Why a sweltering Bengaluru needs more than reactive measures to address heat-stress

Researchers from ATREE are trying to understand how heat interacts with multiple aspects of people's lives, and are collating information that would help people respond to the risks

Shilpa Elizabeth
BENGALURU

On April 2, Bengaluru experienced the hottest day in April in the past three years, with the mercury levels touching 37.2 degrees Celsius. According to experts and weather forecasters, the city needs to brace itself for more, as there seems to be no respite from the sweltering heat any time soon.

Heat stress has been making significant impacts on individuals and communities of the city, threatening the livelihoods of the already vulnerable sections and upending various systems such as water supply, health, energy and more.

Given a relatively newer problem to Bengaluru, which was once known for its pleasant weather conditions throughout the year, the city's capacity to address heat-related challenges is almost non-existent, and the measures by the decision-makers often reactive.

A team of researchers from Ashoka Trust for Research in Ecology and Environment (ATREE) has been working on a project to understand the interactions of heat with different elements at a ward level and to bring together different types of information that would help to respond to the risks of heat-stress.

Clay water pots kept for sale in Bengaluru. PTI

Ujjvala Krishna

Manan Bhan

Mapping heat stress

"We wanted to communicate and discuss how heat, as a climate hazard, is connected to several different systems at the ward level and affects the stakeholders who live or work in the ward," says Dr. Manan Bhan, Fellow in Residence at ATREE.

The project titled 'Understanding Systemic Impacts of Heat Stress in Bengaluru' which commenced in Marappanapalya ward in North Bengaluru last year is being led by Bhan and Ujjvala Krishna, associate researcher at ATREE. It is funded by Bangalore Sustainability Forum.

"We wanted to focus on the ward level because that's where the impacts are often the most immediate. We felt it would be a useful way to bind our work spatially," says Bhan.

"This particular ward is also fairly unique as it has an industrial area, an APMC yard, run-of-the-mill commercial areas, low-income settlements, middle class apartment complexes and so on."

The team first used satellite data to map the green cover and found that areas with less green cover coincided with areas with highest temperature anomalies.

Then, the team identified the big systems such as health, water, energy, waste and mobility that impact lives and livelihoods in the ward, and the various stakeholders.

Agricultural produce are being covered to protect them from heat.

Gaps in adaptation strategies

"We tried to connect these two things to come up with a 'vulnerability matrix' to identify the people who might be most affected in this ward," explains Bhan.

In a heat perception survey that followed the team spoke to about 40 people who work or live in the ward to understand how they perceive heat stress and respond to it.

Heat stress being a relatively new problem to the city, there seems to be gaps in the way the problem is perceived by the authorities whose strategies are often marked by a lack of understanding of ground realities.

While Bhan points out that even within a particular neighbourhood incidents of heat are not uniform and the impact of heat not unidimensional, these differences often escape the adaptation strategies devised by the decision makers.

The heat advisories issued by several states and cities are often reactive in nature and often put the onus on individuals to take action, says Bhan.

Ujjvala Krishna further explains. "Many people still work in a system that's not used to changing for a particular individual. Last year during the summer, the Pourakarmika union asked to change their timing from 6 am-2 pm to 6 am-11 am, but it was denied. Through our work, we've been able to understand that it was denied because the rest of the system can't adapt to it."

Cascading effect

"Similarly, whether a security guard can change their work timings would depend on whether their workplace - a factory or an office - would change its timings, which is then dependent on the people who live or work there changing their timings. So, it becomes a cascading effect. It has to change across all systems and sectors. It can't change in isolation, and that's the biggest thing we realized."

Krishna notes that there also is a challenge with the understanding of a heatwave at the ground level which reflects in the responses of authorities to heat in the city.

"The IMD says that temperature should be 4.5 degrees above the average temperature for that time to consider it a heat wave. But in urban areas because of the urban heat island effect, the temperature ends up being 3 or 4 degrees above the normal temperature recorded. But weather stations record from areas that are generally cooler. Also, factors like humidity and real-feel temperature are not accounted for."

The project aims to eventually bring such findings to the attention of decision-makers and advocate for the need to look at the problem of heat in a systemic manner.

From climate walk to advocacy

The immediate outcome of the ongoing project has been a climate vulnerability walk.

"We were wondering what the best and most scalable way was to communicate our findings to people, something which could be replicated for other hazards or in other wards of the city. So, we came up with this idea of a climate vulnerability walk," says Bhan.

"It lasts for about 1.5 hours and we stop at 7-8 checkpoints in the ward to talk about specific things, specific systems and their relationship to heat. For example, we stop at the yard and talk about the relationship between heat, agriculture and the food system."

The participants are encouraged to map out what they perceive as vulnerabilities, boundaries and stakeholders, and this is followed by a discussion.

Forms of engagement

The team which is planning to conduct the walk every couple of months is also considering other forms of engagements such as games, collaborations, and building climate education tool kits for children and youngsters from lower income settlements.

"Those would be immediate goals. And then we will try to figure out ways to pursue advocacy, and to understand what it takes to move the needle."

Only 22% of unicorns were started by solopreneurs: Report

The Hindu Bureau
BENGALURU

In the last decade, 22 per cent of Indian unicorns were started by solopreneurs as compared to two or more co-founders leading the other 78 per cent, according to an analysis by PrivateCircle Research.

40% of these solopreneurs have started fintech unicorns including CRED, Slice, GoDigit Insurance, Acko and others. Bengaluru was the most preferred headquarters location for solopreneurs of the last decade.

The data suggests a higher win rate for start-ups with two or more founders. PrivateCircle found that Indian unicorns, on average, have two founders. Further, the average revenue generated by co-founder unicorns ₹2,909 crore was found to be 32% more than the average revenue of solo founder unicorns ₹2,196 crore. This is based on the latest revenue numbers available for each company, said a press release.

The research also observed variation in central tendencies of both groups, indicating that on average co-founder led companies raise more funding than solopreneurs. For the uninitiated, Central Tendency is the statistical measure that represents the single value of the entire distribution or a dataset.

However, some solopreneur-led unicorns have managed to raise large funding rounds especially from Bangalore. Additionally, six unicorns led by solopreneurs have successfully launched their IPOs, while seven unicorns led by founding teams have been listed on the stock exchange.

Dr. Murali Loganathan, Director of Research at PrivateCircle said, "The founding team size dilemma is one of the oldest dilemmas faced by startup founders. Ultimately, the choice depends on the individual's temperament, goals, and the specific dynamics of the venture they are embarking upon. Variation in central tendencies of both the groups indicates that investors prefer co-founder led companies. It can also be a function of co-founders being able to tap a larger network of contacts."

C-CAMP develops new OptiDrop platform to study single cells

The novel microfluidic chip-based platform allows for optical sensing of biological samples without the expensive open space, and bulky optical components routinely used in microscopy

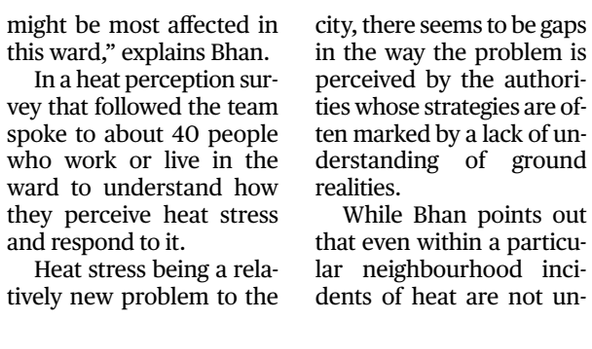
The Hindu Bureau
BENGALURU

The Centre for Cellular and Molecular Platforms (C-CAMP) in Bengaluru has developed a new platform that makes it easier and cheaper to study single cells.

Named OptiDrop, the platform has potential applications in diagnostics, therapeutics, agriculture, and animal health. The novel microfluidic chip-based platform allows for optical sensing of biological samples without the expensive open space, and bulky optical components routinely used in microscopy and flow cytometry-based techniques.

This innovation, developed by C-CAMP's Discovery to Innovation Accelerator team enables the study of single cells encapsulated in droplets with ease and precision.

"Traditional flow cytometers, used for fluorophore-based



OptiDrop is developed using a proprietary microfluidic chip with integrated optical fibres photomultiplier tubes and a pulse counter.

It enables the study of single cells encapsulated in droplets with ease and precision

biomarker detection, are limited by high costs, bulkiness, and larger sample volume requirements, often restricting their usage to few hospitals, research or diagnostic labs. Optidrop will have game-changing downstream applications, including studying the impact on individual cells during a drug screen, environment control (water contamination counter), detection and sorting of CAR-T cells in immuno-oncotherapeutics, selection of CRISPR-modified single cells and selection of high-efficiency clones in single-cell genomics," said Dr. Taslimarif Saiyed, CEO and Director of C-CAMP and one of the lead authors of the paper.

How it work

The team, consisting of researchers from C-CAMP and IIT-Madras, developed OptiDrop using a proprietary microfluidic chip with integrated optical fibres, photomultiplier tubes and a pulse counter. As each droplet flows through the microfluidic channel lit by an incident beam, light is scattered from its surface and contents. The platform detects fluorescent signals associated with the individual droplet. The output or signals are captured, processed and read live through an in-house developed software.

How much does it cost?

Flow cytometers currently available in the market can cost anywhere between ₹45 lakhs and ₹1 crore. OptiDrop setup costs only about ₹10 lakh and depending on the requirements of the application, the cost of light sources, detectors and pumps can be reduced by replacing these components with lower-cost alternatives for larger-scale production.

FROM THE ARCHIVES

The Hindu.

FIFTY YEARS AGO APRIL 4, 1974

Planned Development of Forest Wealth in Kerala

Bangalore, April 3: The Flood and Forest Minister, Mr. K.H. Patil told the Karnataka Assembly, to-day that the forest wealth of the State was being developed in a planned way and in the next seven or eight years, the area under forests would be considerably increased by the afforestation schemes now under implementation.

The Minister, who was answering questions on revenue, from forests in the State pointed out that the Government was strictly following the policy of not releasing any Forest land for cultivation. He said the revenue from forests which was Rs. 14 crores in 1969-70 had gone up to Rs. 20 crores.

No Interference With Steel Misuse Probe: Urs

Bangalore, April 3: The Chief Minister, Mr. D.Devaraj Urs asserted in the Karnataka Assembly that there was no room for any interference in the enquiry being conducted by the Vigilance Commission into the allegations of misuse of cement and steel meant for two Harijan hostels in Bangalore. The enquiry was proceeding satisfactorily, he added.

He also decried the tendency to look at everything with suspicion and appealed to the members not to adopt that attitude.

The Chief Minister was intervening when two members, messers S. Bangarappa (Ind) and H.T. Krishnappa (Cong O), wanted to move an adjournment motion on the enquiry into the alleged misuse of steel and cement.