

Urgency of Heatwave Risk Management



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PREFACE

By Paul Knox Clarke, Principal, ADAPT Initiative, UK

Welcome to this latest edition of *Southasiadisasters.net on the Urgency of Heatwave Risk Management*. As climate change intensifies, the danger posed by heatwaves is increasing every year – particularly in South Asia (although, as articles in this review from Vietnam and the Philippines remind us, the dangers are also very real in other parts of Asia). Heatwaves can be extremely deadly – killing thousands of people in India and Pakistan in 2015, and tens of thousands in Europe in 2022 – and yet they still tend to receive only limited attention from humanitarians and emergency response agencies, or from policymakers more generally.

One notable exception to this general lack of attention is the city of Ahmedabad in Gujarat, India, which suffered from a deadly heatwave in 2010. This led to the world’s first Heat Action Plan, which has been regularly updated since. It is fitting, then, that this topic be a focus for the Ahmedabad based AIDMI team behind *Southasiadisasters.net*. Which was one of many from Ahmedabad to contribute to that plan and follow-up.

And if there is one theme that runs through the articles here, it is the importance of planning for heat events. Heat – below a certain level – does not have to be deadly, if we have taken steps in advance. As someone involved in projects preparing for extreme heat, it is good to be reminded of some of the core elements of an effective planning

Broad Policy Implications

What does this mean for humanitarian and development organisations? In the first instance, those organisations who have recognized the threat should work to make policy makers, donors and partners aware of the danger. While the heat threat is increasingly well understood in South Asia, it is often overlooked in other parts of the world – and the results of this will be increasingly deadly. Secondly, every organisation working in an area with an increased risk of heatwaves should consider how heat will affect the people that they serve, and their ability to provide those services, and take concrete measures to reduce these risks. And finally, we should build multi sectoral platforms to learn more about these risks, and how they can be addressed in different environments, with different levels of resources.

process: that it should be collaborative and multi-sectoral. That it should consider related hazards, such as air pollution. That it should go beyond the physiological effects of heat on the human body to cover broader effects on infrastructure, society and economic activities. That – crucially – it should consider both the effects of extreme heat on different members of society (particularly women, and also groups such as the elderly, young children and people without housing) and their capacities and ways of responding to heat.

It is also important to be reminded that the increased incidence of extreme heat is not a ‘natural disaster’, but a consequence of the human activities that have led to climate change. As such, heat is not just a technical problem but a political challenge. Planning is a necessary, but not a sufficient response, and our plans should come with political action and demands for justice.

I hope that you get as much out of reading this edition as I have, and would join me in hoping that this is just one of many issues to come on the topic. As the contributors point out, we still have much to learn in this crucial area, and we all benefit from more incisive thinking and research along the lines laid out here – from the use of Iron Oxide primer to the role of Civil Society Organisations in planning and response. ■

“Heatwave deaths are avoidable. And must be avoided. This is AIDMI’s conclusion from its over decade long work on planning and implementing heatwave mitigation measures in Ahmedabad city, India, and South Asia.”

- Mihir R. Bhatt

ROUNDTABLE

Heatwaves in South Asia: Dialogue Around Policy Options

By Mihir R. Bhatt and Vishal Pathak, AIDMI, India

The [latest report](#) (6th Assessment Report, IPCC) highlights that global climate change has made Heatwaves more likely. This spring, temperatures hit nearly 50 degrees Celsius across India and Pakistan, while Bangladesh and Sri Lanka sweltered under unusually high heat. The heatwave across India and Pakistan was 30 times more likely this year than 100 years ago due to rapid climate change.

Heatwaves cause an unduly adverse impact on the livelihoods, health, and quality of life of the informal sector workers, especially women. Between 2016 and 2020, heatstroke accounted for 13.6% of total deaths due to forces of nature in India. Heatwaves are a significant threat to health and increase strain on water resources, electricity, and transportation, resulting in problems like water shortages, blackouts, and power shortages.

Heatwaves are more deadly than any other climate hazard or natural disaster. A matter of international concern is that climate change is accelerating their intensity and frequency. Particularly elderly, pregnant, and breastfeeding women are more likely to be impacted by heatwaves due to the triple burden of productive, reproductive, and community work. Women are powerful change-makers, influencing their communities and families, especially when they hold the power of decision-making. Incorporating women leaders and their transformational skills into all levels of heat risk mitigation will



AIDMI with IHSA organised a roundtable on November 6, 2023; at North South University, Dhaka, Bangladesh, under World Conference on Humanitarian Studies, November 5 to 7, 2023.

build better-prepared heat-resilient and adaptive communities.

Urban as well as rural areas must pursue both short-term and long-term objectives to mitigate the negative impacts that extreme heat can have on vulnerable populations – particularly informal businesses. This requires collaboration and cooperation between government agencies, local organisations, community members, and private companies. The corrective actions should focus on building an understanding of extreme heat risk, investing in preparedness, advocating for policy reforms, expanding successful adaptation and mitigation measures and implementing green design and energy-efficient low-cost technology.

The roundtable, encourages researchers, practitioners, and local actors to share their experiences and research related to humanitarian responses and approaches to

heatwaves and related risk management with a focus on heatwave-affected people.

Key questions:

1. What are some of the recent interventions and use cases that have successfully addressed heatwaves and have the potential to be upscaled?
2. How are urban and rural affected communities responding to heatwaves?
3. What are the lessons from the technologies? From financial? From an emerging political economy?

Speakers:

1. Dilruba Haider, UNWOMEN, Bangladesh
2. Dr. Mahbuba Nasreen, University of Dhaka, Bangladesh
3. Sajid Raihan, Start Fund, Bangladesh
4. Dr. Rajvi Joshipura, SEWA, India. ■

Lessons for Higher Educational Institutions for Heatwave Risk Preparedness

By *Sk. Tawfique M. Haque*, Professor and Director, South Asian Institute of Policy and Governance & Chair, Department of Political Science & Sociology, North South University, Dhaka, Bangladesh

Climate change is predicted to increase both the intensity and frequency of heatwaves in the future. Research indicates that hot weather significantly increases mortality, with the impacts of heat prevailing in urban areas and among older adults, children, and men (Burkart and Endlicher 2011). The driving forces behind local heatwaves also affect the upward trend of global climate change. Due to this, the amount, intensity and level of heatwaves are increasing. On the other hand, the increasing use of fossil fuels increases both temperature and air pollution and poses a multifaceted risk to public health. Someone's degree of heat stress depends on a number of variables, including temperature, humidity, speed of the wind, sunlight, apparel, and many more. (Nguyen and Dockery 2016). Vulnerable young or elderly populations are affected by heatstroke.

Lessons for Higher Educational Institutions for Heatwave Risk Preparedness

The following lessons can be learned for heatwave risk preparedness in higher educational institutions:

- The inclusion of heatwave risk preparedness training, exercises, and simulations in university curricula is a necessary step to tackle heatwave risks. It will establish a culture of preparedness and response for future community resilience to heatwaves.
- More academic research on heatwaves can be done to produce knowledge and

disseminate it. The university can prepare a thorough heatwave risk preparedness plan, which has policy ramifications.

- Higher educational institutions should take the initiative to build a resilient health system to tackle heatwaves. There can be specialised emergency rooms for heat-related illnesses.
- First aid training can be given to student volunteers so that they help in case of any sudden heat stroke and heat-related sickness on the campus.
- Developing and strengthening systems for early warning for heatwaves so that prompt actions can be taken.
- Plant more trees inside and around campus to keep the environment cool.
- Organize less outdoor activities during summer. Sports, retreats, excursions, field visits, etc., should be planned during suitable weather.
- Online classes are also recommended during heatwaves to avoid heat-related sickness among students and teachers.
- Heatwave awareness campaigns, seminars, and webinars can be organised to raise awareness among the students. They can then take the necessary steps through various club activities.
- More drinking water stations and sun shades can be installed with signposting to encourage

students to drink more water and avoid heatwaves.

- Measures for proper air flow should be taken to provide natural ventilation in the campus, especially in the classrooms, library, lounges, cafeteria, lecture halls, etc.
- By adopting a heatwave preparedness strategy in educational institutions, students may cultivate a culture of safety and readiness for heatwaves, which can lead to a large decrease in student fatalities and injuries. Furthermore, students who have prepared for heatwaves can impart disaster management knowledge to their families and others in the community too. In this way, we can build a heatwave-resilient society.

References:

1. Burkart, K., and W. Endlicher, 2011: Human bioclimate and thermal stress in the megacity of Dhaka, Bangladesh: Application and evaluation of thermophysiological indices. *Health in Megacities and Urban Areas*, A. Krämer, M. H. Khan, and F. Kraas, Eds. 153–170
2. Nguyen, J. L., and D. W. Dockery, 2016: Daily indoor-to-outdoor temperature and humidity relationships: A sample across seasons and diverse climatic regions. *Int. J. Biometeor.*, 60, 221–229, doi:10.1007/s00484-015-1019-5.

Heatwaves in South Asia:

Observing and discussing the dynamics of heatwaves is crucial for improved heatwave governance and humanitarian responses

By Mihir Bhatt and Vishal Pathak (AIDMI), Prof. Prabodh Chakrabarti, Keya Saha Chaudhary (ICVA), Dorothea Hilhorst (ISS), Khayal Trivedi (HOISA).

The heightened vulnerability of South Asia to heatwaves can be ascribed to several interacting characteristics – but these have not been adequately examined and discussed. The Humanitarian Observatory Initiative in South Asia (HOISA) was launched earlier this year in an attempt to bridge this gap by charting the particular risks and vulnerabilities of the region, observing the state of current humanitarian governance processes, and based on ongoing discussions providing recommendations for more effective responses to heatwaves. This article details some of the main dynamics of heatwaves in South Asia considered during HOISA's first panel discussion, including specific governance challenges that the observatory will focus on.

A heatwave is a climatic process and a period of abnormally high temperatures – higher than the normal maximum temperature that occurs during a particular season.¹ While they have always occurred, their frequency and severity have rapidly increased due to climate change caused by the industrialisation of modern economies and increased carbon emissions.² The WHO considers heatwaves to be one of the most dangerous natural hazards because of their destructive effects, which are severe: from 1998 to 2017 alone, more

than 166,000 people have died globally due to heatwaves,³ and the impact on livelihoods has been just as immense. Yet, heatwaves rarely receive adequate attention because of their delayed effects that moreover are not always easily to pinpoint.

South Asia is particularly vulnerable to heatwaves

While heatwaves are a global phenomenon that know no national boundaries, their manifestations and impact vary from region to region, depending on various characteristics such as demographics and geography. From this viewpoint, South Asia is known to be one of the most vulnerable regions in the world. First, it has a high-density population numbering close to two billion people. Second, the region has immense variations in its geographical features, social structures, built environments, socio-economic means, and much more. The interaction of these characteristics makes it particularly complex to govern – and the complexity increases even more when heatwaves occur.

And South Asia is set to face even more heatwaves

Moreover, a recent [report](#) of the WMO claims that heatwaves are 30 times more likely to take place on the subcontinent than before, with massive damage to livelihoods and well-being, ecosystems, economies,

and infrastructure expected to occur in the coming decades. In one of the latest examples, February this year was observed as the [warmest month since 1901](#). Thus, not only are heatwaves already affecting South Asia badly – it's going to get much worse.

A humanitarian observatory to better understand heatwaves in South Asia

It is in light of this that the HOISA, the Humanitarian Observatory Initiative of South Asia, was launched in April this year. Its objective is to monitor humanitarian governance processes, with a focus on responses to heatwaves. Considering the urgency of the matter, HOISA organized a first panel discussion on April 7th, which brought together about 30 actors working on heatwaves. Panel discussants included Dorothea Hilhorst (International Institute of Social Studies – ISS), Prabodh Chakrabarti (Swami Vivekananda Chair and Professor of Environment and Disaster Management, RKMVERI, Kolkata), Keya Saha Chaudhary (International Council of Voluntary Agencies – ICVA), Nimesh Dhungana (Humanitarian and Conflict Response Institute of the University of Manchester – HCRI), Delu Lusambya (PhD researcher at the ISS) Mihir R. Bhatt (All India Disaster Mitigation

¹ NDMA India: <https://ndma.gov.in/Natural-Hazards/Heat-Wave>

² IPCC Report: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf

³ WHO: https://www.who.int/health-topics/heatwaves#tab=tab_1

Institute – AIDMI), and Khayal Trivedi (HOISA Project Lead).

The panel focused on the increasing risk of heatwaves, the uniqueness of this occurrence in the region, existing humanitarian systems, and the first steps towards measuring and planning for the effects of heatwaves. This is because although South Asia has suffered the most due to heatwaves and also has found many ways to adapt to it, relatively limited humanitarian and governmental action has been observed and recorded. Some of the main observations made by participants and action points are discussed below.

South Asia's characteristics make heatwaves more intense and dangerous

At the launch, we discussed how the abovementioned characteristics such as population density, infrastructure, and geographical features such as altitudes affect and sometimes aggravate the effects of a heatwave. For example, recent research on 'wet-bulb temperatures' in South Asia reports that parts of the region on the subcontinent are much closer to the threshold limits of human survivability than the African and Gulf regions. The depth and range of vulnerability and exposure of the population and economy of the region to heatwaves are also much more intense and complex here. In light of these and other observations, we argue that **the current humanitarian approach to heatwaves in South Asia needs to be revisited.**

In such a context, we must accelerate the implementation of **heatwave action plans** at all levels and in key sectors driving development, starting with employment, health,

education, and so on. The built environment and supporting infrastructure in their current form, for example, are simply not capable of withstanding severe temperature shifts and is making it harder to adapt, Nimesh Dhungana, one of the key panel members from Nepal, shared his view at the panel discussion. A comprehensive study is required to ensure that these are adapted sufficiently and rapidly.

Mobilizing funding for adaptive measures is a key priority

Another important parameter in planning for and mitigating this natural hazard is the **mobilization of funding**. Across the humanitarian sector, current funding is simply not sufficient to meet the growing needs, particularly when it comes to taking adaptive measures. At the panel discussion, we agreed that more holistic and less siloed approaches to securing funding are needed to address the impacts of climate change. In the case of heatwaves, this means funding modalities that consider both the immediate and long-term consequences of heatwaves to ensure not only immediate responses but also the improved resilience of communities to heatwaves over time. Therefore, increased investments and integrated funding should form part of heatwave management strategies and plans in South Asia.

As part of this, attention should be paid to the **meaningful locally led involvement of communities and local and indigenous solutions** to addressing heatwaves. What makes this challenging and even more urgent is that the heatwave-affected population in South Asia is hardly protected by a social safety net, leading to massive losses and

damage. Resolving or forming sustainable practices that ensure uniform funding will protect these populations therefore becomes critical. Furthermore, the coming together of researchers and operational experts to study and pilot **heatwave safety nets**, both formal and informal, is overdue in South Asia.

Heatwaves must be placed on the global political agenda

In the wake of increased risks associated with heatwaves and the distinct ways in which it affects the region and its people,⁴ this phenomenon must be placed on the global political agenda. Governments, the United Nations, academics, and activists together must aim to draw a global heatwave compact signed by all stakeholders – including those affected – that stretches beyond the current climate policy community.

Moreover, as a phenomenon that exceeds borders to affect an entire region, a joint plan of action between countries in South Asia must be formalized. And humanitarian actions must take place simultaneously in a cohesive manner for a positive impact, which is in fact the agenda of the several humanitarian observatories forming across the globe. The formation of a global movement to address the effects of heatwaves worldwide is therefore vital.

Increased trust in science is a key pillar for effective interventions

But such a joint effort and action across South Asia requires a grasp of the state of South Asia's heatwaves. Unfortunately, the increasing distance between science and society, between evidence and knowledge, and the fragmented use

⁴ [The Guardian view on an Indian summer: human-made heatwaves are getting hotter.](#)

of data and tools for adapting to heatwaves have also been observed lately in the region. More research, knowledge, and evidence is needed, as well as interdisciplinary knowledge exchanges and the transfer of technology, tools, data, and key concepts. Unlocking private and public data on heatwaves and related phenomena that are currently difficult to access is an important first step.

Interdisciplinary heatworkforces for improved heatwave governance

Moreover, we need a locally led comprehensive, multi-level and multi-directional approach with multiple stakeholders to plan and mitigate the dire effects of heatwaves



A street vendor in Ahmedabad adapts to heat on hourly basis using his own resources, technology, and design. 2022.

in the region. Building **interdisciplinary heatworkforces** with the knowledge, skills, and capacities to prevent,

manage and reduce losses, and to evaluate how to improve things, can help strengthen existing humanitarian systems.

To summarize, South Asia is undoubtedly one of the most complex of the heatwave-affected regions and requires the urgent attention of researchers, policy makers, humanitarian leaders, and other stakeholders to chart local actions and observations and make changes to these to ensure that effective interventions will make a direct impact. Partners of HOISA must and will continue observing, reflecting on, discussing, and recommending actions humanitarian actors and other stakeholders should take. ■

HEATWAVES OBSERVATORIES

Observing Heatwaves in Light of Adaptation and Mitigation

By Dr Ajit Tyagi, South Asia Meteorological Association, New Delhi; Dr. Niladri Gupta, Asian Disaster Preparedness Center; Akash Goenka, Alliance for an Energy-Efficient Economy; and Mihir R. Bhatt, AIDMI.

Heat waves are turning out to be a major hazard for taking sound, sustained, and substantial adaptation and mitigation measures in South Asia. This is odd, because most science-driven and related observations lead to upcoming catastrophic loss and damage to human life, ecosystems, and economic sectors in South Asia.

HOISA's second panel ([Click here](#)) brought together key experts from the region to collectively observe and focus on the so far under-observed aspects of adaptation and mitigation in addressing the growing frequency of heatwaves in South Asia. It was observed that to aptly form the necessary adaptation and mitigation plan, we must cover the meteorological aspect of heatwaves -

how they are currently observed, assessed, and mapped and what are their projections in the near future.

Heatwaves in summer are a normal climatic feature of the Indian subcontinent. However, due to climate change and an increase in carbon emissions, the past few decades have witnessed an early onset longer lingering, overlapping and increase in frequencies of heatwaves (IPCC AR6). Known to be silent killers, heatwaves have in fact caused significant loss and damage in not just South Asia, but also in Europe, Australia, and the Americas. This situation will only aggravate in the coming years in the region.

There is no universal definition of heatwaves. Until now the heatwaves

were defined in India by the deviation of the mean temperature from normal, this however is undergoing changes. It is important to factor in other factors such as relative humidity, direct sunshine, and wind to be able to give a more precise measure of heat and its effect on the human body. And also, why only the human body? Other living creatures? And non-living objects? This range must be observed well in the coming years to have a more holistic understanding of heatwaves related adaptations and mitigations. Similarly, the measurement of heat denoted simply by one temperature for a city is completely imprecise. Within the city, the temperature varies greatly from area to area depending on the urban planning and land use. It was observed that

the lesser the water bodies in and around the city more severe the heatwave hotspot impact in South Asia. These precise additional datasets—water bodies to vegetation—are therefore required to rightly implement an adaptation and mitigation plan.

With all these variables in play, we need mechanisms that try to address heatwaves at various levels - global, regional, national, sub-national, urban and local. Robust warning and adaptation plans must be designed and implemented at each of these levels to holistically prepare against the global warming we are facing. And while we do so, it is also imperative to take into account how global warming, with all its uneven heating, is projected in the future. We have already witnessed in the past decades how the regions of impact and frequency have increased and we must plan for that future as well.

It was observed by the panel that heatwaves trends are projected to have an increase in intensity, frequency, duration, geographical spread and seasonal spread. In addition, deviation, the layout of the wave, unfurling of heat, rolling out of measures, and escalating of impact must be kept under our observations. Unmitigated urban heat will cost up to 11% of the GDP by 2100. And this estimate leaves out key aspects of GDP contributors such as migrant workers and casual labour. This will threaten sectors such as Food and Agriculture, Water Management, Energy, and Transport. As a consequence, we can also expect a rise in disease-carrying vectors, migration, crumbling infrastructure, wildlife decline, forest fires, increased burden on health care services and

more. India and Pakistan are particularly at risk of an increase in heatwaves by a factor of 30.

While planning for the management of this crisis, actions can be taken at various levels of government, civil society and markets. National Disaster Management Authority ([NDMA](#)) has issued National Guidelines for Heat Action Plans ([Provide link](#)). Centre for Policy Research - India, classified the 37 heat action plans in India, in adaptation and mitigation measures which can be applied across the region. These measures were classified in Infrastructure Changes, Behavioural Changes, Nature Based Solutions, Information Dissemination, Institutional Capacity Building and Technological solutions. You can access it [here](#). These measures would set a very strong foundation for us to tackle heatwaves. AIDMI is currently rating the performance of these heatwave action plans from the point of view of affected citizens in Ahmedabad.

Further, we also need more local Heat Action Plans and appropriate policies, early heat warning systems, vulnerability assessment and social distribution of risk, appropriate

financing and perhaps nomination of Chief Heat Officers as was recently done in Dhaka, Bangladesh.

In light of this crisis, Asian Disaster Preparedness Center plans to systematically collect data on heatwaves, develop monitoring and early warning systems using weather models, communicate to these communities at risk, and help build response capability at a local level.

During the discussion, the panel also touched upon the need to think about developing Cooling Action Plans (CAP). Access to mechanical cooling is still very low in the region. Only 8% use ACs in India, and the per capita of energy spent on cooling is in fact 4 times lower than the world average. This is one domain which will grow tremendously over the years. How can this cooling be green, clean, local, off-grid, and use renewable energy? Colling per se must be observed differently.

Controlling the unmitigated impact of the growing cooling demand, through energy-efficient cooling technologies is part of a matrix of solutions that involves multiple stakeholders with no clear owner. This poses significant complexity, per se, but also to ecosystem-based cooling.

A cross-cutting problem such as sustainable cooling, and developing adaptation and mitigation cannot be solved by a single ministry or department, a UN agency or any other authority in South Asia. And for that matter, it cannot be solved by many different ministries and departments working in silos or in unsynchronized coordination. Cooling is about coming together. In this



context, an integrated policy is the answer to this problem. One successful example of this is ICAP - India's Cooling Action Plan, 2019, which was so successful that it is currently used by several countries, including Cambodia, Pakistan, Jordan, Lebanon, Vietnam, and Indonesia, among 7 others to create their own country-level actions.

We must learn from projects such as ICAP—both what worked and what didn't work—to form an integrated policy and action framework that involves an adequate representation of the public sector, the private sector, and the knowledge sector with a strong enforcement mechanism to resolve the looming heatwaves crisis.

And while we mobilise for a strong policy building, parallel heatwave management solutions must continue on the ground at district and municipality levels with the appointment of Chief Heat Officers (like in Bangladesh) or Nodal officers in charge of the implementation of Heat Actions Plans (like in Ahmedabad) to take immediate actions. Simple measures like having more ventilation in and trees around housing, shifting working time in the afternoon to early morning, change in food and dietary habits, and easy filling or roomy clothes are extremely important.

Progress is being made. There are innovations in the development of heat action plans, forecasting and monitoring, education and awareness, responses to heatwaves, and infrastructure improvements in South Asia. They need to be captured in upcoming humanitarian system studies. And while we move ahead, we must prioritise low-income

group areas and populations who are particularly at risk of heatwaves. Policies, strategies, and action plans must be geared towards protecting affected people who are at high-risk.

Following are a few points of further observations that the panel enlisted.

- First and foremost is the observation area of the heatwave and migration, both as adaptation and mitigation measures. What is it that could be done and can be done to hold and ease the crisis?
- Impact of heatwave on agriculture. We have studies on the impact of heatwaves on life and livelihoods, but not as much on - food, agriculture, and multicultural farming. What is it that could be done as an adaptation measure and mitigation measure in regard to food, agriculture, horticulture, dairy, fishery and more?
- Third is about how to prepare for early warning systems and getting that regional information communicated on the ground to farmers and workers and other stakeholders.
- Fourth aspect is the impact of air, water and land pollution on the heatwaves. What kind of adaptive measures and mitigative measures will help reduce that negative impact between them? Protection from pollution is protection from heatwave impact.
- Forestry is another area that we must observe and this includes urban forests. A lot of work is being done in this domain in Bangladesh particularly but forests as adaptation and mitigation measures are highly important for South Asia.

- What is a sustainable or green habitat? How we must incorporate that into our existing built environment? How can we observe this more?
- Rejuvenation and preservation of water bodies Mitigation of Urban Heat Island effect by cool roofs, green buildings/infrastructure and environment
- A study on heatwaves in the Himalayas is needed - as that's a paradox. But the truth may be that heatwave will greatly affect the people there and in very different ways.
- And lastly, we must investigate the economic cost of heatwaves in terms of the loss and damage it causes to the economy. That is something we have information on, but not enough to really scale up our Heat Action Plans. We must observe more and more carefully.

This panel included Dr Ajit Tyagi, President, South Asia Meteorological Association, Senior Advisor at Integrated Research & Action for Development, New Delhi and Former Director General of Meteorology. Dr. Niladri Gupta, Sr. Water Resources Management Specialist, Asian Disaster Preparedness Center. Akash Goenka, Team Leader at Alliance for an Energy-Efficient Economy. And Mihir R. Bhatt, Director of All India Disaster Mitigation Institute, and member of the steering committee, IASC of the UN focusing on heatwaves.

See more:

<https://www.hoisa.org/post/observing-heatwaves-in-light-of-adaptation-and-mitigation>

Mitigation Research in the Nexus of Heatwave Risks: Iron oxide primer coating of corrugated iron roofs for space cooling

By Nadim Reza Khandaker and Arup Ratan Das, North South University, Bangladesh

Global warming is the most discernible climate change effect in South east Asian countries which are encountering erratic and excessive temperatures and are experiencing heatwaves for prolonged duration over the years. Indoor temperatures in corrugated iron sheet-roof housing increase all throughout the day due to the scorching heat. This is affecting the viability of the poultry industry. Poultry is the major source of animal protein for Bangladesh and other South Asian countries. The higher temperatures increase the indoor ambient temperature of corrugated

iron roof poultry sheds. High inside shed temperature causes heat stress in the poultry, leading to higher mortality and adversely affecting egg production. With unreliable rural electric supply, air cooling and ventilation systems are not a viable option for small-scale rural poultry operators. Developed economies have developed low-emissivity paints that decrease the temperature inside enclosed spaces by means of IR (infrared) wavelength reflectance (1). The new low-emissivity paints are expensive and are not sustainable in developing economies. The need of the hour is to mitigate against high

temperatures in corrugated iron sheds using locally available paints.

A research program using separate corrugated iron sheets of similar dimensions which were painted either with white paint or with iron oxide rust-proof coating, and the emissivity was compared to unpainted iron sheets (Figure 1). The experimental program was conducted during the mid-day summer heat. The temperature on both the surfaces of the corrugated iron sheets was measured to determine their heat reflection and emissivity. Corrugated iron sheets



Figure 1

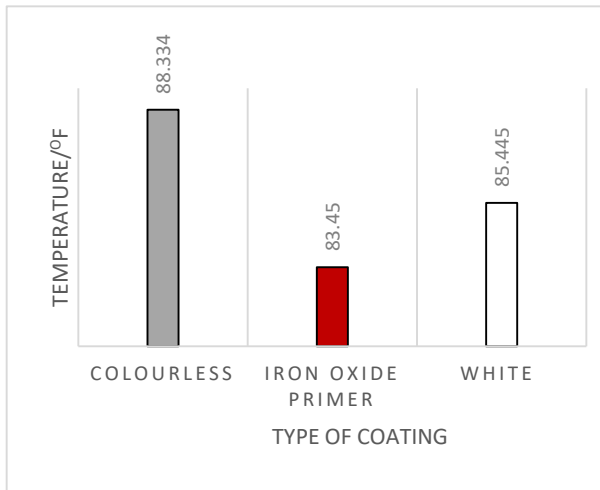


Figure 3

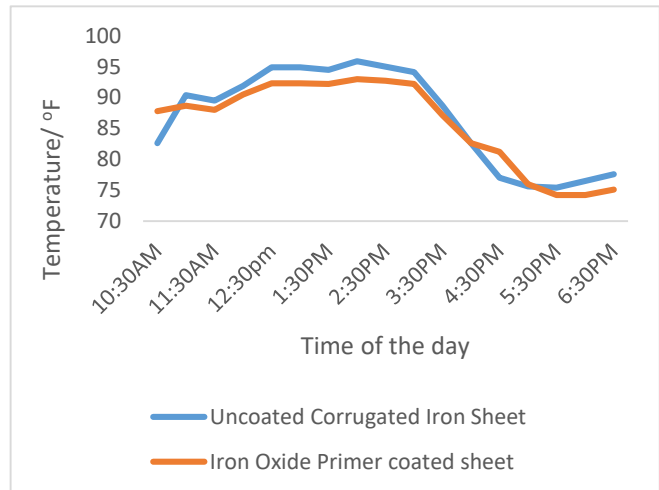


Figure 2

with red oxide rust-proof coating transferred the least heat, resulting in lower temperatures on the bottom surface of the corrugated iron sheets (Figure 2). The inference is that roofs painted with iron oxide rust-proofing are a barrier to heat transfer to the space below.

A field trial on two poultry sheds, one coated with red oxide paint and

the other unpainted, showed that the coated corrugated iron shed experienced temperatures 20F- 40F less throughout the day. Also, the red oxide-coated shed emitted heat more gradually (Figure 3). This simple mitigation protects against rusting and controls temperature in indoor spaces. Application is not limited to poultry but also to human

habitats such as slum housing in developing countries.

Reference: Peng, Y., Lai, J., Xiao, X., Jin, W., Zhou, J., Yang, Y., Gao, X., Tang, J., Lu, F., Fan, S., Bao, Z., & Cui, Y., Colorful low-emissivity paints for space heating and cooling energy savings. Proceedings of the National Academy of Sciences of the United States of America, 120(34) (2023). ■

HEATWAVE FINANCING

Financing Heatwave Preparedness in India Needs Both Disaster and Social Policy Lenses

By *Soutrik Goswami and Subrata Rath*,
Centre for Budget and Governance Accountability (CBGA), New Delhi, India⁵

The global impact of climate change is significantly visible with the year 2023, marked as the hottest since 1901, visibly demonstrating the global impact of climate change and global warming (1). In India, the frequency of intense heatwaves, defined by the Indian Meteorological Department as dangerously high temperatures harmful to human health, has risen dramatically. From 1951 to 2016, the

occurrences of consecutive hot days and nights have sharply increased. By 2050, these are expected to grow two to fourfold, signalling a significant rise in heatwave conditions, particularly when temperatures in the plains reach 40°C or higher, and 30°C or higher in hilly regions (2).

The susceptibility to heatwaves varies across India, with regions like

northwest India, Central, East, and the northern Peninsular being most vulnerable (3). Factors such as geographical location, existing climate conditions, and socio-economic aspects like informal work conditions, access to healthcare facilities, and social and cultural underprivileges, all contribute to the impact of heatwaves. This is evident from the fact that most of the heatwave affected belong to

⁵ Reviewed and Edited by VR Raman, Protiva Kundu, and Sharad Pandey, Centre for Budget and Governance Accountability (CBGA), New Delhi, India.

marginalized working population, who are also probably highly undernourished (4), hence any approach to heatwave preparedness should be built around their well-being. Recognising the cross-cutting impacts of heatwaves on health, livelihood, and the heightened threat to vulnerable populations who are more dependent on public provisioning, a multi-sectoral approach to heatwave management is also essential. Nevertheless, the current institutional framework of the Heatwave Action Plans is not fulfilling this. Categorization of heatwaves primarily as a disaster can also pose challenges towards measures to enable actionable heatwave management, from a social policy perspective.

While the heatwave action plan identifies necessary initiatives across various sectors for heatwave preparedness, it can potentially stop additional financial resources, which is essential for legitimising and implementing the processes effectively from social equity lens. Financially, states are expected to allocate up to 10% of their State Disaster Management Fund towards implementation of heatwave management (5), which would not suffice for addressing the larger challenges. This would require comprehensive national and state

level budgetary planning, allocating public funds to all relevant sectors, including education, health, employment, and social welfare. For instance, schemes like MGNREGA, which involve large numbers of rural workforce in outdoor activities even during peak summer, require not just resilient planning but also financial allocation for adaptive and mitigation measures like drinking water and food facilities, intermittent rest arrangements, awareness programs, and emergency medical services including transportation. Such measures are to be extended to other worksites as well.

To ensure systemic accountability, there should be community participation and social audits of heatwave action plans. These should be integrated into broader planning processes like City Master Plans and Gram Panchayat Development Plans. Such planning, as argued before, needs a much more focused approach across all levels of governance in order to enable a heatwave-resilient social ecosystem for vulnerable communities, both in rural and urban areas. There is also a need to initiate better monitoring of heatwave planning and its implementation. Social autopsies of people who lost their lives can also provide critical insights about social support measures required for

building resilience and risk reduction at the community level.

References:

1. Ramirez, R. (2023, December 6). 2023 will officially be the hottest year on record, scientists report. edition.cnn.com. Retrieved December 14, 2023, from <https://edition.cnn.com/2023/12/06/climate/2023-hottest-year-climate/index.html#:~:text=Between%20January%20and%20November%202023,2016%2C%20the%20prior%20warmest%20year>
2. Mukherjee, S., & Mishra, V. (2018). A sixfold rise in concurrent day and night-time heatwaves in India under 2°C warming. *Scientific Reports*, 8(1), 1–9. Retrieved December 14, 2023, from <https://www.nature.com/articles/s41598-018-35348-w>
3. https://internal.imd.gov.in/section/nhac/dynamic/FAQ_heat_wave.pdf
4. Debnath, R., Bardhan, R., and Bell, M.L., (2023) Lethal heatwaves are challenging India’s sustainable development, *PLOS Climate*, <https://journals.plos.org/climate/article?id=10.1371/journal.pclm.0000156>
5. NDMA, Beating the heat, <https://ndma.gov.in/sites/default/files/IEC/Booklets/HeatWave%20A5%20BOOK%20Final.pdf>



MGNREGA workers in Vidharb region, Maharashtra. Courtesy: Soutrik.

Heatwaves, Health, and Livelihoods: Voices from the Ground

By Dr. Sahil Hebbar, SEWA, India

The worsening impacts of global warming are now increasingly becoming evident as the poor emerge to be the worst sufferers. Among the poor, women and youth bear a disproportionate brunt of the damage caused by climate disasters.

Heatwaves significantly impact the livelihoods of informal sector women and curtail their ability to earn full employment. SEWA members have reported that high temperatures reduce their working hours, decrease their productivity, disrupt the supply chains and access to raw materials, lead to spoilage of produce/materials, impact their markets and customers' demand, and reduce access to water, nutritious food and cattle fodder. Heatwaves and heat-related illnesses also increase out-of-pocket expenditure on healthcare and drain the limited family savings in low-income populations. In 2022, heat-related illnesses were one of the leading causes of members being forced to stay home and unable to work. Heatwaves also adversely



impact members' food and water security, children's education, and energy requirements.

Poor women workers in the informal sector are ill-prepared for adverse climate shocks and accidents. Lower incomes coupled with higher energy and healthcare expenditures frequently result in them borrowing money from lenders at high-interest rates, thus pushing them into the vicious cycle of poverty.

SEWA strongly believes that there is an opportunity in every adversity. The 2.6 million members of SEWA have collectively resolved to work towards making the surrounding and neighbourhood air, water, and soil clean. This will lead the community to "cleaner, purer skies" for the younger generation and future generations to come. At SEWA, we call this "Just Transition" – a transition that generates green livelihoods, which are decent and dignified. Transition that is led by the women.

The need of the hour is innovative, inclusive, community-owned, and

women-led initiatives that will help us scale climate adaptation and mitigation globally and mitigate the impacts of climate change on the poor. Some initiatives that SEWA has piloted as part of the Swachh Aakash Campaign (Clean Skies Campaign) include:

- **Green Villages/Ward:** SEWA seeks to improve clean energy access for informal sector women and promote the use of several green energy solutions like solar lights, cool roofs, biogas plants, electric mobility, solar water pumps, etc.
- **Global Climate Resilience Fund:** Use of blended finance to improve access to capital for SEWA members during climate shocks. The fund seeks to provide immediate support in the event of a calamity and assist with recovery and stabilization.
- **Extreme Heat Income Microinsurance:** An initiative that was designed to partially compensate SEWA members for projected lost income caused by extreme heat. ■

"Our members belong to various trades, and all of them suffer from the impact of high temperatures. Lack of drinking water leads to frequent UTIs. Food spoilage leads to increased cases of diarrhoea and vomiting. SEWA sisters who are working in the scorching heat face the weather's wrath and suffer from dehydration and skin rashes. All this not only affects their health but also decreases their work productivity", says Gauriben Darji, a grassroots leader from Patan, Gujarat, India.

Women, Informality and Heatwaves: Lessons from Gujarat

By Kshitij Gupta, AIDMI

In India, heatwaves are defined as prolonged periods of excessively hot weather that can cause adverse impacts on human health, the environment, and the economy. Being a tropical country, India, is particularly vulnerable to heatwaves. They have become more frequent and intense in recent years. Recently, mass casualties were observed from an apparent heat stroke among a crowd of people attending a government award function in Navi Mumbai (Maharashtra). This incident highlights the potential risks from heatwaves, which are expected to increase in intensity and frequency due to climate change.

While the impact of extreme heat on human mortality and morbidity has been well researched, the evidence of the adverse impacts of extreme heat on livelihoods and the economy has only emerged recently. The size of the informal or unorganized sector in the Indian economy is huge and the impact of extreme heat on this sector needs to be properly studied.

To understand the impact of heatwaves on women micro-entrepreneurs in the informal sector, the All India Disaster Mitigation Institute (AIDMI) conducted a study in rural and urban Gujarat. The objective of this study was to delineate the impact of heatwaves on women on the informal sector and also chart out some of the measures that can be taken to address these adverse impacts.

The key recommendations of this study to mitigate the adverse impacts of heatwaves on women microentrepreneurs in the informal sector are depicted below.

- **Provide Cooling Facilities:** Set up shaded rest areas and cooling stations where workers can take breaks and cool down. This can include fans, misting systems, and access to clean drinking water.
- **Flexible Working Hours:** Encourage businesses to adopt flexible working hours. This allows workers to avoid working during the hottest parts of the day, reducing the risk of heat-related illnesses.
- **Heat Stress Training:** Offer training to workers and employers on recognizing the signs of heat-related illnesses and how to respond. This education can be critical for early intervention.
- **Protective Gear:** Provide appropriate personal protective equipment (PPE) that minimizes heat exposure, such as lightweight, breathable clothing, wide-brimmed hats, and sunglasses.
- **Urban Planning and Infrastructure:** Advocate for better urban planning, including more green spaces and tree-lined streets that can provide shade and help reduce urban heat island effects.
- **Public Awareness Campaigns:** Raise public awareness about the risks of extreme heat and how to stay safe. Use local languages and channels that are accessible to informal workers.
- **Government Regulations:** Encourage the government to enforce regulations or implement new ones regarding heat stress and workplace conditions. Ensure that these rules are accessible and enforceable for informal enterprises.
- **Access to Healthcare:** Ensure that workers have access to affordable healthcare and that local clinics are prepared to treat heat-related illnesses.
- **Financial Support:** Provide financial assistance to informal enterprises for the purchase of cooling equipment, improved shelter, and other measures to protect workers from extreme heat.
- **Technology Solutions:** Promote the use of technology solutions like mobile apps to monitor weather conditions and heat stress levels. These apps can provide real-time information to workers and employers.
- **Collaboration:** Encourage collaboration between informal enterprises, NGOs, and local government agencies to share best practices and resources for dealing with extreme heat.

- **Research and Data Collection:** Invest in research to better understand the impact of extreme heat on informal enterprises and gather data to support evidence-based policy changes.
- **Community Engagement:** Engage with local communities to develop heat action plans that address the unique needs of informal enterprises and workers.
- **Sustainable Practices:** Promote sustainable and climate-resilient practices within informal enterprises, such as better waste management and reducing emissions.
- **Social Safety Nets:** Advocate for the creation of social safety nets for informal workers to provide financial support during extreme heat events.

It's important to note that these recommendations should be implemented in a way that takes into account the specific needs and circumstances of different regions and communities within India and Gujarat. Additionally, collaboration and communication between stakeholders, including government bodies, NGOs, and businesses, are essential for successful mitigation efforts. ■

PUBLICATION OVERVIEW

Extreme Heat, Gender, and Access to Preparedness Measures: An Analysis of the Heatwave Early Warning System in Ahmedabad, India⁶

By Ainsley Trahan, Department of Geography, University of Cambridge, UK

Introduction

Ahmedabad, located in Gujarat, India, faces annual heatwaves that are likely to become more intense with climate change. Such heatwaves have resulted in illness, threats to livelihoods, and even death. Ahmedabad generated South Asia's first Heat Action Plan (HAP) in 2013 following a particularly devastating heatwave in 2010. This HAP outlines a framework for the implementation, coordination, and evaluation of extreme heat response activities, including an early warning system (EWS). It has since been replicated in over thirty Indian cities and in other countries.

Previous studies have outlined the impact of various factors on heat vulnerability. Such factors include occupation, income, education, age,

setting, and overall health. This exploratory study focuses on the impact of gender, a comparatively understudied factor, on heat vulnerability in Ahmedabad. It examines the impact of gender on access to Ahmedabad's HAP's heat EWS.

Research and Methodology

The research team conducted structured interviews with 85 female outdoor labourers in Ahmedabad (30 vendors, 29 construction workers, and 26 waste recyclers). Interviewees were asked a range of questions to gauge the extent of their access to Ahmedabad's heat EWS, their vulnerability to heatwaves, and their capacity to cope with extreme heat.

This research examines heatwaves within the context of the

vulnerability framework, and seeks to understand the link between socio-political constructions of heat vulnerability with access to Ahmedabad's heat EWS, and the subsequent capacity of female outdoor labourers to cope during periods of extreme heat.

Conclusions

Female outdoor labourer's access to Ahmedabad's EWS is inhibited by their social vulnerability, which manifests itself through the interaction of gender with other structural determinants. Participants addressed their perceived vulnerability to heatwaves in relation to health, citing many ailments they face in high temperatures. They also commented upon the threat that heat poses to income. This was particularly

⁶ Ainsley Trahan, Rory Walshe, Varsha Mehta, International Journal of Disaster Risk Reduction, Volume 99, December 2023, 104080, <https://www.sciencedirect.com/science/article/pii/S2212420923005605?via%3Dihub>

noteworthy for fruit and vegetable vendors due to heat-induced spoilage.

This research evidenced two barriers to EWS access: literacy and phone ownership. Though Ahmedabad's heat messaging is often paired with illustrations, much of this information is text-based, posing issues to those with limited literacy skills. The majority of participants reported either not having seen heat warnings or were unsure if they had seen heat warnings. Moreover, 27 participants directly acknowledged the impact of their limited literacy on EWS access. As of 2011, 83.85% of females in Ahmedabad were literate

compared to 92.30% of males (Census of India), suggesting that women may face greater literacy-based barriers to EWS access. It is important to note that Ahmedabad outperforms the rest of Gujarat on literacy, suggesting that women in other cities with a heat EWS may face even greater barriers to access.

The majority of participants also reported not having access to a phone, barring them from receiving warnings via text or WhatsApp. The percentage of all-female interviewees without phones (60%) is higher than the total city average (37%) (Census of India, 2011). However, this research also made

visible three other channels of warning communication: in-person communication via actors such as SEWA or the AMC, personal social networks, and television.

Finally, participants described many coping strategies that they regularly employ to deal with heatwaves, ranging from sitting in the shade to staying home in rare cases. No construction workers reported a change in working hours during heatwaves as compared to 14 of 30 vendors and 10 of 28 waste recyclers. When given the freedom to choose without being constrained by a contractor, individuals chose not to work during the hottest times of the day. For the most part, however, interviewees emphasised the necessity of work during a heatwave, pointing to an impossible trade-off between income and health.

Recommendations

1. Larger-scale statistical comparative studies investigating the difference in EWS access between men and women would be helpful.
2. Further research is necessary following the introduction of the 'Extreme Heat Income Insurance' launched by the Adrienne Arsht-Rockefeller Foundation Resilience Center, the Self Employed Women's Association, and Blue Marble.
3. It must be remembered that the heat EWS is ultimately a technical solution which cannot address the structural conditions that shape vulnerability. Ahmedabad's EWS must continue to be paired with efforts to reduce relevant groups' social vulnerability. ■

HEAT ALERT

DOS & DON'TS DURING HEAT WAVES

- ☀ Drink water, chaas, and other liquids (no soft drinks)
- ☀ Stay out of the sun
- ☀ Find a place to cool down
- ☀ Wear light clothing
- ☀ Check in with friends & family

SYMPTOMS TO WATCH FOR:

- ☀ Heat rash or cramps
- ☀ Heavy sweating and weakness
- ☀ Headache and nausea
- ☀ Lack of sweating despite the heat
- ☀ Red, hot, and dry skin
- ☀ Muscle weakness or cramps
- ☀ Nausea and vomiting

DRINK MORE WATER

People at high risk: children, elders, and pregnant women

In case of an emergency, CALL 108

NRDC
INDIAN INSTITUTE OF PUBLIC HEALTH GANDHINAGAR

Ahmedabad Municipal Corporation (AMC). (2016) Ahmedabad Heat Action Plan 2016: Guide to Extreme Heat Planning in Ahmedabad, India. AMC: Ahmedabad.

Heatwave, Climate Change, and Livelihoods: Voices from the Women

By Sydney Anthony and Emma Jewkes, Students, St. Francis Xavier University (StFX), Canada

The city of Ahmedabad in the western Indian state of Gujarat, like other places around the world, is experiencing extreme and unpredictable weather conditions because of climate change, but those affected most are being heard the least. The intersection between climate impacts and the increased struggles faced by marginalised women, impoverished communities and workers in the informal economy are overlooked in many discussions surrounding the consequences of climate change. We are two university students from Canada who had the opportunity to learn more about this problem first-hand during a 2023 research internship.

The Self-Employed Women's Association (SEWA) was founded in 1972 in Gujarat with the goal of collectivising women working in the informal economy across India and improving their livelihoods. Women joining this organisation are usually under-represented and come from states of extreme poverty. Working with SEWA, we were able to conduct a series of focus group discussions to learn about how climate change has been affecting women's ability to maintain their livelihoods.

There are many different types of labourers and self-employed workers fuelling the informal economy. Many of the women participating in our focus groups were rural workers, including agriculturists working to produce food for

their families and to sell, along with weavers, sewers, and embroiderers. The urban members consisted of daily wage earners such as construction workers, head carriers, home-based workers, trash recyclers and street vendors. These jobs are extremely labour-intensive, and the consequences of climate change and extreme weather events are weakening the livelihoods of SEWA women and their families.

SEWA members reported to us that the most common impacts of climate change they face are extreme heat, unseasonal and hence unpredictable rains, and increasing frequency of cyclones. All of these women are working in hot conditions, mostly outside, often without shade; combined with domestic responsibilities for taking care of their families, this results in 12+ hours of work in the extreme heat. Some women lack access to drinking water on-site or at home, and so the dangers of working in over 40-degree weather are exacerbated by dehydration, headaches, and dizziness. Construction workers pass out on scaffolds, home workers inhale toxic fumes from their

materials, and recyclers are blistered. Most women face financial losses – raw materials and finished goods are ruined in the rain or perish in the heat, and income is foregone when they recover or rest during the hottest periods of the day.

Both rural and urban workers have implemented various short-term adaptations, but for them to have resilient livelihoods, they require investments in their education, health, and communities to develop their human capital, supported by appropriate policies and programs. Rural workers need decentralised community-based resources such as shelters and storage facilities, as well as the tools and guidance to achieve sustainable agriculture practices. Urban workers need employer-provided assets, flexible schedules, and the ability to access basic labour standards like rest and sanitation. The participating women in our study living in rural areas seemed to have more autonomy over their livelihood and potential for climate adaptation, including entrepreneurial opportunities in the green economy. Most of all, we learned that SEWA women know what they need to improve their livelihoods. Grassroots women workers have experience and knowledge that should be leveraged when devising and implementing climate action and adaptation strategies. The time is now for those who are affected most by climate change to be heard. ■



Heatwave Problem in Vietnam

By Nguyễn Lê Uyên Nhi, Vietnam

Vietnam is one of the world's top five most vulnerable countries to climate change. Heatwaves as extreme weather events have recently become a concern for disaster management in Vietnam due to their widespread and severe impact on electrical consumption.

From May to June, due to climate change, the summer temperature reaches a new peak, and last longer, more intense heatwaves become increasingly frequent in Vietnam.

The publication of VnExpress reported on May 6, 2023, that a heatwave throughout northern and central Vietnam has pushed temperatures up to 43 degrees Celsius in certain areas. Some 15 localities recorded temperatures of between 39-43 degrees. The highest temperature in the north central Nghe An Province hit 43 degrees, and in the northwestern Son La Province topped 42 degrees. Hanoi weather stations have recorded temperatures of between 35-37 degrees, while perceived temperatures could be 2-3 degrees higher than that. Northern and central Vietnam are expecting higher heat and fewer rains and storms because of El Nino.

Heatwaves combined with humidity can be dangerous for a human body's "wet-bulb temperature." Scientists [estimate](#) that a wet-bulb temperature of 35 degrees Celsius – or 95 degrees Fahrenheit at 100 per cent humidity, or 115 degrees Fahrenheit at 50 per cent humidity – would be beyond the point at which the human body can cool itself through perspiration.

According to the report of Visual Crossing Weather data, more than half of the days in these months are reported to have max temperature surpass human endurance (>35 degrees Celsius) and even worse due to the urban effect. From 2020 to 2022, the temperature feels like more than 46 degrees, only under 10 percent, which increase sharply in 2023, and reach 30 percent. High temperature combined with humidity larger than 50 (almost around 75) makes the body unable to cool out by sweat. Due to climate change, the range of humidity decreased but higher.

The burden of electricity remains significantly heavier for the north and centre of the country. Inadequate electricity supply limits the ability of children, families, and other sectors of the economy (investment, production), to develop and manufacture their products.

Some hydroelectric plants are at dead water level, including Lai Chau, Son La, Tuyen Quang, Ban Chat, Hua Na, Thac Ba. Particularly, two hydropower reservoirs, Lai Chau and Son La, are unable to generate electricity, this is also the objective cause of electricity shortage.

Regarding coal supplies for thermal power plants, in the first 5 months of the year, Vietnam Coal and Minerals Group and Dong Bac Corporation basically provided the full amount of coal committed in the annual coal purchase contract. 2023 signed. It is expected that the whole year of 2023 will meet and exceed the coal volume committed in the 2023 contract.

However, there was a local coal shortage in some thermal power plants at the beginning of the year and lasting until May.

This is reflected in the fact that the fuel reserves of the plants are low compared to electricity generation needs (except for some Duyen Hai 3MR, Quang Ninh, Ninh Binh plants whose coal inventory basically meets the norm) and or stopped mobilization due to coal shortage.

The Director of Electricity Regulation apologized to the people for the power cut and proposed tasks and solutions for the upcoming electricity supply. The delegate said that it is necessary to consider how EVN operates the power grid for people and businesses soon to have a specific assessment of this group's operations.

Without enough electricity, citizen's life is turn upside down. The source of light is sunlight from the window. Sometimes even at night when the power goes out, the family have to go outside to enjoy the shade until the electricity comes back.

Because of the power cut, schools for children are also closed, and parents proactively take care of their children at home. However, electricity is still supplied normally without any children coming to school. The school was informed that the school would cut off power from 8:00 a.m. to 4:00 p.m., but the power was not cut off until 10:00 a.m., causing teachers to rush to notify parents to come pick up their children.

The power outage greatly affects enterprises' output and delivery

time. Therefore, the company may face the risk of being fined for late orders or even losing orders. Workers in industrial parks are also facing reduced income and affected health because of working in hot environments.

To tackle the problem, Hanoi has shortened the duration of public lighting by an hour each day while halving illumination on some major roads and in public parks.

Vietnam is turning off streetlights, and manufacturers are switching operations to off-peak hours to keep the national power system running amid record temperatures in some areas that have caused a surge in demand.

Regarding fundamental solutions in electricity supply in June and July, Mr. Vo Quang Lam, Deputy General Director of EVN, said to build appropriate electricity supply scenarios for each locality and region

according to the direction of the People's Committee. provinces/cities.

In addition, EVN (Electricity of Vietnam) is closely following the actual developments of the water situation from upstream to hydroelectric reservoirs and the handling and troubleshooting of thermal power units and ensuring coal supply for thermal power plants. Ensuring electricity supply in the current situation is done as optimally as possible under existing circumstances. ■

References:

1. National Assembly of the Socialist Republic of Vietnam, <https://quochoi.vn/tintuc/Pages/tin-hoat-dong-cua-quoc-hoi.aspx?ItemID=76931>
2. VN Express International, Vietnam heatwave sends temperatures to 43 degrees, [temperatures-up-to-43-degrees-in-northern-central-vietnam-4601936.html](https://e.vnexpress.net/news/environment/heatwave-sends-</div><div data-bbox=)

3. VN Express International, Heatwave to persist in northern Vietnam until weekend, <https://e.vnexpress.net/news/environment/heat-wave-persists-in-northern-vietnam-until-end-of-week-4627290.html>
4. Historical weather data for Vietnam, <https://www.visualcrossing.com/weather-history/vietnam/metric/2023-05-01/2023-07-31>
5. Public Security News, <https://cand.com.vn/Xa-hoi/cat-dien-khien-doanh-nghiep-bi-cham-mat-don-hang-i696842/>
6. People's Army Newspaper, <https://www.qdnd.vn/kinh-te/tin-tuc/mien-bac-nguy-co-thieu-dien-tram-trong-nganh-dien-gui-loi-xin-loi-toi-nhan-dan-doanh-nghiep-730517>

LOCAL LEADERSHIP

Heatwave Risk Management: The Role of Civil Society Organizations (CSOs)

By Loreine B. dela Cruz, Executive Director, Center for Disaster Preparedness, Philippines

Last March, this year was the official declaration of the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) of the start of the warm, dry season. It should last when easterlies align with the close of the year cold front. But the dry spells would notably extend to the first half of next year based on PAGASA's forecast. Just last March, the highest heat index can be seen below. These temperatures may cause heat cramps and heat exhaustion. Continuing activity could lead to heat stroke.

Global warming is the apparent mechanism triggering the rising incidence of heatwaves in recent years. At least 73.9% of the world's population could experience at least 20 days per year of deadly heat and humidity based on projections unless greenhouse emissions suppression is undertaken soon. The long-term goal, therefore, is to take the first step to alleviate the issue of global warming.

Asia Pacific temperature has increased faster than the global mean over 60 years. Summers in tropical

Southeast Asia are usually hot ahead of monsoon, but the temperatures remain the same, not exceeding 38 C (100 F) due to humidity. But climate experts said the recent regional heatwave is exceptional and wide-ranging (Gallant). April is usually the hottest month of the year in Thailand, and it has increased by 2.5 degrees Celsius, above the historical average. Temperatures had reached 45.4 C in western Tak province, the highest ever reported anywhere in the country. The authorities cut classroom hours in the Philippines after the heat index reached the

'danger' zone (42-46 C) as power outages crippled parts of Metro Manila. The heatwave hit agriculture and tourism in Laos. In Vietnam, residents said that the heatwave has seriously impacted their lives and income, e.g., street vendors losing customers due to staying indoors and motorcycle drivers delivery stopping during the hottest hours to protect themselves. Myanmar reported many people fainted or visited emergency rooms due to the heatwave.

Some Actions to Manage Heatwave Risks

- Heatwaves impact the health of people and communities in

nations and their economies. Some doable strategies at country and community levels to build resilience to extreme heat may include the following:

- Identifying vulnerable populations is essential to help them create heat preparedness plans that consider all the affected populations in mind. Preparedness plans may include setting up or opening cooling centers during extreme heat and adopting workplace heat stress standards.
- Planting trees to provide shade and to cool the air through evapotranspiration.

- Installing cool and green roofs and cool pavements to reduce the urban heat island effect.
- The pursuit of energy efficiency to reduce demand on the electricity grid, especially during heatwaves.

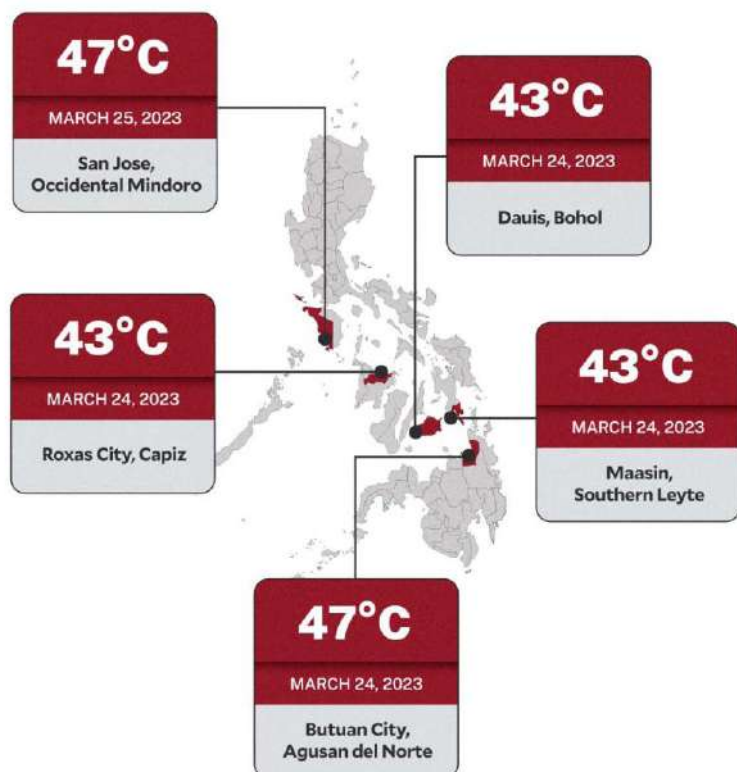
The role of civil society organizations

Over the years, civil society organizations, as was the experience in the past, have proven to play an essential and unique role among other stakeholders as they advocate for change and raise public awareness of existing challenges. They provide services to meet social needs; they act as experts and bring unique knowledge and experience to shape policy and strategy and identify and suggest solutions. They contribute to building the capacity of various segments of society, representing them, and shifting power to the most marginalized and underrepresented communities by giving power to their voices.

CSOs influence policy analysis, policy-making, and strategy formulation at international, regional, national, and local levels. They support implementing and localizing policies in collaboration with national and local governments. Innovative approaches are advanced, including good practices, participatory methodologies, and multi-stakeholder partnerships. They boost the resilience and meaningful participation of vulnerable and marginalized communities. They enable knowledge exchange, and sharing lessons learned and support monitoring and evaluation mechanisms. ■

Highest heat index

Highest temperatures recorded from March 01-March 27, 2023



INQ SOURCES: DEPED, IBON FOUNDATION, 2023/GAA

RCDC's Work in the Bay of Bengal Region: A Climate Change Hotspot

By *Jagannath Chatterjee*, Documentation Manager, Regional Centre for Development Cooperation (RCDC), Odisha, India

The Regional Centre for Development Cooperation (RCDC) is a not-for-profit organization working in the State of Odisha since 1993. It was developed by a few talented and young visionaries of the State who wished to delve deep into the major issues plaguing the State in the thematic areas of forestry, natural resource management and governance, and sustainable livelihoods. However, alarmed by the increased incidence of natural disasters in the Bay of Bengal region that emerged as a climate change hotspot, coastal erosion, and sea ingress in the coastal districts of Odisha, and noticing the impacts on the coastal communities, RCDC decided to get involved and raised the issue in various forums, highlighting the concerns.

Project Paribartan: Increasing Resilience and Reducing Risk

In the year 2011 RCDC, aided by the European Union and Concern Worldwide, embarked on a five-year twin country, India and Bangladesh, an initiative on climate change adaptation and disaster risk reduction program in 84 villages of the coastal districts, Jagatsingpur and Kendrapara in Odisha. Named Project Paribartan it focussed on increasing resilience and reducing the risk of coastal communities to climate change and natural hazards in the Bay of Bengal. A baseline survey conducted prior to the project formulation brought to the fore climate change impacts on life, livelihood and environment. The hazards included increased disaster



frequency, cyclone and sea level rise, flooding, drought, tidal surges and coastal erosion. These impacted the major livelihoods of agriculture and fishery leading to poverty and food scarcity.

The program organised the community, formed and strengthened community-based organizations at hamlet village and Panchayat levels to implement and monitor the program, conducted multi-layered community risk and vulnerability analysis, suggested plans to reduce the vulnerability, consolidated them and involved the local governance system to include them in the Panchayat plans. To address livelihood and coastal protection concerns, pilot options were introduced to present replicable models of resilient livelihoods like integrated rice-fish culture (IRFC) and pond-based pisciculture and vegetable

cultivation, coastal mangrove plantation, rooftop rainwater harvesting, micro insurance, and energy efficient measures. Village-level task forces were set up and trained annually on early warning, search and rescue, first aid, WASH, and shelter maintenance. They also conducted community-level mock drills and awareness campaigns. Overall it was a holistic program that ensured awareness, capacity building, protection and resilient livelihoods. Women empowerment was a focus area and the trained women leaders led from the front.

Prayas: Resilient Livelihoods, Addressing Waterlogging

Also in 2011, RCDC worked in 5 blocks of the coastal district of Puri to implement Project Prayas aided by AusAid and UNDP, organizing communities, awareness and capacity building, building task forces and training them,

empowering women, introducing novel climate resilient agricultural interventions like integrated paddy cum vegetable cultivation, IRFC, pond based pisciculture cum vegetable cultivation, floating gardens to grow vegetables and greens, and building pond based drinking water filtration and supply systems. As the area suffered extensive water-logging and water hyacinth intervention, RCDC undertook the arduous task of cleaning and restoring several defunct water channels. As a result, upon the receding of water levels, the farmers could return to their fields after a hiatus of 32 years!

Pragati: Addressing Unmet Needs of the Naturally Displaced

Since December 2021 RCDC supported by Misereor and with the OSDMA playing a supervisory role, has been working with the naturally displaced community who had to be relocated from the Satabhaya region of coastal Kendrapara, as the seven villages were deeply impacted by sea ingress, low pressures and powerful cyclones. The community consisting of 719 households have been relocated to Bagapatia, about 12 km inland. Though a colony has been built with basic amenities but more needs to be done. The relocated families have not been provided with

any agricultural land, and being deprived of the proximity of the sea, they have lost their livelihood options of agriculture and fishery. Deprived of income opportunities, the youth have migrated in large numbers, leaving the women, children, and elderly behind.

RCDC while implementing Project Pragati has formed and strengthened the women SHG's and formed a federation. The SHG's and their members have been supported by alternative livelihood options like goatery, poultry, dairy and trade and trained. The migrants who wished to return have been offered tailoring and trade as income opportunities. Working in tandem with the PRI members, district and block administration, and department officials, RCDC is looking forward to the integration of government programs and a Rs. 22.52 crore development plan declared by the State Government to strengthen infrastructure has raised hopes. The community members are organized and are being trained on WASH, disaster management, leadership skills, and menstrual hygiene. A task force that has been formed and equipped is trained. Overall RCDC wishes to create a model of climate rehabilitation that can be duplicated in other regions. ■



VACANCY AT AIDMI

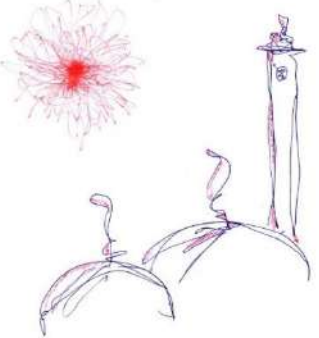

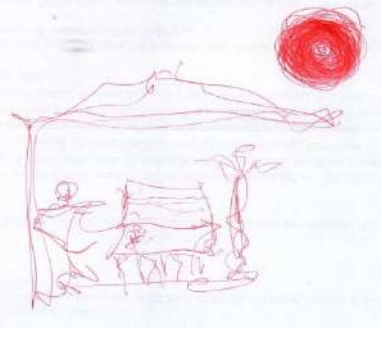


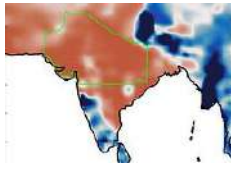
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Click here for more information <https://aidmi.org/internship/>



Resources for Heatwave Action in South Asia

By AIDMI Team

 <p>AIDMI and IIT-Delhi explored ways to better understand and re-plan Delhi's Heatwave Action Plan for 2024, starting with research on key policy gaps at the intersection of energy inequality and disparities of energy inequality and disparities between heatwave mitigation impact. (Copy the link to share)</p>	<h3>Heatwaves 8 Essential Lessons for Humanitarian Responders</h3> <p>See the link (click here) for eight essential lessons for humanitarian heatwave response - starting with immediate actions organisations can take, and moving to longer-term considerations to anticipate future heatwaves.</p>  <h3>HEATWAVES 8 ESSENTIAL LESSONS FOR HUMANITARIAN RESPONSE</h3> <p>ALNAP</p>	 <p>Direct data support accelerates a micro, small and medium informal enterprise after a heatwave or other extreme events, finds AIDMI case studies. (Copy the link to share)</p> <h3>Advisory for Protection Against Expected Heatwaves</h3> <p>India Meteorological Department, Government of India, Heatwaves Guidelines. AIDMI translated the advisory for protection against expected heatwaves in Gujarati, Hindi, Bengali, Malayalam, Marathi, and Telugu languages. (Click here)</p>
 <p>Heat Action Platform - One Billion People More Resilient (See more)</p>	 <h3>BEATING THE HEAT: A SUSTAINABLE COOLING HANDBOOK FOR CITIES</h3> <p>UNEP (Download report)</p>	 <p>Climate Change made devastating early heat in India and Pakistan 30 times more likely – WMO (Download report)</p>

INTERVIEW

Heatwaves in India: Lessons for Implementing Sendai Framework for Disaster Risk Reduction in Asia - Q&A with Mihir R. Bhatt

Over 2,400 citizens have lost their lives over the past two weeks due to lack of preparedness to face the heatwaves. However, it is likely this figure is much higher as heat-related illness is often recorded inaccurately and figures from rural areas are hard to attain. It is suggested that it normally takes a month after the heatwaves to get a true picture of the impact. Loss of health, livelihoods, and business is yet to be calculated, but it is clear this could have been avoided. The United Nations Office for Disaster Risk Reduction (UNISDR) interviewed Mihir R. Bhatt, Head of All India Disaster Mitigation Institute and Chair of Duryog Nivaran, at the ISDR IAP Meeting of 2015 in Bangkok to explain what heatwaves are, how they are impacting India and possible solutions that can be incorporated in implementing Sendai Framework for Disaster Risk Reduction in Asia.

See more [click here](#). ■

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