

'Heatwaves in India are 30 times more likely now than they'd be without climate change'

Robert Vautard is co-chair of the IPCC's Working Group I and senior climate scientist at IPSL, Paris. Speaking to **Srijana Mitra Das** at **Times Evoke**, he discusses heatwaves — and their causes:

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What is the core of your work?

■ I'm co-chair of the IPCC Working Group I on physical science with Xiaoye Zhang. I also research climate extremes and study the relationships between these events and climate change.



Parts of India are getting heatwave alerts in April — is this climate change?

■ Yes. We've done three attribution studies, in 2016, 2022 and 2023, on India with the World Weather Attribution network. In 2022, a huge heatwave and extremely anomalous temperatures occurred in India from March to end-April. We could attribute this to climate change in that such a situation is getting more frequent and probable due to greenhouse gas rises. Last April saw a very humid heatwave especially over parts of eastern India along the coast. That brought heat stress indices to the limit of what the body can tolerate — these exceeded 'dangerous' heat index values, nearing 'extremely dangerous'. Our conclusion was that such events are now 30 times more probable than they'd have been without climate change.

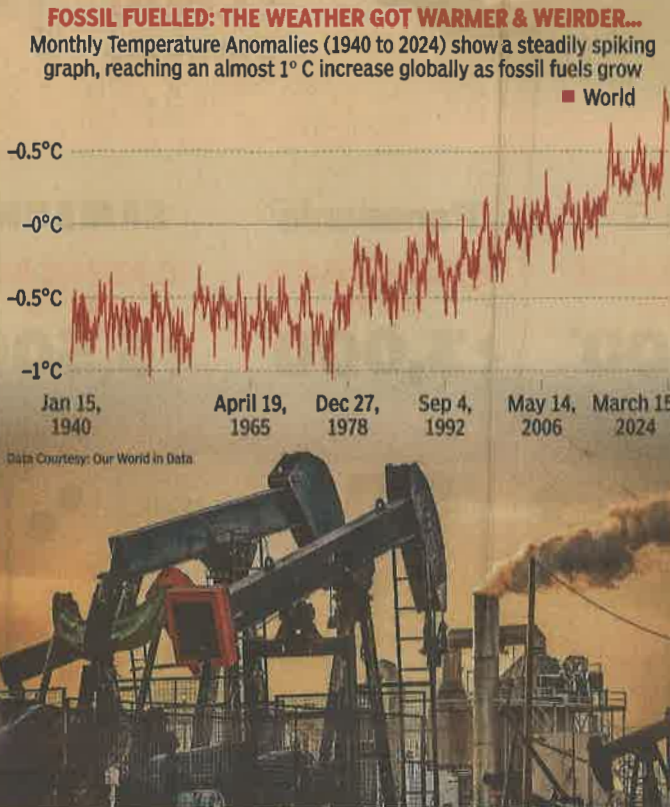
Climate sceptics argue India is very hot — how is climate change driving this?

■ I usually do not fight against climate sceptics. We actually don't



IN THEIR LOFTY SHADE: Trees, a refuge in heating cities, must be protected

have many in Europe as the region is undergoing an extremely fast increase of temperatures. India is around two degrees warmer than it used to be — and to climate sceptics, I'd say that scientists aren't driven by politics but by the truth. Models, statistical tools and observations allow us to make this definite link. For such an attribu-



tion study, we compare the statistics of heatwaves with climatological models, including those which don't represent historical observations. We look at the trends and statistics in these and previous periods, exploring the difference. We compare two very different groups of events thus, those with climate change and those without it, a similar approach being used in epidemiology, etc. All this confirms that India is certainly a hot country, especially before the monsoon — but it is also true that its heat is increasing.

What are the most dangerous threats posed by such heatwaves?

■ These include health risks which is a primary threat — the greatest danger here is from humid heat because in dry heat events, which usually occur inland, people can cope by drinking fluids. When the heat comes with high humidity, the

body cannot sweat as the air is saturated — this means the body can't cool down. Then, you really need to be in a cool place. However, not everyone has access to such cooling, so such episodes pose a tremendous risk to the most vulnerable people who could even perish. This is 'wet bulb heat' — people shouldn't work outdoors in this and it can also be compounded with the urban heat effect.

Is there a link between climate change and air quality?

■ Yes — air quality and climate change are produced essentially by the same activities like transport, construction, industry, etc. The emissions from these produce greenhouse gases like carbon dioxide (CO₂) and pollutants like fine particles, nitrogen oxide, etc. The latter impact our health as chemical compounds — so, reducing CO₂ emissions helps reduce air pollution, a significant co-benefit.

Has the world now definitively crossed the 1.5 degrees Celsius threshold?

■ Not yet — currently, we estimate the level of global warming to be between 1.2° C and 1.3° C. In the sense of the Paris Agreement, '1.5 degrees C' means the long term — it is not a target for a single year. We will cross this when every other year will exceed this measure — that's expected in about 10 years. We might have a small spillover in that we could exceed 1.5° C and then return back but exceeding it will expose many countries to potential tipping points, species extinctions as with corals and very severe climate impacts. Frankly, it will be very difficult not to cross this but if we do, 1.6° C is better than 1.7 which is better than 1.8 and so on.

What adaptations can people make now against such heatwaves?

■ India is relatively well-placed with heat plans but further preventions include hospitals being prepared. There must also be solidarity between people to help each other access hydration and cool places. In the long term, housing is crucial to reduce heat. Policy makers need strong heat plans, forecasts and preventions — India has good systems already.

Fossil fuel companies worldwide are set to increase their output in 2024 — what is your view?

■ As the IPCC Report says, 'Projected



SHIFT THEIR SHIFT: Construction workers face risk in wet bulb events

CO₂ emissions from existing fossil fuel infrastructure without additional abatement would exceed the remaining carbon budget for 1.5° C'.

This means taking into account all the facilities and installations for the extraction of current fossil fuels through their lifetime will lead us beyond 1.5 degrees — hence, new extractions will definitely not help.

READERS WRITE

Dear Times Evoke,

Kudos, TE, for bringing us such enriching articles! I loved Erika Rappaport's interview (13th April) about tea. It's astounding that the tea industry claims it is the second most popular drink on Earth after water! It also made me grateful towards tea labourers who work so hard to bring us that cup. I am eagerly awaiting the next TE!

— Nivedita Rana, Delhi

I have been an admirer of TE for quite some time and it's fascinating to learn about a beverage that's become a lifeline for people worldwide — TE's conversation with Jonathan Morris gave insights about the origins of coffee, its changing commercial uses, its globalisation and how today's climate change is affecting its growth. Here's to more, TE!

— Akhil Verma, Dewas

I really look forward to my TE every weekend. The content is very interesting and informative. I thoroughly enjoyed reading the history of tea with my morning cup. As TE puts it, let's become more informed to make products more sustainable. Thank you for such a beautiful TE page!

— Eswar Sagar, Hyderabad

I really liked Jonathan Morris' bracing replies on what to think when we see our morning coffee... Imagine, there are 25 stages involved from a bean to a cup — and we're all connected through this huge chain of labour. What a novel idea, TE!

— Usha Ponnappa, Bengaluru

I simply love Times Evoke and was amazed reading the 'global epic of tea' and how India paid with indentured labour and damaged ecology for British plantations. Looking forward to reading more such articles, TE.

— Anup Ray, Mumbai

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