Pulitzer Center

OUR WORK/
ENVIRONMENT

ISSUE BRIEF:
CLIMATE
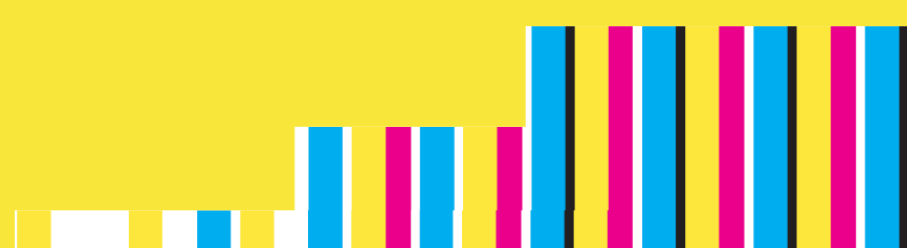# AND LABOR

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Introduction

PARI ISLAND, INDONESIA
CREDITS: Adi Renaldi

The climate crisis has already brought changes and challenges to every ecosystem, segment, and community. While no person remains untouched by climate change, workers especially are at the frontline due to their exposure to climate-induced impacts. Climate change can further intensify the precarious labor conditions under which workers are employed and the types of risks to which they are exposed. Moreover, these impacts will also disproportionately affect some workers more than others. In tropical regions, including Southeast Asia, labor productivity is expected to increase while workers continue to be at a higher risk of warming scenarios under climate change. Both the current challenges and future projections for workers and labor systems demonstrate that greater attention and effective responses to climate change are more urgent than ever.

At the global level, the climate emergency has increasingly placed pressure on governments and decision-makers through a call for action for labor protection and social justice. In 2019, the ILO initiated the Climate Action for Jobs Initiative, which provides a roadmap for ensuring that people's jobs and wellbeing are at the center of the transition to a carbon-neutral and climate-resilient economy. To ensure a just transition to a green economy, climate action must equally advance job creation, social justice and fair transitions for workers, enterprises, and communities on an equal footing.

However, media attention to the intersection of climate and labor still lags drastically behind. In its 2021 **analysis of the media landscape** on this issue, the Pulitzer Center found that no more than 2% of total stories covered climate change as a topic across 1,500 global media outlets, and only 0.005% of all media stories covered the linkage between 'climate change' and 'labor'. In addition to the low quantity of media stories on climate change and labor, the Pulitzer Center's report noted that climate, labor, and media experts interviewed rated the current quality of coverage on climate and labor to be poor. Among the common mistakes identified in the current reporting are the misrepresentation or lack of diverse and workers' voices, the prioritized focus on the Global North in practice despite its global coverage, and the narrow framing of tradeoffs between economic development and protection of the environment. The media coverage on climate change and labor has also overlooked the question of vulnerability—a key discourse in recognizing that the people who have contributed the least to climate are suffering the impacts most intensely. The mainstream media has also missed engaging with gender as a key perspective in the intersection of climate change and labor.

Our media landscape report also identified notable opportunities, especially in light of the sense of importance that the journalist and expert community has placed on this topic for the media to cover. Public concern is at the highest it has ever been about climate change, presenting an opportune moment for climate communications. Labor is a tangible prism through which climate is experienced, for it relates directly to people everywhere, as the majority of us are workers. The media could also provide more

nuanced messaging through focusing on climate justice and sustainable solutions, making issues of consumption and production more visible, and better combining regional and local news to international journalism. By reporting on the tangible impacts of climate change on labor and the everyday realities faced by workers at the frontlines, the media plays an important role in changing the narrative to amplify social movements and key labor voices.

Executive Summary:
Key Issues from Our Work/ Environment

Through the Our Work/Environment grant, the Pulitzer Center has been instrumental in supporting journalists, by providing them with financial support, mentorship, and tools. This support has enabled impactful journalism --- a catalogue of the stories is included in this report --- which contributes to building real-world evidence on the impact of climate change on labor across the world, shaping public discourse, and enriching knowledge exchange among diverse stakeholders.

The Pulitzer Center, with the support of the Laudes Foundation, introduced Our Work/ Environment, a reporting initiative focused on climate change and its impact on workers and diverse work sectors. In 2023, it held the **Climate and Labor Conference** in Coimbra, Portugal featuring academics, journalists, students, and social movements around framing the future of labor in the context of climate justice. Among the key themes were global power, social justice, health, capitalism, colonialism, extreme heat, and land rights. Following the conference, the Pulitzer Center held a Webinar series in 2024, which drew the global audience's attention to the consequences of climate change across various industries and workers.

Key observations from the webinar series centered on how workers are seriously affected by climate change and the importance of listening to more diverse voices on the issue, in addition to governments and official authorities. The webinar audiences also commented on the impact of climate change on communities and livelihoods, highlighting how natural resources and the most vulnerable people are at risk in the climate crisis. The audience noted the importance of local stories and reflections on what a fair energy transition might mean, through the approach to green jobs and workers' rights. The webinars provided a platform for the audience to raise key issues to address around climate justice, gender issues, environmental neocolonialism, worker exploitation, and inequalities—demonstrating diversity in the dialogues and the richness of observations about the intersection of climate and labor.

The webinars indicated further direction for the Pulitzer Center to undertake in its programming by highlighting four key findings.:

- **First**, the impact of climate change, particularly heat, on workers—including those employed in delivery services, farming, and construction—is undeniable, necessitating changes in work conditions to mitigate health risks.

- **Second**, the role of workers in organizing for better protection. While they are underrepresented in policy development addressing climate change, workers and communities around the world are mobilizing to advocate for improved protection.

- **Third**, safeguarding workers in the service of improved economies. The

Pulitzer Center's stories, such as that covering a garment factory in India and another on heat legislation in Qatar, are compelling examples of how protecting workers' well-being go hand in hand with business interests.

- **Fourth**, the need for further dialogue and research on the specific interconnection of climate and labor.

To further its aims under Our Work/Environment, the Pulitzer Center held its Climate and Labor Dialogue in Bangkok on February 22-23, 2024. It convened 50+ journalists, climate and labor experts, private enterprises, civil society organizations, and international agencies, to share their experiences and work on climate and labor issues, learn more about the problems at hand and explore solutions, and to network and collaborate with one another. This dialogue held working sessions on three key thematic areas:

1. Getting to Just: Energy transition and its Impact on the Job Landscape and Labor Rights
2. Tides are Changing: Rising Sea Levels and Shifting Livelihoods
3. Outdoor Workers and Public Health

While the three sessions yielded diverse and nuanced stories about how climate change is affecting labor, they all featured calls for greater collaboration among governments, media, private sector, and communities in researching and producing data. All three sessions, stressed:

- Collaborative efforts are especially needed to develop more comprehensive climate plans, document climate-induced impacts, and communicate critical information and narratives to build awareness, inform policies, and develop sustainable solutions.

- The most vulnerable must be included in the dialogues, with journalists having a key role in bridging the gap between decision-makers and these communities by telling and amplifying such experiences.

- Meaningful consultations and collaborative efforts across all stakeholders are necessary and fundamental for ensuring a sustainable, equitable, and hopeful climate future for all.

The following Issue Brief will present an in-depth recap of the discussions under the three working sessions, with a view on recommendations moving forward that span across sectors and stakeholders.

DOHA, QATAR
CREDITS: Ed Kashi

PUENTE DE VALIZAS, URUGUAY
CREDITS: Matilde Campodónico

ISSUE 1:
Energy transition and labor

Under a 'just' energy transition, governments and businesses have increasingly prioritized a shift from extractive, fossil-fuel based energy practices to cleaner, low-carbon energy systems. Yet, this transition has created tensions: while promising and promoting the creation of new jobs, it has also promoted anxieties regarding job stability and working conditions in the energy sector. Policies to support the energy transition are also scrutinized to the extent that they are meaningfully contributing to economic development, environmental sustainability, and social justice and improvement, especially for vulnerable workers. To ensure the transition into green energy systems is indeed just, there is a need to emphasize and uphold the collective responsibility of stakeholders to safeguard the rights of workers and vulnerable communities.

Overview of key issues:

- **Labor and Vulnerable Communities:** A just transition not only concerns a focus on energy but is also about ensuring equity and support for labor and vulnerable communities in the transition process. This is especially important as frontline workers, women and other vulnerable groups, are likely to experience the most severe impacts from any changes to existing energy systems. However, there is not enough community or worker voices in the setting of policy or decision making.

- **Building a 'Just' Transition Narrative:** The media plays a crucial role in bridging the information gap in energy transition, particularly in shaping a narrative that supports an equitable change, rather than one dominated by quick and false solutions. Through in-depth reporting and amplification of diverse voices and science-backed research, the media can foster a mutual understanding of what constitutes a 'just' energy transition.

- **Vision for Transition:** To ensure that plans lead to action, a just transition requires stakeholders to envision and detail the exact scenario that an energy transformation will accomplish. The infrastructure of a just transition, such as the establishment of solar parks, necessitates a solid plan from the authorities on how they will facilitate and collaborate with the private sector and local communities, and ensure that new policies do not reinforce inequalities or social injustice. Every clean energy project must also balance the narrative between local needs and renewable energy.

- **Renewed Processes:** A just transition to a green and circular economy

also requires transformation of the processes, not just the product itself. In recycling, instead of focusing on the "end-of-the pipe" stage, i.e. by delaying a product's disposal into the landfill by another three years, a circular economy means that the sustainability and recycling of products is embedded in the entire design and production processes.

- **Climate Issues and Working Conditions:** There is minimal consideration about climate change's impact on workers in business and private sectors. There are efforts coming from private sectors in sustainability, however, the discussion on how climate change affects workers is rarely institutionalized. In the energy transition discussion, the mainstream topic around labor has focused instead on green jobs, a topic that to many workers and community groups see as an elite issue.

Challenges and opportunities:

- Part of the workforce, women and other vulnerable groups face specific and additional challenges and barriers to receiving the benefits of the energy tradition. Job creation needs to take an intersectional approach that recognizes and responds to the different impacts and challenges women and other marginalized groups face—for instance, based on their gender, education level, race, and economic class. As one example, less-educated women may not be able to support their families if they receive lower wages compared to their male counterparts. Another real life example from the work of Our Work/Environment grantee Pawanjot Kaur in her short documentary titled "Can There Be a 'Just Transition' from India's Coal Industry?" is the reluctance of women working as coal gatherers in small coal minings to participate in reskilling programs. They refuse these programs because they believe their current job pays well, even though they are aware of the risks associated with future transitions and job loss.

- Governments prioritize certain objectives and actors in their energy transition policies over others. Governments tend to consider private sector benefits in their formulation of policies, over their citizens' well-being. In developing plans and policies, this tendency may also result in the lack of meaningful engagement, consultation, and input from local communities and local decision-makers. All stakeholders, from the local authorities to communities, must be involved in the planning to support the energy transition.

- Transition to cleaner energy may not always lead to improved economic security—especially among those who are most likely to lose their jobs—but this presents an opportunity to rethink and redefine the economic development paradigm. With adequate planning, targeted investment to support the workforce, and policies that support emerging green technology and social justice, the energy transition can become a driver of economic prosperity that leads to equity.

- To avoid relying only on a technological solution, the transition needs to also embrace local knowledge and wisdom that place human and its interdependence on the broader ecosystem and all life forms at the center of transition.

CASE STUDY FROM PULITZER REPORTING:

PAVAGADA SOLAR PARK IN INDIA

KARNATAKA, INDIA
CREDITS: Vaishnavi Suresh

Established in 2015, the Pavagada solar park offered local villagers rent and the promise of jobs in exchange for leasing their land for solar panels to be built on them. However, in practice, skilled jobs were available only to graduates trained in industrial skills; other graduates and unskilled labor could only find limited employment in security or housekeeping jobs.

The cycle of inequality and injustice continued and deepened because of the lack of accountability and justice to ensure that promises of an energy transition were upheld. Villagers in the Pavagada solar park who spoke out faced retaliation, as police complaints were filed against them. Those from marginalized communities in the village received significantly lower wages than those from the upper caste. The lack of regular salaries further compounded a vicious cycle of debt for villagers from marginalized communities: since they had to wait for their rent from leasing their land to be deposited annually, their recourse for income was to take short-term loans from local landlords.

The lack of opportunities for gainful employment in Pavagada solar park, which has been the case with many solar parks in the country, contrasts with India's claims of an inclusive and just energy transition. This shift towards a green energy economy has also excluded women, as the job creation has not been inclusive of women. The case of Pavagada solar park in India illustrates how this transition can (re)produce inequalities and injustices among and within local communities when promises of a just transition are not fulfilled.

Recommendations and potential collaborations:

Media

- To be just, an energy transition also requires a broader ratification of international rights conventions concerning inequality, law enforcement, identification, policies, and discrimination. The media should work towards increased understanding among the public about their rights and the available mechanisms that can be used when there is a rights violation so that people are better equipped to protect themselves.

- Workshop participants from the private sector and civil society said the media needs to develop a more precise understanding of what is considered a green job, especially in societies with diverse backgrounds. A significant part of the circular economy is technical and complex, requiring a more systemic perspective that goes beyond describing the shift from one energy source to another. A specific challenge that the media faces is how to translate the whole process to make it understandable to a wider audience.

- The media should work with other stakeholders to create more education and awareness to highlight the impacts of energy transition, particularly on employment and community welfare.

Private Sector

- Reskilling and upskilling: companies should invest in reskilling and upskilling their workforce to prepare them for the new work landscape. This includes training in operating renewable energy technologies and other green economy skills. Companies can collaborate with educational institutions to align curricula with the skills needed for the energy transition (see **ILO FAQ** on Social Protection and Climate Change). For the private sector, improved infrastructure, media and communication, and decentralization are key requirements for a just energy transition. To ensure job creation and access to new jobs, the private sector must address the challenges that people face when available jobs are outside the locality where they live. People may need inexpensive technical assistance, such as more affordable smartphones, to access the job pool. One recommendation is to create a publicly available dashboard with data visualization. These efforts could also be supported through social media to educate and build awareness around issues of cyber security.

- Social protection measures: The private sector could work alongside government and civil society to ensure social protection is in place for workers most at risk of losing jobs.

- With corruption being one of its biggest challenges to address, the private sector can engage with regulators and legislators to address this issue through a more bottoms-up approach and using more systematic methods, including analyzing this issue in accordance with human rights standards. This bottom-up approach requires encouraging the participation of workers and unions to voice their needs, especially for vulnerable communities across sectors. These efforts also include evaluating and improving the education system to prevent a skills mismatch between the energy transition and the jobs that are created for workers.

Civil society and academic

- Civil society and the academic community could conduct and distribute more public research, which is needed to enhance mutual understanding about the just energy transition. Currently, only a few companies dominate the narrative around this transition. While government agencies have outlined plans for the sectoral transformation, there is room for broader consultation to ensure that the energy transition plan does not only benefit a small group of stakeholders. There needs to be public information campaigns to increase participation and input into the transition plans and processes.

- A potential multi stakeholder collaboration would be to hold more social dialogues among government officials, employers, and workers on the issue of job loss or lack of job creation due to the transition, and the possible remedies. There is also a need to ensure the government addresses the corruption that could occur in energy projects, which would hinder the transition process, as well as how to secure workers and to set up a social safety net for vulnerable workers and communities in these projects.

- More attention and thorough observation, such as increased monitoring from civil society, is needed on the issue of the supply chain, which is where millions of jobs will be disrupted.

- Encourage more social dialogues or structured community associations to enable meaningful participation in key policy or decision making that potentially affect their livelihood or life quality. Also: foster community-to-community discussions to allow knowledge sharing.

Government and policy makers

- Labor unions have expressed concerns over insufficient information and consultation regarding the energy transition strategy and its impacts on worker welfare. The government, both the local labor office and the sectoral department responsible for the technical aspects of the energy transition, should intensify their efforts to engage labor unions throughout the consultation processes. Such engagement is crucial for developing national and sub-national energy transition strategies that take into account worker perspectives.

- In envisioning green jobs, the government should address the concerns of workers in peripheral sectors, particularly women and economically-disadvantaged communities. Ensuring that the transition to a green economy includes support and reskilling programs for these workers is important for an equitable energy transition.

Key recommendations across all stakeholder groups:

The shift towards renewable energy may come at the expense of workers' jobs and livelihoods, necessitating strategies from civil society, private sector, and governments to mitigate potential tensions and trade-offs between climate initiatives and laborers. These actions should be guided with the understanding that any change from an energy transition will produce effects that will have a worse impact on women and other marginalized groups. As such, recommendations for all stakeholders are:

- Creating and empowering community associations to enforce productive discussion.
- Encouraging inclusive communities such as women and marginalized groups to participate, including labor unions, to enhance the discussion.
- Cooperating more actively with media.
- Securing total buys-in to circular economy from authorities at all levels.
- Spotlighting issues through media and social media for communities to engage with.
- Educating and informing communities to overcome language and technical barriers.
- Drafting a legal framework for worker and community participation to become mandatory in the policy process.
- Creating space and tools for the community to engage in knowledge sharing with decision-makers.
- Take Indigenous knowledge into account.

PATTAYA CITY, THAILAND
CREDITS: Unsplash

ISSUE 2:
Rising Sea Levels and Shifting Livelihoods

Climate change has resulted in more frequent and extreme flooding, storms, and rising sea levels. The costs of these environmental impacts have been high, including the loss of land and property, as well as the loss of culture in communities across coastal areas. The displacement of communities has further put at risk the cultural traditions and practices that have sustained these communities over time.

Overview of key issues:

1. **Local Fish Stock and Beyond:** Climate change has disrupted ecosystems, resulting in declining fish stock through altering migration patterns of fish and the introduction of "alien species." Changes to water levels have impacted ship navigation and fishing methods, with implications for food security throughout the region. In the Mekong Delta, which serves as the center of rice production for Vietnam, the government has become concerned about the future of its rice industry due to climate change, with the possibility that the food system in the region will break down, with ramifications throughout the region. Climate effects will reach beyond seawaters: rising sea levels also bring the greater risk of contaminating freshwater, impacting agriculture and the farmers and their livestock. Depleting fish stocks also require fisherfolk to go further out to sea, resulting in increased costs of operations that may result in a reduction of labor. This reality drives up the potential of human vulnerability due to the loss of employment.

2. **Migration and Coastal Communities:** Rising sea level may have direct impacts that remain largely overlooked, not only on the environment, but also on threatening the protection of the rights of migrant workers. In coastal communities in Thailand, the enforcement of military service by the Junta in Myanmar has resulted in the increased risk and number of cases involving human trafficking migrants from Myanmar into Thailand. This vulnerability has become heightened considering the impacts of climate-induced sea level rising, which has not only resulted in a degraded environment in the region, but also negatively impacted employment in the fishing and agriculture industries.

3. **Lack of Holistic Assessment:** While governments are increasingly aware of issues brought by climate change, their policies may not be updated accordingly to reflect the current reality. Governments have largely pursued development projects based on perceived economic benefits but that do not reflect the real economic impacts from climate change, including on the livelihood of fisherfolks, loss of jobs, and tourism. For instance, houses continue to be built in flood-prone zones in Uruguay due to the economic benefits that businesses accrue by being located close to the beach. Local government-led projects for the purpose of building protection against floods, such as seawalls, are constructed without environmental impact assessments being conducted beforehand. Lack of transparency and corruption compromise meaningful action, with a focus on short-term benefits and absent consultation with local communities.

4. **Funding:** Across countries in Southeast Asia, the lack of funding at the national and global level poses a fundamental challenge for governments, which struggle to finance climate mitigation efforts. In addition, countries continue to face a lack of synchronization of policies from the local to global level, to meet their country commitments to climate change adaptation and mitigation under the Paris Agreement.

5. **Understanding & Awareness:** Lastly, the local level challenges demonstrates a continuing perception gap as to the real impacts of climate change on the ground, resulting in a lack of understanding among stakeholders of the connection between sea-level rise due to climate change and the social impacts among communities on the ground, who are directly impacted yet remain unaware of the cause driving these changes.

Challenges and Opportunities:

- Stakeholder Engagement and Collaboration, through a two-way dialogue between government stakeholders and impacted communities:

   There is an opportunity for dialogue with government stakeholders, which can lead to policy changes and secure resources that are needed for the local communities. A dialogue among government, communities, and other relevant stakeholders can also lead to shared knowledge and building a consensus regarding the data and scientific information, which could be complemented with local knowledge. Journalists can also provide coverage of the dialogue and ensure that there is transparency throughout the entire engagement between stakeholders.

   Among the challenges in holding a dialogue, the first are the competing priorities, particularly from the government; climate issues in the coastal area and its impact on the local community may not be high on their priority list and interest. Such a dialogue may just be an activity to tick a box, especially if there is existing mistrust between the community and government. Existing modalities of dialogue may not work, especially given the power imbalances where communities may feel steamrolled and coerced. There is also the challenge of leadership, in terms of who will lead and initiate the dialogue, as well as the process and means to ensure its legitimacy of the dialogue.

- **Communicating about Climate Change: Awareness and Behavior Change** Journalists, civil society organizations, and other stakeholders can create and leverage different tools/mediums to communicate to impacted communities the linkage between their livelihood and climate change. There is an opportunity for more positive stories about what is working to change the narrative on climate change adaptation. Communicating on this issue can help socialize the concept of climate justice and social justice, which would help communities understand how climate change impacts them economically, not just environmentally.
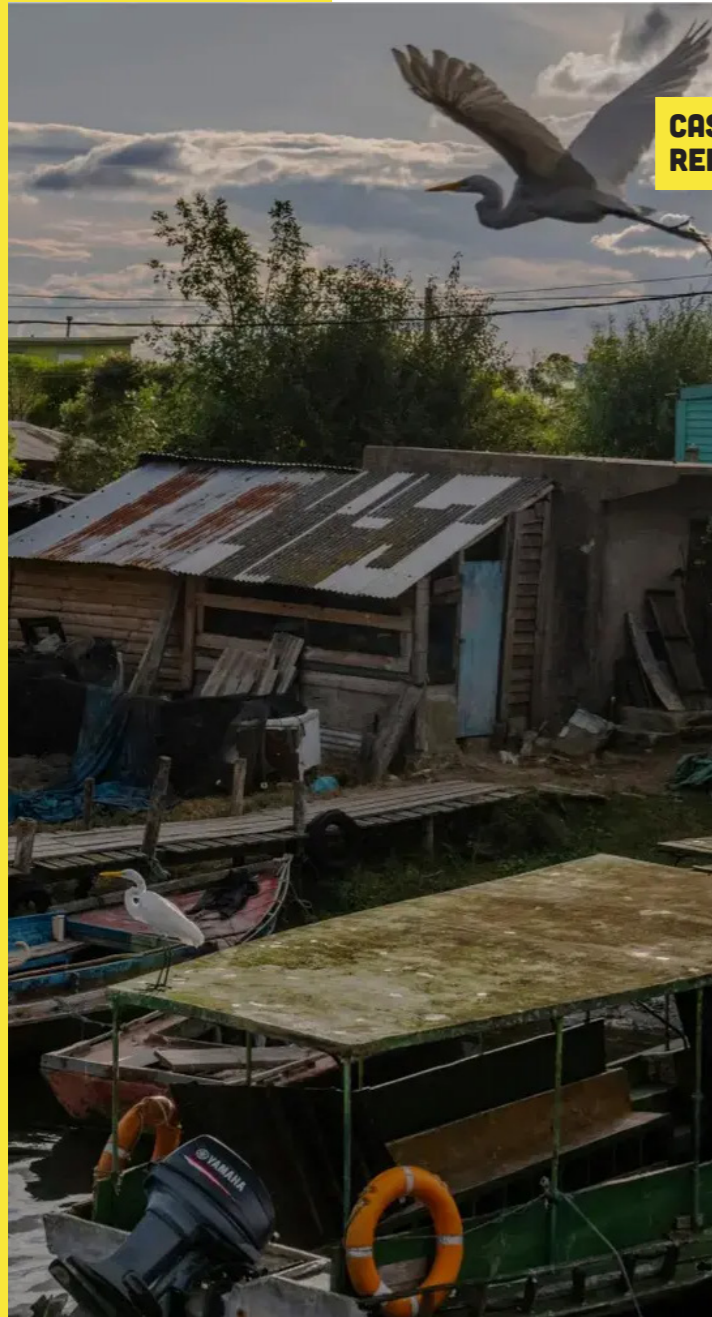
   Communications that led to behavior change will be a challenge more so than awareness raising. This would require a shifting of attitudes from an anthropocentric to ecocentric perspective—moving away from the idea that resources are for humans to use and exploit while also acknowledging the inequalities that heightens the impact of climate change on vulnerable communities.

- **Community Adaptation/Empowerment**
   There is an opportunity for local communities, particularly in the agriculture sector, to work with researchers to become better prepared for adapting to climate change. Innovative solutions from local communities and researchers are vital to addressing climate change, especially through initiatives related to the blue economy such as expanding energy sources and building water-based architecture.

   The challenges are the lack of resources and knowledge on this issue. In addition, some communities may face a top-down approach from the government, with regard to policy implementation and public hearings, which may limit or hinder communities from being empowered and developing community-based adaptation approaches.

CASE STUDY FROM PULITZER REPORTING:

Due to rising levels, communities are increasingly forced to relocate away from danger zones. However, this relocation often moves them to areas that are still prone to flooding, creating a persistent problem. In the **story from Uruguay**, the government has pushed for relocation for communities in vulnerable locations without examining the data of proposed new locations; as a result, the communities are moved from the cities, which increases the difficulties of their lives, while still exposing them to risks of living in flood-prone zones. The cause of this problem is due to the lack of planning and dialogue between different government agencies, where the data is available, but not used. In other cases, data may be outdated or mis-used. In the **story from Indonesia**, frequent tidal floods in the northern coast of Central Java have disrupted industries, affecting thousands of workers. Farmers, grappling with seawater intrusion and destroyed crops, are forced to shift their livelihoods from farming to aquaculture or fishery, while burdened with financial strains to continuously renovate their homes due to seawater intrusions. Amidst these challenges, they struggle to keep the culture and history of their ancestral land alive.

A mosque in a village in Demak, Central Java, inundated by tidal floods. Image by Adi Renaldi/Ekuatorial. Indonesia, 2023.

Tidal floods frequent a neighborhood in Demak, Central Java. Image by Adi Renaldi/Ekuatorial. Indonesia, 2023.

Recommendations and potential collaborations:

- **Climate Communications:** Reach wider audiences, while strategically targeting and focusing specific audiences. Rather than targeting a broad audience, it is recommended to be strategic and focus on who can amplify the message and who will be directly impacted by the message it contains. As demonstrated in the Uruguay case, change was not driven by the story itself, but the exposure to the right people through reaching out to many local communities potentially impacted by their findings and identifying among those communities who can mobilize to drive change.

  Journalists and researchers should focus on the narrative that compels action and storytelling that can carry the message. In this regard, it is important to craft stories using the human element in climate change that can resonate with an audience. The narrative should drive the communication, which the data supports.

- **Open-Dialogue Sessions Among Communities, Government, and Relevant Stakeholders:** Create an open-dialogue session that represents the following groups: CSOs, NGOs, Academics/Experts, Media, Industry, Government, local, Indigenous communities to facilitate understanding of the various challenges. This dialogue will also create knowledge building and data collection through consensus building and designing the best practices and long-term goals.

  The dialogue should be a collaborative, participatory, and coordinated approach. Instead of a sit-down meeting, a designer (as landscape architect, for example) could mediate the conversations when a community has a problem with erosion. A team of architects could become the intermediary between the community and government, while brainstorming solutions and helping to implement the solution through innovative design.

- **Community Adaptation:** Recognizing that community voices matter in adaptation efforts, there is a need to create a masterplan for the community which includes the following areas: analysis of the preparedness of the community, fostering knowledge and understanding of climate change's impact on the community, and a strategy in place for implementing the adaptation plan and piloting it to see how it plays out in practice and is translated into policy recommendations. Researchers should also conduct research together with the communities in areas such as carbon credits and biodiversity. In addition, policies and plans should reflect the realities of the communities. As sustained partnerships are needed, it is also recommended to establish networks between communities, as well as government agencies and research institutes.

ISSUE 3:
Outdoor Workers and Wellbeing

Extreme and escalating heat have jeopardized workers' health and heightened risks to their wellbeing. These climate-induced risks are particularly acute for workers in the agriculture and urban transportation sector. Strategies and safeguards are needed to protect the health and wellbeing of workers, and to mitigate adverse effects owing to shifting climate patterns.

Overview of key issues:

- **Health-centered Approach:** Increasing evidence points to a strong relationship between exposure to climate change and health outcomes, particularly among workers. Climate-sensitive health risks include injury and mortality from extreme weather events, heat-related illness, respiratory illness, water-borne diseases, as well as effects on health systems and healthcare facilities. Heatwaves have produced conditions that are extremely challenging for workers, who often have limited knowledge on how to cope with severe heat conditions. As found in the case of India, high temperatures that have reached up to 40°C in many regions have had adverse effects on outdoor workers, including construction workers, farmers, and delivery personnel.

  Outdoor workers are especially vulnerable to climate-induced risks. In Thailand, motorcyclists who transport passengers or deliver food and good services to customers are particularly exposed to extreme heat. According to one research study, 82.6% of motorcycle delivery workers and 66.5% of motorcycle transport workers reported experiencing sickness from working in extreme weather. Climate-induced heat compounds the vulnerability and risks that drivers are already exposed to because of their working conditions. These risks include safety, long work days and hours, and income instability. Workers in the motorcycle delivery and transport industry are also more likely to be exploited by platform companies.

- **Systems Transformation:** Creating climate-resilient communities requires robust health systems that continue to deliver quality care in an unstable, changing climate. Preliminary research in Thailand shows an association between temperature and hospital admission rates. Public health is an important sector to include in climate-change adaptation approaches, especially in terms of protecting the most vulnerable groups.

- **Environmental Concerns:** Reducing air pollution is also important to climate change action, and there can be co-benefits on actions that seek to reduce air pollution and the impacts of climate change. This issue requires further research and evidence to better understand the influence of climate change on fine particulate matter and other air pollutants, especially at the local level. Greenhouse gases and air pollution often come hand-in-hand, so mitigation measures can also produce major health co-benefits through reduced air pollution.

- **Socio-economic Barriers:** Working conditions of outdoor workers, especially drivers in the gig economy, are increasingly shaped by algorithms that prioritize efficiency and a fast pace. This can contribute to climate change, as reliance on fossil fuels persist. It is important to recognize the systemic pressures faced by workers, which can lead to their reluctance to adopt more climate-friendly practices. For instance, a study in Thailand found that around half of surveyed motorcycle drivers do not want to change to electric motorcycles, and cited concerns around efficiency as the main reason for not changing. Workers often prioritize immediate concerns, such as maximizing their earnings under challenging working conditions. This should not be viewed as a refusal to engage in climate action, but as instead a reflection of socio-economic barriers imposed by the current working conditions they face.

Challenges and opportunities:

- Research on the link between climate change and public health is still insufficient. Air pollution's link to mortality, for instance, currently lacks sufficient research. Outdoor workers, like those in electronics factories, face exposure to harmful substances, highlighting the need for studies on the health impacts they face. More research is also needed on how floods cause significant disruptions for workers, including inability to work and lack of insurance coverage.

- Different socio-economic contexts complicate regional cooperation. Across the region, government efficiency in implementing climate mitigation varies widely.

- With outdoor workers facing health risks from heatstroke, pollution, and associated mental health issues, financial constraints are a main challenge to address the needs of workers, including providing for protective gadgets and health insurance that covers these climate-induced health issues.

CASE STUDY FROM PULITZER REPORTING AND RESEARCH:

In 2022, India faced the hottest March in over a century, leading to heat-induced fatalities, crop failures, and shortages of water and electricity. **The hardest hit were informal outdoor workers** such as farmers, construction laborers, and street vendors. Despite India's national policy of Heat Action Plans (HAPs) in 23 states and over 130 cities, the on-ground implementation of these plans remained unclear, and many workers reported a lack of awareness and adaptation strategies to cope with the escalating heat.

In Thailand, gig workers, particularly food delivery drivers, are facing challenges stemming from inadequate regulatory frameworks to protect their rights. Exploitative practices became prevalent as the demand for delivery services surged. Workers faced a tiered system that favored newer riders, reducing work opportunities and earnings. The fundamental issue of compensation not aligning with the worker's effort and time highlighted the broader problem of unfair labor practices within the gig economy. These conditions, which already make workers more vulnerable to exploitation, may also intensify due to climate-inducted impacts and disasters.

Recommendations and potential collaborations:

Develop Comprehensive Climate Action Plans: Use scientific data and research to craft comprehensive climate action plans, in alignment with COP28 agreements and UN climate goals, to reduce emissions and address both mitigation and adaptation, tailored to local contexts. A comprehensive plan will address the lack of current governmental policies directly impacting workers and the need for actionable steps. It should propose actionable, locally tailored solutions to prioritize effective preventative measures over reactive responses. In India, the Government Heat Action Plan could be enhanced by targeting resources to those most impacted, such as healthcare support for outdoor workers. Plans should also include steps to build climate-resilient communities, such as the development of robust health systems to deliver quality care amidst climate change effects. To be more comprehensive, plans could also include the adoption of cooling measures, such as those in the UAE, to provide worker relief from heat and consider the utilization of public spaces like convenience stores and shopping malls for rest in hot weather.

Strengthen regulatory frameworks to implement plans: Enhance regulatory frameworks by implementing policies that protect workers from the adverse effects of climate change and ensure job security during transitions to greener technologies. Regulations are also needed to protect the rights and safety of transport workers, ensuring fair competition and compensation.

Establish Collaborative Platforms: Create and support platforms that facilitate secure data sharing and collaborative efforts among all stakeholders involved in climate action. More knowledge is needed around the issue linking climate change to workers' health and wellbeing. Improving data accessibility, developing local knowledge database, increasing financial support are ways to address this need.

Strengthen Public-Private Partnerships: Encouraging partnerships between the government, private sector, and non-profit organizations to create sustainable and worker-friendly solutions to climate change challenges. Foster partnerships to support the development of infrastructure and support systems for the widespread adoption of EVs and other sustainable practices. Both corporate and government efforts are needed to mitigate the impact of heatwaves on vulnerable populations. These included the need to direct resources towards the most affected, especially in healthcare. Corporate initiatives include implementing measures to reduce workplace temperatures and protect workers.

Support Private Sector Measures: Positive examples of private sector measures that could be replicated include the case of Shahi Exports in Bangalore, India, which installed cooling systems and LED lights to reduce heat in workplaces.

Implement Community-based Awareness and Education Programs: Highlight the need for greater awareness among workers about coping with heatwaves. Launch targeted awareness campaigns that leverage community influencers to educate and engage the public on climate issues, ensuring the information is accessible and trustworthy. Bridging knowledge gaps about climate change and its health risks is crucial for vulnerable populations. Implement a peer information system for community-based awareness, leveraging influential community figures (e.g.,

monks, village heads, celebrities) as trusted messengers. Focus on training these key individuals to accurately disseminate information on climate change and monitoring their effectiveness in promoting awareness and trust within communities.

Conduct research on priority areas: Focus on providing comprehensive data on the current state of climate change, incorporating scientific research across various fields such as engineering and health. Prioritize research on air pollution's impact on mortality and workers' health. Collect and disseminate data to policymakers to address worker vulnerabilities and guide government actions. CSOs and media can help to relay information from academia to workers and to pressure governments for action. Conducting further research to overcome technological barriers, such as EV efficiency during floods and battery exchange logistics, to ensure that sustainable solutions are practical and accessible for all workers.

Comprehensive Support Systems for Affected Workers: Enhance data accessibility and financial support for effective climate action planning and implementation. Develop financial and technical assistance programs to help workers adapt to new technologies, such as EVs, and improve their working conditions. This support includes help with technological adoption by providing financial incentives, training, and support to facilitate the transition to eco-friendly materials and EVs among transport workers. There is a critical need for mechanisms that ensure the safety, job security, and fair compensation of transport workers amidst technological and environmental shifts.

Promote Fair Labor Practices: Encourage the adoption of Collective Bargaining Agreements (CBAs) and ensure that labor laws are enforced to protect workers' rights to fair wages, safe working conditions, and freedom of association.