and this is likely to increase as the climate warms.

## Food

We imported £218 million pounds' worth of food from Pakistan in 2024, two thirds (65%) of which was in the form of 154 million kilograms of various types of rice worth £121 million.

Pakistan is one of the top 10 rice producers globally and our second biggest supplier; India is number one, providing us with 183 million kilograms of rice worth £174 million last year. The two countries together account for nearly two thirds (61%) of all the rice we import to the UK.

Our second largest food import from Pakistan last year was mangoes, guavas and mangosteens. They supplied almost a tenth (9%) of our imports of these tropical fruits, or £7 million kilograms worth £26 million.

We cannot grow rice or mangoes, guavas and mangosteens at commercial scale in the UK.

## Rice

With half a billion tonnes consumed each year, rice is a global staple for over half the world's population, accounting for a fifth of all the calories consumed by humans. It is grown in more than 100 countries, almost all in Asia, and 95% of them developing countries. UN Food and Agriculture Organisation (FAO) data suggests nearly two-thirds (62%) of the world's rice is grown in low-climate readiness countries.

In the UK, the NHS recommends rice as a good value, low-fat source of energy, fibre and B vitamins. The Rice Association, which represents companies trading in rice, claims that it is bought by 88% of British households.

Extremes of heat and rainfall all impact rice production, with both occurring more frequently in Asian nations in recent years. Pakistan saw yields fall by up to 20% in the aftermath of the devastating 2022 floods which affected a third of the country.

Halfway across the world, we felt the effects of this in Britain. From 2022 to 2023, the average price we paid per kilo for rice imports from Pakistan rose by a third (33%). This dragged up the average price we paid per kilo for rice from all sources (+16% from 2022 to 2023), as Pakistan supplied around a fifth of our rice at the time (18% in 2022 and 17% in

2023). Last year, we got over a quarter (28%) of our rice from there, meaning we are more exposed to climate impacts on Pakistani rice than before.

There is also evidence that increased levels of carbon dioxide in the atmosphere contribute to a lowering of the nutritional content of rice. Considering its importance in the diet of many of the planet's poorest people, this exacerbates the impact of shortages caused by climate impacts.

### *Mangoes, guavas and mangosteens*

Though not biologically related, these three fruits are grouped together in commodity databases like the one used for this analysis. The former two are better known in the UK, while the somewhat rarer mangosteen is a small, purple fruit with tangy flesh around a large seed, similar in size and shape to an almond. Mangoes are in the top five most cultivated fruits in the world and, according to YouGov, the 12<sup>th</sup> most popular in Britain. Pakistan is on track to be the fifth biggest mango producer globally by 2026, as well as the fourth biggest producer of mangosteens and guavas.

93% of the mangoes, guavas and mangosteens imported to the UK in 2024 – 74 million kilograms worth £194 million – came directly from low-climate readiness countries. Globally, 89% of these fruits are grown in low climate readiness countries.

All three of these fruits grow in tropical climates, requiring optimum heat and humidity. Rising temperatures increase water stress on guava trees, which can reduce fruit size and yield, whilst excess rain can leave fruit pulpy. Whilst mango trees can withstand fairly high temperatures, extreme heat and intense sun exposure can scald and damage fruit. In common with most fruits, erratic weather patterns can disrupt flowering – and therefore fruiting – cycles for mangosteens, which impacts crop production. All three, again in common with many fruits, are susceptible to pests and diseases that are thriving as our climate changes.

## Solutions

### Mitigation – net zero

The only solution to halt climate change, and avoid ever worsening climate impacts that threaten food supplies, is cutting emissions to net zero by mid-century, so as to stop adding greenhouse gases to the atmosphere. The Paris Agreement seeks to limit temperature rises to 1.5°C above pre-industrial levels. At around 1.3°C of warming now, we already see the threats and growing danger; this only worsens with each fraction of a degree of temperature rise. The global clean energy transition – the principal means of achieving this – has been driven by policy decisions flowing from nations' commitment to Paris, with investment in renewables internationally now running at twice the level of investments in fossil fuels each year.

### Adaptation and resilience: climate finance

Climate finance from wealthy nations to producer countries with low climate readiness is another part of the solution, as it supports farmers to adapt to climate impacts and secure their crops and livelihoods. Alongside mitigation – i.e. cutting emissions to net zero, to limit further temperature rises and avoid even more dangerous impacts in the future – this will help to reduce volatility in our food system.

Nations that met at COP29 in Baku last year agreed that climate finance needs to rise. Although nowhere near the [£1.3 trillion a year by 2035](#) that experts say is needed globally, world leaders agreed the level should treble from the current \$100 billion a year to at least \$300 billion.

Despite this, in recent months the world has retreated from commitments on overseas development assistance. In the US, [Trump has all but closed down USAID](#). In the UK, following the US' retreat on its pledges and growing threat from Russia, the Prime Minister has significantly cut the [Official Development Assistance \(ODA\) budget](#) to partially offset an increase in defence spending. The ODA budget funds our climate finance commitments, which includes support to farmers overseas who grow staples like rice, bananas, tea and a whole range of fresh fruit and vegetables that we import.

[ECIU analysis](#) shows that UK climate finance has contributed to at least 348 projects supporting overseas farmers hit by climate change in 111 countries, 84 of which (76%) grow food sold on UK supermarket shelves.

Some other nations have made similar decisions on their aid budgets, although the new government in Germany has notably increased defence spending in a way that not only earmarks [€500 billion for climate infrastructure](#), but also further embeds commitment to climate neutrality by 2045 into the German constitution, recognising the security implications of climate change. [Spain's Prime Minister, Pedro Sanchez](#), has also called on the EU to recognise that defence and security mean more than just the threat posed by Russia, saying that, for Spain, they include terrorism, cyber-security and climate change.

Food security is an element of national security. Cuts to foreign aid leave some of the world's most vulnerable farmers exposed to climate change, with the potential to undermine global food production. But additionally, recent research by the [Kiel Institute for World Economics](#) shows that aid, targeted to help recipient nations improve basic public services, substantially reduces people feeling forced to move elsewhere. It also suggests standard-of-living benefits from aid investments in climate-smart agriculture are likely to have similar impacts on drivers causing people to decide to migrate.

## UK support to Pakistan

The UK supports Pakistan to grow rice, as well as other key export commodities like wheat, sugarcane and cotton, via several projects including one under the [Green Climate Fund](#) (GCF) called '[Acumen Climate Action Pakistan Fund](#)'.

This project aims to establish an \$80 million climate adaptation-focused investment fund in Pakistan, providing patient capital (i.e. long-term debt or equity investment prioritising sustainable growth) to agri-businesses. The fund's goal is to improve the climate resilience of vulnerable farmers and their livelihoods by providing access to climate adaptation solutions for smallholder farmers. It seeks to build farmers' capacity by training them in water management, intercropping, mulching, the cultivation of heat-, drought- and salt-tolerant crop varieties and integrated pest management (IPM).

Additionally, \$10 million in technical assistance will provide targeted support to improve the business models of companies seeking investment, and build the overall climate resilience of smallholder farmers and the ecosystem in which they operate.

Overall, the project seeks to ensure the business model is commercially viable, to attract capital towards Pakistan's climate adaptation priorities in the vulnerable agriculture sector.



More broadly, the UK supports Pakistan through overseas development assistance (ODA). The [UK describes the country](#) as “an important regional and strategic partner to the UK [based] on culture, shared history, diplomacy, development, security, trade, and the economy”. Climate vulnerability is one of the four ‘critical structural issues’ which UK ODA aims to support Pakistan to address, including “adaptation by communities, government, and public services ... strengthening disaster preparedness and disaster management.”

In 2023, Pakistan ranked number eight in the list of countries receiving the highest levels of UK bilateral ODA; it [received £69m](#) from the UK Foreign, Commonwealth and Development Office (FCDO), although that was budgeted to increase [to £133m in 2024/25](#). It will also receive UK ODA via multilateral bodies to which the UK provides funds, such as the International Development Association, International Monetary Fund, or the World Health Organisation, for instance.

