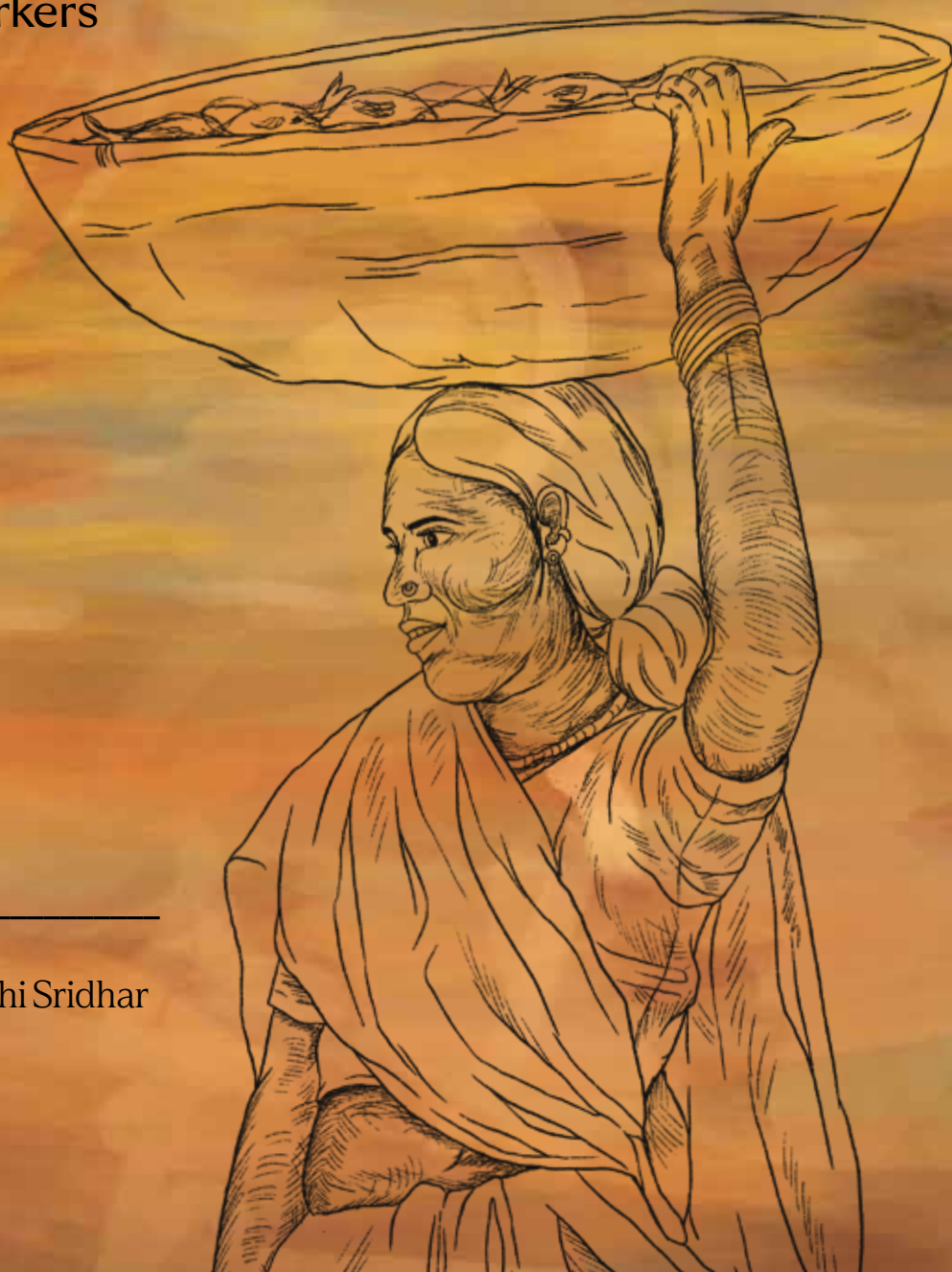


of Fire and Ice

Matters and moods of heat resilience among
Odisha's women fishworkers



Edited by Debangini Ray and Aarthi Sridhar

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We extend our deepest gratitude to the women fishers of Ganjam whose voices, direct words, and lived experiences anchor these pages. We also thank all the community members who generously shared their time, trust, and resilience with us, ensuring their stories live on in this volume.

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Editors' note

Heat is almost always described in numbers and thresholds: forty five degrees wet bulb temperature, five consecutive days of an orange alert or a daily humidity index and forecast. While these metrics serve to trigger action, they rarely capture who extreme heat affects and what it feels like once it weighs on the rhythm of their everyday lives.

How is heat experienced by a woman walking a few kilometres daily with a basket of fish under the blinding afternoon sun? How does it play on her thoughts when she worries if the public bus will let her board with her basket, or will she be turned away? What distance can she cover before the sheer weight of the basket overpowers her will to walk? Will the food she packed at dawn still be edible by noon, or will it have spoiled in the heat? Will there be enough water available to drink before she can wrap up for the day? And what does it mean to endure all of this, only to return to a home that no longer cools down at night?

These are not simply questions about temperature. They also raise fundamental questions about work, health, food, income, infrastructure, and the invisible weight of unpaid care. They force us to ask whose exposure to heat is recognised, whose needs shape our policies, and who is ultimately expected to adapt when climate action fails to be inclusive.

In the coastal stretches of Ganjam, in Odisha, extreme heat is not an abstract climate event; it is an active condition of survival for the Noliya and other fishing communities. Many Noliya families migrated generations ago from present-day Andhra Pradesh, bringing the Telugu language, deep-rooted seafaring and fishing skills, and cultural traditions to build their lives along this shoreline of contemporary Odisha. Today, they navigate rising temperatures alongside the compounding realities of caste, class, gender, informal labour, and profoundly unequal access to welfare services - conditions that dictate who can adapt to a changing climate, and who cannot.

The inspiration for this book began with ATREE researcher Amulya M's Master's dissertation with Dakshin at Ganjam. Amulya and Aarthi began working on ways to arrive at a qualitative measure of heat stress in the context of informal labour conditions, specifically, of small-scale fisheries. Amulya set aside formal heat indicators and indices and instead, one summer, chose to ethnographically accompany women fishworkers in their daily lives, experiencing, with them, a range of conditions of heat each day of their labour. Amulya's perspectives from this experience, covered in the opening article, inspired us to compile an anthology dedicated only to coastal Odisha's experience.

We present perspectives from Dakshin's teams and various programmes of work that spotlight different aspects of extreme heat, its impacts and ways to address them.

This book follows the lives and labour of Noliya fisherwomen across Ganjam's marine fishing villages of Gokhurkuda, Nuagaon, New Baxipalli, Gopalpur, and Podampeta. The stories in these pages began with conversations, field notes, and shared moments from time spent alongside them. Their daily work demands relentless movement between the shore, the landing centres, the drying yards, village streets, and distant marketplaces. Alongside this sits the often unacknowledged and invisible work of cooking, caring, managing households, and keeping families afloat. Heat enters all of these spaces. It shapes how the women work: baskets grow heavier with every step, shade becomes something to seek desperately, meals are skipped or spoiled before midday, and the dull ache of heat lingers in the body long after the sun goes down.

For the fisherwomen of Ganjam, vulnerability is not determined by the sun alone. Heat travels through labour, health, housing, and income, exposing the glaring gaps between what a policy plan promises and what actually reaches Odisha's fisherwomen. A government warning to avoid the afternoon heat means little to someone whose livelihood depends on being outdoors. Reduced working hours might temporarily lower heat exposure, but they force a devastating trade-off, asking a woman to sacrifice her daily income to protect her health. An advisory to stay hydrated assumes that safe drinking water is equitably distributed, and a cooling space is only useful if it is accessible from the landing centre or the drying yard. For women fishworkers, these choices are rarely only about health; their work sits precisely at the intersection of fisheries, informal labour, and household economies, yet it remains profoundly under-recognised and unprotected.

The conversations surrounding extreme heat are, at long last, beginning to shift. Across global climate summits and national policy chambers, institutions are slowly waking up to what coastal communities have known for generations: heat is not merely a meteorological emergency, but a profound crisis of occupational safety, public health, and infrastructure. We are, therefore, moving away from a reactive reliance on weather alerts to asking questions that matter deeply for climate resilience. The focus is no longer simply on forecasting when a heatwave will strike, but on identifying populations at increased risk, determining what physical burdens they bear, which public systems must respond, and where the resources will come from. India's own heat policy landscape is attempting this same pivot. District-level interventions and Heat Action Plans are evolving to look beyond maximum daytime temperatures, starting to account for suffocating coastal humidity, relentless night-time heat, and the specific vulnerabilities of outdoor and informal workers.

Yet, a vast chasm remains between a drafted policy and a lived reality. This anthology is designed to sit exactly within that disconnect. Interwoven alongside the daily realities of the Noliya women are grounded analytical commentaries from researchers and practitioners. These essays step back from

individual journeys to examine the wider currents shaping them, connecting everyday survival with the broader mechanics of fisheries economics, neglected mental health, gendered labour, and institutional design. They reveal what prolonged heat does to bodies and minds, what structural systems make it so devastatingly unequal, and what becomes possible when women's knowledge and leadership are actively recognised within climate adaptation.

And yet, to read these pages merely as a chronicle of helplessness would be a mistake. Noliya women resist the typecast of passive victims of climate disaster. We show the ways in which they have scripted their survival against multiple adversities. They know how to read the shifting coastal winds, adjust their working hours, fiercely protect their perishable catch, and calibrate the inevitable trade-offs between physical safety and financial ruin. Their knowledge is immensely practical, forged in the furnace of the shoreline and accumulated over generations. Between the endless waits at the landing sites and the exhausting negotiations with middlemen, they carve out their own safety nets. They pool their daily earnings to share auto rides, pass around cold drinks under the rare canopy of a tree, and painstakingly wash and re-wash sunburnt fish to hold off the inevitable rot. They turn the smallest moments- like passing an ice cream cone between salt-stained hands on a blistering afternoon- into profound acts of tenderness and solidarity. Through sheer grit, their labour keeps entire coastal food systems alive, bridging the gap between the turbulent sea and the distant, inland kitchens that depend on their catch.

But this continuity extracts a devastating toll: profound physical exhaustion, lost income, and the relentless daily negotiation between earning a living and protecting one's body. It is borne out of systemic neglect that demands that these women bear the entire cost of climate adaptation on their own shoulders, responding to systemic failures with individual courage.

The overarching aim of this book, therefore, is to encourage readers to adopt tangible steps to show up for Odisha's fisher women. Effective heat action by the state, private sector or civil society requires grounded, local understanding to customise intervention design for climate resilience.

Coastal summers are now severe, and the systemic fractures that can address them are deep. In presenting these accounts, the authors do not intend to speak on behalf of the women and communities featured, nor to present a proxy for their lived experiences. Rather, we present Dakshin's own observations from our field-embedded work and our commitment to amplifying the messages, stories, and demands that our community collaborators have generously shared with us, with their permission and in ongoing partnership.

This book is also an appeal to measure heat as being more than the sum of its parts. This would help us design climate action to prevent further suffering, and galvanise efforts to reverse it.

~ Debangini Ray and Aarthi Sridhar

Heat Dialogues:

Between the chapters, you will find three short conversations that revisit the questions raised by the stories in this book. These are informal exchanges between editor Debangini (D) and field researcher Amulya, reflecting on what the field narratives reveal about heat, work, livelihoods, and adaptation.

“If we sit worrying about the heat, who will provide money for us to eat?”





~ ~ ~

D: When you think back to Ganjam, what's the very first image of heat that flashes in your mind?

Amulya: So, imagine the sun on your own back. Feel the weight of the heat. And ask yourself- what does it truly mean to survive and keep going when the world offers little but fire and uncertainty?

Cumulative images appear to me: a woman searching for shade in an unhygienic jetty who finally sits beneath a lorry, women fighting for drinking water at the docks, a woman whose fish got sunburnt, forcing her to wash and rewash them, hands raw, because the heat had spoiled her day's work. And an old woman, carrying her fish basket, walking for kilometres. Their tiredness still lingers in my mind like the shimmer of heat itself.

~ ~ ~

PART 1

Between Fish and Ice: Heat, hope and the long wait

Amulya M and Debangini Ray



The day is almost drawing to a close, but the battles are far from over. Some fisherwomen slowly begin the walk homeward from the Gopalpur bus stand, after managing to sell their fish for the day. Not Bada Kamanna. She stands rooted at her spot. She still has fish to sell.

“What can I do? Everyone else found some shade to sit under, but I didn’t. So, I walked far to find some shade, but I didn’t get any customers there,” she says sadly, half murmuring to herself.

Finally, she finds a sliver of shade beside a wall and sets her basket down. Then, with a sigh, she gestures at the building opposite... *“If only they allowed us to sit and sell there! It’s reserved for big vendors and shop owners.”*

For Bada Kamanna, shade means survival amidst the scorching sun. But even here, in her hard-won spot, customers do not come. After an hour passes without a single sale, she decides to take matters into her own...feet. Lifting the heavy basket once more, she wraps a towel around her head and sets off into the village streets.

“Nobody will buy my fish if I just sit here,” she mutters to herself severely.

As the afternoon air thickens and the light bends into heavy and unyielding heat, somewhere else in Ganjam, another woman’s workday is only just beginning.

On a day when the state issues a heatwave orange alert, the streets look deserted, and the air shimmers everything into waves. 65-year-old Lakshamma is already walking through villages, her callechoing: *“Māchh-ooO, māchh-ooO!* The fish in her basket are fast losing their freshness under the blazing sun. Potential customers take a peek, shake their heads, before turning their backs and walking away from Lakshamma and her basket. Most of them are uninterested in the fish she is selling - *“Too many bones”*, they say. What they really want is *kanagartalu* (mackerel). Once landed, a catch of these mackerel is quickly snapped up by traders before women like Lakshamma can get their hands on it. In winter, when she does manage to buy *kanagartalu*, selling becomes easier without having to drag her feet for long distances. But today, the sun is merciless, and rejection follows her from house to house.

Finally, after walking tirelessly and battling through multiple rejections, she makes her first sale: one *pavu* fish for 15 rupees (~\$0.16 USD). As the cruel afternoon sun shines at 34 degrees Celsius, she wipes her sweat, tries to push further, but exhaustion weighs heavier than the basket. Unable to walk anymore, Lakshamma finally sinks, dejected...

Rest, however, is a luxury that women vendors, especially at her age, cannot afford. At the Nuagaon landing centre, the day begins long before the sun rises high. Women from fishing villages gather on

the shore at dawn, waiting for boats to bring in the catch. Time itself feels elastic as the hours stretch and retract with the absence or arrival of boats. To beat the heat, a group drinks the cold drinks sometimes sold on the shore, as they engage in chit-chat. Among them, 70-year-old Erramma sits quietly, eyes glued to the sea, hopeful. On lucky mornings, she gets her fish at 6 a.m. Most other times she gets them for herself as late as 1 p.m. And on some really wicked days, no fish arrive at all.

Meanwhile, near the Rushikulya river bridge, a heated drama unfolds. An old fisherwoman named Kamanna bargains fiercely with a fisherman. As the fisherman keeps demanding more money, she stubbornly sticks to her decision to pay 500 rupees (~\$5 USD) for the 10 kg of fish she now has in her possession. With a weary sigh, she hauls the basket to her spot beside eight other women.

Here, under the open sky, heat and numbers blur together. Without ice, fish soften quickly, customers haggle harder, and prices plummet, and Kamanna has to engage in a lot of exhausting conversations with customers. Some days Kamanna slashes her fish from a hundred rupees to just twenty or thirty rupees, simply to cut her losses. To salvage what she can, she spends extra on ice - forty, fifty rupees gone before she has sold a single fish.

“Only if I manage to get ice, I can earn around 550–600 rupees (~\$5.50–\$6 USD) in a day, which gives me a profit of 50–100 rupees (~\$0.50–\$1 USD),” she explains. *“Without ice, I’d have to sell the fish at a much lower price. Winter days are still better; I can earn up to 600–750 rupees (~\$6–\$7.50 USD) a day.”*

Without ice, Kamanna divides her stock into three separate containers to prevent spoilage. She keeps two containers under the shade of a tattered chaadar (shawl) that she has hung above her makeshift stall and places the third container in front of her. Every half hour or so, she pours water over her fish to hold off spoilage.

“If the government had provided us with ice boxes, we could protect our fish until the next morning. We could avoid the peak hot hours. It would make our work easier.”

Sometimes, the boats do not arrive.

On such days, some women, like Nagamma, gather firewood on their way home, resigned to drying yesterday’s unsold fish. A single day wasted is a huge loss.

Older women, mostly above 65 years of age, tend to sell fresh fish. The middle-aged often turn to dried fish, working in groups of three or four. Together they salt, spread, and tend the catch before carrying it to Humma dry fish market. Among them is Lachamma, who straddles both worlds, selling dried fish some days, and carrying baskets of fresh catch on others. On a blistering afternoon, you

might find her busy flipping each piece of fish with full focus, eyes darting to the circling crows, who waited for a chance to snatch a piece. *“People think fish doesn’t spoil after it is dried, but that’s not true”,* she says. *“Even if I leave them in the sun for five days, I need to keep them fresh. So, I wash and dry them all over again. Double the work. If no one buys them, we throw them away or eat them ourselves.”*

At Podampeta, 75-year-old Jayamma earns fifty rupees a day helping others dry fish. Hours under the sun leave her exhausted, but she soldiers on until she finally steals a brief rest under a patch of shade. *“For only 50 rupees (~\$0.50 USD), we have to work in this hot weather. I can’t walk and sell fresh fish at this age. At least with this, I can meet my needs without relying on anyone else,”* she says with an ironic smile, sipping a *nimbu* (lemon/ lime) soda. The moment barely lasts before another woman pulls her back to work.

The dried fish sellers mostly travel to Humma market three days a week, pooling their earnings and losses. But even here the sun meddles. Fish break, turn brittle, or redden in the heat. Customers reject them, calling them *gumra sukka*- spoiled.

Kamma, for instance, works from eight in the morning to eight at night. Oftentimes the fish arrive late, and she has to stay up all night to finish her work. Even in months when the beaches are relatively empty on account of fishing restrictions for turtle conservation, you will find Kamma with salt on her hands, wearing a full shirt over her saree and a turban on her head...

“We will die if we don’t get fish.”

Elsewhere, a mother and daughter scrub batches of dried *kabla* (sardines) for the eighth time. The flesh has turned red under the sun, and unless rewashed, it will not sell. *“We need to wash the dried fish at least twice during summers,”* they say. Re-washing not only means losing a day’s earnings, but also more labour- soak, salt, dry, repeat- before the fish is fit for sale again.

The daughter shrugs. *“If no one buys them, we just bring them back and feed them to the poultry.”*

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## FEATURE

# The Heat that Carries: Women’s labour in Ganjam’s dried fish sector

*Sreyasi Mukherjee*



In Ganjam, the day begins before the light has fully settled on the beach. When I reached the Podampetta landing centre at about 7 a.m., I quickly realised that the women working there move almost straight from sleep into labour. They wake before dawn and come to the shore, often without food, waiting for the boats to return. By the time the beach brightens, the heat has already settled in. Ganjam, in May, is unimaginably hot and humid. I joked to myself that the sun seemed to take a fresh bath before shining over Ganjam's beaches. But the joke only held briefly. On that beach, heat stopped being just a research lens; it became an active force shaping bodies, time, hunger, and work. I felt it in my burning skin and parched throat. Like Ganjam's fisherwomen do.

This essay examines how heat shapes the bodies and labour of women dried fish producers in coastal Ganjam. It is also about what becomes visible when we look at fisheries from the shore rather than the boat. Much fisheries writing and policy centres on men at sea, whose struggles are real. But the women who sort, auction, carry, dry, guard, pack, and sell the fish remain at the edges of the frame, even as the dried fish economy runs on their labour. Dakshin's studies in Ganjam show that, under rising heat, fisherwomen face headaches, dizziness, skin irritation, intense sun exposure, and poor access to water, all while heat stress also impacts fish quality and therefore income. What I saw at the landing centres and the market gave those findings texture. Heat is central to dried fish labour: not merely surrounding the work but living within it. Yet, on overcast or rainy days, the fish doesn't dry; it spoils. While the heat burns, its lack thereof, burns more.

The relationship between the women, the fish, and the sun is one of impossible dependence: the sun is both tool and burden. It is the only means of converting perishable fish into storable food, creating value from what the sea provides. But when its intensity rises, that same sun degrades their bodies and deepens their precarity, and this burden is unevenly borne. Women, carrying both paid labour and domestic responsibilities, are expected to absorb the heat's toll without retreat.

At Aryapalli, the ground looked silver: drying fish spread in every direction, shimmering in the sun. I had spent much of the past year reading about fish being diverted from direct human consumption, but experiencing the scale of it was devastating. So much fish, so much labour, so much of it would not be eaten. A significant share would move into poultry and other animal feed chains rather than onto people's plates. Standing there, walking on fish, literally, I was struck not only by its abundance, but by the unequal afterlife of that abundance. Women laboured through intense heat to create value from a catch that might never feed the people whose diets have historically depended most on dried fish.

That contradiction matters because dried fish is not a marginal commodity. It connects the coast to hinterlands, hilly districts, and mountain regions where fresh fish are hard to access. Across

forested tribal districts of Odisha, and the mountain and hilly regions of the Eastern Himalayas, it has sustained people for generations: requiring no refrigeration, travelling where electricity is unreliable and fresh produce is scarce, and remaining among the few durable and affordable forms of protein. But that affordability is breaking down. Even though dried fish remains available in inland wholesale markets, it is often at prices the people cannot afford.

The dried fish economy begins with speed. When men return from sea, women gather immediately to auction and buy the catch. If it is good, a portion is sold to fresh fish traders. Whatever remains is dried. This division reveals two economies of heat. Fresh fish sellers race against spoilage, relying on ice and rapid transport. Dried fish producers convert perishability into shelf life through sun, salt, and labour. While both are vulnerable to heat, for dried fish producers, the body itself becomes part of the preserving infrastructure.

The women working at fish landing centres are a force to reckon with. They handle cash, bargain fiercely, and move with remarkable precision in conditions that would make most people retreat. I met K. Danamma, the newly elected president of the Maa Polamma dried fish producer group. Danamma collects money from her group and buys fish on behalf of the co-producers. Strong, outspoken, and tenacious, she was an obvious leader even to an outsider. But leadership here is not ceremonial. It means coordinating labour, credit, purchase, and sales, all under pressure.

Danamma also engages smaller-scale producers to ferry baskets of fish on their heads from the landing area to waiting trucks, about 30 metres each way. Each trip earns 20 rupees (\$0.21 USD). As men return with more fish, the whole shore slips into urgency. The women run faster, sometimes leaving their slippers behind; the sand is scorching, but bare feet are quicker. On good days, they make twenty or thirty trips. Watching them move up and down the beach, pausing briefly to exchange a few words between them, I was reminded of industrious ants. But this was not instinctive motion. It was labour—timed, skilled, but relentless.

Just as striking was the absence of basic infrastructure. There was nowhere to drink water at the worksite. Water had to be bought. Water brought from home, quickly heated in the sun, no longer relieved thirst – a lesson I learned when my water bottle became too hot to touch, let alone drink from. A detail that seems small becomes central after a few hours there. Without cool drinking water, shade, or rest, coping with heat is reduced to endurance. Each bottle costs 10 rupees (\$0.10 USD), and the women may buy several each day; with no accessible bins, the empty bottles are discarded on the beach. Some carry *pokhal bhaat* (rice fermented overnight), believed to cool the body. Many bring no food at all. They leave home for the landing centre because the catch cannot wait; if time allows, or someone brings food from home, they eat. If not, they work on.

Their day begins before dawn, often before 4 a.m., when the air is still bearable, but the heat is already present, waiting. Most sleep only four or five hours, sometimes less. Men return from sea at first light, and women must be ready to auction, sort, carry, and dry. By mid-morning, the sun is harsh, and it does not ease until after sunset. There is constant movement between the beach and market; little time for family, health, rest, or recreation. The women who sell dried fish at the weekly Huma market stay up through the night, battling both heat and mosquitoes. When sales are slow, they cover their wares with tarpaulin sheets and sleep beside them. This is another aspect of labour time that is not valued: time spent waiting, guarding, staying alert, sleeping lightly beside one's stock, and waking repeatedly to continue selling.

Fisherwomen told me that given control of time, they would simply spend it with their grandchildren. The toll of stolen time is unmistakable: foreheads furrowed from years of squinting, skin weathered by salt and sun, weakening eyesight, bodies marked by chronic pain and fatigue. Under unrelenting labour SSF women appear to age faster than those in other work. Prolonged engagement with fish, salt, and sun, desiccates not only their bodies, but also aspirations, across generations. Yet this cycle of suffering can be broken. Fisherwomen have clearly articulated, in various platforms, what would make work safer and liveable: cool drinking water at landing centres, toilets and washing facilities, shaded places to rest, reliable waste management, and drying spaces designed around their working realities. Through the dried-fish producers' group that I work with, we recognise how needs transform into collective demands and actions, rather than individual burdens. Dakshin's role is to help bridge the gap between Odisha's marine small scale fisherwomen and its government agencies, to address multiple structural deficiencies.

Buguru Tanesu, 55, who works with Danamma, described her role in gathering and drying fish, packing it into baskets, and coordinating the sale to the *dalari* (middleman), after Danamma negotiates the price. At around 10:30 a.m., after working since at least 6:30 a.m., she was brushing her teeth with a neem twig. When I asked whether she had eaten, she said what others seemed to accept as ordinary: if younger daughters-in-law bring food, they eat; if not, they do not. On especially busy days, when hunger becomes too sharp, they roast fish meant for drying over an open beach fire. Working under extreme heat changes not just the nature and intensity of labour, but all other actions in between - eating, resting, washing, and moments of rest.

Later, I asked Tanesu how the constant bending, lifting, squatting, and carrying under a punishing sun affected her. She answered, not in words but by touching her head, shoulder, neck, back, hips, and face - the body recording the labour. I do not speak much Odia, but language felt unnecessary. Pain speaks a universal language. My own urban skin began peeling after just one morning of accompanying the fisher women.

The injustice is not only climatic; it is commercial. Each basket of dried fish that Danamma sold should have weighed 20 kilos, yet the *dalari* casually helped himself to a few extra kilos without paying for the excess. While heat by itself does not create such exploitation, it sharpens it. It creates a desperation to sell at low prices, with urgency narrowing women's bargaining power.

Interventions to address this complex climate induced economic inequity requires a focus not only on conditions of dried fish production, but also changing who controls its value thereafter. Producer collectives can help women purchase inputs, maintain quality standards, store stock rather than sell under distress, and negotiate more effectively with traders. Market linkages, better packaging, and direct relationships with consumers may not transform unequal markets overnight, but they can widen women's bargaining capacities. This is where civil society comes in. Together with Odisha's Mission Shakti, ICAR-CIFT, the Fisheries Department and regional civil society partners such as Mahashakti Foundation, Dakshin is helping this dried fish producer group build their capacity to produce and market hygienically dried fish, while developing sustained market linkages. Simultaneously, by directly connecting the producers and consumers, and thereby reducing intermediaries, we hope to make dried fish affordable for Odisha's traditional consumers, while securing fairer compensation for the women's labour. As part of supporting the dried-fish producers' group, Dakshin has incorporated capacity-building initiatives on hygienic dried-fish processing, including training at ICAR-CIFT. These sessions focus on safer handling, storage, and value addition, while connecting the women producers to practices and institutions that can strengthen the quality and marketability of their product.

Odisha's small scale fisherwomen's labour holds together a fragile but vital food system within its state borders. A nuanced approach to climate aligned interventions needs to account for labour as valuable environmental knowledge, and the condition of human bodies as a metric of environmental stress, on individuals, households, markets, and food networks. The women I met may not speak the language of climate adaptation planning, but they understand heat with a precision that most of us don't. They know the difference a breeze makes, when fish spoils too quickly; when fatigue becomes pain; and what it means to work all day with no water, no shade, and no certainty of food.

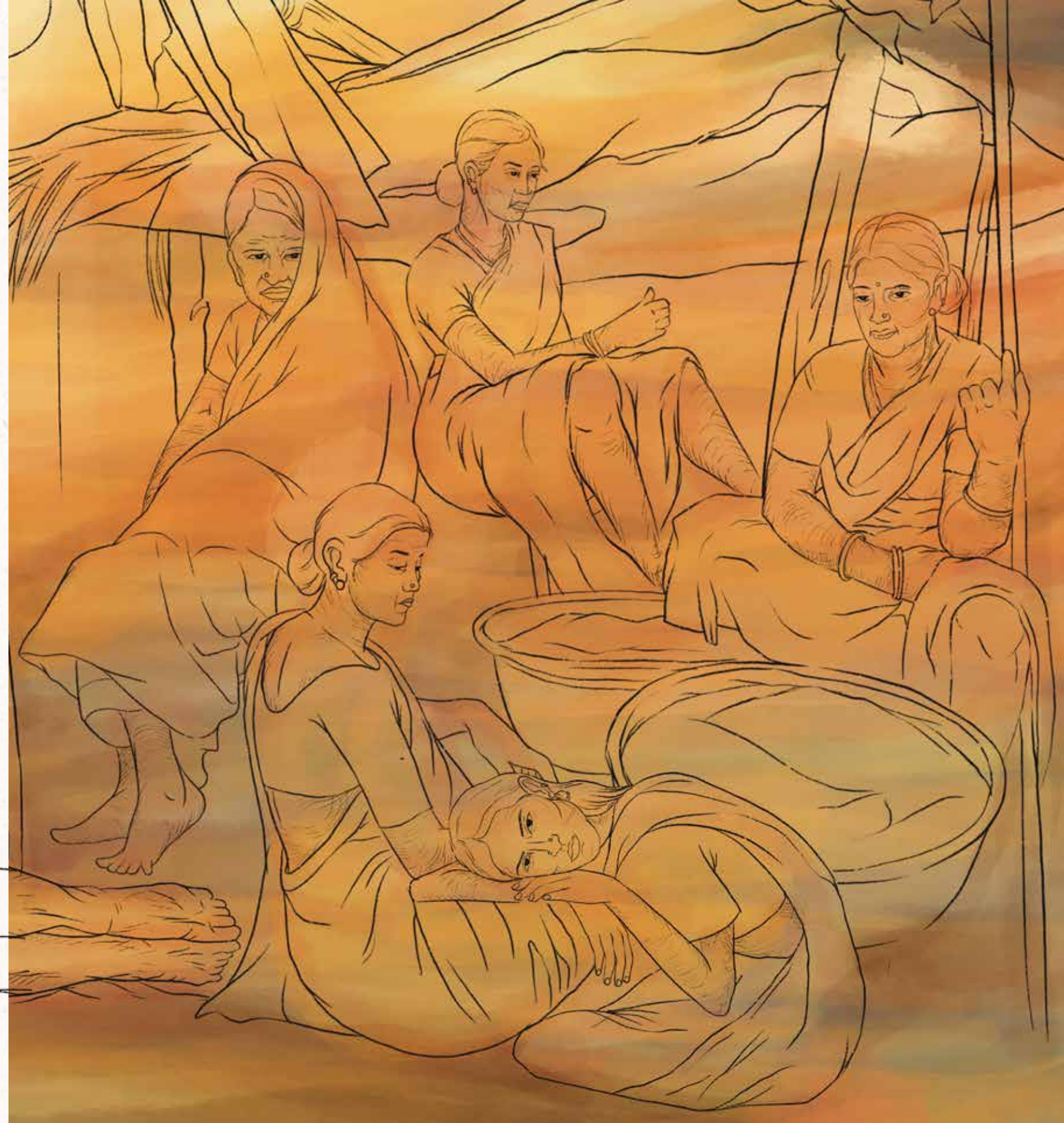
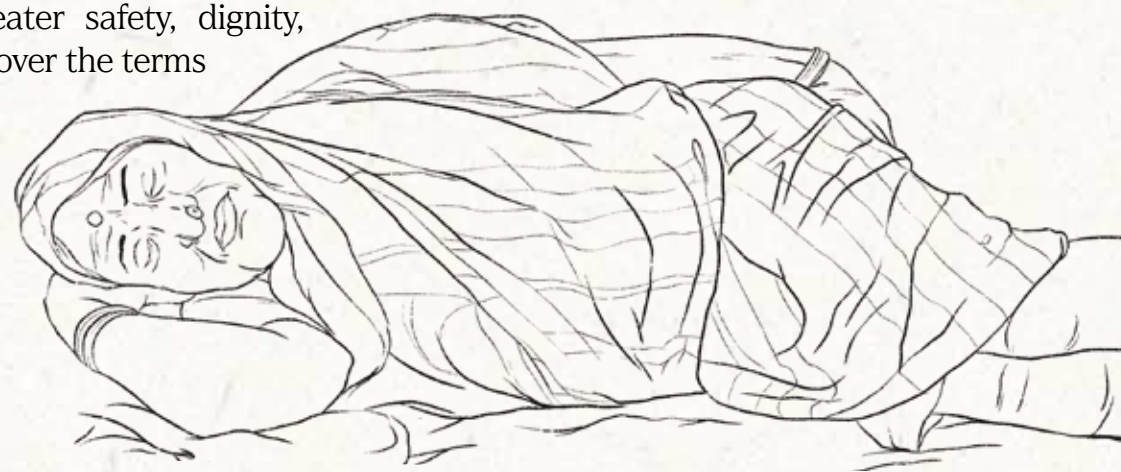
Dakshin Foundation's Sustainable Fisheries and Livelihoods Programme is working with such women producers and public institutions, including the Odisha Rural Development and Marketing Society, the Department of Fisheries, and Mission Shakti, to explore practical, locally grounded improvements. This includes advocating for drinking-water points, toilets, solid-waste management, and shaded rest areas at landing centres, while strengthening women's capacities in hygienic production, leadership, producer group management, and collective enterprise. The aim is not simply to make women more efficient within difficult conditions, but to make those conditions less punishing.

A suitably designed holistic fish drying centre cannot eliminate the sun's power, but it can change the terms on which women work under extreme heat. Co-designed with producers, such improved production centers can respond to the coastal geography, the rhythms of the landing centre, women's care responsibilities, and the need for hygienic handling, storage, water, shade, and rest. Improved drying racks, covered work areas, and appropriate storage, when introduced together with wider wellbeing conditions, can reduce not just exposure to sand, waste, rain, and uneven drying—but also valorises women's knowledge of fish, weather, local markets and their own wellbeing. At Dakshin, we are working closely with the women to renovate an old school building into a primary workspace designed around their stated needs: storage but also rest areas, repaired terrace access for hygienic drying, reliable supply of fresh water, but also for a washroom, a kitchen and shelter from the sun. These are not luxuries. They are the basic infrastructure through which safer, more dignified work becomes possible.

Dried fish in Ganjam is therefore not only a product of sun and salt. It is a product of women's heat-exposed labour. It feeds local markets and wider geographies of need, yet the women sustaining this economy remain poorly served by infrastructure, markets, and public recognition. Any conversation about climate resilience in fisheries that does not begin from their vantage point will miss the point entirely. In Ganjam, heat is not merely an environmental condition. It is a labour, market, and political condition. To write about it honestly is to write about the unequal terms on which some bodies are made to endure so that others may eat.

There are no simple technological fixes for a livelihood shaped by heat, precarity, and unequal markets. But women's everyday knowledge offers a starting point. When producers help design infrastructure, organise collectively, strengthen market connections, and claim basic facilities as a right, dried fish can become more than a record of endurance.

It can become a site of greater safety, dignity, bargaining power, and control over the terms of work.



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D: What surprised you most about how the women adapted to the heat?

Amulya: It doesn't leave their bodies at all. It lingers... in headaches, in muscle pain, in the fainting spells that come unannounced. It is not just about selling fish...

And yet, they make space for small joys. In between their rounds, they gather to eat ice cream – one day, one woman buys for the group; the next day, another does. They tease each other, turning pain into something almost tender. They have normalised their struggles, not out of defeat, but out of a quiet acceptance that life will go on anyway.

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Heat does more than scorch skin; it seeps inward, finding every weakness in the body and pressing against the mind. Women who walk eight to ten kilometres each day with baskets of fish on their heads don't just carry the physical weight but also carry dizziness, persistent headaches, aching muscles, rashes, and fatigue that lingers into the night. Many are older adults juggling high blood pressure or diabetes, conditions that make sudden temperature swings dangerous and recovery harder. Hunger compounds it: meals are few and hurried, sometimes *pakhal bath*\* or *ambali*\*\* eaten on the go or skipped altogether, because stopping to eat or setting the basket down costs time and income...

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\*Pakhal bath (or pokhalo)–An Odia staple consisting of cooked rice soaked in water, often fermented overnight, served cold.

\*\*Ambali- A traditional beverage made from fermented finger millet porridge mixed with buttermilk, roasted cumin, and spices.

## PART 2

# A Fishy State of Mind

*Amulya M and Debangini Ray*





At the Nuagaon landing centre, fifteen or twenty women cluster into the only patch of shade, gossiping softly, sipping cold drinks, waiting for the boats. Their eyes stay fixed on the horizon, hope tethered to the sea. When the fishermen sell their catch to outside vendors for higher prices, the women accept the loss silently, their wait unrewarded. Small comforts break the monotony- mango juice, a bottle of soda, or an ice cream to beat the heat. Somehow, they always make room for one another, squeezing under a tree or sharing water, weaving a beautiful solidarity.

The toll deepens with age. For Kamanna, widowed decades ago, the headaches and muscle pains have become her *“constant companions.”* Doctors give her injections that dull the pain only briefly. Years ago, she lost children at birth for lack of healthcare. Now, without family support, every rupee she earns is fought for under the sun, every bargain with a customer a slow erosion of her energy. Bargaining with customers wears her down; when the fish ban forces her to buy from the river, tensions flare with other communities. Even stopping to drink water means putting down the very heavy fish basket and lifting it back up again. There are hardly any vehicles on this route that she traverses.

*“Now if we face health problems, we have to spend our own money on hospital visits. What does the government do to address our losses?”* says Kamanna, as she walks with a heavy basket on her head, trying to move to the scant shade of a tree. Her three litres of water are over; she is thirsty and dehydrated. By afternoon, the sun shows no mercy. A few metres away, Erramma, visibly worn and dizzy, leans against a wall with a glass of juice from a local shop. *“I feel so dizzy and get these headaches as I am walking. Sometimes I even ask for water if I get thirsty when visiting households.”*

Lakshamma tries to endure the same grind but often collapses under trees, unable to take another step. *“Let the fish spoil; I can’t walk further,”* she mutters, unable to fight the dizziness. *“I get neck pain while carrying the fish on my head.”* Even when she sells her stock, it is often at a loss. One afternoon, tears filled her eyes, and she rushed to the nearby village pond to splash water on her face, 50 rupees poorer than she started. It was a truly heartbreaking scene.

The increasing age does not make matters easier either. Nagamma, seventy-five, nearly blind and hard of hearing, walks four kilometres every morning to sell fish door to door. At home, her husband cannot move or speak. She shrugs at her blood pressure problems and pills, and smiles sadly when asked about heat: *“Even though we suffer so much, who will listen?”*

Jayamma points to the rashes on her skin: *“The itching is constant. Fever comes and goes. But what can we do? We need to work.”* The women have some temporary remedies up their sleeve, which give only momentary relief. Karramma drinks *nimbu paani*, rubs oil on her scalp, stays as hydrated

as she can, and yet the headaches and dizziness persist. There is hardly time to eat properly, and constant worry about the next day replaces any longing to rest.

*“This is our life; we don’t have time to even cook and eat. It’s Sunday tomorrow- we need to go to the market to sell dried fish, so everyone is extra busy today.”*

If you look around, you might find some women like Lachamma opening her tiffin box to have lunch and finding half the food spoiled. The *sambar*\* she had cooked the night before and packed in the morning also could not withstand the heat. Throwing it away sadly, she turns to some rice and pickle instead - relying on this fragile meal to give her strength to walk the next seven kilometres, at the risk of collapsing from exhaustion.

*“We have to skip meals when we need to leave the house early in the morning around 3 or 4 a.m.”*

Lachamma lives alone with no one to take care of her. A week ago, she had fainted while selling fish and had to be taken to the nearby hospital for a check-up. *“Most of the women here have high blood pressure and diabetes, which makes walking difficult,”* she said. *“Carrying fish on my head gives me back pain as well.”* Still, she regularly walks to Gopalpur and Gorapalli villages to sell her fish. She longs to have a good night’s sleep, but her eyes often burn at night.

The absence of basic support is stark: no ORS packets, no government-distributed energy drinks, no local relief measures that might keep someone on their feet. The heat burrows into muscle and memory and returns every summer with a renewed vigour.

Shyamala, a dried fish seller, sits by rows of drying fish as the sun rises. She had a burning fever yesterday, but she is back at work today: *“The ocean wind keeps us cool, but if we go back to our homes, our skin starts burning. It’s even hotter inside the house.”* It’s a relentless cycle for these women- cook for the family, clean the house, care for the children and then come here to work. What kind of superhuman strength is this? Definitely not something that’s changing their lives for the better, that’s for sure. *“We have no choice,”* she says. *“This month is very hot, and next month will be even hotter. Hopefully by August, it may get a little better.”*

But sometimes the problems go beyond heat; for instance, Subamma lost her Aadhaar card in a cyclone seven years ago and has not been able to get a replacement. Without it, she receives no ration. The tehsil office told her that it was not possible to issue another Aadhaar card, even when she offered to pay. *“Will we survive if we don’t work here? Who will give us food?”* she asks. She

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\*Sambar: A spiced lentil and vegetable stew prepared with a tangy tamarind broth, commonly served with rice.

constantly worries about her sick husband, feeling that the medications prescribed by the doctor weren't working, and for quite some time now, she has become the sole earner in the family. *"I hardly make two to three thousand a month, which is not enough to buy rice,"* she says. To quiet the headaches and dizziness, she sleeps... *"If I also fell ill, how would we buy rice....."*, she whispers, almost as if she's afraid of the thought.

There are stories of women who don't receive any care, who have to spend their hard-earned money to treat their illnesses borne from heat, of lack of support shown by the government, of sleepless nights tossing and turning in agony as rashes spread across the skin, of prayers offered to take away the pain endured by the feet and shoulders, only so they would be able to withstand more pain the next day.

*"The ocean is everything for us: if there is fish, there is food; otherwise, we have nothing."*

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FEATURE

Beneath the Blaze: The mental and physical burden of heat

Pavitra Vasudevan



I see everything in a blinding yellow against the blue backdrop of the ocean. Surrounding me is a glimmering vapour, my water bottle empty and no drinking water in sight. I see dots of women going about their livelihood as the day turns hotter.

Odisha's coastline is ablaze in the summer months. I was there to oversee Dakshin's health work in Ganjam at that time, and decided to visit the beach to meet fisherwomen from the Telugu-speaking Noliya community. The conditions I experienced briefly that summer, as a visitor with the privilege of retreating to a comfortable field station, are experienced by Noliya women over several generations. The impact of their hard labour in the market or at home, as described by my colleague Sreyasi in her article, is the last thing any formal health system or climate action plan accounts for. Informal health systems and traditional remedies offer some respite, in addition to the regular visits to completely unqualified medical personnel who impersonate doctors who are just not there.

Intensifying heat waves are a silent climate and health disaster. Nationwide, the number of Indian states experiencing heatwaves jumped from 9 in 2015 to 23 by 2020, with the average number of heatwave days increasing from 7.4 to 32.2 days (Nair et al., 2026; Thawaney, 2025). Odisha remains one of the most vulnerable states due to its geographical positioning, and health concerns top the list of challenges during heatwaves. For the communities that reside here, these become conditions of everyday life, compounded by structural vulnerabilities like poor housing without sufficient ventilation, no access to nature-based or built cooling infrastructure, lack of drinking water and healthcare access, only to name a few.

The women are precise about what heat does to their bodies: dizziness, nausea, and body weakness. Sweating through synthetic clothing before the peak of the day. Headaches and dehydration are constant complaints, but access to drinkable water while carrying heavy loads is scarce, leaving women like Kamanna completely dehydrated under the weight of their baskets. Women who have spent the day outdoors describe a needle-pricking sensation on the skin, for which they apply turmeric and rest. Menstruating women face the additional challenge of rashes and no access to clean water or clean toilets, which means they typically have to go out in the open to relieve themselves. Eating *pokhalo*, applying turmeric or putting a wet cloth on the neck to soothe their skin are ways to adapt that have been shared and passed down. This is the way Jayamma ends her day, after long hours of labour carrying a heavy load to sell fish. The women's adaptive responses come from a generational attunement to the needs of the body in this landscape, awareness of its shifting environment and leaning on available and accessible knowledge and practices. The adaptive response, however, has been stretched beyond its limit.

Coastal heat compounds everything. High humidity shuts down the body's primary cooling

mechanism; sweat cannot evaporate into the already-saturated air. The domestic chores of the day add their own thermal burden, like cooking on open fires in enclosed spaces. The heat takes a physical and psychological toll. Research consistently links this cumulative heat burden to increased mortality, hospital admissions, and rising mental health morbidity. A meta-analysis found that for every 1°C rise in ambient temperature, mental health-related morbidity increases by 0.9% (Romanello et al., 2024; Thompson et al., 2023). Women in low-resource settings experience higher stress levels due to social constraints on clothing, cooking, and sleeping space.

Women use the word *chidchida* (irritability) to describe this mood - one that occupies a significant part of their daily mental load. The state of agitation that everyone experiences in the family is pushed onto the woman to manage; fights break out more often than not, and the household becomes a place of friction. Women also report nervousness and sleeplessness at night as homes no longer cool down inside as they used to. Research confirms that high nighttime temperatures worsen sleep patterns and directly cause or exacerbate depressive symptoms, and separately, that heat increases aggression and conflict within households (Obradovich et al., 2017; Mullins & White, 2019). Sleep loss carries cascading effects on concentration, immunity, and mental health that stretch across a season, becoming worse each year (Rony & Alamgir, 2023; Chandra, 2026).

Unlike heatstroke, mental health is not visible here as a category requiring intervention. There is no service to refer to. Heat stress indicators are systematically tracked, such as hospital admissions for fainting, mortality, and other physical symptoms. Mental health outcomes from chronic heat exposure are recognised in global research as a priority, but in India's heat-health monitoring framework, they are not even recorded alongside physical symptoms. The national disaster management protocols mention mental health and psychosocial support frameworks and the psychological impacts in disaster contexts, but heat remains unnotified as a disaster, placing it entirely outside that mandate. Evidence for the heat-mental health link in low- and middle-income countries remains limited, and what exists focuses primarily on extreme event outcomes, suicide rates, and reported levels of depression in hospital settings, rather than the chronic psychological burden that communities carry. The result is compounding invisibility: physical symptoms of heat stress are undercounted; mental health symptoms are not counted at all. The treatment gap for common mental disorders in India already stands at 80% nationally (Sagar et al., 2020), before heat stress is added to the equation.

Despite these severe working conditions, women remain under tremendous pressure to earn a viable income or diversify their income sources to keep their families afloat. There are no minimum wages or crop protections that will make ends meet. The 2025 Lancet Countdown estimated that

India lost 247 billion potential labour hours to heat exposure in 2024 alone, a 124% increase from the 1990s, costing approximately \$194 billion USD in income (Romanello et al., 2025). These numbers do not account for the informal sectors of women's labour and the health gaps and vulnerabilities that they are exposed to. Gender-related numbers are usually just a footnote or missing altogether.

The gendered dimension of this exposure is structural, not incidental, and we need interventions that target these. Research on informal women workers in India documents that women drink less water to avoid the challenge of finding a toilet- a direct pathway from heat stress to dehydration and genitourinary disease (Bose et al., 2016). Sanitation interventions are therefore central to climate adaptation. Women account for 55% of the population and are most at risk from extreme heat in India. Between 2010 and 2019, heat-related deaths fell among men but rose among women by nearly 10%, a trend that could see heat mortality among Indian women double by 2050 (Thawane, 2025). Gender-disaggregated data on heat-related illness remains largely absent from surveillance systems, making it impossible to assess the true scale of the disparity, let alone act on it (Romanello et al., 2025). For the above reasons, designing interventions to account for heat impacts on women can potentially address more than half the problem.

Back from the beach, I visited a group of women from the community. “*The ASHA has not come,*” they told me matter-of-factly. I wondered if it was because of the heat. The irony is structural - peripheral health workers like the Accredited Social Health Activist (ASHAs) are expected to deliver heat-related health services under the same thermal conditions that make those services necessary. When one recalls that they are among the lowest-compensated workers in the public health system, who frequently go without any payment, then we encounter the question of what structural solutions are needed. Peripheral health workers in India are not trained to address heat strokes beyond basic incidence tracking. Heat-related illness protocols and clinical management remain largely absent from their training at both district and PHC level, a gap with life-threatening consequences. The National Programme on Climate Change and Human Health (NPCCHH), along with the National Centre for Disease Control (NCDC), issues heat-related illness advisories directed at medical officers, not at the peripheral health workers who are tasked with bridging health gaps and bringing people in for treatment. ASHAs are positioned as the last link in the response chain, but *without* the requisite training, compensation, or protection. As frontline workers, they are also the first to be blamed for faults in the health system. This fragmentation is currently hardcoded into policies related to health and climate, but can be easily revised by strong commitments from system-influencing actors, including state governments. Dakshin's ongoing work with peripheral health workers in Ganjam on heat-illness protocols and mapping community practices and adaptations is one example of what revision looks like in practice: incremental, grounded, and replicable.

Odisha developed India's first heat management plan in 1999. But a 2023 assessment by the Centre for Policy Research found that of 37 HAPs examined across India, only two included vulnerability assessments. (Pillai & Dalal, 2023). Plans without vulnerability mapping are akin to plans made for landscapes devoid of humans. Such plans miss the fishing communities with a high incidence of heat exposure, non-communicable disease and also wide health system coverage gaps. These vulnerability indices also miss mapping the constraints of health system challenges. Civil society organisations, like Dakshin and its partners, are building bridges between specialised knowledge and customised solutions for coastal states like Odisha.

Our embedded work at Ganjam has shown us ways to bridge gaps between climate action and health. First, climate change-induced heat must be recognised as an intersectoral planning challenge – for physical health, gender justice, mental health, and labour dignity, *simultaneously*. This requires that Odisha's climate policy and health systems begin addressing heat's harm based on goals that can be tested beyond economic and quantifiable indicators such as lost labour time or productivity hours, hospital admissions, and mortality counts. A revised planning framework systematically includes goals and indicators that capture what economists call non-economic losses and damages, like climate-induced mental health and wellness impacts, disruption to social networks, and the loss of cultural and traditional knowledge practices. Capturing these losses and planning to minimise them requires different planning approaches and tools. Community-based adaptation plans must therefore integrate psychological stressors alongside physical ones.

Secondly, health monitoring and surveillance systems must be redesigned to capture metrics and indicators currently excluded from heat-health frameworks: gendered morbidity, mental health burden like sleep disruptions, low motivation and household conflict, menstrual health complications, informal income loss among women workers, pregnancy outcomes during heatwave months, and the prevalence of informal health knowledge and traditional cooling practices that communities already hold.

Thirdly, for effective outreach and behaviour change, communication needs to be customised for coastal communities, in local coastal languages of Odisha, delivered through trusted community networks, and timed to reach vulnerable age and gender groups alongside early warning systems. Health workers such as ASHAs themselves need to be treated as part of the exposed population, not only as delivery mechanisms. Their working conditions, training, and compensation must be incorporated into planned heat-health responses that claim to function at the community level.

Finally, cooling solutions must be reimagined beyond technical infrastructure: we propose a combined push for restoration of coastal vegetation, supporting traditional architectural

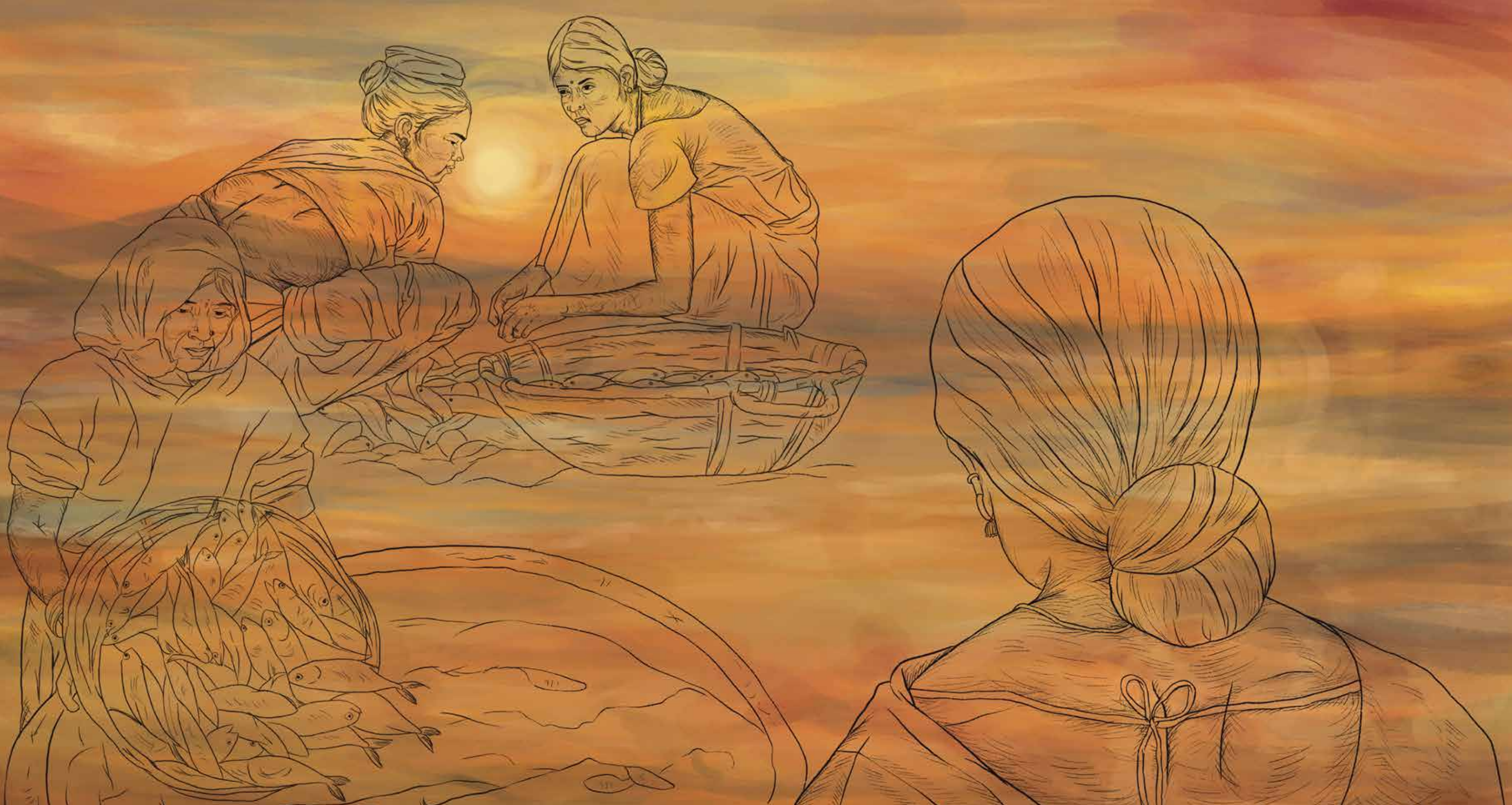
knowledge, protecting access to water, and designing public market spaces with shade, sanitation and rest, built as adaptations that address heat, gender, and dignity together.

Blaming just state failure is neither intended nor accurate. System-wide issues are often the combination of factors and require actions across stakeholders. The restructuring of the issues mentioned above needs to be directed towards equity-centred design across stakeholders. Equity-centred design acknowledges the role played by each actor, where some are better resourced and responsible for certain actions, towards closing the access gaps. Isolated examples exist in India: the SEWA-linked Women's Climate Shock and Insurance Initiative, piloted in Gujarat and Maharashtra in 2024, reached 50,000 women informal workers with parametric insurance, early warnings, and direct income support during heat events, demonstrating that targeted, gender-responsive response is operationally possible (Dhana Sri, 2026).

Slow disasters like heat stress find the cracks in every system and widen them, and in coastal Odisha, those cracks run along the same lines of gender, language, income, health and labour. State and civil society interventions in Odisha can address this collaboratively if we recentre the women of Odisha, fisherwomen, ASHAs, and last-mile peripheral health workers. This will ensure that the cost of inaction is not paid disproportionately by the people least culpable and who can least afford it. The women on this coast are already doing the work in their homes, with a little help from turmeric, *pokhalo*, and by pushing the limits of what their bodies can (or cannot) sustain. The women participants in our workshops are also asking for change beyond their homes, for the wider landscape – in the form of greater coastal restoration, more shaded areas for work and rest, and access to clean drinking water and sanitation. Let us build such interlinked enabling systems for the people of Odisha.

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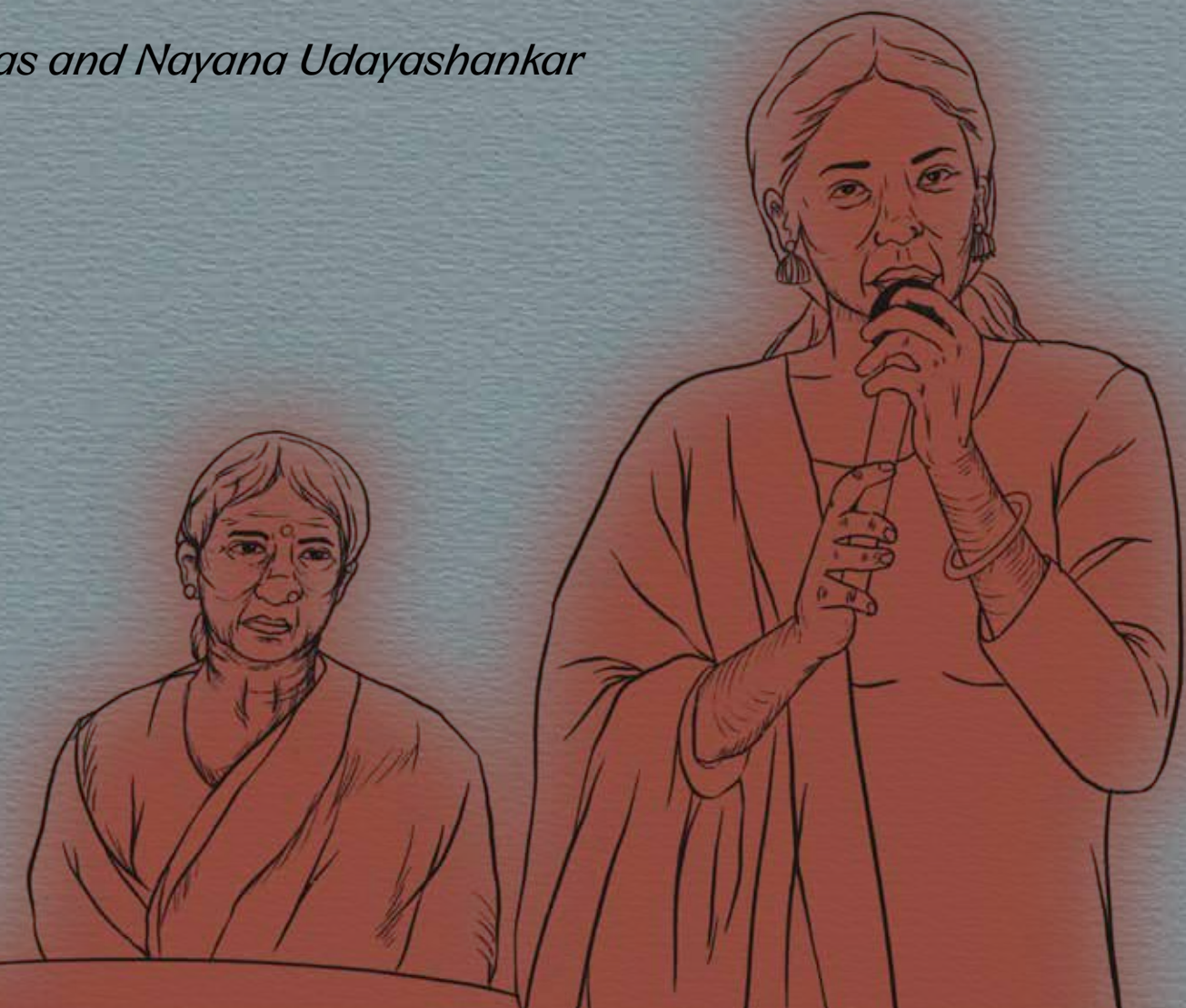




FEATURE

Leading for Change: Women paving the way for heat-resilient communities

Sipra Das and Nayana Udayashankar



It is a hot, humid day in the village of Khirisahi in Puri district, neighbouring Ganjam. It has been a particularly hot summer, and there has been quite a lot of news about rising temperatures. In the only cool spot available, under the shade of the tree, three women are speaking to three fishermen. They are documenting how fishers experience the heatwaves that have now become a regularity. Beyond numbers reported in daily papers that indicate temperature changes, they are curious about what has changed in the fishers' daily routines, their ability to go to work on a daily basis and changes to their spending patterns. Small details of everyday lives have been altered to adjust to climate change.

The coastal fishing communities of Odisha are increasingly experiencing the impacts of climate change. Heat is no longer just a seasonal challenge that has to be dealt with for a short period in the year. It is becoming a growing concern that affects fishing activities, post-harvest work, household work and responsibilities, and community health and well-being.

Heat risk is not experienced equally by everyone. It is a combination of temperature, humidity, existing socio-economic conditions and health vulnerabilities. While temperature and humidity are objectively measurable, to accurately understand heat risk, we also need to be able to map several other related factors such as occupation, working conditions, income, access to drinking water and shade, working hours, and health vulnerabilities. And it is primarily for this reason that heat resilience requires embedded solutions.

We need to move away from reliance only on top-down policies. However, we also need to structure governance in such a way as to deeply listen to local realities and support implementation of embedded, contextual solutions. Many community members care deeply about their local issues such as coastal erosion, conflict arising from resource sharing, access to commons, degradation of commons or health impacts from changing climatic patterns. Not only are they best placed to understand exactly what kind of impacts their homes and communities are facing, but they also have a nuanced understanding of what solutions would work and what would not. This local knowledge also has a role to play alongside formal heat-risk and vulnerability assessments. Mapping heat risk can help identify where exposure and vulnerability are concentrated, but understanding why particular communities are vulnerable and what solutions might actually work requires knowledge of how people live and work in those places. For this, local leadership that has an ear to the ground becomes a crucial element, and we believe that *women* are best placed to lead communities towards heat resilience.

Women as leaders for change

It is well established that women form a large part of the fisheries workforce and contribute significantly to the social, cultural and economic life of fishing villages. But it is also women who are best placed to lead communities towards climate resilience for many reasons. First, seasonal migration is a part of the reality of most fishing families. The peculiarities of the life of fishers also mean that women are more present in villages and thus face the brunt of climate changes across seasons. Men of the household may migrate for a few months at a stretch every year for income. For instance, in Ganjam district, Odisha, as a result of multiple fishing bans every year, men of a fishing household typically migrate for 6-7 months a year to earn an income for the family. As a result, women, who are left behind to care for both the young and the old, while also caring for the community commons, are often in a strong position to understand how climate impacts unfold across the year. Secondly, women can bring in nuance and interrelatedness to climate resilience. Women often experience and respond to climate risks in ways that are closely connected to livelihoods, household well-being and care responsibilities. Thirdly, women's everyday experiences can also reveal dimensions of heat vulnerability that may not be visible through general temperature data or broad heat advisories. For example, changing working hours may reduce exposure to extreme heat, but can also reduce income, while household responsibilities continue.

Understanding these interconnected realities is important for designing responses that are practical and relevant to the people they are intended to support. Thus, women's lived experiences can act as a source of local knowledge that helps identify overlooked concerns, understand how different vulnerabilities are connected and develop responses that are more relevant to community realities. When this knowledge is brought into decision-making, governance can become more responsive, inclusive and effective.

Take, for instance, an excerpt from a climate impacts documentation led by young women catalysing change in the villages of Ganjam district, Odisha. A few excerpts from one of the stories captured the impacts of heat on women fish workers.

Struggling with Extreme Heat: Supali Lakshmi

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As temperatures have continued to rise over the past few years, Lakshmi has changed her working hours in accordance with government guidelines. She works from 8:00 a.m. to 10:00 a.m. and from 3:00 p.m. to 6:00 p.m. She avoids working between 11:00 a.m. and 2:00 p.m., when temperatures are at their highest.

...

The lack of access to clean drinking water, shade and adequate rest facilities at the workplace further worsens these health problems.

...

However, reducing her working hours also means a reduction in her income. As a result, the family's already difficult financial situation becomes even more vulnerable.

Even after working throughout the day in extreme heat, Lakshmi does not get adequate rest when she returns home. She has to cook, fetch water, clean the house, and take care of other household responsibilities on her own. This adds to the pressure on her mental well-being.

"Tomorrow, I have to go to work again. How will I finish all the household work? If I don't go to work, how will we manage the household?"

This constant worry, financial uncertainty, and physical exhaustion significantly increase her mental stress.

.....

Supali Lakshmi's experience shows the gap that can exist between general heat guidance and the realities of people's livelihoods and everyday responsibilities. Reducing working hours may help reduce heat exposure, but for a daily-wage worker it can also mean reduced income, while household responsibilities may remain unchanged. This highlights why heat responses need to be informed by the people who live and work through these conditions.

Women workers are simultaneously struggling with extreme heat, poverty, inadequate nutrition, unsafe working conditions and gender-based discrimination. The team of women who were interviewing Supali Lakshmi were quick to grasp the interconnected nature of challenges that a seemingly simple action, i.e., the impacts that avoiding the hottest hours on a sunny day can have on a household and women's health. Their own lived knowledge and experience, as workers in the fisheries sector and as women who balance multiple responsibilities, helped reveal forms of exposure, livelihood risk and care burden that conventional heat governance can overlook.

Contrary to popular notions of leadership that emphasise individual capacity and formal titles, leadership works best by enabling people to work together, address shared challenges and improve the well-being of their community. The context in which coastal communities operate is increasingly complex: climate change, declining fish stocks, unpredictable seasons, and intricate government schemes. Tackling this complex web of interrelated issues requires leadership that is confident, informed, inclusive, and capable of engaging with multiple institutions and yet grounded in local

reality and, at the same time, able to leverage the strengths of the community it seeks to serve. Leadership to steer a community towards climate resilience would require local knowledge with the ability to navigate wider systems, ensuring community concerns are represented with clarity and dignity.

Herein comes a challenge: women's voices are often missing from governance. Even though women play a vital role in marine fisheries, their work remains largely unrecognised, and they are excluded from coastal governance and decision-making. This would require us to take steps to address systemic issues of gendered representation and participation, while at the same time building capacity for leadership among women.

Building capacity for leadership

Facilitating leadership, therefore, means creating opportunities for women to work together, participate in governance and influence decisions that affect their communities. Leadership can begin with everyday actions: listening to community concerns, identifying common problems, documenting experiences, bringing individual concerns together as collective issues, communicating these concerns with confidence and engaging with institutions to advocate for solutions.

Our Coastal Grassroots Fellowship (CGF) provides one example of an experiment to facilitate leadership for women among coastal communities. Through this process, the fellows are not simply documenting stories; they are also becoming producers of knowledge from within their communities. By listening to different experiences and documenting them, they are able to identify patterns in how climate risks are experienced and how different vulnerabilities are connected. This helps bring community-generated knowledge into conversations around climate action and governance. The fellowship, run by Dakshin Foundation, supports select women from marine small-scale fishing communities for year-long training programmes. Structured as a Learn-Act-Reflect model, fellows are given the opportunity to develop practical skills in storytelling, photography, documentation, communication and community engagement. The sessions are designed to help women engage with issues that affect their daily lives, such as climate change, health, livelihoods, governance and the health of their coastal and marine commons.

Between 2025 and 2026, we ran a fellowship cohort for women from Ganjam and Puri districts, coastal Odisha, with climate change and its impacts on the health and livelihoods of fishing communities as the thematic focus. As a part of the fellowship programme, fellows were tasked with the responsibility of capturing stories of adaptations to climate change by the local villagers. Fellows did this by interviewing men and women workers, asking them questions about how they

experience climate change in their everyday lives, the impacts it has had on income, livelihoods and health and the measures taken, if any, to mitigate the impacts.

The process of documentation by these community-based catalysts of change, also revealed simple but effective measures that heat-affected communities are looking forward to as adaptation measures. Of these, ensuring clean drinking water, shade, and adequate rest facilities in workplaces that fisherfolk occupy took priority. It also included recommendations to suspend work during the hottest times of the day, while at the same time ensuring workers receive fair wages. A strong recommendation was to strengthen heat wave and heat stroke awareness and first aid services in villages and promote women's economic empowerment through self-help groups.

The fellows' narratives capture nuances and connections that are rarely visible in climate impact documentation. It makes clear that affected communities are not only experiencing climate impacts but are also actively thinking about possible solutions and identifying what needs to change. This demonstrates the value of community-generated knowledge in shaping responses to climate risks.

The fellows and Dakshin have produced a book that weaves together the multiple stories captured from villages across Ganjam and Puri districts. The stories serve as an engagement tool to represent and dialogue with local and district officials on what needs to change to address climate impacts. The fellows are armed with the confidence of field knowledge from community members and the deep, committed motivation to work towards change for a people and place that they lovingly call 'home'.

Supporting leadership in the long term

Strengthening women's leadership for climate action requires long-term support, for which leadership programmes such as the CGF programme are only a part of the answer. Relevant institutions must also create spaces where women's participation is valued and sustained.

India's primary strategy for addressing heat risks is through Heat Action Plans. However, plans lack detailed assessment of heat risks and vulnerabilities, making it difficult to prioritise high-risk areas and effectively allocate resources (Prabhu et al., 2025). Heat plans need to reflect where people actually work, what protection is realistic for them and who is responsible for putting those measures in place. On-ground documentation, such as the one conducted by the CGF, which not only brings in a gender lens but also identifies community solutions and priority areas, could help plug this loophole.

However, the burden of adapting to extreme heat cannot sit with women and communities alone; state level organisations and other change agents also need to respond to what communities

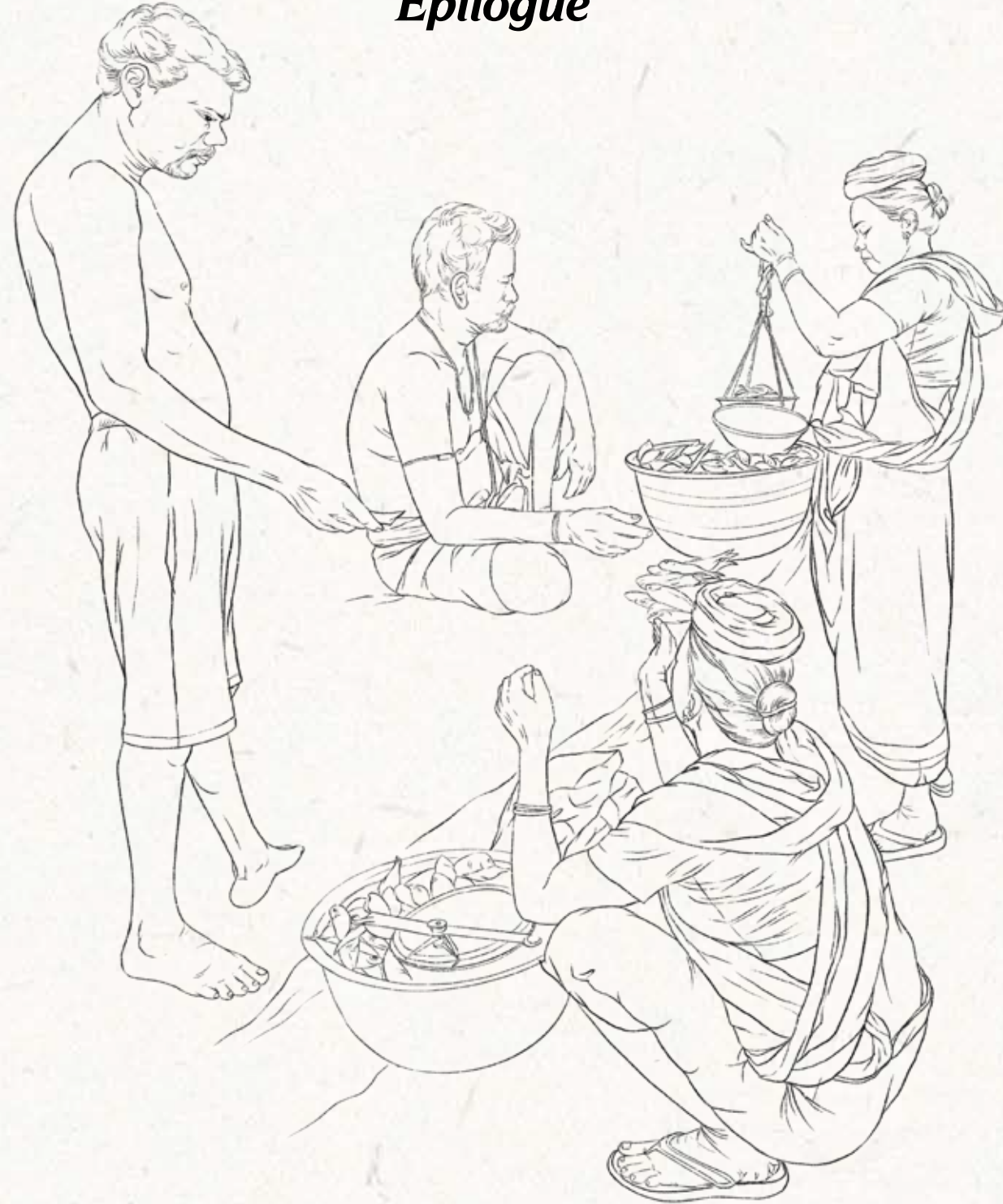
are identifying and asking for. Priorities for this can include increasing women's participation in fisheries governance, creating more opportunities for women to participate in local institutions, strengthening women-led collective action and supporting leadership development through state-run programmes such as self-help groups (SHGs).

At heart, the creation of inclusive governance systems that are better equipped to respond to the growing challenges of climate change is central to gender-just climate leadership.

Reference

Prabhu, S., Sukesh, K. A., Mandal, S., Sharma, D., & Chitale, V. (2025). *How extreme heat is impacting India: Assessing district-level heat risk*. Council on Energy, Environment and Water. <https://www.ceew.in/sites/default/files/mapping-climate-risks-and-impacts-of-extreme-heatwave-disaster-in-indian-districts.pdf>

Epilogue



“We have to work even if we want to drink coffee or tea, to be able to pay for it.”

“Our children aren’t there to take care of us!”

“We don’t receive any pension!”

If you arrive in Reu Katuru at 7:30 in the morning, the village greets you with a deceptive calm. A quiet and narrow road, bordered by pine trees and cashew plants, carries the sharp tang of resin and the sweetness of new fruit. But soon, you’ll arrive at a fork: Bander to the right, Reu Katuru to the left. Take the left turn, and you might find a handful of women gathered at the coffee shop, their baskets empty... for now. They wait for others to join before pooling money for an auto ride to Arjapalli jetty.

Most of the women from these villages live alone, their children long since migrated to Karnataka, Kerala, Tamil Nadu, leaving them to navigate life without familial support. Their eyes have learned to mask grief, and yet will tell you what words cannot fully capture - daily battles and small victories. At the jetty, they will wait patiently until the catch arrives. Then begins the long journey under the scorching sun, feet against blistering tar, and baskets heavy with fish, an unfathomable determination to not give up. Buses pass them by, refusing entry, the fishy odour deemed unwelcome and inappropriate for shared public transportation.

Across the villages of Gokhurkuda, Nuagaon, New Baxipalli, Gopalpur, and Podampeta, these patterns repeat, forming a tapestry of resilience and vulnerability that statistics alone cannot convey. These are not only stories about hardship, but about ingenuity, courage, and adaptation.

We invite the reader to see the plain truth - a societal responsibility and many pathways to ensuring that as the sun rises higher each day over Odisha, so must the spirit and resilience of Odisha’s people, especially her extraordinary small-scale fishing women.

~ ~ ~

D: Out of all the days you spent there, which one left the deepest mark on you?

Amulya: I met a woman in her 70s in Old Podampeta, who was drying fish under the harsh sun. When she saw me, she asked if I would visit her husband—he was in his 80s, suffering from severe burning in his eyes every time he went out to sea. They had lost everything in the recent high tides - Aadhaar, ration card, all gone - and every visit to the tehsil office ended in indifference.

When I asked if I could take a photo, she said, “One minute,” ran inside, changed into a matching saree, and brought a shawl of the same colour for her husband. When they stood together, tears welled up in both their eyes. For her, every day is a choice between caring for her husband’s health and putting food on the table. She dries a few fish, sells them at the Huma market - some days she manages, some days she doesn’t.

As I was trying to understand heat, this story shifted something. It made me see that heat is not just temperature - it’s a question of dignity, of survival, of belonging. It’s about broken systems, missing safety nets, and people who still keep going, because stopping isn’t an option.

~ ~ ~

The Heat Equation Riddle



1. COMMUNITY & WOMEN’S COLLECTIVES

“We already know what changes when the heat becomes unbearable.”



6. POLICYMAKERS & HEAT GOVERNANCE

“A generic city heat warning will not save a coastal village. We need ward-level budgets that fund the shade, water, and wages required on the ground.”



5. LABOUR & SOCIAL PROTECTION

“Telling an informal worker to rest at noon without compensating their lost wage is just a pay cut disguised as a health advisory.”



4. FISHERIES SECTOR

“Without ice boxes or shade at the landing centre, a hundred-rupee catch becomes a twenty-rupee loss before it leaves the sand.”



2. HEALTH SYSTEMS

“A heat warning is only useful if people can act on it.”



3. LOCAL GOVERNMENT & INFRASTRUCTURE

“A cooling space is useful only if it is accessible from the landing centre, market or drying yard.”

Turn the page to change the heat equation



1. COMMUNITY & WOMEN'S COLLECTIVES

CTA: Recognise and support local knowledge, collective coping, and women's leadership in adaptation across climate actions.

Action Points:

- Mandate the direct inclusion of women fishworkers and local knowledge in municipal heat-risk assessment and planning.
- Strengthen community-led adaptation networks and collective responses so women are not forced to rely solely on isolated, individual coping mechanisms.
- Formally position women as primary knowledge holders and decision-makers in local climate governance frameworks.



2. HEALTH SYSTEMS

CTA: Design heat-health responses to explicitly address lived realities of people who work outdoors and in informal occupations.

Action points:

- Identify and respond to the specific health risks of outdoor and informal workers, expanding beyond acute heatstroke to capture chronic exhaustion, dehydration, sleep disruption, and reproductive health needs.
- Strengthen access to heat-health information, prevention, and care, equipping frontline workers to address occupational stress.
- Integrate hyper-local heat preparedness into primary healthcare networks and local health systems.



3. LOCAL GOVERNMENT & INFRASTRUCTURE

CTA: Put basic heat protection directly where people live, work, and move.

Action points:

- Provide reliable drinking water points, accessible shade, rest, and cooling where people actually work.
- Improve WASH and heat-resilient public infrastructure, prioritising facilities that address women's daily labour and dignity requirements.
- Prioritise landing centres, markets, drying yards, and other high-exposure spaces over generic public buildings



4. FISHERIES SECTOR

CTA: Make fisheries infrastructure and commercial markets heat-resilient.

Action points:

- Invest in heat-resilient landing, market, and fish-handling infrastructure, including decentralised ice-storage solutions to prevent spoilage.
- Implement measures to reduce catch spoilage and livelihood losses, recognising heat-induced downtime as a structural economic risk.
- Integrate heat risk into fisheries planning and adaptation, strengthening women's producer groups for greater market bargaining power.



5. LABOUR & SOCIAL PROTECTION

CTA: Protect workers' economic survival alongside their physical health.

Action points:

- Extend robust occupational heat protections to informal, piece-rate, and outdoor workers outside formal labour systems.
- Design work-rest arrangements and support mechanisms that do not transfer the cost of heat (or lost wages) onto the workers.
- Strengthen social protection against heat-related income loss and explicitly recognise unpaid care work.



6. POLICYMAKERS & HEAT GOVERNANCE

CTA: Make Heat Action Plans locally calibrated, implementable, and publicly accountable.

Action points:

- Move beyond generic warnings towards locally specific heat-risk planning that accounts for coastal humidity and heavy physical labour.
- Define clear institutional responsibilities, inter-departmental coordination, and dedicated financing for implementation.
- Use local vulnerability assessments and community knowledge to actively shape Heat Action Plans.

Extreme heat warnings and temperature barriers are already being breached. Can we change the conditions in which it is being experienced most severely?

Contributors

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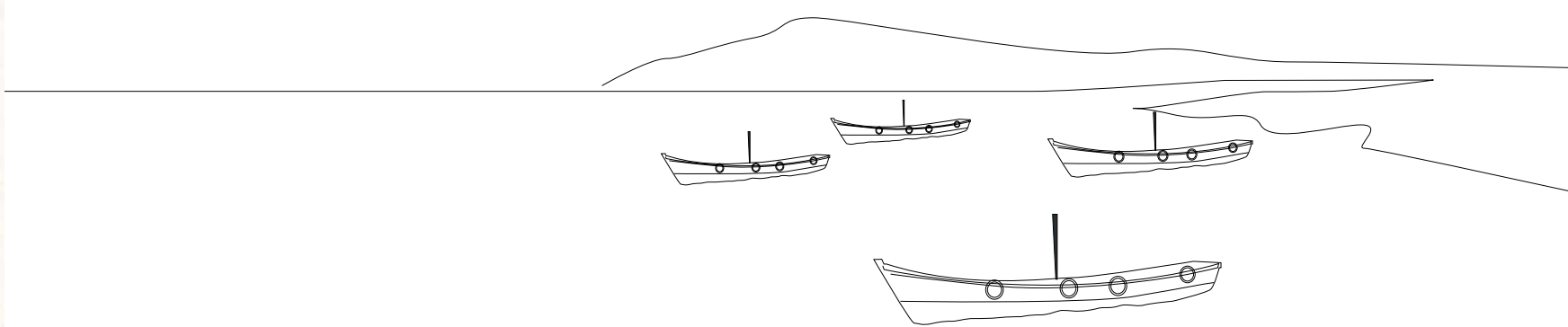
Debangini Ray is a Senior Outreach Coordinator and Communications Officer at Dakshin Foundation, where she focuses on conservation storytelling and science communication. With an interdisciplinary background in ecology, environment, and sustainable development, she is a doctoral researcher at MIT World Peace University, Pune, combining multispecies ethnography and urban ecology to explore human and more-than-human relationships and owl conservation in Indian cities. She is a co-editor of this volume.

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Sreyasi Mukherjee is a Bengaluru-based social anthropologist at Dakshin Foundation. Her work with small-scale fishing communities along India’s coasts is part of the organisation’s Sustainable Fisheries & Livelihoods Programme, which advances environmental justice by supporting dignified, secure livelihoods shaped by coastal communities’ own aspirations and priorities.



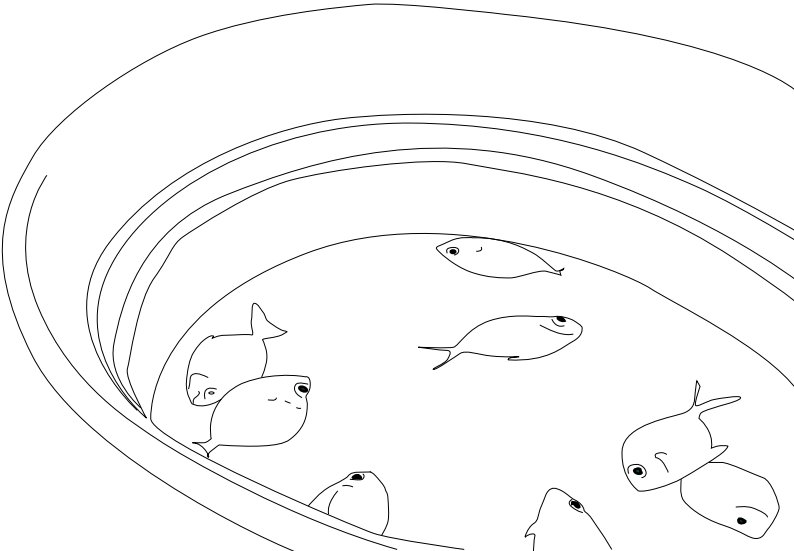
About Dakshin Foundation

Dakshin Foundation is a registered charitable, non-governmental organisation working to inform and catalyse conservation and natural resource management, while promoting sustainable livelihoods, social development, and environmental justice.

For more information, visit: **www.dakshin.org**

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“If we sit worrying about the heat, who will provide money for us to eat?”

Across the sun-scorched shores of Ganjam, Odisha, extreme heat is not an abstract weather event - it is an active, daily condition of survival. *Of Fire and Ice* provides a close account of impacts of extreme heat on the lives and labour of Odisha's fisherwomen.

Weaving together ground-level field narratives, sharp analytical commentaries, and urgent policy measures, this collection is an invitation and pathway towards climate-related ocean solutions for Odisha.

