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DOI:
10.4103/PJHRD.PJHRD_4_25

Resilient futures communities and workplaces amid climate challenges: Highlights of the seventh environmental and occupational health forum, November 21–22, 2024, Manila, Philippines

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Abstract:

Climate change is increasingly affecting public health and safety, disproportionately affecting vulnerable populations and aggravating existing health inequities. Recognizing the urgency of this challenge, the Department of Environmental and Occupational Health (EOH), College of Public Health, University of the Philippines Manila, convened the Seventh EOH Forum on November 21–22, 2024, with the theme Resilient Futures: Enhancing Health and Safety in Communities and Workplaces Amid Climate Challenges. This commentary highlights key points raised during the forum, with a focus on community- and workplace-level initiatives that address climate-related health risks. These efforts include the improvement of heat-health early warning systems, integration of climate resilience in occupational health and safety programs, and hospital-based interventions for environmental footprint reduction. The presentations also emphasized the need for multi-stakeholder collaboration, localized mitigation and adaptation strategies, and climate-informed health promotion activities. The forum highlighted that building resilient communities and workplaces requires not only policy alignment and institutional support but also interventions on the ground that are inclusive and equitable.

Keywords:

Climate change, occupational health, public health, resilience, sustainable development

Background of the Forum

Climate change is the greatest health threat, worsening extreme weather, and straining care for the most vulnerable. Communities and workplaces have developed adaptive strategies and climate-resilient health practices to mitigate these impacts while promoting sustainable

approaches. These initiatives safeguard the well-being of citizens and employees amidst escalating climate challenges. The Seventh Environmental and Occupational Health (EOH) Forum discusses these pressing concerns. This annual event aligns with Sustainable Development Goals 3 (9) (Good Health and Well-being),

How to cite this article: Lomboy-Capino MF, Estrada CA, Fadrilan-Camacho VF, Duarte RA, Hernandez PM, Quizon RR, *et al.* Resilient futures communities and workplaces amid climate challenges: Highlights of the seventh environmental and occupational health forum, November 21–22, 2024, Manila, Philippines. *Philipp J Health Res Dev* 2025;29(3):91-9.

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Received: 06-03-2025

Revised: 25-07-2025

Accepted: 09-08-2025

Published: 21-11-2025

8 (8) (Decent Work and Economic Growth), and 11 (6, b) (Sustainable Cities and Communities). It provides a platform for discussing interventions and tackling priority issues in EOH. The forum brought together diverse stakeholders to share insights and practical solutions for climate and health challenges. Case studies from local governments and the private sector highlighted workforce protection and sustainable practices at the community level. The event aimed to equip participants with strategies to strengthen community and workplace resilience.

Highlights

The Seventh EOH Forum was officially opened by University of the Philippines Manila Chancellor Michael L. Tee and College of Public Health Dean Fernando B. Garcia Jr. In his welcome remarks, Chancellor Tee highlighted the forum as a critical platform for advancing dialogue on climate change, health, and safety in communities and workplaces. He underscored the value of academic-government partnerships and presented UP Manila's ongoing sustainability initiatives, such as renewable energy use and carbon reduction strategies, as part of a broader commitment to climate resilience. Dean Garcia reiterated the urgency of addressing climate-related health risks and the need for practical, evidence-based strategies. He framed the forum as an opportunity to discuss possible solutions to the increasing health impacts of climate change, including extreme weather events and related health burdens that threaten both community well-being and workplace productivity.

The forum consisted of presentations that outlined the far-reaching impacts of climate change on

communities and occupational health and safety (OHS). Speakers highlighted the growing strain on health systems as climate-induced events aggravate existing vulnerabilities.^[1] Table 1 provides a summary of the speakers, their institutional affiliations, and the topics of their presentations. These speakers represented a diverse range of sectors and offered insights on climate-health intersections, occupational safety, disaster preparedness, and systems-based resilience approaches.

Lectures

Climate change and its impact on communities and workplaces

Dr. Bonifacio Magtibay emphasized climate change as the greatest health threat of the 21st century. He discussed how its direct effects on environmental and social determinants contribute to air pollution, climate-sensitive diseases, extreme weather events, forced displacement, food insecurity, mental health degradation, and health concerns within the workforce. He further explained how climate change, exacerbated by carbon emissions, has become the defining challenge affecting health, socioeconomic systems, and infrastructure. These impacts are particularly severe for vulnerable groups, including outdoor and indoor workers exposed to extreme heat or poorly ventilated environments, and informal and seasonal workers, whose workplace settings amplify their risks.^[2] Dr. Magtibay warned that failure to respond to these threats will result in escalating health crises, which will exacerbate issues related to infrastructure, essential services, and health systems' capacity to respond effectively. He referenced the COP29 Special Report on Climate Change and Health developed

Table 1: Forum speakers and topics

Speaker	Affiliation	Topic
Dr. Bonifacio B. Magtibay	WHO Philippines	Climate Change and Its Impact on Communities and Workplaces
Ms. Danica Marie Supnet	Institute for Climate and Sustainable Cities	Engaging the Community in Climate Health Initiatives
Dr. Ronald P. Law	Department of Health	Policies and Plans for Fostering Healthy Communities and Workplaces in the Philippines
Hon. Alfredo M. Coro II	Municipality of Del Carmen, Surigao del Norte	Building Climate-Resilient Communities: Strategies and Innovations for Enhancing Adaptation, Sustainability, and Health in the Face of Climate Challenges
Mr. Jaime B. Cinco	City Health Office, City of Cagayan de Oro, Misamis Oriental	
Dr. Donnabel L. Tubera-Panes	City of Baguio, Benguet	
Dr. Renato G. Josef	Independent OSH Consultant	Developing Climate-resilient Workplaces: Implementing Strategies and Best Practices for Enhancing Adaptation, Safety, and Sustainability in Response to Climate Change
Dr. Rosalie V. Rivera	Shell Pilipinas Corporation	Enhancing Climate Resilience in Hospitals through Effective Indoor Air Quality Monitoring
Ms. Dana Lightha D.T. Babela	Clean Air Asia Philippines	Nature-based Solutions for Climate Resilience
Ms. Joanne C. Flestado	Conservation International Philippines	Harnessing Science and Technology for Climate-Resilient Communities: Innovations in Early Warning Systems and Reduction
Dr. Alfredo Mahar Francisco A. Lagmay	UP Resilience Institute	Integrating Strategies for Sustainable Climate Resilience: A Path Forward for Communities and Workplaces
Mr. Renato Redentor Constantino	Constantino Foundation	

by WHO to combat these risks, which asserts, “Health is the argument for climate action.” The report outlines three interrelated pillars for addressing this challenge: People, Place, and Planet. Climate change endangers health and survival, necessitating health-focused, equitable climate action to ensure economic and national stability. Sustainable urban design, energy systems, and transport systems are critical to creating environments that prioritize health and prevention strategies for populations. Such strategies require a rapid transition away from fossil fuels, which is essential to realigning economic systems with the health of humanity and the planet.^[3] Dr. Magtibay concluded his lecture by emphasizing the need for bold, transformative actions to meet the goals of the Paris Agreement. He urged collective efforts across all sectors to address climate change as a direct threat to human health. Climate solutions, he stressed, must integrate health and climate policies while situating human well-being at the core of efforts to achieve improved health outcomes, social equity, and economic stability.

Engaging the community in climate health initiatives

Ms. Danica Marie Supnet highlighted the intersection between public health and climate change, particularly in vulnerable communities like Guiuan, Eastern Samar. She highlighted the adverse global impacts of climate change, as documented by Intergovernmental Panel on Climate Change assessments, noting their intensification and the resulting vulnerabilities in health and well-being. Locally, projections by the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA) point to significant impacts such as coastal erosion, temperature rise, and flooding due to more intense typhoons. Despite these challenges, Ms. Supnet emphasized the capacity for localized action, exemplified by the Philippines’ National Adaptation Plan (2023–2050), which promotes a multisectoral, systems-thinking approach. Specifically, four key outcomes for climate adaptation were outlined: empowering health workers, gender-responsive healthcare, monitoring health vulnerabilities, and fostering community-led health governance.^[4] Drawing on ICSC’s work in Guiuan, Eastern Samar, Ms. Supnet discussed how community-specific climate action plans were crafted through workshops and vulnerability assessments. These plans integrated gender and health considerations which align with local needs and ensure corresponding budget allocations. She stressed that adaptable and context-specific strategies are critical, as “one-size-fits-all” solutions are insufficient for addressing diverse local climates. The municipality’s efforts were highlighted as a model for integrating health, gender, and sustainability into climate governance, with steps such as green innovations and financial support

embedded in their annual development plans. Ms. Supnet concluded her presentation by encouraging other communities to become advocates for similar initiatives. She stressed the important role of multi-actor partnerships—including NGOs, local governments, academic institutions, and community groups—in advancing comprehensive climate governance. Finally, she called for resource mobilization and the integration of gender and health-focused initiatives as essential components of future climate action plans.

Policies and plans for fostering healthy communities and workplaces in the Philippines

Despite advancements, significant challenges remain in the execution of climate adaptation policies. According to a study by the Climate Change Commission of the Philippines, while 70% of Local Government Units (LGUs) have developed climate action plans, many struggle with insufficient resources for proper implementation. The need for multisectoral collaboration—among government bodies, academic institutions, and private stakeholders—emerges as a key factor in promoting climate resilience. In the third lecture, Dr. Ronald P. Law, Director III of the Health Emergency Management Bureau and Head of Health and Climate Change at the Department of Health, emphasized that climate change is not only a global issue but a pressing reality for the Philippines. Highlighting its impact on public health, he noted that climate change intensifies risks to health systems and facilities, while also exacerbating mental health and psychosocial concerns. Dr. Law stressed that addressing these challenges requires integrating mitigation strategies to achieve resilient and sustainable health systems. Through the Philippine Climate Change Act (Republic Act 9729) and the National Climate Change Action Plan, a framework has been established, including the Strategic Actions on Human Security (2011–2028) and the National Adaptation Plan, which prioritizes the National Healthcare Act and climate-adaptive healthcare. The Department of Health’s eight-point Health Action Agenda, particularly Action #4 on Crisis Preparedness, underscores the creation of responsive and resilient health systems focused on prevention, preparedness, and recovery during public health emergencies. These efforts include fortifying climate-resilient healthcare facilities and enhancing their capacity to manage large-scale emergencies.^[5] Dr. Law also highlighted practical solutions, such as implementing heat health action plans, focusing on vulnerable populations like workers exposed to high temperatures, and improving related health services. He advocated for anticipatory rather than reactive measures, maximizing strategies with co-benefits such as promoting green spaces for mental health, enabling energy-efficient and renewable-powered healthcare systems, and ensuring a just labor transition to sustainable practices. Finally, Dr. Law outlined the

vision for a climate-smart Philippine health system, emphasizing data-driven decision-making, resilient infrastructure, accessible financing, and empowered communities. He ended his lecture by calling for unified action under the Department of Health's commitment to prioritize every life, aligned with their tagline, "Sa Bagong Pilipinas, Bawat Buhay Mahalaga (In a healthy Philippines, every life matters)."

Panel Discussions

The forum also featured panel discussions that provided practical insights and case-based reflections from LGUs, private sector representatives, and public health experts. These sessions enriched the forum by illustrating how climate resilience is being operationalized in communities, workplaces, and healthcare facilities. Panelists shared current challenges, emerging strategies, and lessons learned from on-the-ground implementation efforts.

Table 2 summarizes the core issues raised and the major insights drawn from each panel presentation.

Hon. Alfredo M. Coro II shared their comprehensive climate adaptation initiatives under the presentation titled "Grounding Health Equity: The Del Carmen Experience (and we create more value)." He began by illustrating Siargao Island's reality before and after the onslaught of Typhoon Rai in 2021. The disaster brought significant challenges, such as being a Geographically Isolated and Disadvantaged Area, where repatriating stranded tourists proved difficult, as well as grappling with poverty, which had already been severe with a pre-pandemic poverty incidence of 69.9%. Poverty

and inequity were magnified by the pandemic and compounded by the impacts of Typhoon Odette, forcing vulnerable populations into deeper crises with limited access to basic necessities. These pressing issues underscore the need for proactive health governance, emphasizing that health, being personal, is inherently political. Mayor Coro II highlighted the Municipality of Del Carmen's efforts under the "Grounding Health Equity" framework. The approach focused on three key pillars. First, the ownership of health outcomes which involved developing health champions from diverse community sectors, addressing social determinants of health, and expanding the network of stakeholders responsible for public health outcomes. Second, the implementation of science-based governance stressed the use of advanced health information systems for data-driven decision-making, featuring initiatives like health program documentation, Purok Data Health Boards with spot mapping, and the use of eTablets for streamlined management. Third, mobilization of resources aimed to foster innovative local health solutions, blending top-down government strategies with bottom-up community-driven approaches to enhance accountability and community participation. Furthermore, the municipality pioneered the Community Engagement-Self Monitoring Strategy, which links barangay-level measurements of health outcomes to broader co-creation and co-ownership initiatives. Del Carmen also launched novel programs to address pandemic challenges and social determinants of health. These included Mental Health Campaigns targeting youth, Telemedicine services, "Botika sa Barangay (Village Pharmacy)" initiatives, and hunger management programs to mitigate the impact of food insecurity. Climate-responsive disaster interventions, like

Table 2: Panel Insights Summary

Panel	Key issues raised	Expanded summary of insights
Panel 1: Building Climate- Resilient Communities	Climate-related vulnerabilities and local government adaptation efforts	Local government representatives from Del Carmen, Cagayan de Oro, and Baguio City shared their experiences in implementing climate adaptation strategies at the community level. These included integrating DRRM with climate change adaptation planning, restoring ecosystems such as mangroves, engaging communities in vulnerability assessments, and institutionalizing early warning systems. The panel emphasized the importance of integrating climate considerations in local development plans and securing cross-sectoral coordination and political will to sustain these efforts.
Panel 2: Developing Climate- Resilient Workplaces	Occupational risks intensified by climate change; need for policy and practice updates	The panel highlighted how climate-related stressors such as extreme heat, air pollution, and natural hazards are increasingly affecting worker safety and productivity. Speakers emphasized the need to revise OSH protocols to incorporate climate risks, adopt flexible work arrangements (e.g., adjusted hours during extreme heat), and strengthen employer responsibility in ensuring safe and climate-adaptive work environments. Shell Pilipinas shared examples of workplace monitoring systems and wellness programs, while the independent OHS consultant underscored the need for climate-informed labor policies and cross-sector engagement to promote worker protection and business continuity.
Panel 3: Innovations in Climate- Smart Health Practices	Climate risks in healthcare facilities: infrastructure and operational vulnerabilities	This panel addressed the urgent need to make health facilities more resilient to climate-induced disruptions. Presenters discussed the use of IAQ monitoring, green building features such as rooftop gardens and improved ventilation, renewable energy sources like solar panels, and rainwater harvesting systems. These interventions not only support continuous operations during emergencies but also reduce environmental impact. The importance of capacity building for healthcare workers, routine facility risk assessments, and the integration of health resilience into infrastructure investments and health policy were emphasized.

DRRM: disaster risk reduction and management, OSH: occupational safety and health, IAQ: Indoor air quality

the establishment of community kitchens, postdisaster shelter reparations, and mental health spaces, were designed to ensure nutritional support, emotional recovery, and resilience during times of crisis. These innovative programs led to the Municipality's recognition with the "Seal of Health Governance 2024 Awarding: Flagship of Social Innovation for Health." Concluding his presentation, Mayor Coro II urged local governments to aspire to align their initiatives with global standards, scale local solutions for broader impact, and engage the youth through movements like the Global Youth Health Club. He also emphasized the interconnectedness of health, climate, and biodiversity and advocated for work equity and the pursuit of a unified One Health approach to building a better, sustainable future.

City of Cagayan De Oro, Misamis oriental

Mr. Jaime B. Cinco introduced Cagayan de Oro as a rapidly growing center for commerce and development in Northern Mindanao. He highlighted issues such as widespread substance abuse necessitating psychosocial support and the increasing prevalence of teenage pregnancies demanding reproductive health education. Leading causes of mortality, including myocardial infarction, hypertensive cardiovascular disease, and pneumonia, further emphasized the need for targeted health interventions. In addition, he discussed the city's vulnerability to flooding, worsened by climate change, brought to light after the devastating impact of Typhoon Washi in 2011. Responses to these disasters were swift yet underscored the need for robust, institutional systems for disaster and health emergency management. The city implemented water, sanitation, and hygiene measures, provided nutritional and mental health support, and strengthened disease surveillance through the Surveillance in Post-Extreme Emergencies and Disasters reporting system. Recognizing the long-term implications, Cagayan de Oro formalized its disaster response by establishing the Disaster Risk Reduction Management Department in 2013. This approach is rooted in four essential pillars comprising an updated DRRM-Health (DRRM-H) plan, a fully functional Health Emergency Operation Center, readily available health emergency supplies, and specialized Health Emergency Response Teams. Automatic rain gauges and village-level training programs, including CPR and WaSH protocols, were part of the city's comprehensive effort to build sustained disaster resilience. A notable example of the city's resilience was the response to Typhoon Rai in December 2021. Coordinating through its City Health Office operations center, the city swiftly deployed rapid health assessments and multisectoral cooperation. These measures were instrumental in achieving zero mortalities and preventing disease outbreaks in evacuation centers. However, recognizing that flooding exacerbated by

climate change remains a top hazard, the city continues to refine its DRRM-H system. Initiatives such as disease tracking, routine immunization drives, mental health support programs, and water quality testing underline the city's commitment to safeguarding public health even during normal conditions. Innovations and strategic interventions have positioned Cagayan de Oro as a leader in regional disaster preparedness and public health. Initiatives like establishing milk banks, implementing anti-dengue measures, and increasing health promotion campaigns reflect the city's proactive stance. Proposals for green building designs, renewable energy integration, and scaling up Barangay (Village) Epidemiology and Surveillance Units further demonstrate its investment in a sustainable, inclusive future. Mobile clinics, cold-chain vaccine equipment, mobile kitchens, and lactation stations were also identified as critical resources to enhance disaster response and meet immediate community needs. Mr. Cinco concluded his presentation by emphasizing preparedness as the most effective response to the escalating challenges of climate change. He highlighted the importance of policy advocacy, proactive strategies, and community collaboration in bolstering resilience and ensuring equitable access to resources. Fostering a culture of readiness and mutual support drives Cagayan de Oro towards evolving its systems to combat climate change, protecting vulnerable populations, and building a sustainable future for its residents.

City of Baguio, Benguet

Dr. Donnabel Tubera-Panes began her presentation by highlighting Baguio City's historical reputation as the "Health Resort of the Far East" in 1911, originally designed for a population of 25,000. However, the city's current population has surged to nearly 400,000. Dr. Tubera-Panes shared findings from a National Economic and Development Authority study on the city's urban carrying capacity which showed how thresholds in various sectors like roads, water supply, open spaces, and waste management have been exceeded over time due to rapid urbanization. These challenges extend to areas such as forest cover depletion, population growth, and infrastructure demands, emphasizing the urgent need for strategic planning. She outlined key challenges, including demographic pressure from residents and transients, rising tourism impact leading to the Tourism Irritation Index, and environmental risks such as landslides and floods. Measures have been taken to address these issues, notably the establishment of the Baguio City Command Center in 2021, funded by the Office of the President to implement advanced Cisco technology. This innovation enables efficient resource management, crime and traffic monitoring, environmental tracking, and disaster preparedness.

Dr. Tubera-Panes explained how these efforts fit into the broader framework of Baguio's vision for 2043—to become a livable, inclusive, and creative city. This vision was collaboratively developed using inputs from residents and aligned with localized Sustainable Development Goals. The city has also turned to technology-driven programs such as “Smart Sustainable Baguio” and “Baguio Urban Digital Twin,” which both provide detailed three-dimensional and four-dimensional digital mapping to assess population trends, hazard detection, and structural integrity. These tools have supported initiatives like Climate and Disaster Risk Assessment and the Growth Node Development Framework, guiding the city's spatial development plans for eco hubs, business districts, and more. Dr. Tubera-Panes highlighted the city's commitment to achieving sustainable urban development through measures like decarbonization, circular economy principles, local climate change action plans, and collaborations with private and public stakeholders. Baguio City's efforts have garnered numerous recognitions, including awards for climate initiatives, resilience, urban mapping, and the Smart City designation. Through innovative governance, data-driven planning, and community engagement, Baguio aims to secure its future as a model city. Dr. Tubera-Panes concluded her presentation by emphasizing the value of precise data, addressing risks, leveraging modern innovations, and understanding the aspirations of constituents to achieve a sustainable and inclusive urban future.

The pivotal role of occupational health and safety in the development of a climate-resilient workplace

Dr. Renato G. Josef opened the second panel discussion by addressing the glaring reality of climate change. He emphasized that climate change is undeniably happening, primarily driven by human activities, and will escalate unless greenhouse gas emissions are significantly curbed. Despite these challenges, Dr. Josef underlined a sense of hope grounded in global awareness and action. Shifting his focus to OSH, he discussed how climate change poses unique challenges to workplaces, with rising temperatures, extreme weather, vector-borne diseases, and ultraviolet radiation emerging as significant threats. Outdoor workers are particularly at risk of heat stress, biological hazards, and dangerous working conditions, while indoor workers face high temperatures, burdensome requirements on personal protection, and other challenges. He illustrated how these climate-driven stressors could lead to heat disorders, organ dysfunction, mental fatigue, and “eco-anxiety,” further complicating workplace safety. Dr. Josef advocated for breaking this cycle through effective OSH programs tailored to climate change realities. He shared strategies for

adapting conventional workplace approaches, such as incorporating climate-focused risk assessments, customizing safety protocols to account for workers' medical conditions, and validating information sources to ensure reliability. He emphasized integrating OSH initiatives into Human Resource (HR) policies and implementing robust monitoring and evaluation frameworks to gauge the effectiveness of climate-resilient practices. For enterprises of all sizes, he stressed the importance of proactive measures like embedding OSH compliance, conducting environmental impact assessments, and fostering partnerships across public and private sectors to strengthen resilience. Finally, Dr. Josef encouraged organizations to adopt visionary leadership by incorporating climate resilience into workplace processes, from hiring to continuous workforce training. He proposed key policies, such as environmental management systems and heat stress prevention plans, along with strategies addressing infection control, emergency preparedness, and employee wellness. Additionally, this includes the integration of sustainability mechanisms into OSH frameworks and ensuring alignment with climate-resilient goals so companies can mitigate climate change's impacts. Dr. Josef's concluding message was clear. Climate change demands immediate, coordinated action at all levels, and OSH programs must evolve beyond conventional models to address this pressing global issue.

Shell Pilipinas

Dr. Rosalie V. Rivera began by outlining Shell's endeavor to create climate-resilient workplaces and employees, sharing insights into their global mission. Shell's purpose is not only centered on generating shareholder value but also encompasses addressing climate change through key focus areas. These include powering the lives of employees, customers, and communities inclusively; driving the transition to net-zero emissions by collaborating with customers and external stakeholders; and respecting nature through efforts to protect the environment, reduce waste, and contribute positively to biodiversity. These initiatives are all deeply rooted in Shell's core values and emphasis on safety. Dr. Rivera reiterated that Shell Pilipinas is firmly committed to addressing climate change and aims to become a net-zero emissions energy business by 2050 or sooner. She shared the company's various measures to transition towards cleaner energy solutions while ensuring the delivery of high-quality products and services. Examples include low-carbon product offerings and an expanding network of charging terminals designed for seamless integration into daily life. Reflecting on the reality of climate change, she cited a heat stress index in the Philippines reaching 42–51 degrees Celsius last year, as well as increasingly severe flooding, underlining the worsening extremes in weather patterns. To build

climate resilience, Shell Pilipinas has implemented several strategies during adverse weather conditions like heavy rains, floods, and typhoons. These include offering flexible work arrangements and establishing Business Continuity Management systems to maintain safety and productivity, the Staff Notification System for real-time monitoring and alerts, health advisories and prophylaxis against leptospirosis caused by floods, the Worker Welfare Program to ensure safe transport, food, hygiene, and sleeping quarters, and mitigating disaster impacts through rescue, relief, and recovery efforts in partnership with external stakeholders. To address periods of extreme heat, the company established the Enhanced Heat Stress Management Program, which includes measures such as shifting risk assessments toward heat stress factors, adopting a more accessible Heat Stress Index standard, restructuring work schedules to avoid the hottest parts of the day, revising Personal Protective Equipment protocols, enhancing hydration and cooling facilities, promoting worker well-being through supervision and self-care principles, updating safety protocols, and preparing to implement a Stop Work Protocol targeted for 2025. These measures ensure that business objectives are balanced with employee care, adhering to As Low as Reasonably Practicable standards. Shell Pilipinas incorporates sustainability and well-being into its operations with support from HR through initiatives such as the “Choice Pot” flexible spending allowance for employees to adopt renewable energy in their homes and enhance personal well-being. They have also established eco-friendly workspaces with reusable utensils, coffee ground fertilizers, and waste management systems like composting and eco-brick production for school construction. Energy-efficient practices include motion-sensor lights, workspace optimization, and reliance on solar energy at the Shell Business Operations Manila office. Additional initiatives promote health and sustainability, such as the “Stairwell to Be Well” program to reduce electricity use, partnerships to provide healthy food options, and hydroponic lettuce growing in the office. Dr. Rivera emphasized the significance of Shell Pilipinas’ annual Nutrition Month initiatives, which advocate for food security, reducing environmental impact (“food print”), and adopting eco-friendly diets to benefit both individual health and the planet. She concluded by celebrating the recognition of Shell Health’s Eat Well campaign during Sustainability Week 2023 which underscored collective efforts that made these achievements possible for employees.

Enhancing climate resilience in hospitals through effective indoor air quality monitoring

Ms. Dana Lightha D. T. Babela emphasized the co-benefits of simultaneously addressing air pollution and climate change, given their common sources such

as greenhouse gases and short-lived climate pollutants. Citing the 2024 State of Global Air Report by the Health Effects Institute, she highlighted that air pollution ranks as the second-highest global risk factor for death among children under five, resulting in approximately 8.1 million deaths globally. Among these, 58% were attributed to ambient PM_{2.5} pollution, with additional cases stemming from household pollution or ozone exposure. Specifically, air pollution caused over 709,000 deaths in children under five in 2021, equaling 15% of global child mortality.^[6] In the Philippines, air pollution was found to be the second leading risk factor for death and disability. These findings underline the urgency to tackle both air pollution and climate change comprehensively. Ms. Babela highlighted the importance of baseline measurements and understanding current air quality levels to address these issues effectively. To measure and analyze air pollutants, various technologies are used, including Reference Instruments for highly accurate measurements, Non-Reference Instruments for cost-effective and accessible monitoring, albeit with calibration needs, and Personal Devices for real-time localized measurement. While non-reference instruments are more affordable and portable, they may demonstrate bias and require calibration through collocation with reference instruments to improve accuracy. Ms. Babela presented a case study on indoor air quality monitoring at a maternity hospital, where two non-reference instruments measured PM_{2.5} levels hourly in the public ward and outside the hospital’s waiting area. These instruments were calibrated over a 2-year collocation experiment using an instrument from the Environmental Management Bureau of the Philippine Department of Environment and Natural Resources, which has a relative accuracy of 92% to 100%. This study found that outdoor air pollution significantly influences indoor air quality, especially since public ward areas remained open. Patterns showed that PM_{2.5} levels peaked on certain days and times, often due to human activities and vehicular traffic. Key findings emphasized the need for interventions targeting peak pollution periods and sources. She concluded by underscoring the role of science-based policies, investments, and collaborations in driving initiatives to improve air quality, particularly in healthcare settings. Protecting patients and staff from the health risks of air pollution and climate change requires comprehensive and integrated action.

Nature-based solutions for climate resilience

Ms. Joanne C. Flestado emphasized the urgency of adopting nature-based solutions (NBSs) in healthcare settings, citing the intensifying impacts of climate change, such as typhoons, floods, and heat waves that damage infrastructure, disrupt operations, and worsen indoor air quality. These disruptions strain health services and increase respiratory and infectious disease risks due to

poor ventilation and rising temperatures. Key challenges identified include infrastructure vulnerability, energy and water shortages, and the compounding effects of extreme weather on patient care and facility operations. To address these, Ms. Flestado proposed NBS and complementary technologies, including rooftop gardens, passive cooling systems, rainwater harvesting, and solar energy backups. She also highlighted the importance of risk assessments, cross-sector collaboration, and ongoing evaluation to ensure the effectiveness of these strategies. While her examples, such as the impact of Hurricane Sandy on New York hospitals, demonstrate the real-world consequences of inaction, we note that these cases are drawn from outside the Asian context and underscore the need to document and highlight region-specific interventions in future forums and related studies. Ms. Flestado concluded by calling for policy integration, investment in research, and pilot projects to scale climate-smart innovations and build resilient, low-carbon healthcare systems.

Harnessing science and technology for climate-resilient communities: Innovations in early warning systems and reduction

Dr. Alfredo Mahar Francisco A. Lagmay began his presentation by discussing the concept of a people-centered early warning system, typically provided by agencies such as PAGASA, the National Disaster Risk Reduction and Management Council, and the Philippine Institute of Volcanology and Seismology during disasters like typhoons, the *Hanging Habagat* (Southwest monsoon), and volcanic activity. This system relies on four key pillars: gathering risk knowledge through systematic data collection and analysis, developing monitoring systems and early warning services, disseminating risk information effectively, and fostering response capabilities at both the national and community levels to ensure proper action during emergencies. Dr. Lagmay stressed that the Philippines ranks high on the world risk index due to its vulnerability and low adaptive capacity, which are influenced by factors such as poverty and population demographics, including the very young and elderly. He identified hydrometeorological hazards, such as strong winds, floods, rain-induced landslides, storm surges, and drought, as well as geological hazards, including ground shaking, liquefaction, and tsunamis, among others. For volcanic activity, threats such as ash fall, lava flows, and lahar are critical. These hazards are aggravated by climate change, leading to stronger typhoons and more intense flooding and landslides, posing significant risks to various sectors, including public health. Dr. Lagmay highlighted the use of hazard maps as a vital tool for risk knowledge, enabling safe evacuation planning and resilient infrastructure development. He also underscored the importance of monitoring, using

advanced sensors and satellite images provided by agencies like PAGASA and UPRI, to track hazards such as rainfall and typhoon behavior. He introduced the impact-based forecasting system developed by UPRI through Project Nationwide Operational Assessment of Hazards (NOAH). Acclaimed by the United States Agency for International Development and the World Food Program, Project NOAH empowers communities to take anticipatory actions by providing timely flood warnings, estimating potential damage, and allocating resources effectively. The program integrates 24-h rainfall forecasts and community-driven flood model validation via social media, fostering public participation and accuracy. Another crucial pillar is the dissemination of risk information, utilizing traditional and social media to keep communities informed and innovative strategies to relay vital updates. Finally, building response capabilities is essential at all levels, including government, communities, and individuals, to ensure adequate action during emergencies. Dr. Lagmay concluded his presentation by emphasizing the value of community engagement, participatory approaches, and building resilience across sectors. He pointed out that fatalities from hydrometeorological hazards can be significantly reduced when people collaborate and apply people-centered early warning systems effectively.

Concluding Lecture: Integrating Strategies for Sustainable Climate Resilience: A Path Forward for Communities and Workplaces

The concluding lecture was presented by Mr. Renato Redentor Constantino. Drawing on over three decades of work in climate policy, Mr. Constantino emphasized that climate change is the most pressing challenge the world has ever faced. Despite the severity of this crisis, it is often overshadowed by other socio-economic priorities, particularly for working families focused on basic needs such as food, shelter, and education. He criticized the tendency to associate climate change solely with environmental issues or immediate disasters, noting that slow-onset effects like rising sea levels, coral bleaching, and increasing vector-borne diseases are dangerously neglected despite their devastating long-term impacts on livelihoods and communities. Mr. Constantino stressed that climate change exacerbates systemic inequalities rather than being a “great equalizer.” He expressed concerns on policies that disproportionately serve a privileged minority, such as prioritizing electric vehicles, which benefit only a small percentage of Filipinos who own cars. Instead, he advocated for mass public transportation and infrastructure that address the needs of the majority, such as sidewalks, bike lanes, and accessible transport systems. These measures not only reduce emissions but also enhance the quality of life and economic resilience

for working families. He urged a shift in focus from gross domestic product (GDP) growth to building genuine resilience across all sectors by improving infrastructure, public health systems, supply chains, and energy grids. This approach would not only protect vulnerable populations but also create jobs and foster economic stability. By prioritizing inclusivity and long-term resilience, he argued, the country can effectively respond to the climate crisis while setting an example for global decarbonization efforts. Lastly, he called for leadership rooted in solidarity and purpose and emphasized that while the time left to act is limited, it is not too late to implement meaningful change.

Conclusion and Recommendations

The Seventh EOH Forum served as a timely platform for advancing multisectoral dialogue on the growing risks climate change poses to public health, OHS, and healthcare facilities. Discussions reaffirmed global findings from the World Health Organization and the 2023 Lancet Countdown that climate change not only intensifies health threats but also deepens existing inequities. The forum highlighted the urgent need for climate-informed OHS practices, NBSs in healthcare, early warning systems, and localized adaptation strategies. These approaches align with international frameworks such as the WHO Operational Framework for Building Climate-Resilient Health Systems and the SEAR Regional Strategy. Despite these advances, the forum also highlighted persistent implementation challenges. These include limited institutional capacity to mainstream climate risk into OSH and health planning, fragmented coordination across sectors, underutilization of community-level data, and the pressing need for sustained investment in climate-resilient health infrastructure. These gaps point to a broader need for equity-centered, context-specific approaches that are both adaptive and grounded in real-world experience.

Drawing from speaker presentations and panel discussions, the forum produced several key recommendations to address these gaps. First, climate considerations must be integrated into OSH systems through updated risk assessments, protocols, and workforce training. Second, there is a critical need to invest in resilient infrastructure and promote nature-based interventions such as green buildings, passive ventilation, and sustainable resource management, especially in hospitals and urban workplaces. Third, local governments must strengthen early warning systems and community

preparedness, including heat-health action plans and flood risk strategies. Participants also called for improved multisectoral collaboration and policy coherence, emphasizing the importance of partnerships among government, academe, civil society, and the private sector. Institutionalizing the integration of climate and health in local planning processes and development agendas was seen as vital, along with establishing accountability mechanisms for climate-health action. Lastly, capacity building through continuing education and research was underscored as essential to equipping health professionals, planners, and local leaders with the skills and evidence needed for responsive, climate-resilient decision-making.

Collectively, the forum's outcomes contribute to the growing body of literature calling for locally driven and equity-oriented strategies to strengthen public health systems. They affirm the need for continued dialogue, investment, and innovation to ensure that health systems can adapt and thrive in the face of intensifying climate threats.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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