# Too Hot to Hajj

## HAJJ AND CLIMATE REPORT

Islamic Relief Worldwide

# INTRODUCTION

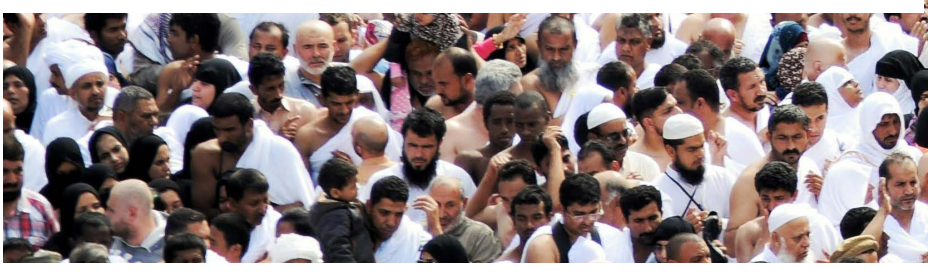
As one of the largest annual gatherings in the world, hajj presents significant sustainability challenges, particularly in relation to carbon emissions, energy consumption, and waste production. This paper aims to examine these environmental concerns while also exploring ongoing efforts to make the pilgrimage more sustainable.

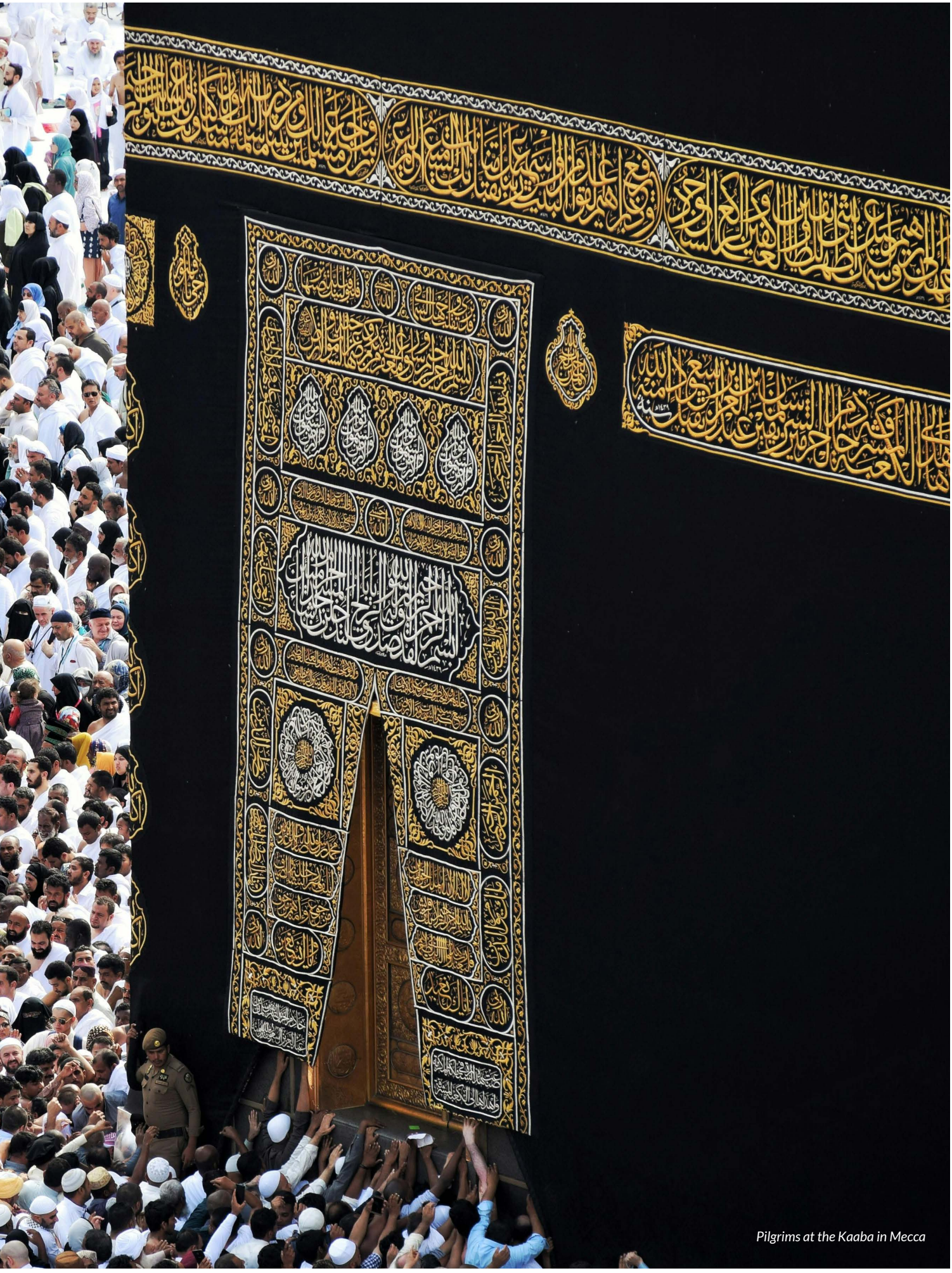
The intersection of the climate emergency and hajj is increasingly relevant as global temperatures rise, posing new risks for pilgrims undertaking this sacred journey. A religious obligation for millions of Muslims, the pilgrimage is becoming increasingly vulnerable to extreme heat, water scarcity and other climate-related hazards. Studies indicate that if global temperatures continue to rise, performing hajj could soon become hazardous due to life-threatening heat stress, particularly for the elderly and other vulnerable groups. The 2024 hajj pilgrimage saw at least 1,300 deaths due to extreme heat, with temperatures reaching 51.8°C (125.24°F) in Mecca. Islam follows a lunar calendar, meaning that the timing of hajj changes every year, but it will continue to fall in Saudi Arabia's hottest months until 2026. A maximum age limit of 65, which was introduced during the Covid-19 pandemic, has also been scrapped —raising further concerns about vulnerable elderly people.

This paper examines how climate change affects the safety and sustainability of hajj, the role of government and Islamic organisations in addressing these challenges, and the responsibility of pilgrims in adopting environmentally conscious practices. By analysing policy initiatives, technological advancements, and religious advocacy for sustainability, this paper aims to contribute to the growing discourse on balancing faith and environmental stewardship.

"The temperatures are well over 40°C (104°F) now, but, of course, that's not automatically attributable to climate change because it's a desert," says Jos Lelieveld, a professor at the Max Planck Institute for the Advancement of Science. "But we know from meteorological measurements, and from our modelling studies, that things are getting really hot in the Middle East, especially in the Gulf region." Even winter temperatures in Mecca rarely fall below 20°C (38°F), and when crowds are involved, the concentration of human bodies makes it harder to dispel heat. From July to October, air is both hot and damp there, which gives way to 'wet-bulb' conditions—a combination of dry air temperature and humidity that can make it harder for bodies to cool down.

Wet-bulb temperatures have risen on average nearly 2°C (3.6°F) over the past three decades, according to Yale Climate Connections, a multimedia non-profit focused on climate change. Temperatures in the Middle East are warming twice as fast as the rest of the world, meaning that it is becoming increasingly hotter than when the Prophet Muhammad (peace be upon him) first inaugurated the hajj in the 7th century.





*Pilgrims at the Kaaba in Mecca*

# THE ENVIRONMENTAL CONSEQUENCES OF hajj

In 2024, hajj saw a total of 1,833,164 pilgrims participating. This includes 221,854 internal pilgrims (12.1 per cent) and 1,611,310 external pilgrims (87.9 per cent). The 2025 hajj was the last summer hajj until 2042, as the pilgrimage will progressively move into cooler seasons starting in 2026. However, the sheer number of people who take part each year requires Saudi Arabia to set national quotas allocating a specific number of annual pilgrimage slots to each country. Here's a look at how that breaks down from nation to nation. This has a significant environmental impact due to the vast number of pilgrims traveling to and within Saudi Arabia. The pilgrimage requires extensive logistical support, including transportation, accommodation, food and water supplies, all of which contribute to carbon emissions and environmental degradation. This section explores the major sources of hajj's carbon footprint and examines how these factors impact the broader climate crisis.

## TRANSPORTATION EMISSIONS (AIR TRAVEL, BUSES, ETC.)

**One of the most significant contributors to hajj's carbon footprint is transportation. Millions of pilgrims travel to Mecca each year, with the majority arriving by air. Long-haul flights account for a substantial portion of emissions, with aviation contributing approximately for two to three per cent of global carbon emissions annually, which is catastrophic for the environment as the aviation industry is heavily reliant on carbon-based fossil fuels.[1] The aviation industry is also the main source of greenhouse gas emissions in the upper hemisphere. Due to high altitudes, the greenhouse effect in the upper hemisphere can be worse than that of landfill gas.[2] Given that a large percentage of hajj pilgrims come from distant locations such as Indonesia, Pakistan, India and Africa, the cumulative impact of these flights is considerable. Studies have found that each pilgrim accounts for 60.5kg of CO2 per day, with long-haul flights accounting for approximately 60 per cent of total greenhouse gas emissions during the hajj season.[3]**

Within Saudi Arabia, transportation between religious sites – such as Mecca, Mina, Arafat, and Muzdalifah – is another major contributor to emissions. Buses, private cars, and taxis facilitate mass movement, leading to high carbon emissions and increased air pollution. While Saudi Arabia has implemented high-speed rail options, such as the Haramain High-Speed Railway, to reduce reliance on road transport, most pilgrims still depend on conventional fuel-powered vehicles. Recognising the need for sustainable methods to be implemented during the hajj season, the Saudi government has introduced multiple initiatives to mitigate the impacts of hajj and Umrah on the environment. Their 2030 national strategy includes a focus on sustainable development.[4]

[1] Schoen, M. and Sayegh, A. (2018). The role of the gut microbiome in health and disease. Clinical Microbiology Newsletter, 40(1), pp.1–8. **https://doi.org/10.1016/j.clinmicnews.2017.11.001**

[2] Yu, Y., Feng, K., Hubacek, K. and Sun, L. (2020). Global implications of China's future carbon neutrality target. Energy Policy, 138, 111215. **https://doi.org/10.1016/j.enpol.2019.111215**

[3] El Hanandeh, A. (2013). Quantifying the carbon footprint of religious tourism: The case of Hajj. Journal of Cleaner Production, 52, pp. 53–60.

[4] Greenpeace (2023). The Green Guide for Hajj and Umrah. Available at: **https://www.greenpeace.org/static/planet4-ummah-stateless/2023/06/9952d4dc-the-green-guide-for-hajj-umrah.pdf**

## ENERGY CONSUMPTION IN MECCA AND SURROUNDING AREAS

**The demand for electricity during hajj surges as millions of pilgrims require air conditioning, and lighting in extremely hot conditions. Hotels and tents in Mina, and religious sites across the country consume vast amounts of energy to maintain liveable conditions. During the hajj season, energy demands in Saudi Arabia increase by approximately 50 per cent due to the extreme heat and need for usage of air conditioning and lighting, all which are powered by fossil fuels. [5] Most of this electricity is still generated from fossil fuels, contributing to Saudi Arabia's overall carbon emissions.**

Cooling infrastructure, such as large-scale air conditioning units in Masjid al-Haram and other facilities further increase energy demand. The increasing frequency of extreme heat events exacerbates this issue, requiring even more cooling solutions. Exploring renewable energy alternatives, such as solar power, could significantly reduce the environmental burden.

## WASTE PRODUCTION AND ITS ENVIRONMENTAL IMPACT

**hajj generates an enormous amount of waste, including food waste, liquid waste from the slaughter of animals, and disposable items such as plastic bottles, prayer mats and medical supplies.. Studies have shown that during hajj, waste generation can reach up to 50,000 tons — a figure significantly higher than Mecca's daily average — highlighting the immense environmental strain caused by the event.[6] The sheer number of pilgrims places immense pressure on waste management systems, often leading to improper disposal and pollution. In recent years, Saudi Arabia authorities have introduced recycling initiatives and biodegradable materials, but waste management remains a pressing issue.**

In particular, single-use plastics are a major concern, with millions of water bottles distributed daily to keep pilgrims hydrated. One survey showed that around 60 per cent of pilgrims had limited awareness regarding correct methods of waste disposal during hajj.[7] Addressing the issue of waste management requires both infrastructural improvements as well as methods of raising awareness, such as large-scale campaigns centred around recycling methods to encourage and behavioural changes, such as encouraging pilgrims to use refillable water bottles and eco-friendly alternatives.

During hajj it is estimated that more than 1.5 million goats, sheep and camels are slaughtered as part of the pilgrimage.[8] The resulting liquid waste slaughter of animals is disposed of without treatment.[9] A study investigating the approaches followed by slaughterhouses in waste disposal indicated that all untreated liquid waste is disposed into a valley in the north-eastern part of Mecca.[10] Such methods of waste disposal pose a danger to the environment as they harm the quality of soil, water, and air. [11]


*Earth globe in plastic bag.*

[5] Rodiyah, R. (2024). Sustainability in Hajj and Umrah Management: Exploring Eco-Friendly Practices and Strategies. Jurnal Manajemen Dakwah, 12(1), pp.1–21. Available at: https://doi.org/10.15408/jmd.v12i1.39153

[6] Osra, F.A., Alzahrani, J.S., Alsoufi, M.S., Osar, O.A. and Mirza, A.Z. (2021). Environmental and economic sustainability in the Hajj system. Arabian Journal of Geosciences, 14, 2121. Available at: https://doi.org/10.1007/s12517-021-08533-x

[7] Alsebaei, A.F., 2014. Solid Waste Management and Recycling During Hajj Pilgrimage in Mina. PhD thesis, University of Leeds. Available at: https://www.researchgate.net/publication/309136020_Solid_Waste_Management_and_Recycling_During_Hajj_Pilgrimage_in_Mina

[8] Henderson, J.C. (2022). Islam and Tourism: Hajj and Umrah. International Journal of Religious Tourism and Pilgrimage, 10(1), Article 12. Available at: https://arrow.tudublin.ie/ijrtp/vol10/iss1/12

[9] Henderson, J.C. (2022). Islam and Tourism: Hajj and Umrah. International Journal of Religious Tourism and Pilgrimage, 10(1), Article 12. Available at: https://arrow.tudublin.ie/ijrtp/vol10/iss1/12

[10] Hussein, F. (2018). Smart food project in Makkah and benefiting from animal waste. Makkah News, 18 May.

[11] Al-Fattly, H.H.H.H. (2013). Comparative Study of Bacteria and Fungi Air Polluted Slaughterhouse of Al-Diwaniya City. Kufa: Kufa Journal for Veterinary Medical Sciences, 4(1), pp. 81–89.

# IMPACT OF THE CLIMATE CRISIS ON HAJJ

*Pilgrims on Mecca's Mount Arafa during hajj*

Over the years, the hajj pilgrimage has been marked by numerous tragic incidents, many of which highlight the increasing vulnerability of pilgrims to both human and environmental factors. From 1987 to 2024, data shows a rising trend in fatalities, shifting from crowd-related disasters to increasingly climate-driven causes. Early tragedies, such as the 1987 Mecca clash, which resulted in over 400 deaths, and the 1990 tunnel stampede that claimed 1,426 lives, were largely due to overcrowding and inadequate infrastructure. Similarly, the 1994 stampede in Mina, which killed 270 pilgrims, and the devastating 1997 tent fire that led to 343 deaths, brought to light the logistical challenges of managing millions of people during hajj (Halal Times 2024).

However, more recent years have seen climate breakdown emerge as a growing threat to the safety of pilgrims. The 2015 Mina stampede, which resulted in over 2,400 deaths, remains one of the deadliest in hajj history and was exacerbated by extreme heat and congested pathways. Scientists have confirmed that the climate crisis contributed to the severity of this heatwave, increasing its likelihood and intensity (The Guardian 2024).[12]

This alarming trend reflects broader global climate patterns, as extreme heat events become more common and dangerous. According to research, the combination of high heat and humidity can push environmental conditions beyond human survivability, particularly for elderly or vulnerable individuals and eventually for all (University of Western Australia 2024).

As global temperatures continue to rise due to fossil fuel emissions, the hajj pilgrimage is increasingly affected by extreme weather conditions, particularly heat stress. The combination of high temperatures, humidity, and the physically demanding rituals of hajj places pilgrims at heightened risk of heat-related illnesses. As hajj continues to attract millions of pilgrims annually, it is critical that both governmental and religious authorities recognise the impact of climate breakdown and implement comprehensive solutions eliminate fossil fuels and to protect the health and safety of worshippers.

[12]Halal Times (2024). Hajj Disasters: A Historical Perspective From 1987 to 2024. Halal Times. Available at: https://www.halaltimes.com/hajj-disasters-a-historical-perspective-from-1987-to-2024/

[13] The Guardian. (2024). Hajj pilgrimage: Death toll rises amid extreme heat in Mecca. 23 June. Available at: https://www.theguardian.com/world/article/2024/jun/23/hajj-pilgrimage-death-toll-extreme-heat-mecca-saudi-arabia

## RISING TEMPERATURES AND EXTREME HEAT EVENTS

Saudi Arabia is already one of the hottest countries in the world, and climate models predict that Mecca will experience more frequent and intense heatwaves in the coming decades. According to researchers, due to potential high greenhouse gas emissions, heat stress during hajj could reach a point where it may be categorised as extremely dangerous by the late 21st century (Kang et.al, 2019)[14]. The MIT Technology Review (Islamic Relief UK 2019)[15] warns that heat stress during hajj could become lethal for vulnerable pilgrims, especially the elderly and those with pre-existing health conditions.

The timing of hajj, which follows the Islamic lunar calendar, means that it cycles through different seasons over decades. When it falls during the summer months, as it will for a quarter of the century, the risks associated with heat exposure become even greater. In 2024, temperatures during hajj reached over 50°C (122°F), leading to reports of heat-related illnesses and fatalities among pilgrims.

## HEAT-RELATED ILLNESSES AND FATALITIES AMONG PILGRIMS

Extreme heat during hajj has already resulted in numerous cases of heat exhaustion, heatstroke, and dehydration. Studies have shown (World Health Organization 2024)[16] that prolonged exposure to temperatures above 40°C (104°F) can be life-threatening, especially for individuals walking long distances in crowded conditions.

Certain rituals, such as standing in prayer at Arafat for several hours and performing Tawaf (circumambulation around the Kaaba), increase the likelihood of heat stress. Many pilgrims, particularly those from cooler climates, are unprepared for the extreme temperatures and may not take necessary precautions such as proper hydration, wearing heat-resistant clothing, or resting in shaded areas. The substantial increase in heat stress cases emphasises the dire need for safety measures for pilgrims, as well as increasing awareness for pilgrims.

The Saudi Arabian Ministry of Health reported that during the 2023 hajj season, the national health system delivered over 465,000 specialised medical treatments to pilgrims. A significant focus was placed on managing heat-related illnesses, particularly heat stress, as the pilgrimage faced intense temperatures and prolonged sun exposure. According to official data, 1,201 deaths were recorded (Saudi Press Agency, 2023).[17]

## PREDICTIONS FOR FUTURE CLIMATE CONDITIONS AFFECTING HAJJ

*Pilgrims in Mina during hajj, where extreme heat and overcrowding pose environmental and health challenges*

If greenhouse gas emissions remain unchecked, performing hajj in the future could become impossible. A 2019 study from the American Geophysical Union predicts that by 2050, heat stress levels in Mecca will surpass the threshold considered safe for human endurance. (Kang et.al 2019)[18] The combination of high humidity and extreme temperatures could lead to an increase in mass heat casualties, making hajj physically impossible for many pilgrims.

**In 2019 Islamic Relief UK called for urgent action to address the risks posed by climate breakdown on hajj. The organisation highlighted the need for both immediate and long-term solutions, and called on MPs to urge immediate action by the UK government in enhancing policies that can limit global heating.**

[14] Kang, S., Pal, J.S. and Eltahir, E.A. (2019). Future heat stress during Muslim pilgrimage (Hajj) projected to exceed "extreme danger" levels. Geophysical Research Letters, 46(16), pp.10094–10100.

[15] Islamic Relief UK. (2019). Hajj could become lethal if the climate crisis continues. Available at: https://www.islamic-relief.org.uk/hajj-could-become-lethal-if-the-climate-crisis-continues/

[16] World Health Organization (WHO). (2024). Climate change and health: Heat and health. Geneva: WHO. Available at: https://www.who.int/news-room/fact-sheets/detail/climate-change-heat-and-health

[17] Saudi Press Agency (SPA). (2023). Saudi Arabia launches initiatives to make Hajj more environmentally sustainable. [online] 25 June. Available at: https://www.spa.gov.sa/en/N2128057

[18] Kang, S., Pal, J.S. and Eltahir, E.A. (2019). Future heat stress during Muslim pilgrimage (Hajj) projected to exceed "extreme danger" levels. Geophysical Research Letters, 46(16), pp.10094–10100.

# ISLAMIC RELIEF'S STANCE ON CLIMATE BREAKDOWN

**Islamic Relief recognises the urgent need to address the climate crisis. We emphasise that environmental responsibility aligns with Islamic teachings, which advocate for stewardship (khalifa) and balance (mizan). No community is immune to the effects of climate change, and it is essential for Muslims to acknowledge their role in contributing to environmental degradation while actively participating in efforts to combat the climate emergency. The principles of Islamic environmentalism are deeply rooted in the Qur'an, which promotes a respectful and sustainable relationship with the natural world. This ethical foundation—referred to as Ilm ul Khalq, or Knowledge of Creation—serves as a guide for action. The culmination of these values was reflected in a collaborative effort that led to a global Islamic declaration on climate change. This declaration, shaped by a wide-ranging consultation involving scholars, scientists, and faith leaders, was finalised, and launched at a landmark symposium in Istanbul, Türkiye, on 18 August 2015. It calls upon all nations, particularly high-income countries, to take responsibility while urging individuals to contribute meaningfully to rebalancing the Earth's systems (Islamic Foundation for Ecology and Environmental Sciences 2015).**

- We at Islamiic Relief support every ethical action designed to eliminate greenhouse gas emissions. This includes ending coal, oil and gas exploration, production and use and replacing them with renewable sources of energy.
- We demand that the necessary transformations to societies and economies are just and equitable and respect human rights and dignity.
- We require that the means, capacity, and technical support to adapt to climate breakdown is made available to all.
- We expect proper provision to be made to address Loss and Damage due to climate breakdown.
- We recognise the overwhelming ethical and moral responsibility of those who have benefitted from the activities that have led to climate breakdown, to provide for adaptation and, where this is not possible, compensation for Loss and Damage incurred.
- We hold that climate action is both compatible and necessary to achieve the Sustainable Development Goals.

As hajj faces increasing environmental challenges, faith-based institutions are uniquely positioned to advocate for sustainable religious practices, educate pilgrims on eco-friendly habits, and influence policy at national and international levels.

# ISLAMIC TEACHINGS ON ENVIRONMENTAL STEWARDSHIP:

The Qur'an and Sunnah offer a profound framework for understanding humanity's role as caretakers of the Earth. Environmental stewardship in Islam is not a modern concept but an intrinsic part of the faith, deeply rooted in principles of justice, moderation, and accountability. As the world grapples with accelerating climate breakdown and environmental degradation, Islamic teachings offer clear guidance for promoting sustainable living and protecting creation.

**Environmental stewardship is deeply embedded in Islamic teachings, rooted in the Qur'an and Sunnah. Muslims are entrusted by Allah with the responsibility to act as guardians of the Earth, a role known in Arabic as khalifah. The Qur'an states: "It is He who has made you successors (khalifah) upon the Earth..." (Qur'an 35:39). This concept highlights that humans are not owners of the Earth but trustees, tasked with maintaining and preserving the natural world for current and future generations. Stewardship demands a relationship of care, responsibility, and ethical interaction with the environment, rather than exploitation or negligence.**

Central to this stewardship is the Qur'anic principle of mizan. Allah created the universe in perfect equilibrium: "And the sky He raised high, and He has set up the Balance, so that you may not transgress the balance" (Qur'an 55:7-8). Disrupting this balance — whether through pollution, deforestation, excessive carbon emissions, or waste — constitutes a transgression against divine order. Climate change is a contemporary manifestation of humanity's collective failure to honour this balance. Therefore, Muslims are religiously obligated to act in ways that preserve equilibrium, aligning their lifestyles with moderation and sustainability.

Islam strongly condemns wastefulness (israf), a behaviour seen as incompatible with true faith. The Qur'an warns: "Indeed, the wasteful are brothers of the devils, and ever has Satan been to his Lord ungrateful" (Qur'an 17:27). Even in religious rituals, such as wudu (ablution), the Prophet Muhammad (PBUH) instructed moderation, telling his followers not to waste water even if they were performing ablution by a flowing river (reported in Ibn Majah).[19] This commandment shows the depth of Islam's environmental consciousness, emphasising that sustainability should permeate even everyday acts of devotion.

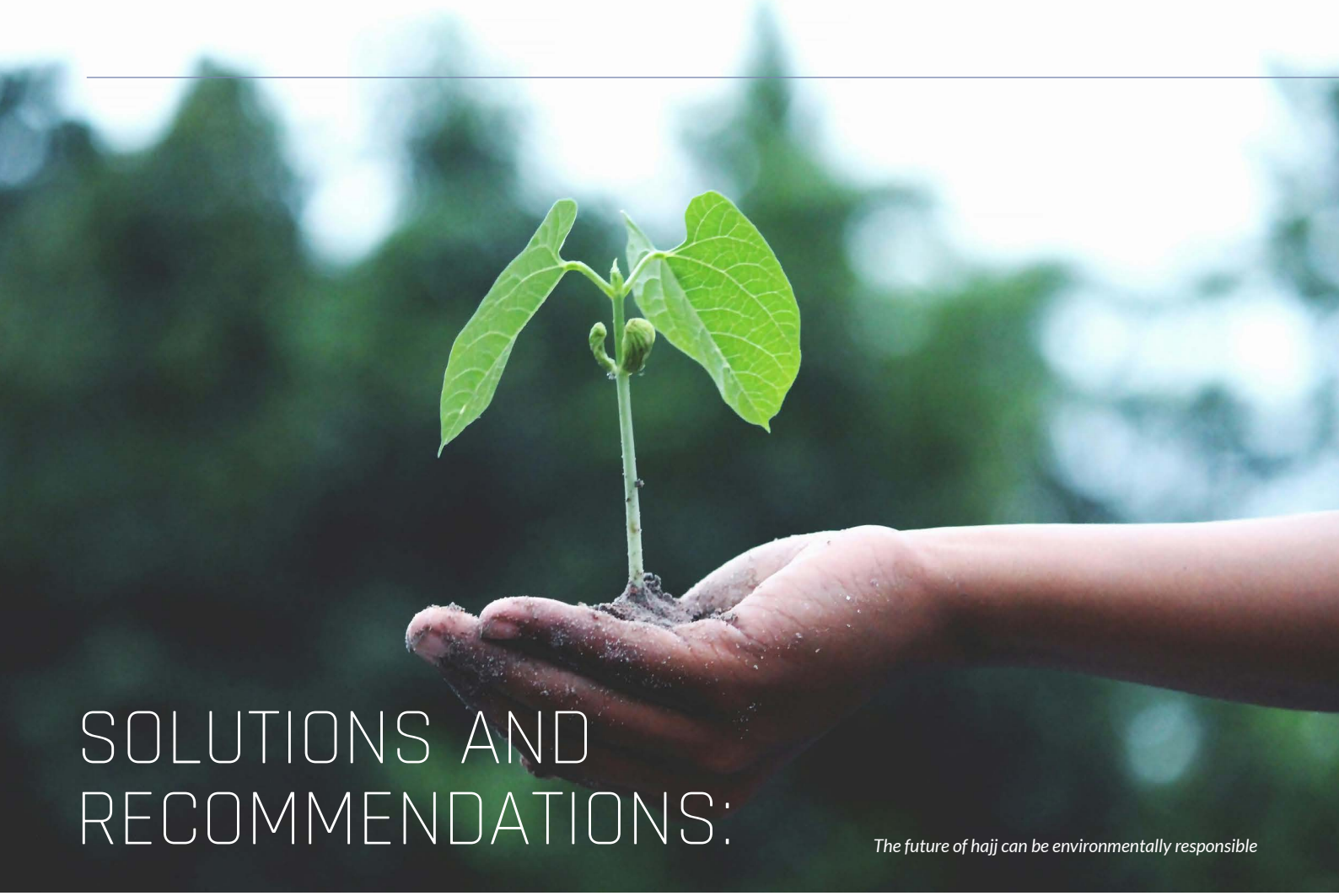
Accountability is another critical dimension of Islamic environmental stewardship. The Qur'an stresses that all human actions will be brought to account: "Then We will surely question those to whom (a message) was sent, and We will surely question the messengers" (Qur'an 7:6). Environmental degradation, whether through overconsumption, pollution, or negligence, is not merely a worldly issue but a moral and spiritual failing with consequences in the Hereafter. Muslims are therefore called upon to act justly toward the environment as part of their faith commitment.

Finally, the ethic of rahmah (mercy) extends to all creation. Allah describes Prophet Muhammad (PBUH) as a "Mercy to the Worlds" (Qur'an 21:107), a title that encompasses humanity, animals, and the environment alike. Islamic teachings advocate for treating animals, plants, and ecosystems with compassion and respect. Inflicting unnecessary harm upon living creatures or degrading the environment is strongly condemned. Thus, caring for the Earth is an expression of mercy, gratitude, and obedience to Allah.

In the context of global climate breakdown, these teachings serve not only as a moral guide but as a blueprint for urgent action. Upholding Islamic environmental ethics requires holistic engagement — conserving water, protecting biodiversity, reducing carbon emissions, and advocating for climate justice — as integral parts of a believer's worship and duty. Especially during collective religious experiences like hajj, where environmental impacts are magnified, returning to these foundational teachings is critical for ensuring that faith and sustainability walk hand in hand.

*Caring for the environment is deeply embedded in Islamic teachings*

[19] Ibn Majah. Sunan Ibn Majah, Book of Purification, Hadith 425. Available at: https://sunnah.com/ibnmajah:425



# SOLUTIONS AND RECOMMENDATIONS:

*The future of hajj can be environmentally responsible*

As climate breakdown continues to impact the hajj pilgrimage, it is essential to address the environmental impact of hajj. This requires collective effort from governments, religious organisations, and individual pilgrims. By implementing policies that promote sustainable travel, investing in green infrastructure, and encouraging ethical consumer choices, the future of hajj can be both environmentally responsible and spiritually fulfilling.

**1. Reducing carbon footprint through travel choices**

- **Direct flights:** Pilgrims should be encouraged to book direct flights where possible, minimising emissions associated with multiple take-offs and landings.
- **Shared transportation:** Upon arrival, using buses, group shuttles, and metro systems reduces individual carbon footprints compared to private vehicles.

**2. Sustainable accommodation and resource management**

- **Eco-Friendly Hotels:** Pilgrims should be advised to stay in hotels that are certified for sustainable practices (e.g., energy-efficient operations, recycling initiatives, water conservation systems).
- **Energy and water use:** Accommodations can implement water-saving devices such as low-flow faucets and encourage guests to reduce electricity usage by turning off lights and air-conditioning when leaving rooms.

**3. Waste reduction strategies**

- **Minimising single-use plastics:** Pilgrims should be urged to bring reusable water bottles, cloth bags, and sustainable food containers to cut down on plastic waste, which is a significant environmental issue during hajj.
- **Recycling initiatives:** Recycling bins should be widely available at all major hajj sites, with clear instructions in multiple languages to facilitate proper waste separation and disposal.
- **Biodegradable alternatives:** Use of compostable utensils and biodegradable hygiene products should be promoted in pilgrimage packages.

**4. Water conservation**

- **Efficient wudu practices:** Campaigns encouraging pilgrims to perform ablutions (wudu) with minimal water, following the Sunnah of the Prophet Muhammad (PBUH), who performed wudu using a small amount of water.

**5. Ethical consumption**

- **Supporting local economies:** Purchasing local products reduces the carbon footprint associated with importing goods and supports local communities.
- **Mindful souvenir buying:** Encouraging pilgrims to avoid mass-produced plastic souvenirs and instead choose locally handmade, sustainable goods.

**6. Awareness and education campaigns**

- **Pre-departure training:** hajj groups and mosques should provide pilgrims with education on sustainable practices before departure, integrating environmental stewardship into hajj training seminars.
- **Faith-based messaging:** Quranic verses and Hadiths that promote care for the Earth to frame environmental action as an Islamic dutyshould be used in messaging.
- **Guides:** Distributing eco-friendly guides in multiple languages that outline simple, practical steps pilgrims can take to minimise their environmental footprint.

# CONCLUSION

## WHY IT WILL BE TOO HOT TO PERFORM hajj BY 2050

### Conclusion

hajj, the sacred pilgrimage to Mecca, is one of the five pillars of Islam and a spiritual journey millions of Muslims undertake each year. However, a growing body of research indicates that by 2050, the climate crisis could make it dangerously hot to perform hajj. With temperatures already soaring during the summer months, and global warming on the rise, the physical act of pilgrimage could pose serious health risks, particularly for the elderly and those with pre-existing conditions.

### The science behind the heat

Climate scientists have used heat index models to predict how global warming will impact temperature and humidity in the Gulf region. According to studies cited by Islamic Relief, Mecca is projected to face extreme heat events with temperatures exceeding 45°C (113°F) combined with high humidity. These conditions can push the heat index beyond safe human tolerance levels, particularly during the peak hajj season, which occasionally falls in the summer due to the lunar Islamic calendar.

Heat stress becomes deadly when the body can no longer cool itself efficiently. The risks include heat exhaustion, dehydration, and heatstroke—all of which can escalate quickly in crowded conditions like those found during hajj. Recent hajj seasons have already seen hundreds of casualties due to heat-related illnesses, and future projections suggest these numbers could rise significantly without climate intervention.

### Islamic Relief's warning

Islamic Relief has raised alarms about the impact of climate breakdown on Islamic practices. Our advocacy ties environmental justice to religious duty, emphasising that the ability to safely perform hajj is being threatened by human-induced climate breakdown. The organisation urges both Muslim communities and the international community to take immediate steps to mitigate global warming through carbon reduction, policy changes, and education.

### Broader implications

The threat to hajj is emblematic of a larger, global issue: the climate crisis is not only an environmental and economic crisis, but a spiritual and humanitarian one as well. As access to religious rites becomes compromised by climate conditions, faith-based communities are finding themselves on the frontlines of climate advocacy. This adds a moral dimension to the climate conversation, pressing for justice and sustainability not just for the sake of survival, but for the preservation of cultural and spiritual heritage.

By 2050, hajj may become perilously hot due to the compounding effects of climate crisis. The consequences go beyond physical danger; they strike at the heart of Islamic identity and religious obligation. As Islamic Relief and other organisations emphasise, urgent climate action is not only a scientific necessity but a moral and spiritual one. To ensure that future generations can fulfil their religious duties safely, the world must unite in combating the climate crisis with both urgency and compassion.

# REFERENCES


Al-Fattly H (2013) Comparative study of bacteria and fungi air

Al-Khudair, D. (2022) 'Restoring ecosystem for a green hajj requires good carbon, says forum chief', *Arab News*, 2 July. Available at: https://www.arabnews.com/node/2115316/saudi-arabia

Alsebaei, A.F., 2014. *Solid Waste Management and Recycling During hajj Pilgrimage in Mina*. PhD thesis, University of Leeds. Available at: https://www.researchgate.net/publication/309136020_Solid_Waste_Management_and_Recycling_During_hajj_Pilgrimage_in_Mina

Associated Press (2023) 'Ambitious Saudi plans to ramp up hajj could face challenges from climate change', *AP News*, 15 June. Available at: https://apnews.com/article/islam-hajj-saudi-climate-sustainability-b151c7dbaac4a5f9e8708ed3005f0d09

Batrawy, A. (2024) '1,300 people died in heat-stricken hajj pilgrimage', *NPR*, 21 June. Available at: https://www.npr.org/2024/06/21/nx-s1-5013582/hajj-heat-deaths-saudi-arabia

El Hanandeh, A. (2013). "Quantifying the carbon footprint of religious tourism: The case of hajj." *Journal of Cleaner Production*, 52, 53-60 for Veterinary Medical Sciences 4(1): 81-89. Available at: https://repository.qu.edu.iq/wp-content/uploads/sites/31/2016/11/Comparative-Study-of-Bacteria-and-fungi-air-polluted-Slaughterhouse-of-AlDiwaniya-City.pdf

Green Islam (2024) 'Brazil is the world's largest exporter of halal meat. Here's why that's a problem', *Green Islam*, 11 September. Available at: https://www.greenislam.org/articles/brazil-is-the-worlds-largest-exporter-of-halal-meat-heres-why-thats-a-problem

Greenpeace. (2023). *The Green Guide for hajj and Umrah*. Retrieved from https://www.greenpeace.org/static/planet4-ummah-stateless/2023/06/9952d4dc-the-green-guide-for-hajj-umrah.pdf

Halal Times (2024) *hajj Disasters: A Historical Perspective From 1987 to 2024*. (online) Halal Times. Available at: https://www.halaltimes.com/hajj-disasters-a-historical-perspective-from-1987-to-2024/

Hameed, N. (2024) 'How Saudi Arabia aims to make hajj 2024 an eco-friendly pilgrimage', *Arab News*, 14 June. Available at: https://www.arabnews.com/node/2530736/saudi-arabia

Hashem, H. (2019) 'Saudi authorities scale up 'Green Haj', more countries get involved', *Salaam Gateway*, 5 August. Available at: https://salaamgateway.com/story/saudi-authorities-scale-up-green-haj-more-countries-get-involved

Hussein F (2018) Smart food project in Makkah and benefiting from animal waste. Makkah News, 18 May.

Islamic Foundation for Ecology and Environmental Sciences (IFEES). (2015) *Islamic Declaration on Global Climate Change*. Available at: https://www.ifees.org.uk/about/islamicdeclaration/

Islamic Relief UK (2019) *hajj could become lethal if the climate crisis continues*. (online) Available at: https://www.islamic-relief.org.uk/hajj-could-become-lethal-if-the-climate-crisis-continues/
Kang, S., Pal, J. S., & Eltahir, E. A. (2019). Future heat stress during Muslim pilgrimage (hajj) projected to exceed "extreme danger" levels. *Geophysical Research Letters*, *46*(16), 10094-10100.?

Nizami, A. S., et al. (2017). "Waste management during the hajj pilgrimage." *Procedia Environmental Sciences*, 35, 489-497.

Osra, F.A., Alzahrani, J.S., Alsoufi, M.S., Osar, O.A. & Mirza, A.Z. (2021). Environmental and economic sustainability in the hajj system. *Arabian Journal of Geosciences*, 14, 2121. https://doi.org/10.1007/s12517-021-08533-x
polluted slaughterhouse of Al-Diwaniya city. Kufa Journal

Rodiyah, R. (2024) 'Sustainablity in hajj and Umrah Management: Exploring Eco-Friendly Practices and Strategies'. Jurnal Manajemen Dakwah, 12(1), pp. 1-21. Available at: https://doi.org/10.15408/jmd.v12i1.39153

Saudi Press Agency (SPA) (2023) *Saudi Arabia launches initiatives to make hajj more environmentally sustainable*. (online) 25 June. Available at: https://www.spa.gov.sa/en/N2128057

Schoen, M., & Sayegh, A. (2018). The role of the gut microbiome in health and disease. *Clinical Microbiology Newsletter*, 40(1), 1–8. https://doi.org/10.1016/j.clinmicnews.2017.11.001

The Guardian (2024) *hajj pilgrimage: Death toll rises amid extreme heat in Mecca*. (online) 23 June. Available at: https://www.theguardian.com/world/article/2024/jun/23/hajj-pilgrimage-death-toll-extreme-heat-mecca-saudi-arabia

University of Western Australia (2024) *More than 1300 hajj pilgrims died this year when humidity and heat pushed past survivable limits. It's just the start*. (online) December. Available at: https://www.uwa.edu.au/news/article/2024/december/more-than-1300-hajj-pilgrims-died-this-year-when-humidity-and-heat-pushed-past-survivable-limits-its-just-the-start

World Health Organization (WHO), 2024. *Climate change and health: Heat and health*. (online) Geneva: WHO. Available at: https://www.who.int/news-room/fact-sheets/detail/climate-change-heat-and-health

Yu, Y., Feng, K., Hubacek, K., & Sun, L. (2020). Global implications of China's future carbon neutrality target. *Energy Policy*, 138, 111215. https://doi.org/10.1016/j.enpol.2019.111215

Islamic Foundation for Ecology and Environmental Sciences (IFEES). (2015) *Islamic Declaration on Global Climate Change*. Available at: https://www.ifees.org.uk/about/islamicdeclaration/

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