APRIL 2026

NEWSLETTER

THE LATEST NEWS AND UPDATES FROM MEER

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Welcome to the April 2026 edition of the MEER Newsletter

This edition of the MEER Newsletter highlights ongoing fieldwork, community engagement, and engineering progress across Sierra Leone and India, alongside insights into climate science and emerging passive cooling approaches. From prototype development and on-ground research to student engagement and knowledge-sharing initiatives, the work reflects a continued focus on translating ideas into real-world application.

Together, these efforts point toward a broader objective: developing low-cost, practical cooling interventions that can reduce heat exposure, support vulnerable communities, and contribute to more resilient responses to rising temperatures.

NEWS FROM AFRICA

Community Research and Engineering Progress

Over the past month, our team in Sierra Leone has continued advancing several prototype climate-adaptation projects while also deepening our engagement with local communities most affected by extreme heat. As temperatures continue to rise across West Africa, the urgency of this work becomes clearer every day. Many residents in informal settlements live with constant exposure to heat and humidity, often with little shade, ventilation, or protection from the sun. Understanding these realities is essential if we are to design meaningful solutions.

On the engineering side, the team has continued refining several prototype structures and construction approaches. These projects allow us to test and improve the practical design of low-cost cooling systems that can be replicated in heat-vulnerable environments. A major focus remains on the use of sustainable and locally available materials such as bamboo, along with up-cycled components that can be integrated into structural and shading systems. Each prototype helps the team refine construction techniques, improve durability, and better understand how these systems perform in real conditions.

At the same time, a significant part of the past month has been dedicated to the pre-experimental research phase in Kroo Bay, one of Freetown's most heat-exposed informal settlements. Members of the MEER team spent time within the community conducting structured surveys and documenting the living conditions experienced by residents who face relentless heat from the sun combined with intense coastal humidity.

Homes in Kroo Bay are often constructed from materials that trap heat and provide limited airflow. Shade is scarce, and indoor temperatures can remain extremely high long after sunset. Through conversations with residents and systematic documentation of environmental conditions, the team gathered important information about daily experiences of heat, housing conditions, sleeping environments, and the broader impacts of heat exposure on health and wellbeing.

This work was not only about gathering data; it was also a core part of MEER's ongoing training program for local team members. Throughout the survey process, participants were learning how to conduct community-based research in a careful, structured, and ethical manner. This includes developing the ability to collect information methodically, document observations clearly, and engage respectfully with residents while maintaining compassion and sensitivity to the challenges people face.

Following the fieldwork, the team presented their survey findings as part of the training process. These presentations help build the ability to analyze information and communicate results effectively. The skills to present research clearly to scientists, policy makers, and the wider public are essential for anyone working in the climate adaptation field.

Building these capabilities within the local team is central to MEER's approach. Climate adaptation requires not only new technologies and engineering solutions, but also the development of skilled researchers and practitioners within the communities most affected by rising temperatures.

NEWS FROM INDIA

Field Visit to Hanuman Nagar: Students Explore MEER's Passive Cooling Work in Pune

The MEER India team hosted a field visit for students from Fergusson College to observe firsthand how passive cooling solutions are being implemented in heat-vulnerable communities in Pune. The visit was organized and led by Bunny and Samiksha, who invited their graduate college juniors to gain practical exposure to MEER's work, office operations, and community-based climate adaptation initiatives.

The visit took place in Hanuman Nagar, where a few homes have been fitted with MEER's reflective rooftop sheets designed to reduce heat absorption. Students first visited the local MEER office space before moving to the demonstration site within the settlement. There, they were able to observe tin-roofed homes that had been fitted with reflective material and see how the installation works in practice. The visible contrast between untreated metal roofs and those covered with reflective sheets helped illustrate how surface-based cooling can be applied in dense informal settlements where heat exposure is particularly severe.

During the site visit, the MEER team explained the basic principles behind the intervention, including how reflective materials reduce solar heat absorption at the roof surface. Students were particularly interested in the simplicity of the installation process and the lightweight nature of the materials, which make them suitable for deployment in communities where more complex cooling technologies are not feasible.The field visit also included an interactive discussion session in which students raised several thoughtful questions about the technology and its wider implications. Topics included how reflective sheets compare to other Passive Daytime Radiative Cooling (PDRC) approaches, the long-term durability of the materials, and whether reflected heat could contribute to atmospheric warming.

For many of the students, visiting the settlement provided an important perspective on how extreme heat affects everyday life in vulnerable communities. Even before the peak summer season, conditions inside the settlement were already noticeably hot, reinforcing the importance of practical and affordable cooling solutions.

The visit concluded with an informal lunch and discussion, allowing students to reflect on what they had observed and ask further questions about MEER's work. Several participants expressed interest in volunteering or becoming involved in future field activities. Overall, the visit helped connect classroom concepts such as heat transfer, albedo, and climate resilience with real-world climate adaptation efforts on the ground.

Beehive Structures – A Passive Cooling Idea

As heat becomes more intense across many regions, interest is growing in cooling methods that work without electricity. One approach being tested in parts of India uses beehive-inspired structures to create natural cooling through airflow and evaporation.

The design uses rows of terracotta cylinders arranged in a honeycomb pattern. Warm air passes through the clay cones while water flows across their outer surfaces. As the water evaporates, it absorbs heat from the surrounding air, lowering the temperature of the air moving through the structure.

This simple system combines evaporative cooling and natural ventilation, using basic materials such as clay and recycled water. Because it requires no electricity and produces no greenhouse gases, it offers a low-energy way to reduce heat in outdoor or semi-open spaces.

While not a replacement for all cooling systems, early trials suggest these structures can noticeably lower temperatures in their immediate surroundings, highlighting the potential of simple, nature-based cooling solutions.

A MESSAGE FROM DR. YE TAO

Engineering Progress as the Heat Season Begins

As we move into the hotter months here in Sierra Leone, the realities of the climate challenge become impossible to ignore. Each year the heat season seems to arrive earlier, last longer, and push temperatures further. For many people living in low-income communities, these conditions are not simply uncomfortable — they are increasingly dangerous. Homes trap heat, shade is limited, and access to cooling is scarce. These conditions are a daily reminder of why the work we are doing matters. Climate adaptation is no longer a future concern; it is a present necessity for millions of people living in vulnerable environments.

Over the past two weeks we have also had an international documentary film crew working with us on the ground. They have been capturing the work of the team, the construction process, and the wider context of the communities we are working alongside. Their aim is to document the practical engineering and the human stories behind these projects. Filming will continue over the coming months, helping to share this work with a broader global audience and highlight the importance of locally grounded climate solutions.

From an engineering perspective, March has been a month of sustained effort focused on advancing canopy systems that can deliver meaningful cooling in different environments. Much of our work is now centered on refining canopy designs that can be scaled across a variety of settings — including dense urban neighborhoods, agricultural areas, and potentially water infrastructure such as reservoirs where reflective shading systems could help reduce heat absorption.

The goal is to develop structures that are practical, modular, and adaptable to different local conditions. This involves refining the structural geometry of the canopy systems, improving joint and fastening systems, and ensuring that the materials and assembly techniques can be replicated using locally available resources. The engineering process is iterative: each prototype teaches us something new about load distribution, stability, airflow, and the interaction between structure and shade.

Alongside this technical development, a major focus continues to be the training and education of the local team in Sierra Leone. New team members, trainees, and community recruits are learning the skills needed to manufacture structural components, assemble canopy systems, and maintain cooling infrastructure in their own communities. This transfer of knowledge is essential. The long-term success of climate adaptation projects depends not only on the technology itself but on the capacity of local teams to build, repair, and improve these systems independently.

Beyond Sierra Leone, our international collaborations are continuing to expand. We are working with partners in material science who are investigating new types of cooling materials and reflective technologies that may improve the performance and durability of passive cooling systems. These efforts are exploring ways to enhance thermal performance while keeping materials affordable and scalable for widespread use.

At the same time, our technical collaborators in Europe and the United States are developing specialized instrumentation designed to measure the real-world impacts of heat on people living in low-income environments. These systems are being calibrated to capture detailed environmental and physiological data related to thermal stress. The aim is to support rigorous research that helps quantify the benefits of cooling interventions and deepen our understanding of heat exposure and human health in the Global South.

As the temperatures continue to rise here in Sierra Leone, the urgency of this work becomes clearer every day. Progress is being made steadily, through experimentation, collaboration, and hands-on learning. Step by step, we are building the knowledge and systems that will support more resilient communities in a warming world.

WATCH MARCH'S MEERTALK !

CLIMATE NEWS

Earth Is Now Storing More Heat than It Can Release

The Earth is accumulating heat at a rate scientists say is both measurable and increasingly concerning.

According to the latest United Nations climate assessments, the planet is now experiencing a growing **energy imbalance**—a state in which more energy from the sun is being absorbed than is being reflected or radiated back into space. It is a fundamental shift in Earth's physical system, and one that underpins the acceleration of global warming.

At its simplest, the climate system operates on a balance. Incoming solar radiation warms the planet, while outgoing infrared radiation allows heat to escape back into space. For thousands of years, this exchange remained broadly stable. Today, it no longer is.

Driven primarily by greenhouse gas emissions from the burning of coal, oil, and gas, the atmosphere is trapping an increasing share of that energy. The result is not just rising temperatures, but a steady accumulation of heat across the entire Earth system.

Recent findings show that this imbalance is intensifying. The past 11 years are now confirmed as the warmest on record, and the rate at which excess heat is being stored—particularly in the oceans—is continuing to rise. Scientists point out that the oceans absorb the vast majority of this surplus energy, acting as a buffer, but also storing heat that will influence the climate for decades to come.

This dynamic has wide-ranging consequences. Warmer oceans contribute to stronger storms, rising sea levels, and shifting weather patterns. On land, the additional energy is linked to more frequent and intense heatwaves, prolonged droughts, and changes in ecosystems. The system, in effect, is building momentum.

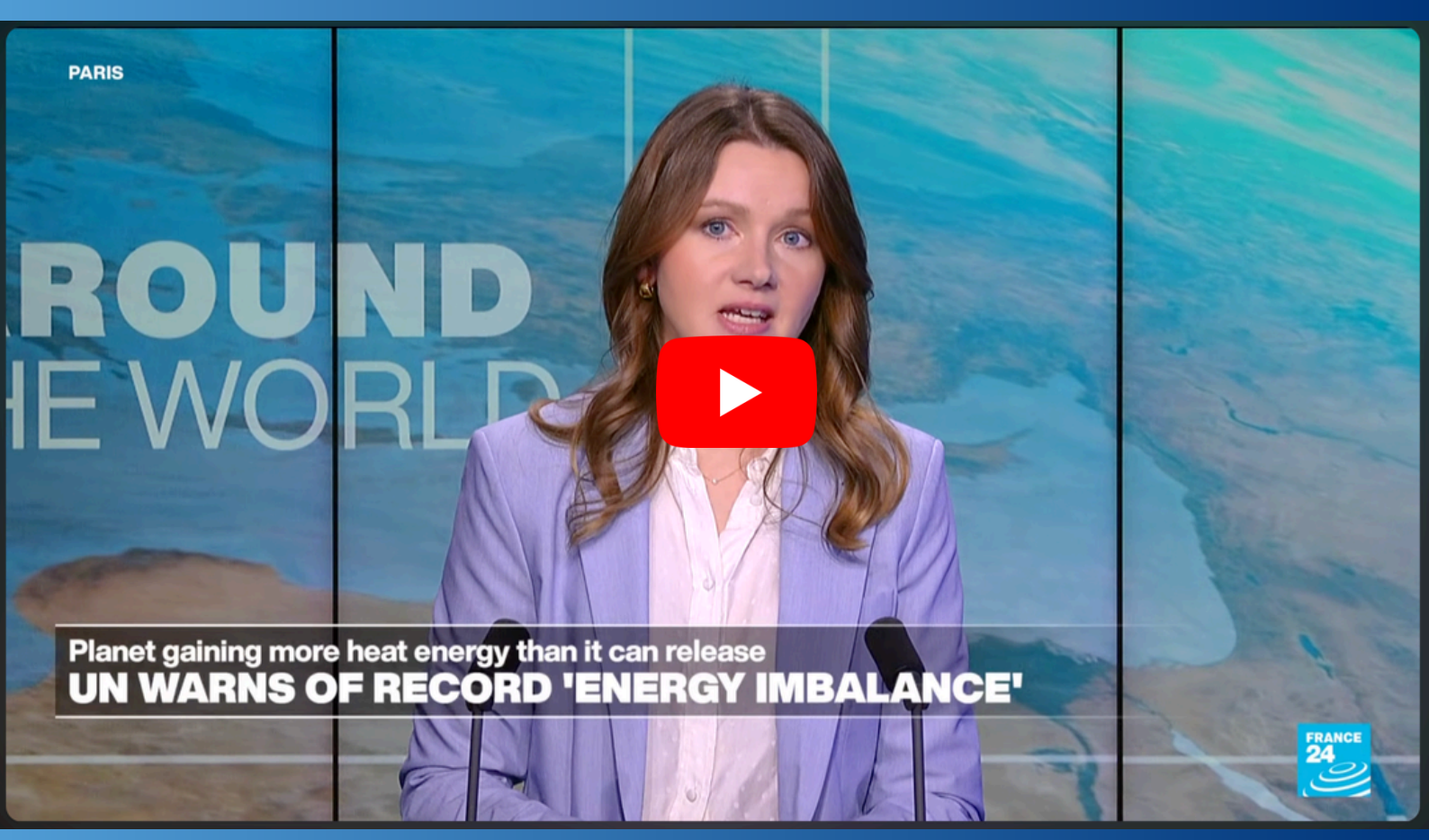
There is also growing concern about how natural climate variability may interact with this underlying trend. The potential return of El Niño conditions—typically associated with higher global temperatures—could further amplify heat records in the near term.

What makes the concept of energy imbalance particularly significant is that it reframes climate change in physical terms. It is not only about surface temperature increases, but about the total energy being stored within the Earth system. As long as that imbalance persists, warming will continue.

It is therefore notable—and encouraging—that this framing is beginning to appear more clearly in mainstream reporting. Coverage by international broadcasters, including France 24, reflects a shift toward explaining the mechanisms behind climate change, not just its symptoms. The language of energy flows, radiative balance, and system dynamics is becoming part of the public conversation.

That shift matters. Understanding the drivers of climate change provides a clearer picture of both the scale of the challenge and the urgency of response.

The France 24 report below offers a concise overview of the UN's latest findings and the growing concern among scientists that the Earth is now storing more heat than it can release.



MEERTalk

Fred Pearce

Environmental Journalist

Climate Overshoot: Is There a Way Back?

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MONICA PICCININI

Brazil, the Amazon, and the Climate Story

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Thank You for Being Part of Our Journey

As we move through the early months of 2026, we want to thank everyone who continues to follow, support, and engage with MEER's work. Your interest and trust make it possible for us to move from research and design into real-world testing and delivery.

This month marks an important period of groundwork and coordination, as teams prepare for major field trials, expand monitoring and evaluation efforts, and strengthen student engagement and collaboration. These steps may be less visible than installation or deployment, but they are essential to ensuring that our cooling interventions are robust, responsible, and effective.

MEER's approach remains rooted in collaboration, careful science, and community partnership. As heat risks continue to intensify, building evidence that links practical cooling solutions to measurable health and social benefits is more important than ever.

We are grateful to be moving forward together and look forward to sharing further progress in the months ahead. Thank you for being part of this work — and part of this journey.