



|                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Workshop Title</b>                                                                                                                                                                                                                                                                     | The Unholy Alliance: A Simulation Exercise on Tackling the Climate-Antimicrobial Resistance -Nexus                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Facilitators and contributors</b><br>Details of the individuals leading and contributing to the workshop, including: <ul style="list-style-type: none"><li>• Workshop facilitators</li><li>• Guest speakers or contributors</li><li>• Their roles in the session</li></ul>             | Kristina Osbjør (facilitator)<br>Sabiha Essack (facilitator)<br>Sunday Ochonu Ochai (facilitator)<br>Cèlia Ventura i Gabarró (facilitator)<br>Percival Ethan Lao and Geminn Louis C. Apostol from Ateneo Centre for Research and Innovation (Presenter)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Background</b><br>An overview of the context and rationale for the workshop, outlining the key issue, challenge, or opportunity it addresses, and why this topic is timely and relevant.                                                                                               | Low- and middle-income countries (LMICs) contribute minimally to greenhouse gas emissions yet bear the greatest burden of climate change. Similarly, antimicrobial resistance (AMR) disproportionately affects LMICs, undermining health systems, food security, and economic development. When these threats converge in human, livestock and aquaculture systems, they form an unholy alliance that has elevated consequences on health systems for security, nutrition and livelihoods of populations in LMICs, Hydroclimatic extremes such as floods and typhoons, alongside rising temperatures and altered ecosystems, contribute to increasing disease incidence and antimicrobial use, which accelerate the emergence and spread of drug-resistant infections. Flooding disperses and concentrates pathogens, disrupts water and sanitation systems, and forces displacement that intensifies disease transmission, while heat stress compounds susceptibility and climate-driven disease shifts necessitate therapeutic interventions. Understanding and disrupting this synergy requires urgent attention, yet the climate-AMR nexus remains critically understudied. |
| <b>Workshop Aims</b><br>A description of the purpose of the workshop and its intended focus. This section highlights what participants can expect to explore, learn, or develop during the session.                                                                                       | This workshop aims to build a shared evidence base for how climate change amplifies AMR risks in livestock and aquaculture systems, and then to put that evidence to work through an immersive simulation exercise. After grounding participants in scoping review findings, geographic hotspot analyses, and field-tested country interventions, the session centres on a structured simulation: working in small multidisciplinary groups, participants will respond to an escalating crisis linking climate shocks and AMR, developing coordinated actions across researcher, practitioner, and policymaker perspectives. Through successive scenario injects, attendees will test priorities, weigh trade-offs, and design context-appropriate interventions that tackle both threats together rather than in isolation. By bridging research, practice, and policy, the workshop will help participants recognise integrated opportunities, surface critical knowledge gaps, and shape collaborative research agendas. Insights generated will directly inform a resource guide for embedding a climate change lens in AMR agendas.                                        |
| <b>Participant Takeaways</b><br>A summary of what participants will gain from attending the workshop. This may include new knowledge, practical skills, tools, frameworks, or shared resources, as well as any tangible outputs (e.g. ideas, draft materials, or collaborative outcomes). | Participants will gain insights on a synthesis model illustrating climate-AMR interaction pathways in animal production and human health systems, grounded in scoping and literature reviews.<br>This workshop will provide opportunity for participants to discuss the developed hotspot maps with convergence zones where climate and AMR risks intersect most severely, enabling evidence-based intervention targeting. Documented small-scale interventions from field projects, including technical specifications, implementation challenges, success factors, cost considerations, and adaptation guidance for diverse contexts will be shared and discussed.<br>Participants will help in shaping the guiding resource which will provide foundational principles and practical decision-support tools for integrating a climate change lens into AMR interventions, including criteria for selecting and deploying climate-smart technologies that simultaneously reduce antimicrobial use and enhance climate smart food production.                                                                                                                                  |

|                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                             | <p>Participants will collectively identify priority questions and knowledge gaps requiring investigation to strengthen the evidence base for integrated climate-AMR solutions.</p> <p>Participants will collaboratively contribute to a publication in the form of a workshop report/an opinion article/ white paper synthesizing workshop insights and recommendations for integrated climate-AMR action in animal production systems.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b>Expected Impact</b></p> <p>An outline of the broader value of the workshop, including how it may:</p> <ul style="list-style-type: none"> <li>• Influence research, policy, or practice</li> <li>• Support collaboration and knowledge exchange</li> <li>• Contribute to future work or ongoing initiatives</li> </ul> | <p>Participants will leave with a synthesis model illustrating climate-AMR interaction pathways across human, livestock, and aquaculture systems, grounded in scoping and literature reviews. They will gain familiarity with hotspot maps identifying convergence zones where climate and AMR risks intersect most severely, supporting evidence-based intervention targeting. Field-tested case studies of small-scale interventions, including technical specifications, implementation challenges, success factors, cost considerations, and adaptation guidance, will be shared for transfer to diverse contexts.</p> <p>Critically, the simulation will equip participants with a transferable approach to coordinated crisis response: each group will produce a set of integrated actions addressing an escalating climate-AMR scenario across human and animal health, developed from researcher, practitioner, and policymaker perspectives and synthesised as a shared output.</p> <p>Participants will also help shape a guiding resource offering foundational principles and decision-support tools for embedding a climate change lens in AMR interventions across One Health sectors, including criteria for selecting climate-smart technologies that reduce antimicrobial use while strengthening sustainable food production. Finally, attendees will collectively surface priority research questions and knowledge gaps, and contribute to a planned publication (workshop report, opinion article, or white paper) synthesising insights and recommendations for integrated climate-AMR action.</p> |
| <p><b>Who should attend?</b></p> <p>Information on the intended audience for the workshop, including:</p> <ul style="list-style-type: none"> <li>• Relevant backgrounds, sectors, or expertise</li> <li>• The level of participation expected (e.g. discussion, group work, problem-solving)</li> </ul>                     | <p><b>Target backgrounds:</b> AMR researchers, climate scientists, veterinarians, aquaculture and livestock production specialists, environmental health practitioners, epidemiologists, policy advisors, agricultural extension officers, water resource managers, and international development professionals. Particularly valuable are participants with LMIC field experience, One Health expertise, or involvement in climate mitigation and adaptation or antimicrobial stewardship programs.</p> <p><b>Participation mode:</b> Highly interactive including simulation exercises with small groups that form expert groups tasked with solving the AMR-climate nexus. Also includes plenary discussions, collective priority-setting exercises, and peer exchange. Multidisciplinary perspectives valued over specialised expertise.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p><b>Workshop Schedule and Duration</b></p> <p>A summary of the structure and flow of the workshop, including:</p> <ul style="list-style-type: none"> <li>• Key session components</li> <li>• Interactive or breakout activities</li> </ul>                                                                                | <p><b>Half-day workshop (4.5 hours)</b></p> <p><b>Welcome (10 mins)</b><br/> Introductions and workshop orientation<br/> Framing: Compound burdens of climate change and AMR on LMICs<br/> Learning objectives and session roadmap</p> <p><b>Context Setting (50 min)</b><br/> <b>Part 1: Understanding the Intersection (15 min)</b><br/> Scoping review presentation: Climate-AMR interaction pathways in livestock and aquaculture<br/> Facilitated discussion: Mechanisms, sector vulnerabilities, emerging patterns<br/> <b>Part 2: Mapping the Hotspots (15 min)</b><br/> Presentation: Methodology and geographic analysis of climate-AMR convergence zones (15 min)<br/> <b>Part 3: Country Interventions (20 min)</b><br/> Presentation: Two country projects highlight key results on real-life interventions tackling dual threats of climate change and AMR</p> <p><b>Refreshment Break (30 min)</b></p> <p><b>Simulation exercise (120 min)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

Simulation exercise: The simulation will centre on an escalating crisis linking AMR and climate change. Participants will work in groups of 6-8 at round tables to discuss responses to each scenario inject. Each group will develop coordinated actions addressing the perspectives of researchers, practitioners, and policymakers.

**Synthesis, Golden thread & Next Steps (40 min)**

Key takeaways summary

Network building and ongoing collaboration mechanisms

Follow-up activities and resource access