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HIT FOR SIX

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Acknowledgements:

Professor Mike Tipton (University of Portsmouth)

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FOREWORD

BY DAREN GANGA

FORMER WEST INDIES CAPTAIN & PROJECT OFFICER AT THE UNIVERSITY OF THE WEST INDIES, FACULTY OF SPORT

There is no doubt in my mind that today cricket faces its ultimate test. Forget concerns around different formats, TV deals or the battle for eyeballs in a multi-screen age.

This challenge is an existential one and it comes in the form of a rapidly changing climate.

Ever more intense heatwaves, deadly storms, excessive rainfall, drought, air pollution - these are just some of the phenomena linked with climate change that are causing chaos at all levels of the sporting pyramid.

I have played in blistering heat and vividly recall the nausea, the dizziness, the cramps that come with feelings of heatstroke. I have witnessed the disruption, despair and uncertainty sown by extreme and unpredictable weather. And things are only expected to deteriorate for the next generation of players, fans and clubs.

I am a proud Trinbagonian of East Indian descent. From the Caribbean to South Asia and beyond, this is a global issue that impacts the people who most care about cricket.

I have had the immense privilege to have enjoyed a career representing my country playing the game I love. A sport that is also beloved by millions and millions across the globe. From Trinidad to Taunton, from Delhi to Durban, I have seen the unbridled joy and enthusiasm that this game of ours brings to different generations and nations.

It is a pleasure to behold and cherish and it saddens me deeply to see it threatened by a worsening climate crisis.

The time to come to the crease and heed the climate call is now. The future of cricket is up in the air and this is one ball that we cannot afford to drop.

FOREWORD

BY SELWIN HART

SPECIAL ADVISER TO THE UN SECRETARY-GENERAL ON CLIMATE ACTION

I come from Barbados and grew up playing cricket at home, at school and on the beach. I dreamt of one day stepping onto the pitch at the Kensington Oval - the most iconic cricket ground in the Caribbean. I had the privilege of a front row seat to the best and most celebrated team ever to play the sport, and watching some of the all time greats - Gordon Greenidge, Desmond Haynes, Malcolm Marshall and Sir Viv Richards. These legendary Barbadian and West Indian cricketers didn't just inspire us - they helped put our small islands on the global map.

Cricket gave the Caribbean a voice. It brought us together as a region under a single banner. But now, climate change threatens to take that away.

As Special Adviser to the UN Secretary-General on Climate Action, I hear and see how the climate crisis is disrupting lives and livelihoods around the world. Cricket is no exception. From unprecedented rainfall in Pakistan, to drought in South Africa, bushfires in Australia, blistering heatwaves in India, and even hurricanes disrupting tournaments - as happened last year in my own homeland when Team India was stranded in Barbados. The game we love is on the frontlines.

No cricketing nation is immune, with grounds becoming unplayable, seasons harder to predict, and extreme heat posing a real risk to players and fans alike. Cricket cannot escape climate change. But it can make a difference. With its global reach and passionate following, this sport is uniquely positioned to inspire real change. And, from grassroots to governing bodies, those who love and lead must take bold action for a more sustainable future.

Cricket is a game where players take calculated risks and seize opportunities every minute - assessing the field and playing the best shot or bowling the best ball based on the scenario they face. The shots we need to play - as my boss, UN Secretary General Antonio Guterres frequently says - are clear; an accelerated phase out of fossil fuels; a rapid scale up of renewable energy; and delivering climate justice to developing climate vulnerable countries at an unprecedented pace and scale.

Unpredictable, dangerous, accelerating: climate change is the ultimate bouncer. If we misjudge it - as many a batsman facing Malcolm Marshall has done - it will inflict lasting damage. Leading cricketing nations - those with the greatest resources and ability- have a special responsibility to protect our great game.

If cricket is to survive and thrive, it needs to adapt. But, like any good team, it also needs major cricket powers to play their respective parts in tackling the root causes of the climate crisis. This report is a timely reminder of what is at stake. Let us harness the unifying power of cricket to drive meaningful change, ensuring that present and future generations can continue to enjoy the game under clear skies and on firm ground.

EXECUTIVE SUMMARY

"Before I'd seen the report I hadn't really thought about how [climate change] would impact the game of cricket. I was really taken aback. The game has to have a plan, a strategy for how we adapt for it."[1]

Those were the words of the late, great Shane Warne upon reading the pioneering Hit For Six report in 2019.[2]

Six years on, the sentiments of the finest spinner in cricket history ring truer than ever. Since then, cricket-loving nations around the world have been further impacted by extreme heat and seismic weather events such as hurricanes, drought and flooding.

As an outdoor summer pursuit played over multiple hours, cricket is regarded as the most climate-vulnerable pitch sport.[3] And its susceptibilities are at their most apparent in the nation where the passion for the game burns brightest: India.

For this follow-up report to the original Hit For Six, we have honed in and examined the impacts of the climate crisis, in particular rising heat, on a country that contains most of the world's one billion cricket fans.[4]

Our analysis of the 65 matches played in the 2025 IPL reveals more than half were played in conditions classified as meriting either "Extreme Caution" or "Danger" on the Heat Index — a measure that combines air temperature and humidity to assess heat-related risk. 27 of those took place under "Extreme Caution" conditions - where heat exhaustion becomes a serious threat. A further nine reached the "Danger" zone, where sunstroke, muscle cramps, and even heat exhaustion are likely, and heatstroke possible with prolonged exposure. This fresh data uncovers a stark picture of one of the world's biggest sporting leagues edging deeper into a climate danger zone.

We hear about the "debilitating air pollution" in Delhi from all-rounder Ashton Turner, who warns that "without change the next generations will be faced with insurmountable challenges" as "ever-increasing temperatures put the game at risk".

Former West Indies captain Daren Ganga recalls his experiences of playing in the "intense heat in central and southern India" and in heat that was "so oppressive that players were cramping by the second session [...]. I remember feeling disoriented because of the excessive heat". He also remembers matches in Delhi when "breathing was difficult" due to the pollution, including one in which "players wore masks - not something you'd imagine in a sport like cricket".

We examine the wide-ranging consequences of extreme heat on player safety, scheduling, training, match tactics and pitch care.

From the grassroots game, we have collected testimony from emerging club cricketers and coaches across India. Amidst experiences of fainting and hospital visits due to heatstroke whilst playing, their concerns include the myriad effects on bowlers, batters, facilities and fixture planning. A shared fear is that increasingly extreme weather patterns are making the sport less inclusive and accessible to younger generations, as articulated by coach Afzal Khan: "If we want to keep the game alive for future generations, we have to protect it where it begins - with the kids."

It is a worry also harboured by former Australia opener, now coach, Simon Katich, who tells us of his "concern about the future of the game and younger generations being affected by extreme weather […]. There is no doubt the extreme weather can impact cricket and affect finances and participation."

England's Maia Bouchier details how "climate change has been impacting cricket quite dramatically over the last couple of years now from what I've seen" and recounts her memories of playing in "incredibly hard" conditions of extreme heat, which left her unable to breathe in the humidity and incapable of standing up - "an experience I will never forget!"

Leading heat specialist Dr Mike Tipton further sets out the physiological and mental effects of heat on cricketers, while scientists from Climate Central provide fresh data analysis that highlights human-induced temperature increases.

We also look at the impacts of climate change on some of the world's other major cricketing nations, from hurricane havoc in the West Indies to flooding in the UK, Australian bushfires and brutal drought in South Africa.

The picture is a disconcerting one. Radical measures - such as roofed stadia, the Ashes played as a day-night series and Boxing Day Tests moved to November - are amongst those to have been proposed.[5]

To coin a phrase, it's just not cricket. Climate change is stopping play as we know it.

"It's brutal. The pitch dries out faster, making it hard for bowlers. Also, batsmen struggle to play their shots when the ground is so hot. It's definitely a growing concern among players of all levels, especially at grassroots."

Raghav, Toss Cricket Academy, Delhi

"All of us talk about it. My teammates and I are noticing that cricket doesn't feel the same. It's a bit scary because we don't know how bad it'll get."

Mohammad Kaif, Wonders Club, Noida

"During a match last summer, I felt like I couldn't breathe properly. My skin was burning, I was sweating nonstop, and I had no strength to even run between the wickets."

Madhvi Bidhuri, DDCA

BY CLIMATE CENTRAL: A POLICY-NEUTRAL 501(C)(3) NON-PROFIT AND INDEPENDENT GROUP OF SCIENTISTS AND COMMUNICATORS WHO RESEARCH AND REPORT THE FACTS ABOUT OUR CHANGING CLIMATE AND HOW IT AFFECTS PEOPLE'S LIVES

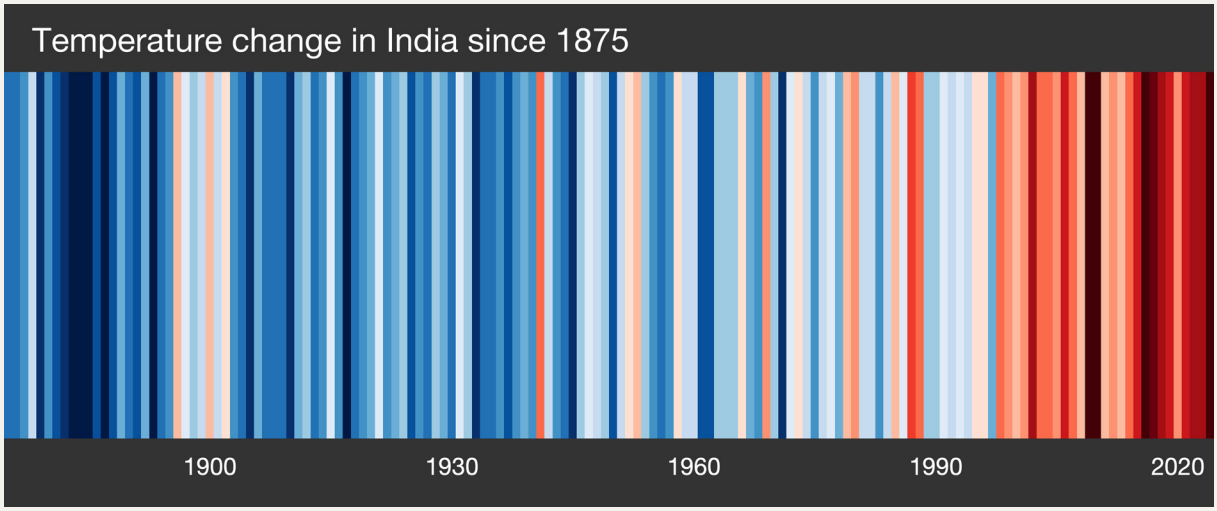
The science of climate change is unequivocal: the Earth is warming, primarily due to the burning of fossil fuels like oil, coal, and gas, and the consequences of that warming are intensifying.[6] The latest report from the Intergovernmental Panel on Climate Change (IPCC) concludes that this warming is increasing the frequency and intensity of extreme weather events around the world. For sports, and in particular for cricket, the consequences are already being felt.

From prolonged heatwaves and severe droughts to more intense tropical storms and erratic rainfall, these climate extremes disrupt match schedules, deteriorate infrastructure, and jeopardise the health and safety of players, officials, and spectators. Nowhere is this more evident than in India, home to cricket's largest fanbase, iconic players and an expanding calendar of matches.

INDIA: RISING HEAT IN THE CAPITAL OF CRICKET FANDOM

India is at the forefront of the climate crisis. Rising temperatures, sweltering humidity and frequent extreme heat days have been redefining how the sport is played and experienced.[7]

- In 2024, India recorded 52 days with temperatures at or above 37°C, compared to a 5-year average of 46 days. Climate attribution science indicates that six of these extreme heat days in 2024 were directly linked to human-induced climate change. Days above 37°C are not just uncomfortable and disruptive to sporting events, but can also pose serious risks to human health, including the potential for fatalities.[8]
- On average, between 2015 and 2024, an average of 315 million people in India have experienced at least 5 additional days with temperatures above 37°C each year because of human-caused climate change.
- Since 1970, the number of days with dangerous humid heat (that is, a heat index exceeding 37°C) for the country as a whole has increased by more than 20 days per year. Outdoor activity in such humid heat poses serious health risks.[9]
- This threat is compounded by air pollution.[10]
- Some urban areas are warming even faster due to the urban heat island effect. Cities like Delhi, Mumbai, and Guwahati – home to major cricket stadiums – are experiencing accelerated warming due to the urban heat island effect. This is because cities tend to experience an extra temperature boost from the replacement of vegetation with heat-absorbing infrastructure.



INDIAN CITIES

Cities that once hosted matches in relatively mild climates are becoming thermal hotspots. For this analysis, we looked at all major cricket stadiums in India and analyzed the daily temperatures between 1970 and 2024, looking for hazardous heat days.

Hazardous heat days are days with temperatures hotter than 90% of temperatures observed in a local area over the 1991-2020 period, also referred to as temperatures above the 90th percentile. Heat-related health risks rise when temperatures climb above this local threshold, because it significantly exceeds the temperatures people's bodies have adapted to.[11]

Almost every major cricket stadium in India has seen an increase in the number of hazardous heat days per year since 1970.[12]

Greenfield International Stadium in Thiruvananthapuram has seen the sharpest increase in heat risk, with more than one hazardous heat day added per year since 1970 — a total of nearly two additional months of extreme heat days over the period.

- Guwahati (43 days), Mumbai (40 days at both Wankhede and Brabourne), and Navi Mumbai (38 days) show high total increases in the number of days with temperatures that pose threat to human health. Urban heat island effects and humidity may compound risks in these cities.
- Even traditionally cooler venues, such as the forest-encircled city of Dharamsala, are not immune to these trends.

CITY	STADIUM(S)	INCREASE IN ANNUAL HAZARDOUS HEAT DAYS SINCE 1970	TOTAL NUMBER OF HAZARDOUS HEAT DAYS IN 2024	HAZARDOUS HEAT THRESHOLD (90TH PERCENTILE, °C)
THIRUVANANTHAPURAM	GREENFIELD INTERNATIONAL STADIUM	57	117	30.2
GUWAHATI	ACA STADIUM, BARSAPARA CRICKET STADIUM	43	90	33
MUMBAI	WANKHEDE STADIUM & BRABOURNE STADIUM	40	72	29.6
NAVI MUMBAI	DY PATIL STADIUM	38	64	32.8
DHARAMSALA	HIMACHAL PRADESH CRICKET ASSOCIATION STADIUM	16	71	27.5
PUNE	MAHARASHTRA CRICKET ASSOCIATION STADIUM	14	55	34.7
JAIPUR	SAWAI MANSINGH STADIUM	13	43	39.6
RANCHI	JSCA INTERNATIONAL STADIUM COMPLEX	11	52	36.1
GWALIOR	MADHAVRAO SCINDIA CRICKET STADIUM	10	43	40.7
NEW CHANDIGARH	NEW PCA STADIUM	8	43	38
BENGALURU	M. CHINNASWAMY STADIUM	8	48	33.2
INDORE	HOLKAR STADIUM	7	22	39
KOLKATA	EDEN GARDENS	7	47	35.6
VADODARA	GUJARAT STATE FERTILIZER CORPORATION GROUND	7	26	39.2
VISAKHAPATNAM	DR.YS RAJASEKHARA REDDY ACA-VDCA CRICKET STADIUM	4	53	33.9

Cities hosting major stadiums experienced a sharp increase in the number of days per year exceeding 37°C, a threshold beyond which outdoor activity becomes increasingly unsafe.

Other cities that did not see as many additional hazardous heat days still experienced the impacts of climate change through disruptions caused by other extreme weather events, such as tropical cyclones and extreme rain.[13]

A GLOBAL PATTERN: OTHER CRICKETING NATIONS FEELING THE HEAT

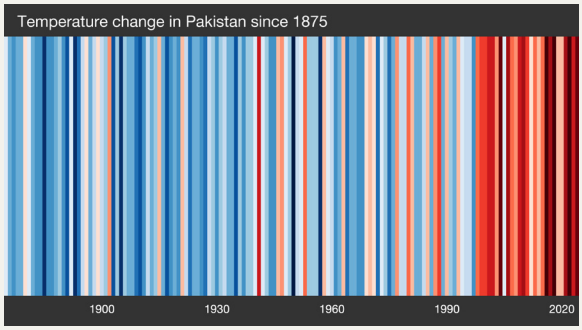
While India faces a frontline battle with heat driven by climate change, it is not alone. Other major cricketing nations across Asia, Africa, the Caribbean and Oceania are also experiencing extreme weather linked to climate change.

Nearly all major cricketing nations see a rise in the number of hazardous heat days, with some seeing significant increase in the number of days per year with temperatures above 37°C due to climate change.[14]

COUNTRY	AVERAGE NUMBER OF DAYS PER YEAR ABOVE 37°C (5 YEAR AVERAGE)	AVERAGE NUMBER OF DAYS PER YEAR ABOVE 37°C ADDEDS BY CLIMATE CHANGE (5 YEAR AVERAGE)
PAKISTAN	83	10
AUSTRALIA	46	15
INDIA	46	5
SOUTH AFRICA	8	6
BANGLADESH	8	-2

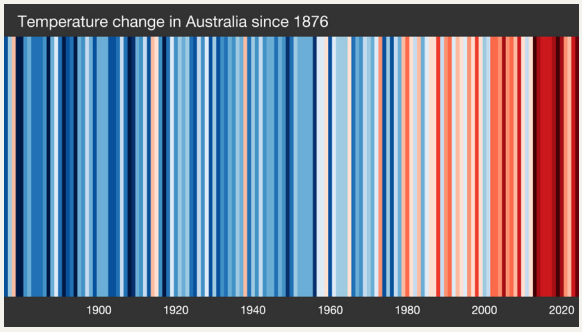
South Asia (Pakistan, Bangladesh and Sri Lanka)

Pakistan, Bangladesh and Sri Lanka are facing deadly combinations of heat and humidity. The 2015 deadly heatwave,[15] 2022 record-breaking March heat[16] and 2023 April humid heatwave[17] were all made at least 30 times more likely due to climate change. Monsoons are also intensifying: Pakistan's 2022 floods were the most destructive in decades and were likely influenced by climate change.[18]



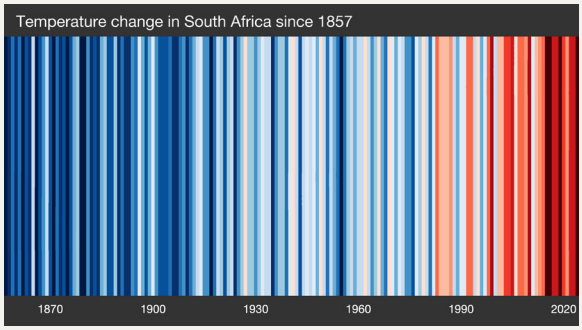
Australia

Increasing fire risk, humidity, and prolonged droughts have disrupted both domestic and international matches. Recent exceptional weather events influenced by climate change include the 'Millennium Drought' in the summer of 2010/11,[19] the 'Tinderbox Drought' of 2017-2019[20] and the conditions that led to the 2019-20 fires.[21]



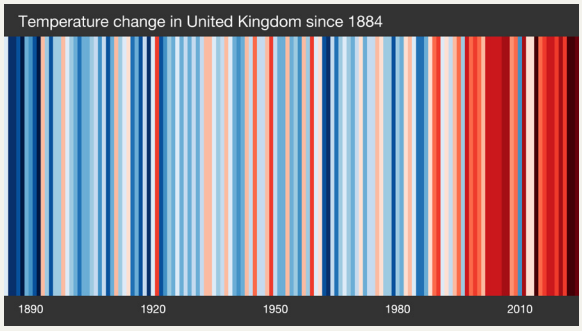
South Africa

Suffering from both drought and excessive rainfall, matches have been cancelled due to persistent downpours or oppressive heat. Climate change contributed to recent drought conditions, impacting pitch quality and water supplies.[22]



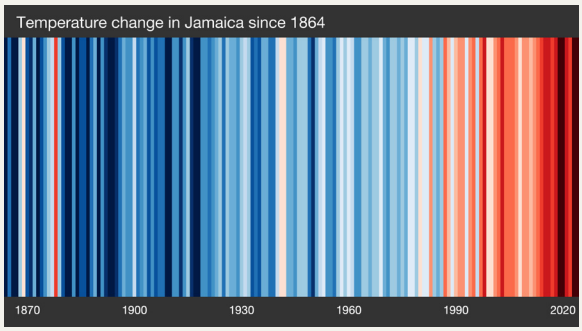
UK

Although less heat-prone historically, the UK has seen a record number of days above 37°C in recent years,[23] and exceptional weather events influenced by climate change such as intensified flooding.[24]



West Indies

Caribbean nations face escalating hurricane threats. Grounds have been damaged by tropical storms, and humid heat is becoming increasingly frequent – a particular concern for player safety, as outlined in the following section of this report. Recent exceptional weather events influenced by climate change include the 2024 Atlantic hurricanes.[25]



SECTION 3- HEAT AND CRICKET

BY PROFESSOR MIKE TIPTON, EXTREME ENVIRONMENTS LABORATORY, UNIVERSITY OF PORTSMOUTH

For the 2019 'Hit For Six' report, I outlined the various physiological effects that extreme heat caused by a changing climate had on cricketers.[26] It is worth revisiting some of the salient points for this follow-up report, including the major factors determining the likelihood of heat-related illness, how the body deals with heat, the impact on performance and the consequences of overheating.

The major factors determining the likelihood of heat-related problems for cricketers, in addition to the duration of exposure, relate to:

- Environmental conditions (temperature, humidity, solar load);
- Intensity and duration of exercise – about 80% of the energy used exercising is released as heat;
- Clothing worn - clothing provides insulation and a barrier to heat exchange with the environment, it absorbs sweat reducing evaporation next to the skin and increases clothing weight.

These factors are highly relevant to cricket as it is played in the summer, often in hot climates, involves a range of exercise from near rest (e.g. slip fielding) to intense exercise (e.g. bowling, running when batting) and a range of clothing (from light everyday clothing to significant padding and head protection). This means that the risk of heat-related issues, and the nature of the problems likely to be encountered in cricket, varies from location to location, from day to day and from player to player.

It has already been established that in hot conditions cricket players can suffer heat-related illness. Two separate studies from Australia have found links between hospitalisation due to heat-related illness and the playing of cricket.[27] The threat of overheating when playing cricket is now more widely appreciated than it was in 2019.[28 29 30]

It is worth noting that the sports resulting in heat-related hospitalisation include those with both high (marathon running) and low (bowls) levels of metabolic heat production. The reasons for this are addressed in the following section.

HOW THE BODY DEALS WITH HEAT

The body has a number of ways of responding to either internal (generated through exercise) or external (environmental) heating. The responses are known as the 'heat loss effector mechanisms'. These include increasing skin blood flow (vasodilatation) to deliver heat to the surface of the body to be lost to the outside world, and sweating, which enables evaporation at the surface of the skin thereby cooling the blood flowing through the skin and consequently the body. These effector systems work best when unclothed, at rest in low humidity air at about 26-28 °C, or colder (~11 °C) if exercising. When air temperature is higher than skin temperature (which is normally about 33-35 °C) heat is gained, not lost, from the environment by non-evaporative routes, and the only route for the body to lose heat is through the evaporation of sweat, which is less effective in high humidity environments. Additionally, the body can react to heat with behavioural responses such as reducing physical activity - the drive to do this increases as body temperature increases.

CONSEQUENCES OF OVER-HEATING

Overheating can have both a psychological and physiological impact on the body.

The Psychological Responses

Increases in body temperature can negatively affect not only the physical functioning of the body but the brain too. Simple cognitive tasks (such as basic arithmetic and how long it takes to make a decision) are less vulnerable to heat stress than more complex tasks such as vigilance (the ability to maintain attention, for example, when batting), short-term/working memory (for example a bowler remembering how the ball bounced off the pitch) and dual tasks (for example, a batter keeping an eye on an incoming delivery while simultaneously manoeuvring to take a shot).[31]

Heat stress adversely affects comfort, mood state, vigour and fatigue. The perception of feeling hot (e.g. hot "flushed" face) or the body's responses associated with heat (e.g. facial sweating) can be distracting, affect concentration and thereby performance when focus and attention are required. For cricket this could be bowling, batting and fielding.

The Physiological Responses

The negative physiological responses to heat range from performance-threatening to life-threatening (Figure 1). They include:

Heat exhaustion. The most common form of heat illness, defined as the inability to continue exercising in the heat. Usually seen in unacclimatised individuals i.e. those not used to the conditions or who haven't had enough time for their bodies to get used to them. It is caused by the body not sufficiently adjusting to the hot conditions and dehydration (reduced blood volume) and is characterised by breathlessness, hyperventilation, weak and rapid pulse, low blood pressure, light-headedness/ dizziness, headache, flushed skin, nausea/gastro-intestinal upset, paradoxical chills (goose bumps and shivering in high temperatures), irritability, lethargy and general weakness. Deep body temperature is raised, but not excessively, sweating persists and there is no organ damage.

Heat stroke. This is a medical emergency resulting from failure of the thermoregulatory system as a result of deep body temperature rising to more than 40.5°C compared to normal body temperature of around 37 °C. It is characterised by confusion, central nervous system dysfunction, diminished coordination, absence of sweating, hot and dry skin, and circulatory instability. If not treated by immediate cooling, it results in death from circulatory collapse, increased gut permeability, inflammation and multiorgan failure. Aggressive steps should be taken to cool the casualty as mortality is related to the degree and duration of hyperthermia.

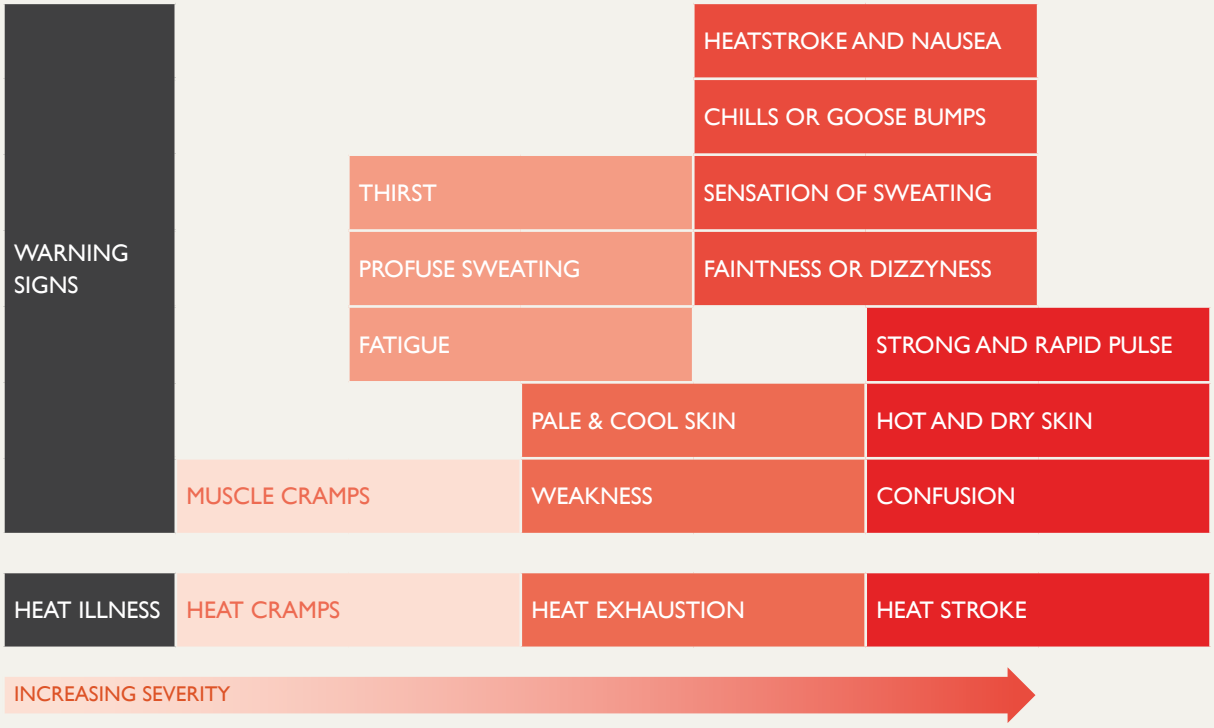


Figure 1. The warning signs of heat-related illness.

Contributing factors

The impact of high ambient temperatures and humidity on performance and risk of heat-related illness can vary significantly from person to person depending on a wide range of chronic and acute individual factors that include:

- Air temperature, humidity, movement, radiant heat load
- Body size (mass, body surface area, skinfold thickness)
- State of training/sudden increase in training
- Degree of acclimatisation
- Hydration status
- Heat production (exercise intensity/duration)
- Clothing worn (vapour permeability, fit, colour, weight)
- State of health (e.g. fever – viral illness, cold, flu; diabetes mellitus, cardiovascular disease, gastro-enteritis/diarrhoea)
- Genetic disorders (e.g. mutations for cystic fibrosis, malignant hyperthermia)
- Skin disorders (including sunburn over 5% of body surface area)
- Use of medication (e.g. diuretics; antihistamines; ergogenic stimulants)
- Sweat gland dysfunction (e.g. prickly heat)
- Salt depletion
- Age
- Sleep deprivation
- Glycogen or glucose depletion
- Acute/chronic alcohol/drug abuse

It is also now clear that people in a competitive situation, or with certain personality traits, are more likely to push themselves to the point of heat illness.[32]

Because some of these factors can be temporary in nature, a player can suffer heat illness in circumstances in which they were previously unaffected. Acclimatisation to heat is generally regarded as the most effective way of reducing the risk of heat-related performance impairment and illness with benefits including: greater cardiovascular stability; improved salt balance; better thermoregulation; improved thermal comfort and work capacity.

IMPACT ON PERFORMANCE

Performance impairment due to heat occurs via two main mechanisms, both of which can occur during exercise:

1. The direct effects of high deep body temperatures on cellular, central nervous system and organ function. This is usually seen when intense exercise results in the body producing large amounts of heat, or lower levels of heat production but when wearing clothing or protective equipment (which inhibit heat loss) in warm, humid or hot conditions.

2. The indirect effects of skin blood flow (vasodilatation), sweating, dehydration and consequent compromised cardiovascular function (ability of the circulation to cope with demands placed upon it) (Figure 2) resulting in overheating, low blood sugar and impaired performance of the cardiovascular system.

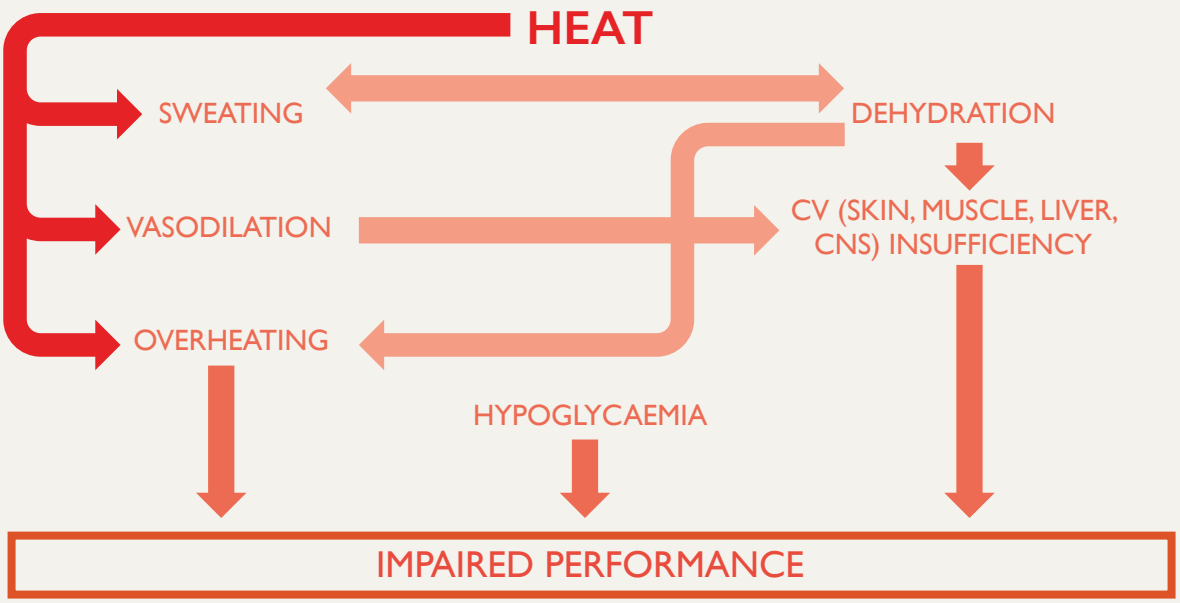


Figure 2. Mechanism of indirect, cardiovascular-related, performance impairment in the heat. CV is cardiovascular; CNS is central nervous system, hypoglycaemia is low blood sugar

It is likely that people playing less intense sports (so generating less heat themselves), but in high temperatures out in the sunshine (a high radiant heat load) will experience the indirect effects of heat with modest increases in deep body temperature but large increases in skin blood flow, and associated dehydration and cardiovascular problems (e.g. heat-related hypotension, light-headedness and fainting).

With more intense sports which see the body generate high levels of heat, problems are more likely to come from direct effects of increasing deep body temperature resulting in hyperthermia and heat stroke.

The important point is that cricketers, depending on what they are doing (bowling, batting, fielding) are susceptible to both these causes of heat-related physical and cognitive impairment. Both mechanisms, and therefore heat-related illness, are made more likely by dehydration. During exercise body fluid loss, primarily due to sweating, depends on several factors including external temperature, fitness, level of acclimatisation, intensity and duration of the activity. An athlete competing all day in a hot climate may require 4–12 litres of fluid. Without adequate fluid replacement, athletes can lose body fluid equivalent to 3–10% of their body mass while exercising. Dehydration equivalent to losing just 1-5% of body mass can impair cognitive and physical performance in the heat, resulting in exhaustion, significant reductions in performance and increases in deep body temperature due to reduced heat loss from sweating and skin blood flow. Dehydration of 4.3% of body mass can reduce endurance by 22–48% and maximum aerobic exercising capacity by 10–22%.

HOW HOT IS TOO HOT?

The most widely used measure of hot environments is the "Wet Bulb Globe Temperature" (WBGT) index; it is regarded by many as the criterion standard for the assessment of thermal stress during physical activity. The index combines dry (Tdb) and wet bulb (Twb) air temperature with radiant (Tg e.g. sunlight) temperature in the following formula:

WBGT = 0.1Tdb + 0.7Twb + 0.2Tg

The high weighting for 'wet bulb' (which is related to the humidity [water vapour pressure] in the environment) emphasises the large impact humidity has on the body's ability to evaporate sweat and the importance of sweating in avoiding heat stress.

A few examples should help demonstrate why measuring WBGT is more important than measuring just air temperature. Taking a fixed air temperature of 30°C and wind speed of 0.5 metres per second in all cases:

Example 1: Cloudy day (no sun), relative humidity 50 percent,
WBGT = 25.9°C

Example 2: Sunny day, relative humidity 35 percent,
WBGT = 29.5°C

Example 3: Light cloud cover, humid day (relative humidity 90 percent),
WBGT = 32.0°C

These examples demonstrate that WBGT does not equal air temperature - they are different measurements; while air temperature alone provides relatively little information about the potential heat strain faced by players. They also emphasise that high humidity limits sweat evaporation and therefore the ability to control body temperature (sweating serves no function [other than dehydrating] unless the sweat produced can evaporate).

But how can WBGT be used? The American College of Sports Medicine has developed the following WBGT recommendations for avoiding heat-related injury during continuous activities such as running and cycling*.

WBGT	ACTION
>28° C	BLACK FLAG: CANCEL OR RECOMMEND VOLUNTARY WITHDRAWAL. (RACES THAT ARE ALWAYS HELD IN THESE CONDITIONS SHOULD ACKNOWLEDGE THE EXTREME HEAT RISK TO THE POORLY ACCLIMATED AND NON-RESIDENT COMPETITORS IN THE PRE-RACE LITERATURE AND THE PRE-RACE ANNOUNCEMENTS)
23° C – 28°C	RED FLAG: RECOMMEND PARTICIPANTS AT INCREASED RISK FOR HEAT COLLAPSE WITHDRAW FROM RACE AND OTHERS SLOW PACE TO MATCH CONDITIONS.
18° C – 22°C	YELLOW FLAG: RECOMMEND PARTICIPANTS AT INCREASED RISK FOR HEAT COLLAPSE SLOW PACE. WARN ENTRANTS OF INCREASED RISK OF HEAT COLLAPSE.
<18°C	GREEN FLAG: COLLAPSE CAN STILL OCCUR. DECREASED RISK OF HYPERTHERMIC AND HYPOTHERMIC COLLAPSE.
<10°C	WHITE FLAG: INCREASED RISK OF HYPOTHERMIC COLLAPSE

Table 1. The American College of Sports Medicine WBGT recommendations for continuous activities

*(*Although cricketers are usually not considered as engaging in "continuous activity", the example presented earlier in this report suggests that the heat production of an international batsman is equivalent to an individual running at about 8 km/h).*

These recommendations relate to lightly-clothed "road race" athletes so for cricketers wearing heavier clothing or protective padding (which add to work performed, and can limit radiative or evaporative heat loss), the lower temperature in each range should be used. However, whilst Australian cricket and others have introduced a heat policy, specific WBGT guidelines for cricket are not widespread. Australian cricket and others have introduced a heat policy. Clearly, any increases in ambient air temperature, humidity and solar radiation and more severe and longer heatwaves with climate change will increase the impact of climate on cricket even more." "On the basis of safety-related heat stress indices, more games being postponed or rearranged to cooler times of the day, due to high ambient temperatures." "Poorer performance due to deteriorating cognitive function resulting in more errors, shorter innings and lower skill levels."

POSSIBLE IMPLICATIONS FOR CRICKET

Cricket is a game that requires its players to have a wide range of physical and psychomotor skills, including concentration, hand-eye coordination, agility, fast decision making, fast reaction times, sprinting and endurance. These technical skills, cognitive and physiological capabilities, must be maintained at the highest of levels over the course of often long periods. Many of these functions are adversely affected by the heat and high body temperatures. The implications for cricket matches being played in very hot conditions are many and varied. They include:

- On the basis of safety-related heat stress indices, more games being postponed, rearranged to cooler times of the day, due to high ambient temperatures.
- Poorer performance due to the deteriorating cognitive function resulting in more errors, shorter innings and lower skill levels.
- Decreased motivation ("central fatigue") to perform at a high intensity be that fielding, fast bowling or running between the wickets.
- Increased likelihood of heat exhaustion and other heat illnesses leading to performance decrement and retirement.
- Increased likelihood of heat stroke resulting in the need for medical intervention.

The impact of the very high temperatures associated with climate change will not be limited to players. Similar impairments of cognitive function could be seen in overheating umpires leading to more errors and a greater reliance on technology. Spectators will be exposed to higher temperatures, more direct sunlight increasing the chance of hyperthermia, heat syncope (fainting) and sunburn. Young people have different physiological responses to heat and a generally lower tolerance of hotter conditions. Particular care should be taken for young cricket players to ensure these lower tolerances are taken into account when considering what extra facilities, guidance or rules are required.

Where the game is played at the grassroots level at any age, consideration should be given to the facilities and expertise available; unlike at the elite level, cooling and hydration strategies and access to proper medical attention might not be immediately on hand.

INDIA

Cricket is more than a sport in India. It is consumptive, a febrile obsession that envelops its population of over 1.43 billion and captures the nation's consciousness in an unparalleled way.

India was a host of the ODI World Cup for the first time in 1987. They most recently hosted the tournament in 2023. The intervening decades have seen a trend of increasing temperatures and heatwaves that have doubled in frequency.[33]

The 2023 competition was characterized by scorching heat, as players from multiple teams struggled to adapt to the conditions.[34] At the semi-final between the hosts and New Zealand in Ahmedabad, India's Virat Kohli and Shubman Gill suffered debilitating cramps, with Gill having to leave the field at one point before resuming his innings and Kohli forced to miss practice sessions in order to recuperate.[35]

AIR POLLUTION

The extreme heat also intensified the effects of air pollution. One of the tournament's iconic images was not of a trophy being lifted or a boundary being hit, but rather of Bangladesh players and staff wearing masks as they trained ahead of their match against Sri Lanka in Delhi.[36] Players with asthma had to stay away and the ICC were warned of the "existential threat" of climate change to cricket.[37]

"Some of us developed coughing, so there's a risk factor," commented Bangladesh's team director Khaled Mahmud. "We don't want to get sick."[38]

The Sri Lankan team cancelled their training after advice from team doctors as the Air Quality Index (AQI), which measures the level of air pollution, soared above a maximum value of 500 (a staggering 10 times the level classified as 'good').[39] The Sri Lankans knew all about the risks involved, having experienced playing in dense pollution at the same venue in 2017. During that Test, a number of players were forced to leave the field to vomit in the changing-room, with others being treated on the pitch for respiratory problems and fielders donning masks as they came out to play.[40]

And the scenario was not unique to Delhi. At the 2023 tournament, India captain Rohit Sharma was compelled to eloquently express his concerns over the worsening air quality in Mumbai:[41]

"In an ideal world, you do not want a situation like this […]. It is not ideal and everyone knows that. Looking at our future generations, your kids, my kid. Obviously it is important that they get to live without any fear. Every time I get to speak outside of cricket, or not discussing cricket, I always talk about this. We have to look after our future generations."[42]

Earlier in the World Cup, England's Joe Root voiced his own alarm following a loss against South Africa in Mumbai:

"I've not played in anything like that before. I've obviously played in hotter conditions, and probably more humid conditions. But it just felt like you couldn't get your breath. It was like you were eating the air. It was unique.

"I mean you couldn't get away from it. You walk out onto the field and your shirt's soaking wet, and you have a lot heavier breath than you would do, and you know you've done your fitness and stuff, it's not like you're short on that. So you are very aware of it."[43]

Former West Indies captain Daren Ganga shared his experiences of playing in India with this report:

"Apart from the intense heat in central and southern India, air pollution during some matches in Delhi made breathing difficult. In one match, players actually wore masks- not something you'd imagine in a sport like cricket.

"During an India v West Indies Test match in Delhi 2002, the heat was so oppressive that players were cramping by the second session, and I remember feeling disoriented because of the excessive heat- something that rarely happened in my career.

"Hydration and stamina are constant battles now. When temperatures soar past 40°C, your decision-making, reflexes and physical endurance suffer. Mental fatigue sets in quicker, and that can decide a match."

It is a feeling that is familiar to Ashton Turner, the vastly experienced Australia all-rounder who has played around the world for both his country and a range of teams, including in India.

"I've seen the impact our changing climate can have on our game, from the debilitating air pollution in Delhi to the extreme temperatures we experience in our Australian summers," he told this report.

"Without change the next generations will be faced with insurmountable challenges. Ever-increasing temperatures are putting the game at risk and it's affecting everyone from players to coaches to umpires to spectators and everyone in between.

"We've seen elite athletes at the pinnacle of the sport be struck down from heat exhaustion, how are the under-10's boys and girls meant to cope on hot days? Cricket is a sport for all and we know the health and social benefits of playing team sports, we don't need any more excuses for our kids to be inside."

THE INDIAN PREMIER LEAGUE

The Indian Premier League (IPL) has become one of the biggest sporting events in the international calendar, a cultural behemoth that has blossomed into a multi-billion dollar business and attracted the finest cricketing talent, including the likes of Ashton, from across the globe.[44] Only founded in 2008 and boasting a television audience of 500 million, it has been one of the great success stories of modern sport, rivalling even the likes of the NFL and Premier League.[45]

The tournament takes place between March and May in the pre-monsoon period in cities around the country, including Delhi, Mumbai, Nagpur, Hyderabad and Ahmedabad. These months are now marked by record-toppling temperatures.[46] In 2024, a gruelling heatwave brought mass disruption,[47] with a series of red alerts and a highest-ever Indian temperature of 52.3°C in Delhi as more than 37 cities grappled with temperatures over 45°C[48] and the country recorded its hottest May in over 35 years.[49] The heat caused over 100 deaths, as well as more than 40,000 suspected cases of heatstroke.[50].

During that heatwave, players were prone to cramps, severe fluid and weight loss, fatigue

and heatstroke.[51] The health risk was not limited to the players, with Bollywood legend and Kolkata Knight Riders owner Shah Rukh Khan hospitalised[52] for a number of days after suffering from heatstroke whilst watching his team take on Sunrisers Hyderabad.

The 2025 IPL season unfolded in a sweltering haze, with extreme heat becoming the rule, not the exception. Veteran bowler Ishant Sharma was an early casualty, forced to leave the field[53] with heat illness as Gujarat Titans took on Delhi Capitals. Extreme heat is already influencing tactics during mid-afternoon matches, with captains choosing to bat first if they win the toss, forcing the opposition to field in blistering heat. Of the 65 matches played, more than half were played in conditions classified as either "Extreme Caution" or "Danger" on the Heat Index — a measure that combines air temperature and humidity to assess heat-related risk, with only nine avoiding triggering heat warnings altogether. The rest veered into dangerous territory: 27 took place under "Extreme Caution" conditions - where heat exhaustion becomes a serious threat. A further nine reached the "Danger" zone, where sunstroke, muscle cramps, and even heat exhaustion are likely, and heatstroke possible with prolonged exposure. This fresh data uncovers a stark picture, of one of the world's biggest sporting leagues edging deeper into a climate danger zone.

In new research conducted for this report, cricket non-profit The Next Test evaluated air quality during all 75 matches of the 2025 IPL season (see Table 3). The analysis found that not a single match recorded air quality within the "Good" category of the Air Quality Index (AQI). While conditions did not reach the "Severe" or "Hazardous" levels, nearly half of the matches - 34 in total (47%) - were classified as "Poor." An additional five matches were assessed within the "Unhealthy" range.

These findings are particularly concerning given the vulnerability of athletes to air pollution. During high-intensity physical activity, athletes inhale significantly more air than individuals at rest and tend to breathe through their mouths, bypassing the natural filtration processes of the nasal passages. This combination increases the intake of airborne pollutants and leaves athletes more vulnerable to associated health risks.[54]

TEMPERATURE	RATING	POSSIBLE IMPACTS	NUMBER OF DAYS
<26.7			9
26.7-32.2C	CAUTION	FATIGUE POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY.	20
32.2-39.4	EXTREME CAUTION	SUNSTROKE, MUSCLE CRAMPS, AND/OR HEAT EXHAUSTION POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY.	27
39.4-51	DANGER	SUNSTROKE, MUSCLE CRAMPS, AND/OR HEAT EXHAUSTION LIKELY. HEATSTROKE POSSIBLE WITH PROLONGED EXPOSURE AND/OR PHYSICAL ACTIVITY.	9

Table 2: Heat Index Rating of the 65 IPL matches data was available for

AQI	RATING (US STANDARD)	POSSIBLE IMPACTS	NUMBER OF DAYS
0-50	GOOD	AIR QUALITY IS CONSIDERED SATISFACTORY	0
51-100	MODERATE	FOR SOME POLLUTANTS THERE MAY BE A MODERATE HEALTH CONCERN FOR A VERY SMALL NUMBER OF PEOPLE WHO ARE UNUSUALLY SENSITIVE TO AIR POLLUTION.	35 (47%)
101-150	POOR	MEMBERS OF SENSITIVE GROUPS MAY EXPERIENCE HEALTH EFFECTS.	34 (46%)
151-200	UNHEALTHY	EVERYONE MAY BEGIN TO EXPERIENCE HEALTH EFFECTS; MEMBERS OF SENSITIVE GROUPS MAY EXPERIENCE MORE SERIOUS HEALTH EFFECTS.	5 (7%)
151-200	VERY UNHEALTHY	HEALTH ALERT: EVERYONE MAY EXPERIENCE MORE SERIOUS HEALTH EFFECTS.	0
301-400	HAZARDOUS	HEALTH WARNINGS OF EMERGENCY CONDITIONS. THE ENTIRE POPULATION IS MORE LIKELY TO BE AFFECTED	0

Table 3: Air quality readings for all IPL 2025 matches

RESPONSE FROM PLAYERS AND CLUBS

Such questions have sparked a growing conversation amongst some of India's most high profile cricketers.

"Climate change is on our doorstep, and it's our responsibility to take care of the only planet that we call home," warned Virat Kohli, widely regarded as one of the game's finest batsmen, amidst a 2022 heatwave.[55]

"I think about our future generations: what will they have? They'll have nothing if the world continues the way it is right now," Rohit Sharma told Ebony Rainford-Brent in the Sky documentary 'Cricket's Climate Crisis':

"They won't have fresh air to breathe, they won't have the ocean to go and watch all the marine life, that's something you think about every day. I enjoy it so much, I want it to continue."[56]

And the peerless Sachin Tendulkar, known as the 'Little Master' for his batting genius, has embraced environmental activism and engaged in sustainable movements. "A small step by each one of us can go a long way in making our Earth a better place to live in," he stated.[57] "Every action to preserve our biodiversity for our future generations counts."

"Go Green India," he has urged.[58] "It's our responsibility to take care of our environment."

In the IPL, the Royal Challengers Bengaluru (RCB) are amongst those seeking to raise climate consciousness. The carbon-neutral franchise, who monitor their emissions around travel and stadium operations, have implemented an annual 'Go Green' initiative, wearing special recycled kits and issuing regular rallying calls.

"Our green jerseys are more than just a symbol," said their COO Rajesh Menon.[59] "They are a call to action. As proud representatives of the Garden City, sustainability is a natural priority for us."

RCB team analyst Freddie Wilde recalled one lingering experience during an encounter against Chennai Super Kings in 2021 which saw the entire tactical overview of the game drastically influenced by the heat.

"You could see players retreating into the shadows [by the stands], even if it wasn't in the fielding position they were meant to be in - it was that hot," he told Euronews.[60]

"It was just unbearable and it completely broke the players. The fear that that might happen again is always on your mind."

TACTICAL IMPACTS

A variety of impacts on certain styles of bowling, due to factors such as pitch conditions and excess hand sweat, are further examples of how the type of game being played is shaped by extreme heat.[61] Even batting first after winning the toss, to avoid fielding in the glare of the sun, comes with its own risks.

England international Maia Bouchier relayed one of her memories of playing in scorching heat to this report:

"I have been subject to the temperature increases in the subcontinent, where conditions were incredibly hard to play in […]. After one game, where I had only really been batting for about 45 minutes to an hour, I couldn't breathe in the humidity and I had to sit down for 15 minutes[…] because I felt light headed and physically couldn't stay standing.

"We also had to have a drink every 15/20 mins which is not normal for a standard T20 game of cricket, which usually lasts about an hour and fifteen minutes for one innings. [...] With batting, you have to wear a helmet, a thigh pad, pads for your legs, and gloves for your hands - so fully covered, as well as being in long sleeve trousers. Let's just say it was an experience I will never forget!"

STORMS

Of course, heat is not the only climatic factor to seriously affect Indian cricket. Fans were sent scattering at the stadium in Lucknow in 2023 after debris crashed into the stands and advertising hoardings were ripped from their fastenings during the fierce winds of a dust storm.[62]

In Hyderabad in 2019 the roof canopy of the Rajiv Gandhi International Stadium was ripped apart by winds of up to 78 kmph, [63] which were accompanied by heavy rainfall, while a cyclonic storm caused large-scale damage to the SCA stadium in Rajkot in 2023, shattering the glass windows of the commentary and media boxes and causing havoc for scheduled matches.[64]

The severe rainfall and floods triggered by Cyclone Michaung in 2023 caused a number of fatalities, an estimated $1.32 billion worth of damage and the evacuation of over 41,000 people. Amidst the chaos, highly respected Indian international cricketer Ravichandran Ashwin issued a series of passionate pleas:

"[I] have been speaking to some senior government officials and the stories they are sharing after being on the road for 3–4 days is heart-wrenching to say the least," he wrote.[65]

"We need to value lives and also put a value on our lives. If we don't expect a certain standard for ourselves, no one else is going to knock on our door and give it to us.

"Climate change is real and make no mistake, all of us that think this is someone else's problem have to wake up because it's coming for us and we better be prepared." [66]

Buffeted by storms, unseasonal rains, drought and pollution, and with expert predictions that by as soon as 2050 temperatures in India will surpass human survivability limits,[67] Ashwin's words carry a powerful message for his country, its cherished national sport and the wider world.[68]

VOICES FROM THE GRASSROOTS GAME IN INDIA

As part of this report, we have collated testimony from a range of cricketers at different ends of the professional spectrum. This includes the experiences of emerging club cricketers and coaches across the country. Below are a collection of their responses:

"It's brutal. The pitch dries out faster, making it hard for bowlers. Also, batsmen struggle to play their shots when the ground is so hot. It's definitely a growing concern among players of all levels, especially at grassroots."
Raghav, Toss Cricket Academy

"Last summer, I couldn't handle the heat during a long innings. I ended up with a heatstroke and had to be rushed to the hospital."
Vikram, U-19 state player

"I've definitely felt the difference in extreme heat during games. Last summer, I fainted after a long day in the sun. It was a wake-up call for me about how dangerous this heat can be."
Aarav, Toss Cricket Academy

"We have to adjust our schedules and train early in the morning or late at night. It's tough because I feel like I'm missing out on key practice time."
Arjun, Jamia Hamdard

"I've seen a lot of younger cricketers miss out on matches because of heat and storm disruptions."
Mohit, Toss Cricket Academy

"All of us talk about it. My teammates and I are noticing that cricket doesn't feel the same. It's a bit scary because we don't know how bad it'll get."
Mohammad Kaif, Wonders Club

"It's hard to ignore now. The weather changes suddenly- either it's burning hot or it's pouring. Matches get cancelled or shortened all the time."
Danish, Collage Sports

"Batting in extreme heat is mentally and physically exhausting. It's hard to concentrate for long, your reflexes slow down, and you get tired way too fast."
Vanam Aggarwal, Ardee School

"At our level, we don't have many resources. So when the weather gets extreme, it hits us harder. Pitches get ruined, grounds stay unusable for days, and we lose match time that's hard to get back."
Waqar Khan, Raebareli

"During a match last summer, I felt like I couldn't breathe properly. My skin was burning, I was sweating nonstop, and I had no strength to even run between the wickets."
Madhvi Bidhuri, DDCA

"I'm very worried. If kids can't play safely or regularly, they'll start drifting away from cricket. And for girls especially, it's already hard enough—this just makes it harder."
Kavita, Hind

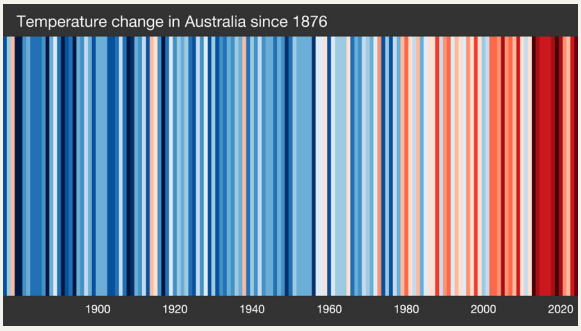
"Everyone around me is noticing it. Whether it's players or coaches, we're all adapting constantly to weather that feels more extreme every season."
Sushma, Toss Cricket Academy

"As a wicketkeeper, you're in crouch position for hours, fully geared up, and constantly moving. In extreme heat, it becomes unbearable. It's hard to stay focused when you're overheating and sweating nonstop."
Shweta, Jasola Sports Complex

"We need awareness, investment, and innovation at the local level- not just in elite cricket. If we want to keep the game alive for future generations, we have to protect it where it begins - with the kids."
Afzal Khan, IIIT Delhi

AUSTRALIA

Australia has been at the frontline of the effects of a changing climate for decades, with average summer temperatures rising consistently across the last 100 years.[69] The hotter weather is also starting earlier in the year, lasting longer and becoming more extreme.[70]



This has led to a growing number of Australian athletes - such as cricket captain Pat Cummins and former Wallabies captain David Pocock - powerfully harnessing their profiles and platforms in recent years to raise awareness of the impacts on the sports they cherish.[71] [72]

Simon Katich represented the Australian cricket team in over 50 Tests, often opening the batting for them during the hottest spells of the day. Now a successful coach whose career spans a rich variety of continents and teams- including the Perth Scorchers and Punjab Kings- Katich is keen to add his voice to the collective call to arms.

"There is a genuine concern about the effects of climate change," he told this report.

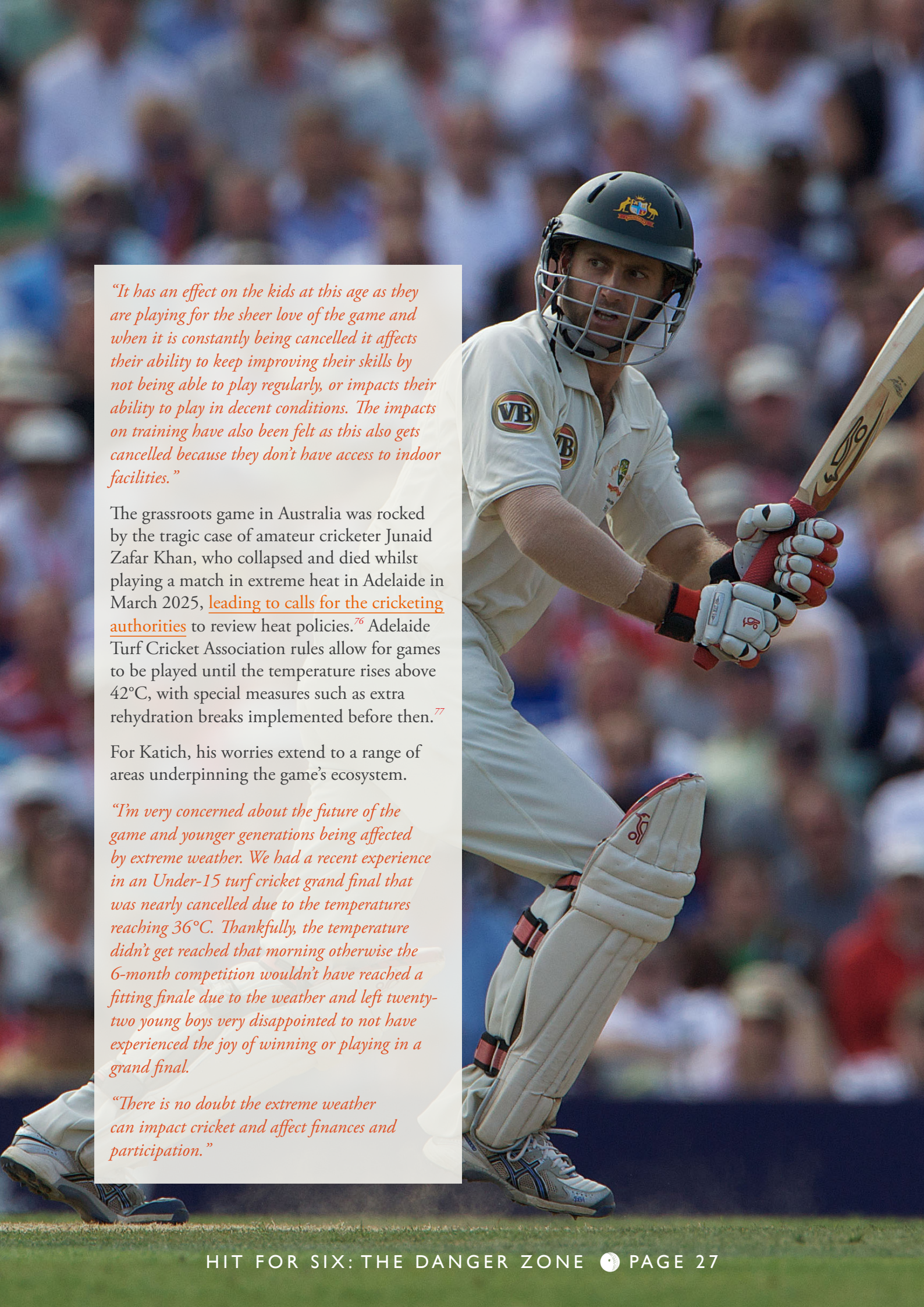
"In the last few years in Sydney we have seen multiple occurrences of extreme heat leading to bushfires. [The one] in 2019 cost 34 people their lives and destroyed over 3000 buildings. We have also witnessed flooding due to extreme rainfall in 2021 and more recently in late March 2025 from Ex-Tropical Cyclone Alfred."

Playing conditions during those 2019 bushfires were described as "like smoking 80 cigarettes a day" by Australian spinner Steve O'Keefe.[73] "It's not healthy," he said at the time. "I don't have kids, but if I did they'd be locked up inside, and if I was at home I wouldn't be training or playing."[74]

At the 2024 Boxing Day Test in Melbourne, an iconic fixture in the Australian sporting calendar, severe heat warnings were issued by Cricket Australia ahead of the first day of the fourth Test between Australia and visitors India.[75]

Katich, who was accustomed to grappling with heat cramps whilst playing in temperatures above 40°C during his early career in Perth, has witnessed first-hand how all levels of cricket in Australia - from the elite to the grassroots - have been increasingly affected by extreme weather events.

"The impacts on cricket have been felt at the junior levels [...] with numerous matches washed out due to the excessive rainfall. The Sydney Test in early January has also been affected by heavy rainfall a number of times in the last decade, leading to an impact on the result of the Test due to time lost for so much rain. I've personally been affected with my son's junior cricket being cancelled at least four times in the most recent 2024/25 cricket season.



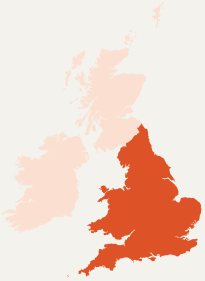
"It has an effect on the kids at this age as they are playing for the sheer love of the game and when it is constantly being cancelled it affects their ability to keep improving their skills by not being able to play regularly, or impacts their ability to play in decent conditions. The impacts on training have also been felt as this also gets cancelled because they don't have access to indoor facilities."

The grassroots game in Australia was rocked by the tragic case of amateur cricketer Junaid Zafar Khan, who collapsed and died whilst playing a match in extreme heat in Adelaide in March 2025, leading to calls for the cricketing authorities to review heat policies.[76] Adelaide Turf Cricket Association rules allow for games to be played until the temperature rises above 42°C, with special measures such as extra rehydration breaks implemented before then.[77]

For Katich, his worries extend to a range of areas underpinning the game's ecosystem.

"I'm very concerned about the future of the game and younger generations being affected by extreme weather. We had a recent experience in an Under-15 turf cricket grand final that was nearly cancelled due to the temperatures reaching 36°C. Thankfully, the temperature didn't get reached that morning otherwise the 6-month competition wouldn't have reached a fitting finale due to the weather and left twenty-two young boys very disappointed to not have experienced the joy of winning or playing in a grand final.

"There is no doubt the extreme weather can impact cricket and affect finances and participation."



ENGLAND & WALES

The Game Changer II report of 2023 utilised fresh data and analytical methodology to highlight the chaos inflicted on cricket in the UK by weather disruption,[78] noting increasing rates of match abandonment and use of the Duckworth-Lewis-Stern method (a mathematical formulation used to calculate the target score for a batting team when the game is interrupted by weather).[79]

This frustration was crystalized by the rain-soaked ending to that year's Ashes series, which saw relentless downpours at Old Trafford drown out hopes of the most memorable climax possible: instead of a winner-takes-all fifth Test, rain stopped play and Australia retained the trophy in the pavilion rather than on the pitch.[80] Dampness trumped drama, on a day for a different kind of duck.

Heat has also become more of a disruptive factor for the UK's cricketers. The summer heatwave of 2022 saw a temperature of 40°C recorded [81] for the first time in the UK.[82] Fans fainted and cricketers wilted in sweltering conditions,[83] including the England bowler Matthew Potts, whose One Day International debut against South Africa in Durham was ruined when he had to leave the field after only four overs because of heatstroke.[84]

It was only more than six months later that Potts felt able to revisit his ordeal publicly, recounting his horror at how what should have been a dream day turned into a nightmare.[85]

"I bowled the end of that fourth over and I was kind of wobbling […]. An hour after coming off the pitch my heart rate was still 150-160. I was still panting and honestly the next few days it felt like concussion. I had fuzzy memories from the game and I was still getting dizzy spells after exercise.

"The next ODI was at Old Trafford and I was training. I was bowling 10 minutes off a half run-up and I just felt really, really dizzy and really, really ill, vomiting and whatnot. It wasn't great."

"We are not cars, you can't just fill us up and we'll go out there and be ready to be fuelled up again."

"We are not cars, you can't just fill us up and we'll go out there and be ready to be fuelled up again." [86] [87] [88]

Maia Bouchier has represented England in a number of formats and has observed the consequences of different types of extreme weather.

"Climate change has been impacting cricket quite dramatically over the last couple of years," she told this report.

"The increase in flooding, which is causing ground damage, heatwaves causing safety concerns to the players, and quite a number of grassroots clubs have been struggling to finance the costs to repair their grounds in an attempt to sustain their revenue due to climate change.

"The grassroots clubs with fewer resources can struggle to maintain or upgrade their infrastructure to cope, which limits opportunities for training. The unpredictable weather patterns with more rainfall and

storms can lead to match cancellations, especially in the regions that have limited or no covered facilities. Another impact is that there is a decrease in training and playing time, as there are fewer training sessions and fixtures taking place due to the busy schedule and/or extended rainy seasons. This can really limit player development."

It is a frustration shared by Lancashire CCC's Phoebe Graham, as she told this report:

"The unpredictability makes it harder to get into routine or rhythm with cricket. Flooding majorly affects our game. It can really affect fans, the commercial aspects and revenue of the sport."

And, according to her Lancashire teammate Evelyn Jones, just moving training to an indoor environment is not always the most practical solution.

"Having to train indoors is quite unrealistic," she explained. "Then you're fighting for space with other squads at the club.

"We have seen snow in April during pre-season/the first few games to mini-heatwaves the same time the following year."

Bouchier, meanwhile, has directly experienced how heat impacts health and playing style.

"In high heat, you fatigue quicker. This means it is much harder to concentrate for long periods of time, especially when it comes to the long format in cricket. You need to be able to concentrate (as a batter, bowler or fielder) for nearly three and a half hours during the day, which is impacted in the heat. This can also impact your reflexes - being able to react to the ball quickly is affected when you have decreased concentration. If you are dehydrated and not getting enough sugar on board, you can cramp, which stops you being able to perform."

Ultimately, Bouchier does feel that there is a growing global awareness of the effects of climate change on cricket and is hopeful that more players, clubs and organisations will add their voices to a concerted campaign to amplify the conversation and act as a catalyst for change.

"There definitely has been a shift in the sense that cricket is being impacted by the environment all over the world, which people are now seeing through social media and are wanting to take action. Organisations like the Marylebone Cricket Club (MCC) and the boards of various countries have been highlighting this, with more players speaking up publicly about their experiences and the boards have been working collaboratively with their grassroots clubs."

A STATEMENT FROM THE ENGLAND & WALES CRICKET BOARD (ECB)

Changing rainfall patterns (including duration, seasonality, intensity and frequency), along with population growth, urbanisation and factors relating to management of watercourses, mean that cricket has had to respond to an ever-growing number of flooding events.

This does vary year on year, but flooding was first added to the ECB's risk register in 2004 and we issued our first technical guidance on flood recovery and resilience in 2007. We also began our first climate change insights work with Cranfield University at this time. This work showed that over a third of cricket grounds were at risk of flooding from rivers and sea and that when combined with the potential for future drought a total of 40% of grounds were likely to be at risk.

Unfortunately, 2023-2024 was another wet year affected by repeated flooding. A further 54 clubs have approached us for support with flood and storm damage, and we have provided nearly £900,000 of additional emergency funding, so far.

These numbers give an indication of the scale of support and response we have had to develop and provide.

Not every flood recovery and resilience project has required funding from the ECB. Budleigh Salterton CC is a brilliant example of how a community club has self-funded its move, from a site repeatedly affected by coastal flooding, to a new, more sustainable site and future for the club. But where needed, we have stepped in to help clubs with flood-threatened futures to keep playing. Examples include Copley CC, Tewkesbury CC, Sowerby Bridge CC and Appleby Eden CC.

The highest profile climate-change and flooding affected club is Worcestershire County Cricket Club, who have been affected by flooding repeatedly. Following seven floods over the 2023-2024 winter (and more since), the club are moving from reacting to every flood event (and the cost that incurs) to taking a strategic approach to developing a flood-resilient solution that provides sustainability for cricket in Worcestershire over the next 100 years.

ECB are taking an innovative approach to understanding flood risk. We are currently working on a project to stratify risk of flooding, taking us beyond just knowing which cricket grounds are at risk of flooding, to which parts of those grounds are at risk of flooding.

This will allow us to target resilience support, guidance and funding to those clubs most at risk and work from there to help build a game that is more resilient to climate change.

Climate and population growth models show that this is likely to be a continued and growing challenge for cricket (and many other sports) in England and Wales, but we are committed to providing a response that is effective and can be sustained in the future.

We will need help to do that – the causes of flooding lie outside cricket and flooding impacts across communities. This requires more resources, and engagement with a range of partners to work with us on integrated solutions.

WEST INDIES

It all came together for India's players at the ICC Men's T20 World Cup in 2024, a tournament co-hosted by the West Indies and the USA. An undefeated run carried them to the final in Barbados where they edged out stern opposition from South Africa to claim their first T20 World Cup title in 17 years.[89] The victory sparked wild scenes of celebration across India and jubilation on the Kensington Oval pitch in Bridgetown.

Less than 48 hours later, the Indian team, administrators and coaching staff were stranded at the airport in Barbados after Hurricane Beryl tore through the Caribbean and left a catastrophic trail of destruction in its wake.[90]

"The aftermath of Hurricane Beryl is a stark reminder of the vulnerability our region faces," said Dr Kishore Shallow, the President of Cricket West Indies, in a statement at the time. "The destruction and loss are profound, and the road to recovery will be challenging."[91]

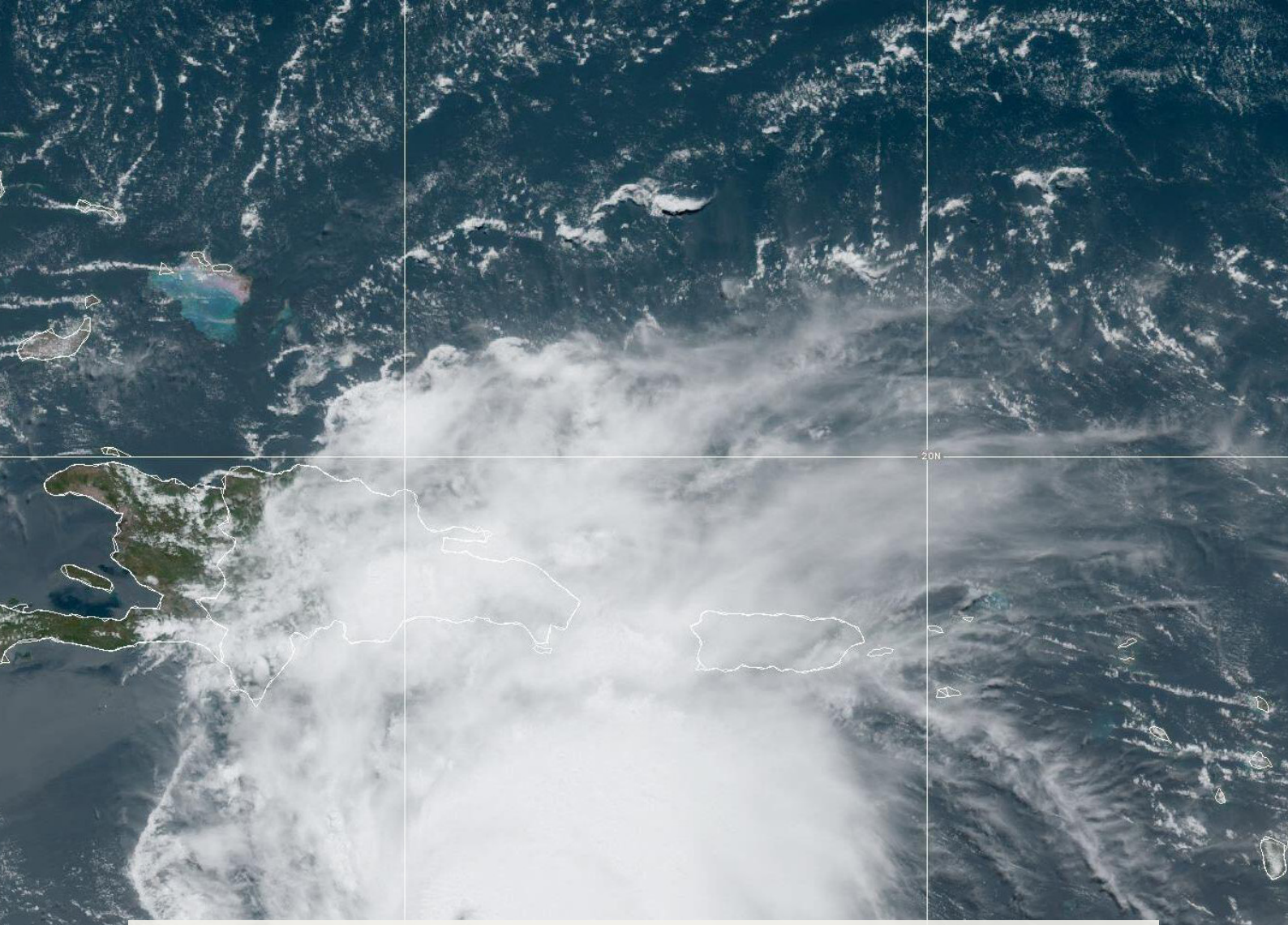
The tropical cyclone was the first of two Category 5 storms of the 2024 Atlantic hurricane season. With its intensity and formation more likely because of climate change, it broke a series of meteorological records- including becoming the earliest-forming Category 5 hurricane on record after it developed rapidly in late June.[92] Scientists found that the hurricane's extreme winds were nearly twice as likely due to climate change.

The West Indies team were in England at the time, preparing for their Test series. During a meeting with King Charles at Buckingham Palace, the players expressed their acute worries for their friends, families and communities back home.[93]

"I told him that the hurricane devastated the islands and caused a great deal of damage and now we've got even more to play for to make West Indians proud," remarked captain Kraigg Brathwaite. "I said that we want to bring some joy back and put a smile on their face. We want to give people something to cheer for. It's the least we can do."[94]

As detailed by the original Hit For Six report,[95] it was not the first time hurricanes fuelled by climate change had battered the islands in recent years.[96]Hurricane Irma and Hurricane Maria brought death, billions of dollars of destruction and damage to cricket stadiums across the Caribbean, with refugees taking desperate shelter at the Sir Vivian Richards Stadium in Antigua.[97]

The growing intensity of hurricanes, coupled with rising sea levels and soaring temperatures, has produced a volatile and at times deadly climate mix. Indeed, as Dr Shallow identified in 2024 in the wake of Hurricane Beryl, the risk is an annual reality, the threat lingers and the stakes could not be higher.[98]



Former West Indies captain Daren Ganga is amongst those to recognise these dangers.

"Coming from Trinidad and Tobago and traveling extensively across the Caribbean, South Asia, and Australia, I've seen first-hand how weather patterns have shifted," he told this report.

"There are more frequent and intense heatwaves, flash floods, and even unseasonal rain that affects match schedules. Just a few years ago, hurricanes in the Caribbean intensified so rapidly it caught entire nations off guard."

He also outlined the impact of the changes in climate on cricket.

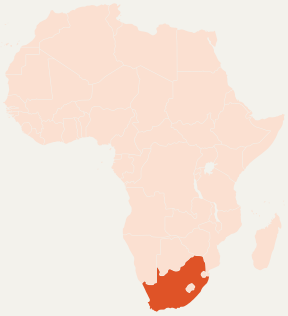
"The game has become more unpredictable. Matches are shortened or called off. Outfields get waterlogged or become dangerous due to excessive dryness. It disrupts not just tournaments but entire domestic seasons, especially in regions like the Caribbean where cricket is a central part of life.

"If weather continues to disrupt series, affect broadcasting schedules and discourage youth participation, the economics and the culture of cricket could be at serious risk."

And Ganga's warning takes on an added urgency in the face of denial and inaction.

"Climate change isn't just a headline - it's a lived reality, especially for island nations like mine. My hope is that sport, including cricket, becomes a louder voice for change.

"Open your eyes. Look at the floods in South Asia, the fires in Australia, the hurricanes in the Caribbean. This isn't fiction- it's happening now. Denial only delays solutions. Sport teaches us to adapt, but also to take responsibility. It's time to act."



SOUTH AFRICA

South African cricket is known for its skill, tenacity and competitive edge. In recent years, players have also had to contend with the formidable foe of extended periods of extreme heat.

The brutal Cape Town drought, which was made far more likely by climate change according to studies and spanned a number of years between 2015-2018,[99] led to the cancellation of school and club cricket as a result of severe water rationing.[100] Officials announced that after such a sustained period of drought, the city was just three months away from running out of any water at all - a scenario known as 'Day Zero'.[101]

Evan Flint was the groundsman at the Cape Town stadium Newlands during this aqua-apocalypse. A few years later he reflected on that time with journalist Tanya Aldred:[102]:

"On a personal level, I remember 2018 being incredibly scary […] and on a professional level it was hard. We still had to irrigate the pitch because of the high clay content, but the outfield we let go.

"In the time I was at Cape Town I noticed a drop in the amount of winter rain which would have a devastating effect in the hot summer months, especially during the 2018 drought."[103]

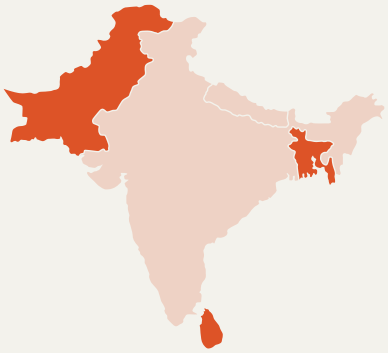
The dire situation facing facilities that did not have the water-harvesting capabilities of elite grounds ensured Flint would even consider a radical option that many cricketing traditionalists would struggle to find palatable.

"I say this with this beautiful turf in front of me, and professional sportsmen want to play on grass, but artificial surfaces do make sense," he told Aldred.[104] "I'm being really sacrilegious now but think about golf courses. The enormous amounts of water those things guzzle is extraordinary."[105]

As Flint identified, the gulf in resources when it comes to turf management systems, equipment and infrastructure ensures that clubs and schools in poorer and rural areas are disproportionately affected by the significant rises in average temperatures over the past decades.[106]

The associated deterioration in pitch quality, postponements, financial and player safety implications have notable knock-on effects on community participation and talent development.

"I am worried. I've got young children, it does concern me how we're treating the world, and until it's actually in front of you it is easier to pretend it is not a problem," Flint remarked on the wider issues at play. "Then you wake up, but it might be a bit late."[107]



SOUTH ASIA (PAKISTAN, BANGLADESH & SRI LANKA)

It is not just a profound passion for cricket that fellow South Asia countries Pakistan, Bangladesh and Sri Lanka share with India.

Their climates too are particularly vulnerable to the destructive effects of rises in temperature and extreme weather events.[108] In Pakistan, for example, nearly 10 million people were displaced by devastating floods in 2022 that resulted in over U$30 billion in damages, while 2024's heatwave saw temperatures reach the 50°C mark.[109]

In 2023, Bangladesh's capital Dhaka recorded its highest temperatures in almost 60 years, leading to the loss of lives, melting roads and severe power outages.[110] The following year schools across the country were again forced to close due to the extreme heat, with lessons cancelled for 33 million children.[111]

Meanwhile, Sri Lanka consistently ranks amongst the top ten countries in the world most at risk when it comes to the effects of climate change.[112] Flooding and landslides such as those caused by the 2024 storms have proved deadly and affected hundreds of thousands of Sri Lankans.[113]

And as the region's favourite sporting pastime, cricket too has been highly susceptible to the danger and disruption. In 2022, a storm ripped the roof off from one section of the stadium in Galle during a Sri Lanka Test against Australia. Play was delayed, broadcast equipment damaged and miraculously no injuries were reported after a spectator stand collapsed in another area of the ground.[114]

Concerns about player wellbeing in rising temperatures have been raised around the beginning of the Dhaka Premier League, especially as it coincided with fasting during Ramadan.[115] At the 2025 Women's World Cup Qualifiers in Lahore, West Indies captain Hayley Matthews was stretchered off after suffering from cramps in the intense heat.[116]

Cricket in such conditions, summed up in one report as a "walking cremation", are seared into the collective memory of touring fans and players, including the England batsman Owais Shah who had to be hospitalised and put on a saline drip after collapsing in Colombo.[117] This led to the verdict of the legendary former Australia wicketkeeper and ECB coach Rod Marsh: "I don't think you are meant to play cricket in this kind of humidity. No matter how much fluid you put into the players it goes very quickly."[118]

Since then, the global cricketing calendar has become ever more congested, mainly due to the growing number of T20 franchise leagues. As demands on schedules and playing time increase against a backdrop of steady temperature rises, cricket in South Asia will continue to be in the eye of the climate change storm.[119]

RECOMMENDATIONS

The 2019 Hit For Six report outlined a series of detailed recommendations for stakeholders within the game at multiple levels.[120] Some major cricketing organizations such as Cricket Australia and the ECB have been active in implementing new heat policy guidelines and planning sustainability strategies.[121]

However, despite repeated occurrences of disruptive and dangerous extreme heat and weather events in the intervening period, as outlined by this follow-up report, many of those recommendations are yet to have been actioned.

These remain relevant and include a proposed central ICC global disaster climate fund to better support cricketing communities in vulnerable regions impacted by heatwaves, storms and flooding.[122]

As part of this follow-up report, we asked cricketers, coaches, heat specialists and others working within the game for their principal recommendations. Our hope is that they will provide a further reference point and source of dialogue going forward for all those who love the game of cricket and care about its viable future in a changing climate.

Their key recommendations include:

GUIDELINES

- More national federations to publish guidelines for playing in extreme heat.
- Federations and international governing bodies to annually review these heat policies, factoring in the latest meteorological data and extreme weather events.
- Addressing air pollution directly in ICC guidelines, including a hard cut-off for play to be postponed should AQI readings reach above a certain level.

INVESTMENT

- Investment in education around heat illness, hydration support and pitch care.
- Investment in more eco-conscious infrastructure, such as water-efficient outfields and solar-powered venues.

RESEARCH

- Increased levels of detailed research into the effects of climate change on sport to be supported.
- In-depth assessments of the commercial viability and environmental impacts of covered cricket stadia.
- Scheduling to be reviewed and to take further account of extreme heat and weather events.

AWARENESS

- Further campaigns led by high-profile cricketers to raise awareness of the impacts of the climate crisis on the game.
- Review of the game's commercial relationships with fossil fuel companies.
- ICC to sign up to the UN Sports for Climate Action Framework.[123]

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