

8TH INTERNATIONAL CLIMATE CHANGE & POPULATION CONFERENCE ON AFRICA

CC POP-GHANA 2026

PROGRAMME & ABSTRACTS

THEME

"Our Health in Peril"

VENUE

**Medical Training & Simulation Centre (MTSC)
University of Ghana Medical Centre (UGMC)
University of Ghana, Legon, Accra, Ghana
16th - 18th June, 2026**





8TH INTERNATIONAL CLIMATE CHANGE & POPULATION CONFERENCE ON AFRICA

CCPOP-GHANA 2026



PROGRAMME AND ABSTRACTS

Host

Regional Institute for Population Studies (RIPS)
University of Ghana



INTEGRI PROCEDAMUS



THE UNIVERSITY OF GHANA



The University of Ghana, the premier university and the largest University in Ghana was founded as the University College of the Gold Coast by Ordinance on August 11, 1948, for the purpose of providing and promoting university

Our Vision

To achieve global impact through innovative research, teaching and learning, using a technology-driven and people-centred approach.

Our Mission

To create an enabling environment that makes the University of Ghana increasingly relevant to national and global development through cutting-edge research and quality teaching and learning.



education, learning, and research. As a University poised to distinguish itself in the area of research to make an impact at the

national and international level, the University has launched a new Strategic Plan. This new Strategic Plan (2024-2029), building on the 2014-2024 Version, and intended to further enhance the consolidated gains made from the reappraisal of the University's mission and practices and situate these within five Strategic Priorities.

Our Strategic Priorities

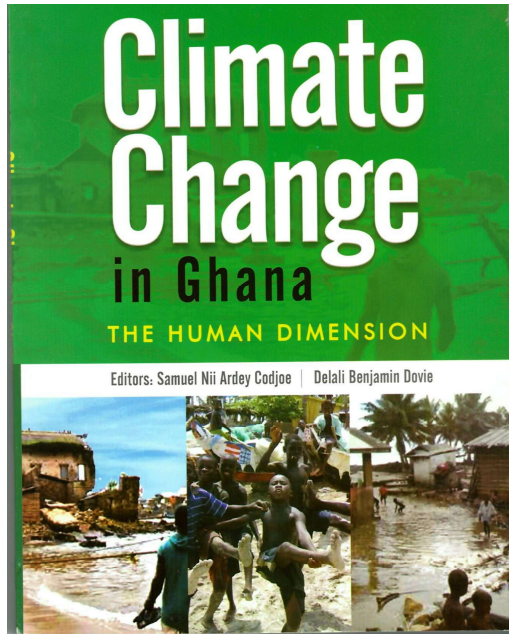
- Transformative Student Experience
- Commitment to our Faculty and Staff
- Sustainable Resource Mobilisation and Stewardship.
- Impactful Research
- Engagement and Partnerships

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UNIVERSITY OF GHANA

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CCPOP-GHANA 2026 IN PERSPECTIVE

The Eighth International Climate Change and Population Conference on Africa (CCPOP-Ghana 2026), represents strategically important policy-science platform that evolves political space at a time when climate change is rapidly converging with public health risks across Africa. A few days ago (June 5), the World Environment Day (WED) celebration called for Climate Action, themed "*Inspired by Nature. For Climate. For Our Future.*"

The conference under the theme "**Our Health in Peril**" aligns directly with emerging global priorities following the outcomes of the United Nations Framework Convention on Climate Change (UNFCCC) COP 2025 climate-health agenda in Belem, Brazil.

The CCPOP-Ghana has historically convened policymakers, academics, and development actors to close the science-policy gap. However, the scale and urgency of climate-health risks now require engagements beyond dialogue to coordinated national action for Africa.

The 2026 conference is uniquely placed to leverage whole-of-government commitment to climate-health resilience, reinforcing Africa's credibility in translating global frameworks into actionable national strategies, with country-diverse participants represented.

With increasing international attention on the intersection of climate risks and health systems, CCPOP-Ghana 2026 offers opportunities as a thought leader for climate-health innovations. It signals to international partners including multilateral agencies, research institutions, and development financiers that Africa is ready to lead and coordinate transformative responses to climate change but requires high-level political support to safeguard population health in an era of climate uncertainty.

Prof. Delali Benjamin K. Dovie, Conference Convener

CONFERENCE ORGANISATION AND MANAGEMENT

MEET THE CCPOP-GHANA 2026 TEAM

 DR. MARGARET APPIAH Special Assistant	 MS. LOIS ANTWI-BOADI Conference Co-Manager	 MR. MICHAEL WREDU Conference Co-Manager	 MS. ESTHER YORUKU Protocol
 MR. ADUDAKAR ABDJLAI Finance	 MS. BETINA AMEVOR Administration	 PROF. DELALI B.K. DOVIE Convener	



GENERAL CONFERENCE INFORMATION & LOGISTICS

Accommodation

The conference website features adequate information on accommodation within close perimeter of the conference venue, including the University's Yiri Lodge, which is a walking distance from the UGMC. Closest suburbs with different accommodation types include East and North Legon, Haatso, Madina, Okponglo, Achimota, Dzorwulu, and Shiashi. You may also inquire from any of the security posts on the university campus for help. Like any country in the world be selective who you speak to and not disclosing your residence.

Restaurants

There are several eating places on campus ranging from traditional restaurants "chop bars" to sophisticated settings within walking distances from the conference venue, including the traditional halls with own restaurants and bars from which both local and European dishes are available and reasonably priced. Amounts from \$3 - \$10 should give you a decent meal around the meeting venue including restaurants withing the premise of the meeting at UGMC. There is the University Night Market close to the International Students Hostel with diverse goods and services. You do not have to go outside the campus to find decent food or drink, unless you want some other experience beyond the venue.

Transportation

Taxicabs and Uber services are easily accessible and plying between the University of Ghana Campus and the Legon Lorry Park / bus stop (although just a walking distance) and beyond. You can easily connect to Accra's CBD and other suburbs. In most of the cases, you do not have to hire a taxi if you want to explore by using mini and big buses, again on the University of Ghana campus and the bus stops outside the main University entrance. When around the Airport and in central Accra, you can join any bus or taxi heading towards Madina, Adenta, Atomic, and Ashale Botwe, and get off at the Pentagon Residence, Legon Bus Stop or Police Station opposite the old university entrance. You may also use Uber or similar services.

Shops & Banks

There are various forms of shops in Accra, ranging from tabletop to kiosks, tuck shops and supermarkets and big malls. On campus, you will find smaller shops and tuck shops. Supermarkets are found around the university basic schools, central cafeteria & the international students' hostel, easy to reach on

foot. You may also visit the student halls for other services (refer to map). The closest multi-shopping centre is the Accra Mall (about 3 km from the University Campus on your way to the CBD or Airport). Get off at the Tetteh-Quarshie interchange and head left across the foot bridge towards Spintex Road direction or use dropping.

Pharmacies, drug stores and clinic

These are also available on campus and within some of the halls. There is a campus clinic located within the Central Cafeteria, the university hospital behind the Police Station, opposite the old University entrance, which is ready to assist with all cases, and the state-of-the-art UGMC, the conference venue. Several private health services are within reach of the venue. **For your health safety, please complete a form at the Conference Help Desk.**

Laundry

Several laundries are on campus with two major ones at the Legon Hall (main) and opposite the Faculty of Arts building on your way to the University Guest Centre. The other is at the Akuafu Hall car park and opposite Crops Science Department. Guest Centres, Lodges / Hotels also offer such service.

Security

Although security is not a grave issue in Ghana, and only involving petty crime, be alert and call for help. Keep all valuables with you at all times (e.g. credit card, cameras, passports, money, laptop) and beware of roaming taxicabs already with passengers. Avoid dark, quiet, and obscured spaces. The Campus Security Help Line is 0285460669 / 0285460668.

Telephone

Several gsm / cell phone providers exist with the most patronised being MTN, and Telecel. All that you need is a chip that costs around \$3 with relevant registration, and you are connected to the rest of the world. Vendors can easily be located but seek help at conference reception.

Volunteers and other contacts

Please make use of the Volunteers / Protocol at the meeting venue, whose name tags are clearly marked. The language of the Ghanaian is courtesy and not always about personal right so observe that and be polite even if you insist on getting something done.

Conference Help line: +233 (0) 501361835



DAILY PROGRAMME AT A GLANCE

Time	Day 1: Tuesday 16 June 2026	Day 2: Wednesday 17 June 2026	Day 3: Thursday 18 June 2026
08:30 	Registration (MTSC Reception)	Registration (MTSC Reception)	Registration (MTSC Reception)
09:00-10:30 	OPENING CEREMONY EVENT & NETWORKING <i>Venue: Auditorium</i>	Oral Session 01: Climate-Driven Health Outcomes I (R-6209) Oral Session 02: Climate Change, Food and Nutrition (R-6210)	Oral Session 06: Mental Health & Psychosocial Well-being I (R-6209) Invited Panel 03: Climate vulnerability and nature-based solutions (R-6210)
10:30-11:00	Special Guest of Honour & Keynote Address by Ghana's Health Minister	Morning Break / Networking	Morning Break / Networking
11:00-12:30 		Oral Session 03: Physical Science Basis (R-6209) Invited Panel 01: Climate-Health Indicators (SOSCHI) (R-6210)	Oral Session 07: Mental Health & Psychosocial Well-being II (R-6209) Oral Session 08: Data, Methods & Modelling (R-6210)
12:30-13:30	Lunch Break / Networking	Lunch Break / Networking	Lunch Break / Networking
13:30-15:00 	Plenary: Lancet Commission in Africa / ONS-UK SOSCHI <i>Venue: Auditorium</i>	Oral Session 04: Climate-Driven Health Outcomes II (R-6209) Oral Session 05: Climate-Driven Disease Transmission (R-6210)	Oral Session 09: Transdisciplinary Topics (R-6209) Oral Session 10: Adaptation, Early Warning, and Indigenous Knowledge (R-6210)
15:00-15:30	Afternoon Break / Networking	Afternoon Break / Networking	Afternoon Break
15:30-17:00 	Roundtable: Post-COP30 (Belem) <i>Venue: Auditorium</i>	Invited Panel 02: Climate change, Social Protection, and Population Wellbeing (R-6209) Symposium: Health Systems & Infrastructure in Ghana (R-6210)	CLOSING EVENT RECEPTION & NETWORKING <i>Venue: Atrium, MTSC Atrium</i>
17:00-19:00	Opening Reception, MTSC Atrium	Networking Evening MTSC Atrium	



SPRINGER NATURE



Ayaga A. Bawah, Stephen O. Kwankye, Pearl S. Kyei

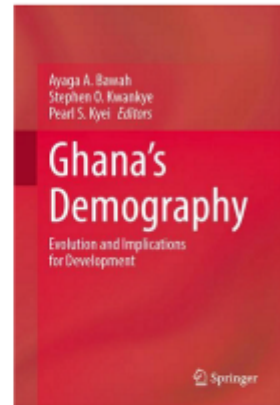
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**OPENING CEREMONY — ORDER OF PRESENTATION**

08:00 AM

**Arrival and Registration
of Participants**

10:00 AM

**All Seated and
Call to Prayer****Purpose of Gathering
and Introductions****Professor Mumuni Abu**Director, Regional Institute for population
Studies, University of Ghana, Legon, Ghana**Host Institution
Welcome Address****Prof. Nana Aba Appiah Amfo**

Vice Chancellor, University of Ghana, Legon

**Goodwill Message****Prof. Tafadzwa Mabhaudhi**Centre on Climate Change & Planetary Health,
London School of Hygiene & Tropical
Medicine, UK, & Director, Lancet Countdown in Africa**Goodwill Message****Ms. Samina Bhatia**Acting Development Director,
British High Commission in Ghana**Goodwill Message****Prof. Samuel Kaba Akoriyea**

Director-General, Ghana Health Service

**Interlude****Special Guest of Honour Keynote
Address and Official Opening****Hon. Kwabena Mintah Akandoh**

The Minister for Health, Republic of Ghana

**University of Ghana Anthem****Announcements & Updates****Vote of Thanks / Closing Prayer****Photography and Networking**

12:30 PM

**Lunch Break**

13:30 PM

**Technical Sessions Commence***(Admission is by Accreditation Only)*



12:30-13:30 - Lunch Break

DAY 1 (Technical Sessions)
TUESDAY, 16TH JUNE 2026

PLENARY	Lancet Countdown in Africa (LCA) / Standards for Official Statistics on Climate-Health Interactions (SOSCHI)
Moderator / Chair	Prof Victor Mogre: University for Development Studies, Tamale, Ghana
LCA Theme	Implications of Climate Change on Health in Africa: The role of Data for Planning Adaptation and Resilience
Speakers:	Metrics on Health and Climate Change-Related Hazards, Exposures, and Impact <i>Guéladio Cissé*</i> , <i>Thandi Kapwata</i> , <i>the 2025 Lancet Countdown Author Group</i> [Centre Suisse de Recherches Scientifiques en Cote d'Ivoire (CSRS); South African Medical Research Council, South Africa; The Lancet Countdown Collaboration, UCL]
	Metrics on Adaptation, Planning and Resilience for Health <i>Pascalía Ozida Munyewende*</i> , <i>the 2025 Lancet Countdown Author Group</i> [Wits RHI, University of the Witwatersrand, Johannesburg, South Africa; The Lancet Countdown Collaboration, UCL]
	Metrics on Mitigation Actions and Health Co-benefits <i>Mark Tomlinson*</i> , <i>Victor Mogre</i> , <i>the 2025 Lancet Countdown Author Group</i> [Stellenbosch University, South Africa; University for Development Studies, Ghana; The Lancet Countdown Collaboration, UCL]
	Metrics on the Economics and Finance of Climate Change and Health <i>Olufunke Aduke Alaba*</i> , <i>Maxwell Mudhara</i> , <i>the 2025 Lancet Countdown Author Group</i> [University of Cape Town, South Africa; University of KwaZulu-Natal, South Africa; The Lancet Countdown Collaboration, UCL]
	Public and Political Engagement with Health and Climate Change <i>Elizabeth Wambui Kimani-Murage*</i> , <i>Alice Ruguru Karanja</i> , <i>the 2025 Lancet Countdown Author Group</i> [African Population and Health Research Center (APHRC), Kenya; The Lancet Countdown Collaboration, UCL]
	An International Framework for Official Statistics Measuring Climate-Driven Health Outcomes <i>Bonang Lewis*</i> [Office for National Statistics, UK]
13:30-15:00	Venue [Auditorium]



PLENARY BACKGROUND

Implications of Climate Change on Health in Africa: The role of Data for Planning Adaptation and Resilience

Data and methods for generating indicators on the impacts of climate change on health in Africa are scarce. Ongoing initiatives including the Lancet Countdown on Health and Climate Change in Africa are bridging this gap through use of national and regional data and expertise. In this plenary/symposium, the Africa Lancet Countdown lead experts would discuss the data and indicators across five thematic areas: Health impacts of climate change; adaptation and health co-benefits; mitigation actions and health co-benefits; economics of climate change and health; and political and public engagement on climate and health. The panel will stimulate engagement and call for wider collaboration on the Lancet Countdown and initiatives to improve African driven science on climate change impacts across Africa. This discussion is around the theme: Data, metrics and climate change and health. A scientific, funder, policymaker and climate advocates are a target audience.

An International Framework for Official Statistics Measuring Climate-Driven Health Outcomes

The Standards for Official Statistics on Climate-Health Interactions (SOSCHI) project (2022–2026), funded by Wellcome and developed by ONS, AIMS Rwanda, RIPS Ghana, and international partners, has built a framework of indicators to monitor climate impacts on population health. This session analyses the framework, highlighting six priority indicators endorsed by the UN Statistics Commission for the Global Set of Climate Change Statistics. These cover heat- and cold-related mortality, mental health and extreme temperatures, wildfire PM_{2.5}, water- and vector-borne diseases, and air pollution effects. The session also presents indicator metrics from partner countries and examines challenges around data availability, generalisability, governance, and opportunities for national implementation.



15:00-15:30 - HEALTH BREAK

ROUNDTABLE**Post-COP30 (Belem) UNFCCC Meeting and the Belem Health Action Plan****Moderator / Chair****Dr Samuel Dotse:** HATOF Foundation, Ghana**Theme****Leveraging support for climate-health interactions for policy decision-making.****Speakers:***Aaron Christian* [Regional Institute for Population Studies, University of Ghana, Legon, Ghana]*Bernice Ofosu-Baadu* [Ghana Statistical Service, Accra, Ghana]*Delali Benjamin K. Dovie* [Regional Institute for Population Studies, University of Ghana, Legon, Ghana]**15:30-17:00****Venue [Auditorium]****BACKGROUND**

Climate change presents urgent and complex challenges for health, ecosystems, and sustainable development, particularly in the Global South, where vulnerabilities are high, and data systems remain fragmented. Despite growing evidence linking climate impacts to health outcomes and environmental degradation, from heat-related mortality to deforestation and biodiversity loss, many national data and policy frameworks still lack the capacity to systematically integrate these insights for informed decision-making. This Roundtable will highlight Ghana's leadership in developing integrated, data-driven approaches to climate action that link health, environment, and sustainable livelihoods. It will highlight innovations in climate-health data systems and the role of nature-based solutions in accelerating the implementation of Ghana's NDCs and strengthening resilience across sectors. This event aligns with COP30's theme, "Climate and Biodiversity for a Just Transition."



**ABOUT****LANCET COUNTDOWN
AFRICA REGIONAL CENTRE**

Tracking Africa's Climate and Health Future



Established on 22 April 2025, the Lancet Countdown Africa Regional Centre exists to strengthen African-led evidence at the intersection of climate change and health. The Centre is headquartered at Future Africa at the University of Pretoria in South Africa and is one of five regional centres within the global Lancet Countdown network. It generates locally grounded, policy-relevant research that African communities and policymakers urgently need.

**WHY THIS MATTERS**

Africa faces some of the most severe health impacts of climate change, despite contributing the least to global greenhouse gas emissions. Rising temperatures, floods, droughts, food insecurity, climate-sensitive diseases and increasing pressure on health systems already affect communities across the continent.

**OUR WORK**

The Centre develops Africa-specific climate and health indicators and contributes findings to the annual Lancet Countdown global report published in *The Lancet*. It works collaboratively with researchers, academic institutions and policymakers across the continent to bridge science, policy and society. Our focus areas include:

- Advancing Africa-specific climate and health indicators
- Supporting evidence-informed policy and decision-making
- Strengthening collaboration between science, policy and society
- Building research capacity for early- and mid-career African scholars
- Promoting resilient, equitable and health-centred climate responses
- Convening African researchers and institutions working on climate and health

CONTACT USwww.lancetcountdown.org/africa | africa@lancetcountdown.org

**DAY 2****WEDNESDAY, 17TH JUNE 2026****Early MORNING [09:00 – 10:30] MTSC Second Floor**

OSE-01	Climate-Driven Health Outcomes I
MODERATOR	Dr. Alice Karanja: African Population and Health Research Center (APHRC), Nairobi, Kenya
VENUE	Room 6209 (2nd Floor)
OSE-01-01	Women's Representations of Heat-Related Health Risks in a Climate Vulnerable Coastal Community in Accra, Ghana <i>Vida Asah-Ayeh, Maame Adwoa Nyame Sam*, Thandi Kapwata, Lara Dugas, Ama De-Graft Aikins</i> [University of Ghana; South Africa Medical Research Council; University of Cape Town]
OSE-01-02	The 2024 Heatwaves in Ouagadougou: Health Burden, Community Perception, and Behavioural Response to Extreme Heat <i>Jérémie Namono*, Watton Rodrigue Diao, Mamadou Traoré, T. Serge Pacome Soubeiga, Christophe Tago, Kiswendsida Guigma</i> [Health Emergency Response Operations Center(CORUS); Burkinabe Red-Cross (CRBF); Red Cross Red Crescent Climate Centre (RCCC)]
OSE-01-03	The Impact of Climate Change on Sperm Viability <i>Samuel Kofi Arhin*, Isaiah Kofi Arhin, Precious Barnes</i> [School of Medical Sciences, University of Cape Coast, Ghana]
OSE-01-04	Health Implications of Climate Change in Small and Vulnerable Coastal Communities in Ghana <i>Forgive Awo Norvivor*, Nathaniel Annang Armah, Elijah Kwasi Peprah, Ruth Dzokoto, Abdul Fuseini Kwadja, Emily Bailey</i> [Department of Epidemiology and Biostatistics, Fred N. Binka School of Public Health-University of Health and Allied Sciences, Hohoe, Ghana; Accra School of Hygiene, Korle Bu; Department of Public Health, College of Pharmacy and Health Science, Campbell University]
OSE-01-05	Effects of Floods on Women's Access to Sexual and Reproductive Health Services in Kasese, Uganda <i>Muhereza Dancan*, Katusiime Annet</i> [Reproductive Health Uganda]
10:20-10:30	General Discussion & Conclusion
OSE-02	Climate Change, Food and Nutrition
MODERATOR	Prof. Olufunke Aduke Alaba: University of Cape Town, South Africa
VENUE	Room 6210 (2nd Floor)
OSE-02-01	Food Policies and Practices Shaping the Food Environment in the Low- and Middle-Income Countries in the Past 40 Years: A Scoping Review <i>Wendy Geza*, Trylee Nyasha Matongera, Nyabasi Makori, Geoffrey A. Asalu, Ee Von Goh, Festo Massawe, Maxwell Mudhara, Tafadzwanashe Mabhaudhi</i> [Centre for Transformative Agriculture and Food Systems, University of KwaZulu-Natal, Private Bag X01, Scottsville 3209, South Africa; School of Biological and Environmental Sciences, University of Nottingham Malaysia, Semenyih, Malaysia; Sokoine]
OSE-02-02	Climate Variability and Health Risk: Community-Lived Pathways Linking Environmental Change, Livelihood Disruption, and Health

**Vulnerability**

Charles Gyan, Jacob Kwakye, Ata Senior Yeboah* [School of Social Work, McGill University]

OSE-02-03 **Addressing Future Food Supply Gaps in the Gambia through Agricultural Adaptation to Climate Change**

Zakari Ali, Alcade C. Segnon, Tony Carr* [MRC Unit The Gambia at LSHTM, Banjul, The Gambia; International Center for Tropical Agriculture (CIAT); London School of Hygiene & Tropical Medicine]

OSE-02-04 **Impact of Climate Variability on Nutritional Security and Child Stunting**

*Bangomb Teclaire Amandine, Teda Soh Fossi Rodrigue Marcial** [International Union for the Scientific Study of Population(IUSSP); Union for African Population Studies (UAPS)]

10:20-10:30 **General Discussion & Conclusion**



10:30-11:00 - Snack & Health Break



Late MORNING [11:00 – 12:30] MTSC Second Floor

OSE-03 MODERATOR **Physical Science Basis**

Dr. Naomi Kumi: Department of Atmospheric and Climate Science, University of Energy and Natural Resources, Sunyani, Ghana

VENUE **Room 6209 (2nd Floor)**

OSE-03-01 **Effect of Nighttime Temperatures on Stroke Mortality in Burkina Faso: A Time Series Analysis**

Flavian Otieno, Moustapha Tall, Letisha Najjemba, Henry Owoko, Agnes Kiragga* [African Population and Health Research Center, Nairobi, Kenya; Committee on Data of the International Science Council-CODATA, Paris, France]

OSE-03-02 **Extreme Weather and the Sustainability of MNCH Service Delivery in Southern Ghana**

*Perfect Edinam Asamoah, Abigail Osei Owusu** [University of Nottingham, School of Medicine; Dodowa Health Research Centre, Ghana]

OSE-03-03 **Influence of Upwelling Systems and the West African Monsoon on Nitrogen-Containing Aerosol Particles around Cape Verde.**

Hamidou Mani Issa, Khanneh Wadinga Fomba* [Institute of Marine Engineering and Science (ISECMAR), Technical University of the Atlantic (UTA), WASCAL Programme, Cabo Verde; TROPOS, Leibniz Institute for Tropospheric Research, Leipzig, Germany.]

OSE-03-04 **Floods and Vector-Borne Diseases: Vulnerability of Health Facilities in Precarious Neighbourhoods of Douala.**

*Noupeu Maurice Magloire, Teda Soh Fossi Rodrigue Marcial** [Green Horizon; Union for African Population Studies (UAPS)]

12:20-12:30 **General Discussion & Conclusion**



IPN-01	Climate-Health Indicators (SOSCHI)
MODERATOR	Dr Desmond Klu: Institute of Health Research, University of Health and Allied Sciences, Ho, Ghana
VENUE	Room 6210 (2nd Floor)

This panel brings together four studies examining climate-health interactions across Sub-Saharan Africa, with a particular focus on Ghana. The presentations explore how rising temperatures and extreme weather events drive childhood undernutrition, cerebrospinal meningitis, and diarrhoeal disease, revealing pathways through WASH, vegetation cover, dust, humidity, and seasonal rainfall patterns. Collectively, the studies apply advanced statistical methods including structural equation modelling, spatiotemporal Bayesian frameworks, and distributed lag nonlinear models to generate actionable, policy-relevant evidence. The panel also highlights the SOSCHI project's open-source Climate-Health R package and platform, offering National Statistical Offices a harmonised and accessible toolset for producing official climate-health statistics and supporting evidence-based adaptation policy across diverse settings.

- IPN-01-01 **Open-Source Tools for Operationalising Harmonised Official Statistics on Climate-Health in Low-Resource Settings**
*Kenechi Omeke** [Office for National Statistics, UK]
- IPN-01-02 **Climate-Driven Diarrhoeal Risk in Young Children in Ghana: Toward Standardised Reporting for Official Climate-Health Statistic**
*Etse Yawo Dzakpa**, *Mouhamadou Bamba Sylla*, *Lema Logamou Seknewna*, *Mawuli Dzodzomenyo*, *Duah Dwomoh*, *Marta Blangiardo*, *Monica Pirani*, *Masahiro Hashizume*, *Maquins Odhiambo Sewe*, *Vijendra Ingole* [African Institute for Mathematical Sciences Research and Innovation Centre (AIMS RIC), Rwanda; School of Public Health, University of Ghana, Legon, Accra, Ghana; Imperial College London, UK; The University of Tokyo, Japan; Department of Epidemiology]
- IPN-01-03 **Climate Variability and Childhood Nutrition in Ghana: Emerging Evidence and Pathways**
*Aaron Kobina Christian**, *Eric Afful-Dadzie*, *Desmond Klu*, *Vijendra Ingole*, *Delali Benjamin K. Dovie*, *Myer Glickman* [Regional Institute for Population Studies University of Ghana, Legon-Accra, Ghana. P.O. Box LG 96; Department of OMIS University of Ghana Business School, Accra, Ghana; Institute of Health Research]
- IPN-01-04 **Forecasting Meningitis Risk with Short and Long Run Dust-Climate Effects: Evidence from Ghana**
*Daniel Kwabena Twerefou**, *Eric Afful-Dadzie*, *George Wak*, *Reuben Kwao*, *Myer Glickman*, *Benjamin Delali Dovie* [Department of Economics, University of Ghana; University of Ghana Business School; University of Health and Allied Sciences; Office of National Statistics, UK; Regional Institute for Population Studies, University of Ghana]

12:20-12:30 **General Discussion & Conclusion**



12:30-13:30 - Lunch Break

**Early AFTERNOON [13:30 – 15:00] MTSC Second Floor**

OSE-04 Climate-Driven Health Outcomes II
MODERATOR Prof. Fidelia N.A. Ohemeng: Department of Sociology, University of Ghana, Legon, Ghana
VENUE Room 6209 (2nd Floor)

OSE-04-01 **Heat-Induced Neonatal Mortality and Inequities in Relative Vulnerabilities in Ghana: A Modelling Study; 2008–2025**
*Duah Dwomoh**, *Mawuli Dzodzomenyo*, *Monica Baaba Jones*, *Frances Amonoo Mccarthy*, *Ama Frimpomaa Boateng* [School of Public Health, University of Ghana]

OSE-04-02 **Socioeconomic Impacts of Flooding in West Point, Greater Monrovia, Liberia: Assessing Vulnerabilities and Resilience Strategies**
Luther P. Whian, *Samuelina Siipara Arthur*, *Benice Naa Amarteley Gemdzi**, *Michael Agula* [Regional Institute for Population Studies, University of Ghana]

OSE-04-03 **Heat Exposure, Healthcare Disruption, and Neonatal Mortality in Ghana: Evidence for Parallel Climate–Health Pathways**
*Vincent Bio Bediako** [University of Pennsylvania-Max Planck Institute for Demographic Research]

OSE-04-04 **Understanding the Health Effects of Climate Change on Older Adults in Ghana's Upper West Region**
*Joseph Asumah Braimah** [Department of Public Health, St. Lawrence University, Canton, NY, USA]

14:50-15:00 **General Discussion & Conclusion**

OSE-05 Climate-Driven Disease Transmission
MODERATOR Dr. Oksana Ryabinina: School of Medical Sciences, University of Cape Coast, Cape Coast, Ghana
VENUE Room 6210 (2nd Floor)

OSE-05-01 **Network Curvature Reveals Climate-Sensitive Transmission Pathways for Influenza Control in High School Contact Networks**
*Oladimeji Samuel Sowole**, *Nicola Luigi Bragazzi*, *Geminpeter A. Lyakurwa* [The Nelson Mandela African Institution of Science and Technology, Arusha, Tanzania; African Institute for Mathematical Sciences, Research and Innovation Centre, Kigali, Rwanda]

OSE-05-02 **Climate Change and Malaria: Knowledge and Perceptions among Local Communities in Dar es Salaam, Tanzania**
*Iddi Mapande**, *Hussein Mohamed*, *Jovine Bachwenkizi*, *January G. Msemakweli*, *Oscar Punguti*, *Rajendra P. Shrestha* [Department of Environmental and Occupational Health, School of Public Health and Social Sciences, Muhimbili University of Health and Allied Sciences; Department of Epidemiology, Bloomberg School of Public Health, Johns Hopkins University; Department of Medical Sciences and Technology, Mbeya University of Science and Technology; Faculty of Food, Agriculture and Natural Resources, Asian Institute of Technology]

OSE-05-03 **Climate-Driven Flooding and Wash Failure in IDP Camps: Cholera and Malaria Risks in North-East Nigeria**
*Michael Kutte**, *Gambo Tumba*, *Wesley Markus* [Modibbo Adama University, Yola; Adamawa State University, Mubi; Yobe State University]

**OSE-05-04 Climate-Driven Urban Heat Island Intensification and Thermal Exposure Risk in Peri-Urban Ghana.**

*Joseph Oduro Appiah, Richard Larbie** [Department of Geography, Bucknell University, Lewisburg, USA; Department of Geography and Rural Development, Faculty of Social Sciences, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana]

14:50-15:00 General Discussion & Conclusion**15:00-15:30 - HEALTH BREAK****Late AFTERNOON [15:30 – 17:00] MTSC Second Floor****IPN-02 Climate change, Social Protection, and Population Wellbeing in North-Western Ghana**

MODERATOR **Dr. Elijah Bisung:** School of Kinesiology and Health Studies, Queen's University, Kingston, Ontario, Canada

DISCUSSANTS Myles Ongoh, Isaac Mensah-Addo, and Joseph Asumah Braimah

VENUE **Room 6209 (2nd Floor)**

Social protection could act as a vital tool for adapting to climate change by strengthening resilience and protecting vulnerable populations from shocks like floods, droughts, and crop failures. In this session, we showcase empirical evidence on the complex relationships between social protection and population wellbeing and women's empowerment in the face of climate-related shocks and environmental stressors, using Ghana's LEAP as a case study. This session examines how social protection supports climate resilience, population wellbeing and women's empowerment amid environmental shocks, drawing on evidence from Ghana's LEAP program. Target audience: policymakers, development and public health practitioners, researchers, NGOs, gender advocates, and students interested in climate resilience, poverty reduction, public health, and policy.

IPN-02-01 Improving Water Security Through Social Protection: Findings from a Natural Experience with Ghana's Livelihood Empowerment Against Poverty (LEAP) Program

Elijah Bisung, Urbanus Azupogo* [School of Kinesiology and Health Studies, Queen's University, Kingston, Ontario]

IPN-02-02 Modelling Predictors of Physical and Mental Health among Cash Transfer Beneficiaries and Non-Beneficiaries in Resource-Limited Settings: Findings from Ghana's LEAP

David Adedia, Mavis Pearl Kwabla, Martin Ayanore, Urbanus Azupogo, Elijah Bisung* [School of Basic and Biomedical Sciences, University of Health and Allied Sciences, Ho, Ghana; Queen's University, Kingston, Ontario, Canada; Fred N. Binka School of Public Health, University of Health and Allied Sciences, Ho, Ghana]

IPN-02-03 Predictors of Food Insecurity among Households in Ghana: Comparison of Livelihood Empowerment Against Poverty (LEAP) Beneficiaries and Non-Beneficiaries

Mavis Pearl Kwabla, David Adedia, Martin Ayanore, Urbanus Azupogo, Elijah Bisung* [Fred N. Binka School of Public Health, University of Health and Allied Sciences, Ho, Ghana; Queen's University, Kingston, Ontario, Canada]

IPN-02-04 'I Receive Free Money Yet Cannot Afford Water': Linking Cash Transfers to Improved Water Security in Northern Ghana



*Ophelia Soliku**, *Mildred Molle*, *Elijah Bisung* [Department of Community Development, University of Business and Integrated Development Studies, Wa, Ghana; Department of Geography and Environment, University of Western Ontario, London, Ontario, Canada; School of Kinesiology and Health Studies, Queen's University, Kingston, Ontario]

IPN-02-05 **The Impact Doesn't Matter: Neighborhood Ties and Relocation Intentions of Residents in Flood-prone Locations in Two Ghanaian Cities**

*Vincent Z. Kuuire**, *Irenius Konkor*, *Ebenezer Dassah*, *Yaw Agyeman Boafo*, *Elijah Bisung*, *Florence Dery*, *Ibrahim Abdul-Salam*, *Urbanus W. Azupogo*, *Divine K. Ahadzie* [Department of Geography, Geomatics & Environment, University of Toronto Mississauga, Canada; Department of Global & International Health, School of Public Health, Kwame Nkrumah University of Science and Technology, Ghana; Center for Climate Change & Sustainability Studies, University of Ghana, Ghana; Department of Africana Studies, University of Tennessee, Knoxville, USA; Department of Geography and Planning, University of Toronto, Canada; Center for Settlement Studies, Kwame Nkrumah University of Science and Technology, Ghana]

IPN-02-06 **Cash Transfers and Women's Empowerment in the Context of Climate Change among Extremely Poor Households in Ghana**

*Maame Addai**, *Mildred Moller*, *Elijah Bisung* [School of Environmental Studies, Queen's University; Department of Geography, University of Western Ontario; School of Kinesiology and Health Studies, Queen's University]

16:50-17:00 **General Discussion & Conclusion**

SYMPOSIUM MODERATOR	Climate, Healthcare Systems & Infrastructure in Ghana (SOSCHI) Prof. Peter Agyei-Baffour: School of Public Health, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana
VENUE	Room 6210 (2nd Floor)

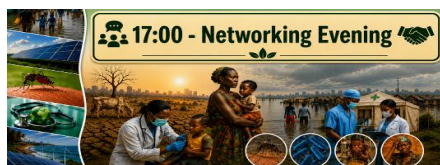
SYMP-01 **Capturing the Quantitatively "Unmeasurable": Agenda-setting for Climate-Healthcare Systems Indicators in Ghana**
Delali Benjamin K. Dovie [Regional Institute for Population Studies, College of Humanities, University of Ghana, Ghana]

SYMP-02 **Methodological Journey into Climate and Health Systems Research**
Lois Antwi-Boadi [Regional Institute for Population Studies, College of Humanities, University of Ghana, Ghana]

SYMP-03 **Impacts of Climate Change on Ghana's Healthcare Systems**
Margaret Appiah [Department of Environment and Public Health, University of Environment and Sustainable Development, Somanya, Ghana]

SYMP-04 **Policy Perspectives of Climate Change and Healthcare Systems Interactions**
Wilhemina Quaye [Science and Technology Policy Research Institute, Council for Scientific and Industrial Research, Accra, Ghana]

16:30-17:00 **General Discussion & Conclusion**





SOSCHI

Standards for Official Statistics on
Climate-Health Interactions



The aims

- develop an international statistical framework for official reporting of climate impacts on health
- develop a global reporting and knowledge-sharing platform



Get involved!

We're looking for:

- health and climate experts to join our advisory groups
- statistics and public health stakeholders to review and test the indicators
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DAY 3 THURSDAY, 18TH JUNE 2026

Early MORNING [09:00 – 10:30] MTSC Second Floor

OSE-06	Mental Health & Psychosocial Well-being I
MODERATOR	Dr. Lily Kpobi: Regional Institute for Population Studies, College of Humanities, University of Ghana, Legon, Ghana
VENUE	Room 6209 (2nd Floor)
OSE-06-01	<p>Perception of the Influence of Climate Change on Mental Health and Psychological Wellbeing of Undergraduates <i>Nelson Aderemi Oyewo*</i>, <i>Lawrence Olagoke Adika</i> [Department of Special Education & Guidance & Counselling, Faculty of Specialised & Professional Education, Emmanuel Alayande University of Education, Oyo, Oyo State, Nigeria]</p>
OSE-06-02	<p>Climate Change, Displacement and Mental Health in Africa: A Social Work Perspective on Psychosocial Well-Being <i>Christopher Bolawa Olapade*</i> [Social Work Department, Emmanuel Alayande University of Education, Oyo, Oyo State, Nigeria]</p>
OSE-06-03	<p>Beyond Exposure: Climate Hazard Impacts on Subjective Well-Being in Coastal Ghana <i>J. H Dzeble*</i>, <i>S. N. A Codjoe</i>, <i>M Abu</i> [Regional Institute for Population Studies, University of Ghana]</p>
OSE-06-04	<p>Climate Pressures and Social Media: Double Whammy for Mental Health - Eco-Digital Mindfulness-Based Interventions <i>Ayotunde Oyedele Oyediran</i>, <i>Olugbenga Oladapo Ayena*</i>, <i>Adekola Oyebamiji Adeyemo</i> [Emmanuel Alayande University of Education, Oyo, Oyo State, Nigeria]</p>
10:20-10:30	General Discussion & Conclusion

IPN-03	Addressing climate vulnerability through nature-based solutions using transdisciplinary engagement with wetland communities (AV-STEC)
MODERATOR	Prof. Charlotte Wrigley-Asante: Department of Geography and Resource Development, University of Ghana, Legon, Ghana
VENUE	Room 6210 (2nd Floor)

Climate change is causing considerable harm to humans, with many communities within the Black and White Volta basins contending with flood and other climate related challenges, just as the environments in these communities are facing intense pressure from land use changes, livelihood demands, and the erosion of traditional conservation practices. These dynamics undermine the livelihoods and ultimately, the well-being of riparian and other communities in complex ways. This session presents findings from the AV-STEC project which addresses issues of climate change, and associated vulnerabilities, in rural communities along the wetlands and riparian zones of the Black and White Volta basins in Ghana. The session seeks to highlight vulnerable groups exposure and overall actual flood experiences including mental health issues which warrants policy attention. It will also provide insights on the role of nature-based traditional conservation practices.



- IPN-03-01 **Gender Differences in Climate Vulnerability: Evidence from Selected Communities in the Black and White Volta Basins of Ghana**
*Charlotte Wrigley-Asante**, *Fidelia N.A. Ohemeng*, *Joseph Mensah*, *Kwasi Adjepong Darkwah* [Department of Geography and Resource Development, University of Ghana; Department of Sociology, University of Ghana; Department of Geography, York University, Canada; University of Ghana]
- IPN-03-02 **Spatio-Temporal Changes in Wetlands and the Role of Ecocultural and Socioeconomic Factors in Conservation along the Black and White Volta Rivers, Ghana**
*Enoch Fosu Atuahene** [Department of Geography and Resource Development, University of Ghana]
- IPN-03-03 **Flooding and Mental Health: A Study of Affected Communities along the White Volta Basin**
*Isaac Toe** [Department of Sociology, University of Ghana]
- IPN-03-04 **Gender Dimensions of Nature-Based Adaptation Strategies to Floods in Ghana's Wetlands**
*Anne Hawa Breh** [Centre for Climate Change and Sustainability Studies, University of Ghana]
- IPN-03-05 **The Impacts of the Bagre Dam Spillage on Biodiversity along Ghana's White Volta**
*Emmanuel Nii Attram Taye**, *Sandra Owusu-Gyamfi*, *Kofi Amponsah-Mensah*, *Christopher Gordon*, *Yaa Ntiamao-Baidu* [Centre for Biodiversity Conservation Research; Department of Animal Biology and Conservation Science; Ghana Wildlife Society]
- IPN-03-06 **Flood-Induced Changes in Water Quality and Aquatic Biodiversity along the White Volta River in Northern Ghana.**
*Alfred Vanderpuye** [Department of Animal Biology and Conservation Science, University of Ghana, Legon, Ghana]

10:20-10:30 **General Discussion & Conclusion**



10:30-11:00 - Snack & Health Break



Late MORNING [11:00 – 12:30] MTSC Second Floor

OSE-07 Mental Health & Psychosocial Well-being II
MODERATOR **Dr. Samuel Kofi Arhin:** School of Medical Sciences, University of Cape Coast, Cape Coast, Ghana
VENUE **Room 6209 (2nd Floor)**

- OSE-07-01 **Emotional and Psychological Impacts of Climate Change among Adolescents in Ghana**
*Oksana Ryabinina**, *Nicholas Ekow Thomford*, *Christian Kobina Ackom* [School of Medical Sciences, College of Allied Health Sciences, University of Cape Coast, Cape Coast, Ghana]
- OSE-07-02 **Climate Change, Mental Health, and Resilience Among Youth in Ghana: A Multi-Zone Longitudinal Mixed-Methods Study with Intervention**



*Queen Angela Norman**, *Annabella Osei-Tutu*, *Angela Gyasi-Gyamerah*,
Adote Anum [University of Ghana]

OSE-07-03 **Climate Stress, Food Insecurity and Mental Health in Kenya's Drylands**

*Alice Ruguru Karanja**, *Stepha McMullin*, *Elaine C. Flores*, *Frederick Wekesah*, *Esther Leah Anono*, *Bonventure Mwangi*, *Elizabeth Kimani-Murage* [African Population and Health Research Center (APHRC), Nairobi, Kenya; CIFOR-ICRAF / World Agroforestry, Nairobi, Kenya; London School of Hygiene & Tropical Medicine, London, UK]

OSE-07-04 **Characterizing the Effects of Climate Change on Health along the Volta Basin of Ghana: A Qualitative Study**

*Jessica Boateng**, *Frank Oppong Kwafo*, *Celestine Forfoe*, *Solomon Yabila*, *Christopher Mensah*, *Elvis Enowbeyang Tarkang*, *Mawuli Komla Kushitor* [Department of Population and Behavioural Sciences, F.N Binka School of Public Health. University of Health and Allied Sciences, Hohoe, Ghana; Department of Epidemiology and Biostatistics, F.N. Binka School of Public Health, University of Health and Allied Sciences]

12:20-12:30 **General Discussion & Conclusion**

OSE-08 MODERATOR	Data, Methods & Modelling Prof. Louis Asiedu: Experience: Department of Statistics and Actuarial Science, University of Ghana, Legon, Ghana
VENUE	Room 6210 (2nd Floor)

OSE-08-01 **Modelling Health Vulnerability under Climate Constraints: An Approach Using Urban AI and Administrative Data**
*Teda Soh Fossi Rodrigue Marcial** [Union for African Population Studies (UAPS)]

OSE-08-02 **Modelling Climate Change-Driven Heat Trends and Future Projections in the Greater Accra Metropolitan Area, Ghana**
*Clinton Sekyere Frempong**, *Dennis Kweku Mawuli Okyere*, *Patrick Addo*, *Hubert Amu* [School of Public Health, University of Ghana; Ruach Research Institute, Accra, Ghana; Fred Newton Binka School of Public Health, University of Health and Allied Sciences]

OSE-08-03 **Opportunities and Limitations of Integrating Machine Learning and Agent-Based Models for Climate Risk Modelling**
*Abdoul Rachid Moussa Soumaila** [West African Science Service Center on Climate Change and Adapted Land Use (WASCAL), Graduate Research Program on Climate Change and Disaster Risk Management, Université de Lomé, Lomé, Togo]

OSE-08-04 **Integrated Analysis of Social Media and Temperature Data to Characterize Thermal Sensitivity and its Health Implications in Abidjan (Côte D'Ivoire)**
*Iba Dieudonné Dely**, *Etienne Yao Kouakou*, *Madina Doumbia*, *Abdoulaye Tall*, *Matthew Chersich*, *Stanley Luchters*, *Brama Koné*, *Cissé Guéladio* [University Peleforo Gon Coulibaly, Korhogo, Cote D'Ivoire; Swiss Center for Scientific Research, Abidjan, Cote d'Ivoire; University Nangui Abrogoua; Witwatersrand University, Johannesburg, South Africa]

12:20-12:30 **General Discussion & Conclusion**



12:30-13:30 - Lunch Break

**Early AFTERNOON [13:30 – 15:00] MTSC Second Floor**

OSE-09 Transdisciplinary Topics
MODERATOR Prof. Samuel Agblorti: Department of Population and Health, University of Cape Coast, Cape Coast, Ghana
VENUE Room 6209 (2nd Floor)

- OSE-09-01 **Climate-Driven Water Scarcity and Disability: Gendered Time Poverty, School Dropout, and Health Impacts in Northern Nigeria**
*Michael Kutte** [Modibbo Adama University, Yola]
- OSE-09-02 **Tangent Topp-Leone Distributions for Advanced Modelling of African Climate-Driven Health Outcomes**
*Frimpong Kwadwo Adu-Agyei** [University of Health and Allied Sciences]
- OSE-09-03 **Assessing Nutrient Profile and Adequacy of Commercial Food Products Targeted at Children 0-36 Months in Ghana.**
*Louisa Amuzu-Kpeglo**, *Juliana Nyarsodzi* [University of Health and Allied Sciences]
- OSE-09-04 **Economic Instability and Mental Health Outcomes in a Low-Income Economy: Evidence from Malawi**
*Machiru Moyo**, *Gowokani Chijere Chirwa*, , *Chelina Kim*, *Esther Lee*, *Yeeun Cho*, *Sarah Oh*, *Arianna Gravatt*, *Rucy Won*, *Sung-Hyeon Yu* [Clinical Research Education and Management Services (CREAMS), P.O. Box 31045, Lilongwe, Malawi; Economics Department, University of Malawi P.O.Box 280 Zomba, Malawi; North-West University, Potchefstroom, South Africa]
- OSE-09-05 **A Review of Policies that Enhance Climate Adaptive and Resilient Communities in Ghana**
*Antoinette Tsiboe-Darko**, *Emmanuel Ameyaw* [Centre for Social Policy Studies, University of Ghana; Africa Centre for Nature-based Climate Action]

14:50-15:00 **General Discussion & Conclusion**

OSE-10 Adaptation, Early Warning, and Indigenous Knowledge
MODERATOR Dr. Pascalia Munyewende: Wits RHI, University of the Witwatersrand, Johannesburg, South Africa
VENUE Room 6210 (2nd Floor)

- OSE-10-01 **Machine Learning–Based Early Warning of Climate-Sensitive Diarrhea Risk in Rwanda**
*Thabita Nyiraneza**, *Ignace Kabano* [African Centre of Excellence in Data Science, University of Rwanda]
- OSE-10-02 **Development of an Artificial Intelligence Model for Early Warning of Cholera in Far North Cameroon.**
*Teda Soh Fossi Rodrigue Marcial** [Union for African Population Studies (UAPS)]
- OSE-10-03 **Living with Non-Communicable Diseases in a Changing Climate: Coping Strategies of Smallholder Farmers in Ghana**
Alhassan Siiba, *Joseph Kangmennaang**, *Leonard Baatiema*, *Isaac Luginaah* [School of Kinesiology and Health Studies, Kingston, Ontario Canada; Department of Health Policy, Planning and Management, School of Public Health, University of Ghana]



OSE-10-04 **Bridging Knowledge Systems: Indigenous Flood Adaptation in Ghana's New Policy Framework**

*Crystal Bubune Letsa**, *Roland Asare*, *Geoffrey Adebayo Asalu*, *Portia Adade Williams* [Council for Scientific and Industrial Research - Science and Technology Policy Research Institute, Accra; University of Health and Allied Sciences, Ho]

14:50-15:00 **General Discussion & Conclusion**



**PLENARY Lancet Countdown in Africa (LCA) / Standards for Official Statistics on Climate-Health Interactions (SOSCHI)****Metrics on Health and Climate Change-Related Hazards, Exposures, and Impact**

*Guéladio Cissé**, *Thandi Kapwata*, *the 2025 Lancet Countdown Author Group* [Centre Suisse de Recherches Scientifiques en Cote D'Ivoire (CSRS); South African Medical Research Council, South Africa; The Lancet Countdown Collaboration, UCL]

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Climate change is increasing the frequency and intensity of extreme weather events that are life-threatening. High ambient temperature and heatwaves increase morbidity and mortality in Africa, especially for vulnerable population groups such as children under 5 years, pregnant women and older people aged over 65 years. Using relevant data and sound methods, we estimate the direct impacts of climate change on health in Africa across different risk areas. These estimates are based on the 2025 report of the Lancet Countdown on Health and Climate Change and relate to impacts experienced in 2024. Globally, more than 30 heatwave days per year that were attributable to climate change occurred in 27 countries. Small Island Developing States, Africa, and Asia had the largest increases in heatwave exposure due to climate change. In 2024, adults older than 65 years (20.8 days per person) and infants younger than 1 year (20.5 days per person) experienced record-high exposure to heatwave days, representing a 304% increase in older adults and a 389% increase in infants compared with the 1986-2005 baseline average. In 2024, there was a record length of global coastline suitable for *Vibrio* transmission. Climate defined suitability for the transmission of potentially fatal dengue, West Nile virus, leishmaniasis, and tick-borne diseases continued to grow, as did the converted land area suitable for malaria. The increased incidence of heatwaves and droughts also led to a record number of people facing food insecurity. Climate change is rapidly escalating life-threatening effects on health in vulnerable populations including Africa that requires urgent attention.

Metrics on Adaptation, Planning and Resilience for Health

*Pascalina Ozida Munyewende**, *the 2025 Lancet Countdown Author Group* [Wits RHI, University of the Witwatersrand, Johannesburg, South Africa; The Lancet Countdown Collaboration, UCL]

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Even though Africa experiences extreme vulnerability to climate-change related events, adaptation to climate change in the continent has been slow and inadequate. With hazards set to continue growing even under the most ambitious climate change mitigation scenarios, urgent efforts to adapt systems, infrastructure, and communities are urgently needed to protect the health and survival of people today and in the future. Metrics here track the progress and challenges in assessing, planning, and delivering climate change adaptation for health; the conditions that facilitate health adaptation; and the changing vulnerabilities to adverse climate-related health outcomes - including national and city level assessments and preparedness. Vulnerability and adaptation assessments allow for a comprehensive understanding of the potential health risks and impacts associated with



climate change. They provide crucial information for decision makers, inform planning and intervention activities, and guide resource allocation. National-level adaptation planning and assessment remains slow which calls for attention of both national and city level governments to act to protect human health against climate change.

Metrics on Mitigation Actions and Health Co-benefits

*Mark Tomlinson**, *Victor Mogre*, *the 2025 Lancet Countdown Author Group* [Stellenbosch University, South Africa; University for Development Studies, Ghana; The Lancet Countdown Collaboration, UCL]

*markt@sun.ac.za

Despite the abundance of clean energy resources, half of Africa's population still does not have access to electricity. The African continent has the highest number of people facing energy poverty globally. Without immediate and sustained action, the capacity to adapt will be exceeded and climate impacts will continue to grow. Metrics here track progress on the energy transition that defines both greenhouse gas emissions and health outcomes: the potential health co-benefits from improved air quality; the health opportunities of transitioning to low-emission food systems and diets; tree cover loss, which is vital due to its impact on carbon sinks, respiratory health, and zoonotic disease risks. We find that global energy-related emissions grew by 1.6% during 2023, pushing associated CO₂ emissions to a new all-time high. But globally, the share in the use of modern renewable energy for electricity generation has concurrently continued to grow, from 5.5% in 2016 to a record-high 12.1% in 2022. The proportion of household energy coming from harmful solid biomass dropped from 28% in 2016 to 26% in 2022; however, 88% of energy in low resourced countries and 64% of energy in medium resourced countries still came from solid biomass in 2022. With increasing use of clean household energy, deaths attributable to ambient PM_{2.5} from fossil fuel combustion decreased by 5.8%, from 2.68 million deaths in 2010 to 2.52 million deaths in 2022. Global agricultural greenhouse gas emissions increased by 36% from 2000 to 2022, with red meat and dairy responsible for 55% of agricultural emissions in 2022 - mainly driven by production and consumption in high income countries. Targeted mitigation actions have the potential to protect human health and offer other environmental co-benefits.

Metrics on the Economics and Finance of Climate Change and Health

*Olufunke Aduke Alaba**, *Maxwell Mudhara*, *the 2025 Lancet Countdown Author Group* [University of Cape Town, South Africa; University of KwaZulu-Natal, South Africa; The Lancet Countdown Collaboration, UCL]

*olufunke.alaba@uct.ac.za

The economic costs of climate change on health and other sectors of developing economies are substantial and hinder the attainment of the SDGs and other regional agendas. Physical damages and sectoral disruptions, particularly in agriculture and tourism, are driving direct economic losses, while health-related impacts reduce labour productivity and increase health-care costs. We monitor the economic losses associated with delayed climate change action, which further undermine the socioeconomic conditions foundational to good health.



In 2024, weather-related extreme events caused \$304 billion in global economic losses, a 58.9% increase from the 2010-14 annual average representing 0.27% of global GDP, and of which 55.7% were uninsured losses in predominantly low- and middle-income countries. The average annual monetised costs of global heat-related mortality for those older than 65 years for 2020-24 were \$261 billion, an increase of 208% from 2000-04. In 2022, the monetised value of air pollution-related mortality was \$4.84 trillion, equivalent to 4.7% of global GDP. Heat exposure can make work less productive or more dangerous. In 2024, labour capacity reduction due to heat exposure led to \$1.09 trillion in global potential income losses, 39% of which occurred in the agricultural sector. Investments in adaptation and mitigation actions could be an avenue to prevent climate-related losses and facilitate sustainable growth across the world, especially in Africa where the majority of such losses occur.

Public and Political Engagement with Health and Climate Change

*Elizabeth Wambui Kimani-Murage**, *Alice Ruguru Karanja*, *the 2025 Lancet Countdown Author Group* [African Population and Health Research Center (APHRC), Kenya; The Lancet Countdown Collaboration, UCL]
*ekimani@aphrc.org

Climate change adaptation and mitigation policies are needed to address climate change and simultaneously deliver major benefits for people's health. This requires key societal actors at all levels of governance—including governments, corporations, civil society, communities and the wider public—to engage and advocate to put health at the forefront of climate change actions. Here, metrics track engagement with health and climate change by actors in the public and political domain on whom the transition to a net zero and healthy future depends. We also track engagement by the media, scientists, civil society actors, the public, governments, international organisations, and corporations. We find that, in 2024, 24.8% of climate change articles mentioned health, up from 23.5% in 2023; however, average coverage of health and climate change across sources fell by 15%, from 204 articles per news source to 173 articles per news source. Individuals' proactive engagement with health and climate change is also increasing, with the average global Google search index increasing from 49.4 in 2023 to 59.9 in 2024, with the world's most affected countries dominating the trend. Scientific evidence on health and climate change is also increasing. In 2024, the number of scientific articles on health and climate change published declined by 2.2% compared with 2023 but remained higher than for every other year. However, government engagement with health and climate change continued to decrease in 2024, with only 30% of countries mentioning health and climate change in their UN General Debate statement, down from 62% in 2021. For effective policies and action on adaptation and mitigation to protect human health, governments, corporations, civil society, and the wider public need to increase awareness and engagement with health and climate change.

An International Framework for Official Statistics Measuring Climate-Driven Health Outcomes

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The Standards for Official Statistics on Climate-Health Interactions (SOSCHI) project has developed a framework of recommended indicators and tools for monitoring the impacts of climate on population health and a range of health outcomes, to better inform policy and public health measures and develop adaptation strategies. SOSCHI is a four-year project (2022-2026) funded by Wellcome, in collaboration between the UK Office for National Statistics (ONS), the African Institute for Mathematical Sciences (AIMS) Rwanda, the Regional Institute for Population Studies (RIPS) in Ghana, and other international partners. This is one of two complimentary talks on the SOSCHI project. This session will launch the framework and focus on the climate-driven health outcomes covered, presenting the final scope of selected topics and indicators. While the framework covers a range of outcomes, there are six priority selected indicators, which have been endorsed by the UN Statistics Commission, to be included in the Global Set of Climate Change Statistics and Indicators. The priority SOSCHI Framework indicators focus on heat- and cold-related mortality, mental health and extreme temperature, health effects of extreme weather events (wildfire PM2.5), water- and vector-borne diseases, and health effects of air pollution (PM2.5). We will reflect on the theoretical and practical development of the framework, including information on proposed indicators and statistical methodologies, with examples of indicator metrics based on data within partner countries. We will highlight challenges encountered in areas such as generalisability, data accessibility and availability, method testing and governance. The observed opportunities and obstacles to national implementation will also be outlined.

ROUNDTABLE Post-COP30 (Belem) UNFCCC Meeting and the Belem Health Action Plan

Climate change poses escalating risks to human health, ecosystems, and sustainable development, particularly in the Global South, where climate vulnerability intersects with persistent inequalities including data paucity. Despite growing evidence linking climate hazards to adverse health outcomes, including heat stress, vector-borne diseases, food insecurity, and flood-related injuries, many countries continue to face challenges in generating integrated evidence to inform policy and investment decisions. This Roundtable highlights Ghana's leadership in advancing climate-health intelligence through the Standards for Official Statistics on Climate-Health Interactions (SOSCHI) initiative and interoperable data repository platforms. It explores approaches for harmonising climate, health, and environmental datasets, strengthening institutional coordination, and embedding climate-health indicators within official statistical systems to support evidence-based adaptation and resilience planning. The Roundtable aligns with the Belém Health Action Plan and COP30's theme, emphasising the importance of climate-resilient health systems, equitable access to health services, nature-based solutions, and integrated surveillance mechanisms that connect environmental change with population health outcomes. Thus, fostering collaboration among statistical agencies, health institutions, policymakers, researchers, and development partners, identifying practical pathways for translating climate-health evidence into action.

**OSE-01 Climate-Driven Health Outcomes I****OSE-01-01 Women's Representations of Heat-Related Health Risks in a Climate Vulnerable Coastal Community in Accra, Ghana**

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Extreme heat events are increasing in frequency, severity, and duration, threatening human health. Densely populated coastal communities such as Ga-Mashie, in Accra, Ghana, are particularly vulnerable to extreme heat exposure. This qualitative social psychological study explores Ga Mashie women's perspectives of (extreme) heat exposure and coping and adaptive strategies. Four focus group discussions (FGDs) and 12 situated conversations were conducted with 32 women aged 18-65, in the local Ga language. Notes were taken of the conversations. The discussions were audio recorded and transcribed. The data was analysed thematically using 'local knowledge' as an overarching framework. Interpretation was informed by social representations theory which allowed examination of sources, content and functions of knowledge. Participants had nuanced local knowledge and understandings of the drivers of extreme heat events and impact on their health. They attributed extreme heat events to a range of natural, social and structural factors including prolonged sunshine, deforestation, urbanisation, poor ventilation and commercial cooking. They drew their knowledge from traditional beliefs on ecology, community experiences of housing and lived experiences of extreme heat. Physical health conditions (such as skin diseases, headaches, fatigue and irregular periods) and psychosocial health problems (such as irritability, anxiety, sleep disorders, relational tensions) were associated with extreme heat. Coping/adaptation strategies included drinking more water, wearing lighter clothing, using fans and sleeping outdoors, but these came with financial and other costs. We discuss the implications of these findings for building 'heat health competence' among women and girls in the community.

OSE-01-02 The 2024 Heatwaves in Ouagadougou: Health Burden, Community Perception, and Behavioural Response to Extreme Heat

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Heatwaves are an emerging public health threat in the Sahel countries. In Burkina Faso, the 2024 heat period saw record-breaking temperatures and a sharp rise in heat-related illness and deaths. This study aimed to assess the health impact of this heatwaves in Ouagadougou. We conducted a mixed-methods, cross-sectional study in 2024. Mortality data were collected from two main teaching hospitals. In parallel, a community survey was administered to 1,717 residents across 26 urban neighbourhoods of the city of Ouagadougou using digital questionnaires via KoboToolbox. Weather data were sourced from the national meteorological agency. Data were processed using Epi Info, Stata and R. Three mortality peaks coincided with heat waves exceeding 43°C, the threshold used for extreme heat wave in the city.



Excess deaths were recorded mainly among people aged 60+ (40.7%) and children under 5 (14.5%). Nearly half (49.2 %) had chronic diseases. The leading causes of death were stroke (12.9 %) sepsis (11.9 %), renal failure (10.2 %), and respiratory infections (9.9 %). Among surveyed residents, 93% recognised climate change as a real threat and 100% perceived the 2024 heat waves as exceptionally severe. 45% of respondents said they had noticed an increase in mortality rates in their local community. The main protective measures reported were drinking more water (94.5%), seeking shade (73.1%), and adjusting daily activities (14.1%). This study highlights both the health risks posed by heat and the vulnerability in urban context. It calls for reinforced early warning systems and community education.

OSE-01-03 **The Impact of Climate Change on Sperm Viability**

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Climate change is increasingly recognized as a major global health challenge with significant implications for human reproduction, particularly male fertility. This systematic review and meta-analysis examined the effects of climate-related environmental stressors on sperm viability and semen quality. Following PRISMA 2020 guidelines, studies published between 2015 and 2025 were identified through PubMed, Scopus, and Web of Science using predefined search terms related to climate change, sperm viability, male infertility, air pollution, oxidative stress, and temperature. Evidence from epidemiological, experimental, and observational studies across diverse geographic regions was synthesized to evaluate the impact of environmental exposures on sperm concentration, motility, morphology, and DNA integrity. Fifteen studies comprising more than 100,000 semen samples met the inclusion criteria. Meta-analysis demonstrated significant reductions in sperm concentration (pooled SMD = -1.12, 95% CI: -1.48 to -0.76) and sperm motility (pooled SMD = -1.78, 95% CI: -2.45 to -1.11) among populations exposed to climate-related stressors. The evidence consistently showed that both excessive heat and abnormally low temperatures adversely affect sperm quality, while concurrent exposure to elevated temperatures and air pollution further exacerbates reproductive damage, largely through oxidative stress-related mechanisms. Seasonal and regional variations were found to influence the magnitude of these effects, indicating population-specific vulnerabilities. By integrating evidence on temperature extremes, air pollution, and climate-related environmental stressors, this review provides a comprehensive assessment of the emerging threat posed by climate change to male reproductive health. The findings suggest that climate change may contribute to the growing global burden of male infertility and highlight the urgent need for targeted public health interventions, environmental mitigation strategies, and longitudinal research to safeguard reproductive health in a warming world.

**OSE-01-04 Health Implications of Climate Change in Small and Vulnerable Coastal Communities in Ghana**

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Climate change has resulted in increased sea levels and temperatures exacerbating the frequency of adverse weather events, particularly flooding. This has become a severe global issue, particularly affecting small and low-lying coastal communities. Low-and middle-income countries (LMICs) bear a disproportionate burden of these impacts. In Ghana, coastal communities face significant challenges due to climate change, including coastal erosion, flooding, and socioeconomic disruptions. In Ghana, coastal areas such as Ketu South face mounting challenges, including coastal erosion, flooding, and socioeconomic disruptions, exacerbating public health vulnerabilities. This paper reviewed and commented on the public health implications of climate exposure on vulnerable coastal communities in Ghana, focusing on the Ketu South area. This also included recent field observations on various climate-induced phenomena its unique impacts on indigenous communities, drawing on previous studies. Essentially, it explored the intersection between climate change and Sustainable Development Goals (SDGs) 3, 6, and 13. The major climate change impacts on Ghanaian coastal communities identified included flood-related accidents, property loss, and livelihood disruption. It highlighted water quality issues, including groundwater salinization and WASH facility destruction. Increased diarrheal infections and mental health problems were noted, with the vulnerable group who were disproportionately affected. The study revealed a lack of longitudinal data and insufficient community involvement in climate change interventions. The study advocates for locally appropriate strategies to build climate-resilient communities, emphasizing improved access to climate-resilient WASH facilities. It calls for innovative qualitative research to capture narratives from specific vulnerable groups, to address the mental and physical health impacts of climate disasters. A framework adapted from the WHO's SIDS initiative is proposed to protect vulnerable populations and coastal ecosystems. The study concludes that building climate-resilient communities is crucial for mitigating public health impacts.

OSE-01-05 Effects of Floods on Women's Access to Sexual and Reproductive Health Services in Kasese, Uganda

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Flooding, one of the most frequent and severe consequences of climate change, has become an increasingly serious challenge, especially in developing countries. In Uganda, Kasese District has been experiencing recurrent riverine and flash floods, which result in economic, social and geographical constraints limiting access to Sexual and Reproductive Health (SRH) services, particularly for women. This study examined the effects of flooding on women's access to SRH in Kasese District. The

study employed a mixed-methods approach, integrating both qualitative and quantitative techniques. For the qualitative component, 28 in-depth interviews were conducted with purposively selected participants, including health workers, technical staff from Kasese District and Kasese Municipality, the Ministry of Water and Environment (MWE), the Ministry of Health (MoH), and other implementing partner organisations. The quantitative component involved a cross-sectional survey using a structured questionnaire, administered to 192 respondents aged 15–49 years. The results indicated that both women’s education level and income were significantly associated with access to SRH services. Furthermore, flooding severely disrupted women’s access to SRH services through the destruction of health facility infrastructure, reported by 78% of respondents; compromised privacy, dignity and security reported by 61% of respondents; and interruption of community health outreaches, which integrate SRH, reported by 71% of respondents. The study seeks to demonstrate and broaden understanding of how women face challenges accessing SRH services amid climate disasters such as flooding. The study's results aim to inform policy improvements in health service accessibility amid climate disasters such as flooding. These findings highlight the need for the government, through the Ministry of Health (MoH), the Office of the Prime Minister (OPM), and other stakeholders, to prioritise the integration of comprehensive SRH service packages into flood preparedness and response mechanisms, as well as to strengthen health systems to protect essential health infrastructure and services from flood-related damage.

OSE-02 Climate Change, Food and Nutrition

OSE-02-01 Food Policies and Practices Shaping the Food Environment in the Low- and Middle-Income Countries in the Past 40 Years: A Scoping Review

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The rising burden of diet-related non-communicable diseases in low- and middle-income countries (LMICs) highlights the important role governments play through policy and regulation in creating an enabling environment that enhances and safeguards population health. This policy review assessed food policies that influence the food environment in LMICs and their role in shaping eating behaviours over the past 40 years, using Malaysia, Tanzania, Ghana, and South Africa as case studies. It focused on fiscal and regulatory policies, as fiscal policies are an influential lever for shaping dietary choices by directly affecting food affordability and accessibility, thereby nudging consumer choices. Of the 29 policies identified across countries and regions, only 10 have explicit fiscal components. Across countries, fiscal measures are concentrated in general VAT systems and targeted sugar-sweetened beverage (SSB) taxes, with limited use of broader, nutrition-sensitive food taxes or subsidies. Additionally, there is a lack of policy enforcement and compliance in the informal sector, which reinforces inequalities for low-income urban residents (whose food environments are dominated by

informal vendors), making them more vulnerable to undernutrition, obesity, and diet-related NCDs. While targeted measures, such as VAT exemptions on staples, can reduce access inequalities, they do not fully address gaps in diet quality or dietary diversity. Consequently, this limits policy effectiveness and highlights systemic governance challenges. These can be overcome by improving governance through platforms that facilitate multisectoral coordination, strengthening law enforcement (particularly in marketing and vendor practices), improving regulatory compliance, and investing in consumer awareness. This will ensure that interventions reach a wider demographic and address disparities across population groups.

OSE-02-02 **Climate Variability and Health Risk: Community-Lived Pathways Linking Environmental Change, Livelihood Disruption, and Health Vulnerability**

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Climate change is increasingly recognized as a major driver of population health risk in Africa, yet limited attention has been paid to the lived pathways through which climatic exposures translate into health vulnerability. This study examines how climate change is experienced and interpreted at the community level and how these experiences generate cascading risks to livelihoods, food and water security, and population health. Drawing on qualitative evidence from rural climate-affected communities, the findings reveal a marked breakdown of historically reliable weather systems, characterized by irregular rainfall, prolonged dry spells, extreme heat, and short, intense rainfall events. Participants described the loss of seasonal predictability as a fundamental disruption to ecological rhythms that once structured agricultural production and daily life. These climatic shifts are closely intertwined with environmental degradation driven by deforestation, land conversion, and extractive activities, creating feedback loops that intensify exposure to climate hazards. Agriculture emerged as the primary pathway linking climate change to population health risk. Erratic rainfall and rising temperatures have destabilized farming calendars, reduced crop germination and yields, and intensified food insecurity. These disruptions undermine household income, increase indebtedness, and erode nutritional security, with downstream implications for physical and mental health. Water scarcity further compounds vulnerability, as drying streams and shrinking water bodies threaten sanitation, disease prevention, and everyday survival. Beyond biophysical impacts, the study highlights the socioeconomic amplification of climate risk. Declining agricultural productivity reverberates through local economies, driving food price inflation, reducing market activity, and deepening poverty across farming and non-farming households. By centering community narratives, the study advances an integrated exposure–risk–outcome framework for climate–health research and policy in Africa, underscoring the need for interdisciplinary and community-informed approaches.

OSE-02-03 **Addressing Future Food Supply Gaps in the Gambia through Agricultural Adaptation to Climate Change**

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Food systems in West Africa are currently constrained by the dual pressures of demographic expansion and rising macroeconomic incomes, which concurrently elevate regional food demand. Simultaneously, anthropogenic climate change introduces severe environmental stochasticity, undermining predictable crop yields. To mitigate these risks, biophysical crop simulation models serve as critical diagnostic tools; they quantify agricultural productivity across diverse climate projections and evaluate the efficacy of targeted adaptation strategies. In this study, we modelled the projected food demand and assessed the extent to which climate adaptation alone could close the demand-supply gap in The Gambia. Even with aggressive climate adaptation, The Gambia is projected to still face a 50% food supply deficit by 2050. By modeling future food needs against rapid population growth and limited farmland, researchers found that strategies like using resilient crop varieties and shifting planting dates are simply not enough to close the gap. Under a "business-as-usual" scenario, the agricultural sector alone cannot produce enough food to keep up with the country's expanding demand. To prevent this looming crisis, policymakers need to shift focus toward more diverse solutions beyond the farm. There is now a critical need for investment in post-harvest handling to reduce waste, alongside the expansion of urban agriculture and more robust food import strategies. By addressing these infrastructure gaps now, The Gambia can build a more resilient food system that does not rely solely on traditional field crops.

OSE-02-04 **Impact of Climate Variability on Nutritional Security and Child Stunting.**

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In Cameroon, the persistence of chronic malnutrition highlights a worrying correlation with climate disruption. Beyond calorie availability, climate variability degrades the nutritional quality of crops and undermines rural incomes, jeopardising linear growth in children. Stunting thus becomes a silent marker of climate insecurity. This article explores the causal link between rainfall anomalies and anthropometric indicators. The objective is to quantify the impact of climate variability on the prevalence of stunting (height-for-age) in order to identify areas of priority nutritional vulnerability. The research combines microdata from the Demographic and Health Surveys (EDS-Cameroon) with time series of agricultural yields and national rainfall. The approach combines comparative descriptive analyses (Sahelian vs. forest areas) and explanatory econometric modelling. The latter isolates the effect of climate shocks on nutritional status by controlling for household socio-economic variables (education, standard of living). The study reveals a significant correlation between rainfall irregularity and micronutrient deficiency. Households experiencing more than two climatic shocks per year have a rate of child stunting that is 20% higher than the national average. The lean season is identified as the peak period of vulnerability, when the disconnect between food stocks and nutritional



needs is exacerbated by climatic hazards. This work breaks new ground by linking agrometeorology to social paediatrics to define the concept of 'climate-related stunting'. It recommends combining social protection with climate insurance schemes for producers and promoting biofortified crops that are resilient to heat stress.

OSE-03 Physical Science Basis

OSE-03-01 Effect of Nighttime Temperatures on Stroke Mortality in Burkina Faso: A Time Series Analysis

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Stroke is a climate-sensitive condition influenced by environmental stressors and a serious public health issue that significantly contributes to mortality in Sub-Saharan Africa. Although a few studies from temperate climates have established a link between nighttime temperature and an increased risk of stroke mortality, evidence from sub-Saharan Africa remains limited. This study quantifies the effect of nighttime temperature on stroke mortality in Burkina Faso during the cooler season, November to February. We used daily stroke mortality data from a population-based cohort in the Ouagadougou Health and Demographic Surveillance Site. Using a time-series analysis, specifically the Distributed Lag Non-Linear Model (DLNM), we assessed the association between nighttime temperature and stroke-related deaths across all ages and within age groups (under 65 and 65 and older), with lags of 0 to 14 days. Sex stratification analysis was also conducted to determine which sex is more vulnerable to nighttime temperature-related stroke mortality. We present the exposure-response relationships at both the lower and higher percentiles of the nighttime temperature distribution of the study area. We observed an increased risk of stroke mortality for all ages at lag 2 at 1st, 2.5th, and 5th percentiles (1st percentile: RR=1.19, 95%CI = 1.04 -1.36; 2.5th percentile RR=1.14, 95%CI = 1.03-1.20; 5th percentile RR=1.11, 95%CI = 1.02-1.20) and at lag 14 for 90th and 95th percentiles. Women showed a notably higher susceptibility to nighttime temperatures across all ages, including both age groups, compared to men. In age-stratified analyses, nighttime temperature was not significantly associated with stroke mortality in either group. Our findings reveal a significant burden of stroke-related deaths associated with nighttime temperature, which is likely to increase due to climate change, and thus, climate adaptation measures should be implemented, such as expanding the use of green space to safeguard vulnerable populations, particularly women, from stroke-related deaths.

OSE-03-02 Extreme Weather and the Sustainability of MNCH Service Delivery in Southern Ghana

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Extreme weather events are increasingly undermining the sustainability and resilience of health systems, particularly in low- and middle-income countries. While the impacts of climate change on maternal, newborn,



and child health (MNCH) outcomes are well documented, less is known about how climate-related shocks affect the delivery and continuity of MNCH services at the primary care level. Evidence from healthcare workers remains limited, despite their central role in sustaining essential services during environmental disruptions. This exploratory qualitative study draws on 18 in-depth interviews with primary healthcare providers working in climate-vulnerable districts across Southern Ghana. Interviews were audio-recorded and transcribed verbatim. Data were analyzed thematically using a hybrid deductive–inductive approach, guided by the World Health Organization’s Climate Change and Health Vulnerability and Adaptation Framework. Findings reveal widespread service delivery disruptions, including suspension of outreach activities, reduced facility attendance, and delays in antenatal and child welfare services during periods of heavy rainfall and flooding. System fragility was evident through facility inaccessibility, cold-chain failures caused by power outages, and reliance on neighboring facilities for vaccine storage. In the absence of formal preparedness mechanisms, healthcare workers adopted informal coping strategies, including rescheduling services, using personal mobile phones during power outages, and relying on community volunteers to sustain outreach. Across sites, participants reported major preparedness gaps, including the absence of climate-specific standard operating procedures, limited training on managing extreme weather conditions, and weak institutional support. Findings highlight that primary MNCH service delivery in Southern Ghana is being sustained through improvised, short-term responses rather than planned, system-level resilience. Without deliberate investment in climate-resilient infrastructure, workforce preparedness, and operational guidance, MNCH services risk becoming increasingly unsustainable under escalating climate stress. Strengthening climate-resilient primary healthcare systems is therefore critical to protecting women and children and advancing equitable, sustainable health systems in a changing climate.

OSE-03-03 **Influence of Upwelling Systems and the West African Monsoon on Nitrogen-Containing Aerosol Particles around Cape Verde.**

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Cabo Verde, off the West African coast, lies at the convergence of the Canary Current upwelling system and the seasonal West African Monsoon, creating a unique setting for studying ocean-atmosphere interactions. Nitrogen aerosols, including particulate nitrate and ammonium, influence air quality, regional nutrient cycles, and potential climate-driven health risks, yet the relative contributions of oceanic upwelling and atmospheric transport remain poorly understood. This project investigates how seasonal upwelling and monsoon dynamics shape nitrogen aerosol concentrations and distribution around Cabo Verde. By combining satellite-derived sea surface temperature, chlorophyll-a, and wind data with atmospheric chemistry observations, the study will explore correlations between ocean nutrient availability and aerosol levels. Time-series analyses and spatial mapping will identify patterns of nitrogen aerosol variability linked to both oceanic and



atmospheric drivers. Preliminary inspection of data indicates that stronger upwelling may increase nutrient fluxes to the atmosphere, while monsoon winds influence aerosol transport and deposition. Understanding these processes is essential for evaluating potential respiratory health risks and integrating ocean-atmosphere dynamics into climate-health assessments. This research will inform monitoring strategies and adaptive measures to protect population health under escalating climatic pressures in West Africa.

OSE-03-04 **Floods and Vector-Borne Diseases: Vulnerability of Health Facilities in Precarious Neighbourhoods of Douala.**

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In Douala, informal urbanisation and climate change are exacerbating the vulnerability of precarious neighbourhoods. In these areas, health facilities (CSI, FOSA), which are key to crisis response, suffer from recurrent flooding. This situation compromises continuity of care and transforms facilities into ecological niches that promote vector proliferation, creating a 'double burden' on the health of disadvantaged populations. This article analyses the resilience of health facilities located in informal settlements. The aim is to assess their environmental and structural vulnerability in order to define adaptation priorities based on local climate risk. The study uses a mixed approach combining GIS mapping of flood-prone areas (Maképé-Missoké and Mabanda neighbourhoods), surveys on hospital sanitation, and malaria/dengue incidence data. The approach combines a descriptive analysis of the physical exposure of buildings with explanatory spatial modelling correlating the intramural vector disease burden with drainage system failure. The analyses reveal that 70% of the targeted FOSAs experience at least three floods per year, causing systematic interruptions in care. Larval density is five times higher than in structured neighbourhoods, correlated with a 45% increase in malaria cases among local patients. The study demonstrates that the precariousness of hospital buildings is the main determinant of the risk of nosocomial vector contamination. This work documents the 'double penalty' imposed by climate change on last-resort healthcare facilities. It proposes a vulnerability assessment model adapted to the context of urban precariousness in Africa. It recommends launching an emergency plan to raise vulnerable technical platforms and systematise community drainage management to secure healthcare provision.

IPN-01 Climate-Health Indicators (SOSCHI)

IPN-01-01 **Open-Source Tools for Operationalising Harmonised Official Statistics on Climate-Health in Low-Resource Settings**

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The Standards for Official Statistics on Climate-Health Interactions (SOSCHI) project has developed a harmonised framework of recommended indicators, methods and implementation tools for producing official statistics on climate-related health risks, to better inform policy and public health measures and develop adaptation strategies. SOSCHI is a four-year project (2022-2026) funded by

Wellcome, in collaboration between the UK Office for National Statistics (ONS), the African Institute for Mathematical Sciences (AIMS) Rwanda, the Regional Institute for Population Studies (RIPS) in Ghana, and other international partners. This is one of two complimentary talks on the SOSCHI project. This session will demonstrate two open-source tools: (1) the Climate-Health R package for local statistical production using national and subnational datasets, and (2) the Climate-Health Platform, which provides a web interface for non-technical users to access the R package. The SOSCHI framework can be accessed via the Climate-Health Platform. This is a knowledge-sharing platform, which offers the global statistical community a unified framework and open-source toolset designed to support consistent and scalable reporting on climate–health interactions. It provides methodological guidelines, indicator definitions, implementation pathways, and practical resources that help countries navigate common data and technical challenges in producing robust climate–health statistics. The SOSCHI toolset operationalises statistical and epidemiological frameworks relevant to official statistics production, including distributed lag non-linear modelling and case-crossover approaches for heat and mental health indicators, wildfire smoke analyses, and spatiotemporal INLA-based methods for malaria and diarrhoeal outcomes. It also includes a descriptive statistics module for pre-analysis diagnostics and data quality checks. This functionality lowers technical barriers by simplifying complex modelling steps, promotes harmonisation of approaches and ensures methodological transparency. For many National Statistical Offices, especially in low-resource settings, the open-source toolset offers an accessible entry point for operationalising indicators that previously required advanced expertise, enabling countries to focus on interpretation, planning, and policy action.

IPN-01-02 **Climate-Driven Diarrhoeal Risk in Young Children in Ghana: Toward Standardised Reporting for Official Climate–Health Statistic**

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Infectious diarrheal diseases are climate-sensitive and remain a significant public health concern among children under five years in Ghana. Understanding how climatic factors influence diarrheal disease is essential for informing effective interventions and adaptation strategies at national and subnational levels. This study applied a spatiotemporal Bayesian hierarchical modeling framework integrated with Distributed Lag Nonlinear Models (DLNMs) to estimate the relative risk (RR), attributable number (AN), and attributable rate (AR) associated with extreme temperatures and rainfall, using monthly district-level surveillance data from 261 districts (2013–2024) alongside ERA5 reanalysis climate data adjusted for humidity, surface runoff, and population structure. The analysis revealed that diarrheal risk increased noticeably in the two months following exposure to maximum



temperatures between 28°C and 32°C (peak RR: 1.016, 95% CrI: 1.012–1.021) and monthly rainfall between 100 and 394 mm (peak RR: 1.023, 95% CrI: 1.015–1.032), with protective effects observed outside these ranges, while an estimated 148,986 cases were attributable to nonoptimal climate exposures, comprising 79,803 cases (95% CrI: 53,280–109,415) linked to temperature and 69,183 cases (95% CrI: 47,405–91,301) linked to rainfall, corresponding to attributable rates of 16.42 (95% CrI: 10.95–22.55) and 14.19 (95% CrI: 9.72–18.73) per 100,000 population, respectively. Northern districts showed higher climate sensitivity, while some southern regions carried disproportionately high absolute burden due to larger populations and higher baseline incidence, seasonal attributable burden peaked between May and October coinciding with Ghana's main rainy season, and these findings demonstrate that the SOSCHI framework can be operationalized using routine surveillance and openly accessible climate data, offering a practical and reproducible pathway for integrating climate evidence into official health statistics and subnational adaptation planning.

IPN-01-03 **Climate Variability and Childhood Nutrition in Ghana: Emerging Evidence and Pathways**

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Climate change increasingly threatens child nutrition and health in Sub-Saharan Africa, where rising temperatures intersect with socioeconomic and environmental vulnerabilities. Understanding how climate stress affects child nutrition through intermediary mechanisms is essential for designing effective adaptation strategies. Using data from the Ghana Demographic and Health Survey (DHS) linked with high-resolution climate and environmental datasets, this study examined the association between mean cluster temperature and childhood undernutrition outcomes. Structural equation modelling was applied to test both direct and mediated pathways involving water and sanitation access (WASH), caregiving practices, and vegetation cover, while accounting for potential endogeneity and sociodemographic covariates. Higher mean ambient temperatures were significantly associated with increased risks of stunting, underweight, and anaemia among children under five. Mediation analysis revealed that WASH and caregiving practices explained approximately 9–11% and 7–12% of the total temperature–nutrition relationship, respectively. Vegetation cover also mediated 36% of the association, though with a negative indirect effect, suggesting complex ecological trade-offs and potential suppression effects. This study provides novel empirical evidence linking climate variability to childhood undernutrition through multiple environmental and behavioural pathways. Strengthening climate-resilient WASH systems, promoting gender-responsive caregiving support, and safeguarding vegetation resources are critical for building adaptive capacity and advancing progress toward SDGs 2, 3, and 13 in Ghana and similar climate-vulnerable settings.

**IPN-01-04 Forecasting Meningitis Risk with Short and Long Run Dust-Climate Effects: Evidence from Ghana**

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Cerebrospinal meningitis (CSM) remains a major health concern across the African meningitis belt, with Ghana positioned at its more humid margin but undergoing gradual “savannization,” in which formerly greener areas are becoming drier and more dust prone. While outbreaks align with dry-season conditions, few studies have separated short- and long-run climatic influences. Using region–month data for Ghana’s 16 regions (2010–2022), we applied negative binomial models with region and month fixed effects to assess short-term anomalies and long-term trends in dust, humidity, solar radiation, and wind. Short-run results show that dust surges sharply increase CSM incidence (Incidence Rate Ratio (IRR) ≈ 1.5 per standard deviation anomaly), whereas humidity anomalies suppress it (IRR ≈ 0.6). Dust effects intensified under very dry anomalies, revealing a compound hazard of “dust and dryness,” while solar radiation and wind further elevated risk. Long-run trends indicate protective effects of increasing humidity (IRR ≈ 0.08) and temperature (IRR ≈ 0.52), consistent with Ghana’s moistening climate, although dust trends remain uncertain. Strong temporal effects reflect vaccination gains and improved surveillance. These findings underscore the need for climate-informed early-warning systems integrating dust and humidity monitoring, supported by sustained vaccination, ecosystem restoration, and anti-desertification measures across Ghana’s transforming ecological zones.

OSE-04 Climate-Driven Health Outcomes II**OSE-04-01 Heat-Induced Neonatal Mortality and Inequities in Relative Vulnerabilities in Ghana: A Modelling Study; 2008–2025**

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Climate change poses an increasing threat to maternal, neonatal, and child health, yet evidence on how temperature-induced spikes affect neonatal mortality in sub-Saharan Africa remains limited. This study employed robust statistical models to quantify the impact of variations in maximum temperature on neonatal mortality and to identify high-risk burden communities across 261 administrative regions. We conducted a comprehensive longitudinal district-level panel analysis to robustly evaluate the impact of maximum monthly temperature on neonatal mortality in Ghana. We integrated two distinct detailed monthly data sources on health and climate from 261 districts spanning 2008 to 2025, which were modelled using Poisson, negative binomial, and quasi-Poisson models with deliveries as the exposure. Additionally, we generated counterfactual risk estimates under a median-maximum temperature scenario, underscoring the critical importance of climate considerations in neonatal health strategies. A one-unit increase in the combined maximum temperatures at lags 0–3 months is linked to a 9%

rise in neonatal mortality rates (incidence rate ratio 1.09, 95% CI 1.04 to 1.13). Temperatures above 28.2 °C are associated with significantly higher neonatal mortality rates than typical median temperatures. From 2008 to 2025, approximately 652 [95% CI: 516 to 788] neonatal deaths can be directly linked to exposure to temperatures above the median. The impact of temperature on neonatal mortality varied greatly across districts and regions, with the highest risk seen in Ghana's five northern regions, where median monthly temperatures consistently exceed the national average. Our study showed that higher temperatures are linked to hundreds of additional neonatal deaths from 2008 to 2025. It is crucial to prioritize targeted, heat-adaptive interventions, such as enhanced neonatal monitoring during hot months and early warning systems. Focusing efforts on high-exposure districts and regions can significantly reduce temperature-related neonatal fatalities and save lives.

OSE-04-02 **Socioeconomic Impacts of Flooding in West Point, Greater Monrovia, Liberia: Assessing Vulnerabilities and Resilience Strategies**

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Flooding is one of the most devastating natural hazards worldwide, causing significant socio-economic strain through infrastructure damage and livelihood disruption. Climate change is increasing rainfall and the frequency of flooding, particularly in Sub-Saharan Africa (SSA), which faces vulnerabilities due to rapid urbanization and reliance on rain-fed agriculture. West Point in Greater Monrovia exemplifies the challenges faced by coastal communities in Liberia, where rising sea levels and heavy rainfall worsen existing socio-economic issues. These environmental stresses heavily impact local fisheries, vital for livelihoods and food security, and contribute to increased poverty. Although the literature addresses the decline of fisheries and the risk of floods, it often overlooks how these combined risks affect community resilience and policy responses. This study analyzes academic and government reports to detail vulnerabilities and resilience in West Point. Using thematic analysis, it examines impacts on local livelihoods, food security, and social well-being. The article highlights adaptation efforts by residents, such as migration for better opportunities and adjustments in fishing practices. However, the community's resilience is fragile, being informal and underfunded, and constrained by non-compliance with zoning laws, inadequate disaster preparedness funding, and low community participation in urban planning. The review underscores the need for comprehensive resilience programs that extend beyond fisheries management, advocating for enhanced local institutions, significant investment in flood control infrastructure, and community involvement as first responders. It emphasizes coordinated actions to safeguard livelihoods and build resilience in Liberia's coastal settlements against climate change and socioeconomic stresses.

**OSE-04-03 Heat Exposure, Healthcare Disruption, and Neonatal Mortality in Ghana: Evidence for Parallel Climate–Health Pathways**

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Climate change poses a growing threat to maternal and child health in sub-Saharan Africa, yet the pathways linking heat exposure to infant survival remain poorly specified. This study examines how prenatal heat affects neonatal mortality in Ghana and whether heat simultaneously disrupts healthcare utilisation through temporally distinct mechanisms. I link birth histories from four rounds of the Ghana Demographic and Health Survey (2003–2022; $N \approx 21,800$ singleton live births) to ERA5-HEAT reanalysis data measuring the Universal Thermal Climate Index. Heat exposures are expressed as anomalies relative to location- and month-specific climatological baselines (1981–1996), centred within birth cohorts. Survey-weighted logistic regression models with ecological zone and cohort fixed effects estimate associations between trimester-specific heat and mortality, decomposed into neonatal and post-neonatal components. Healthcare pathway models use temporally matched exposures: pregnancy-level heat for antenatal care, and delivery-period heat for skilled birth attendance. Effect modification models test whether healthcare access buffers the biological impact of early-pregnancy heat. First-trimester heat anomaly is associated with elevated neonatal mortality (OR = 1.22, 95% CI: 1.02–1.47), with no corresponding association for post-neonatal deaths, consistent with a fetal developmental mechanism. Pregnancy-level heat significantly reduces skilled birth attendance (OR = 0.72, $p < 0.001$), facility delivery (OR = 0.78, $p < 0.001$), and continuum of care completion (OR = 0.79, $p = 0.004$). Classical mediation does not hold: first-trimester heat does not predict healthcare utilisation, and healthcare does not mediate the neonatal effect, because the biological damage precedes healthcare contact. The two pathways—biological damage from early-pregnancy heat and healthcare disruption from contemporaneous heat—operate in parallel. Heat exposure affects neonatal survival and healthcare access through distinct temporal mechanisms. Climate adaptation and health-system strengthening address different components of climate–health vulnerability and should be pursued as complementary rather than substitutable strategies.

OSE-04-04 Understanding the Health Effects of Climate Change on Older Adults in Ghana's Upper West Region

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Climate change represents a significant existential threat to populations in low- and middle-income countries (LMICs), including Ghana. Although a growing body of research has examined the impacts of climate variability on livelihoods and communities in Ghana, limited attention has been given to how climate change shapes the health and wellbeing of older adults, particularly within the Guinea Savanna agroecological zone where livelihoods are heavily dependent on subsistence rain-fed agriculture. This study employs a photovoice technique to explore older adults' (aged 60 years and above) perceptions of climate change and its



implications for their health and wellbeing. The research was conducted in Laderteng, located in the Wa West District of Ghana's Upper West Region, involving 15 older adult participants. Data were analyzed using an inductive thematic analysis approach, and participants generated a total of 132 photographs documenting their lived experiences. Findings reveal that climate change produces multiple, intersecting adverse health impacts on older adults, particularly through pathways related to health needs, food insecurity, economic precarity, and water insecurity. As climate variability intensifies alongside the rapid growth of Ghana's aging population, the study highlights the urgent need for greater research attention to structurally exposed populations, as well as context-specific interventions aimed at strengthening older adults' resilience to climate-related stressors in Ghana and similar settings.

OSE-05 Climate-Driven Disease Transmission

OSE-05-01 Network Curvature Reveals Climate-Sensitive Transmission Pathways for Influenza Control in High School Contact Networks

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Respiratory infectious diseases such as influenza are highly sensitive to climate variability, with seasonal changes in temperature and humidity influencing transmission dynamics, particularly in school environments where close contact is frequent. Understanding how climate-sensitive transmission interacts with contact network structure is essential for improving preparedness and intervention strategies. This study investigates how Forman-Ricci curvature, a geometric network measure, can identify structural vulnerability and improve control of influenza-like illness in a high school contact network. Using high-resolution face-to-face interaction data from the SocioPatterns project, we constructed a weighted network representing student contacts and computed curvature alongside traditional centrality measures. We then simulated influenza transmission using a curvature-modulated network-based susceptible-infected-recovered model, incorporating transmission scenarios consistent with climate-sensitive respiratory disease dynamics, including increased transmissibility under conditions favourable to viral survival. Our results show that negatively curved edges identify critical bridges connecting student groups, which act as climate-sensitive transmission pathways and accelerate outbreak spread. Epidemic simulations demonstrate that increased transmissibility, consistent with favourable climatic conditions, leads to earlier and larger epidemic peaks. Importantly, interventions targeting curvature-identified structural bridges significantly reduce epidemic size and delay peak infections compared to conventional strategies targeting highly connected individuals. These findings highlight the importance of considering both climate-sensitive transmission and contact network geometry when designing intervention strategies for respiratory diseases in schools. Network curvature provides a novel tool for identifying high-risk transmission pathways and improving targeted interventions. This approach can support climate-informed public health planning and strengthen resilience against climate-driven respiratory disease outbreaks in educational settings and beyond.

OSE-05-02 **Climate Change and Malaria: Knowledge and Perceptions among Local Communities in Dar es Salaam, Tanzania**

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Climate change can modify malaria risk by influencing mosquito vectors and parasite development through alterations in temperature, rainfall patterns, humidity, and the frequency of extreme weather events. In Dar es Salaam, Tanzania, where malaria remains a significant public health concern, understanding community knowledge and perceptions of climate-malaria linkages is critical for designing locally appropriate risk communication and climate-informed malaria control strategies. A cross-sectional survey was conducted among 422 participants selected from 16 wards across five administrative districts of Dar es Salaam (Ilala, Kinondoni, Temeke, Ubungo, and Kigamboni). Data were collected using a semi-structured questionnaire capturing sociodemographic characteristics, climate change awareness, information sources, perceived local climate changes, and perceptions of climate-related malaria risk. Descriptive statistics summarized the data, while chi-square tests and multivariable regression analyses examined associations between sociodemographic factors and climate change awareness at a 95% confidence interval. Overall, 75.4% (n=318) of participants reported being aware of climate change. Radio was the most common information source (40.8%), followed by television (34.9%). Significant sociodemographic disparities in awareness were observed. Education level showed the strongest association, with awareness increasing from 58.2% among individuals with no formal education to 98.2% among those with tertiary education ($\chi^2=53.394$, $p<0.001$). Males demonstrated significantly higher awareness than females (83.5% versus 68.8%; $\chi^2=12.142$, $p<0.001$). After adjustment, secondary and tertiary education emerged as the strongest independent predictors of awareness, alongside male gender, older age groups, and employment status. Participants commonly reported rising temperatures (84.4%), increased rainfall (49.5%), flooding (28.2%), and droughts (19.9%) over the past decade. Increasing rainfall, temperature, and humidity were perceived as key drivers of malaria transmission. These findings highlight the need for targeted, gender-sensitive, and education-appropriate public health messaging that integrates climate information into malaria surveillance and control programs to enhance community resilience.

OSE-05-03 **Climate-Driven Flooding and Wash Failure in IDP Camps: Cholera and Malaria Risks in North-East Nigeria**

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Climate change is increasing the frequency and intensity of extreme flooding across the Lake Chad Basin, severely disrupting water,



sanitation, and hygiene (WASH) systems in fragile humanitarian settings. In North-East Nigeria, over 2.3 million internally displaced persons (IDPs) live in overcrowded camps with climate-sensitive infrastructure. Flood-induced sanitation failure may accelerate transmission of climate-sensitive infectious diseases, yet quantitative evidence linking extreme weather events, WASH disruption, and disease burden in displacement settings remains limited. This study examines the impact of climate-driven flooding on sanitation functionality and subsequent cholera and malaria transmission in IDP camps. A retrospective mixed-methods ecological study was conducted across six IDP camps (estimated population: 148,000) in Borno and Adamawa States between 2021 and 2025. Satellite-derived rainfall and flood extent data (CHIRPS, Sentinel-1) were integrated with longitudinal WASH infrastructure assessments, water quality testing records, malaria rapid diagnostic test (RDT) results (n=68,412), and cholera surveillance reports from camp health facilities. Interrupted time-series and multivariate Poisson regression models quantified associations between flood exposure, sanitation disruption, and disease incidence. Qualitative interviews with camp health and WASH coordinators contextualized system vulnerabilities and adaptive capacity. Flood exposure was associated with a 64% increase in cholera incidence (IRR: 1.64; 95% CI: 1.32–2.04; $p < 0.001$) and a 37% increase in malaria positivity rates (IRR: 1.37; 95% CI: 1.18–1.59; $p < 0.001$) within eight weeks post-flood. Functional latrine coverage declined by 41%, while 52% of water sources tested positive for fecal contamination during flood periods. Camps experiencing severe sanitation disruption showed significantly higher disease incidence. Infrastructure damage, inadequate drainage, and delayed repairs amplified vulnerability. Climate-driven flooding is a major driver of WASH system collapse and infectious disease risk in displacement settings. Strengthening climate-resilient sanitation infrastructure, early warning systems, and integrated surveillance is critical to protect vulnerable populations and advance climate-resilient health systems under increasing climate extremes.

OSE-05-04 **Climate-Driven Urban Heat Island Intensification and Thermal Exposure Risk in Peri-Urban Ghana.**

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While global climate change drives rising ambient temperatures, local Urban Heat Island (UHI) intensification acts as a multiplier, exacerbating public health vulnerabilities. In Ghana, UHI research has focused on metropolitan cores, yet rapid built-up expansion in peri-urban areas in the Oforikrom municipality suggests significant thermal shifts. The conversion of vegetation into high-density housing likely compromises natural cooling, increasing thermal exposure risks. This study assessed climate-driven UHI intensification and its implications for the spatial patterns of thermal exposure risk using Oforikrom, a rapidly urbanizing peri-urban landscape, as a case study location. This study utilized a multi-decadal dataset (2005, 2015, and 2025) of Landsat 7, 8, and 9 Collection 2 Level 2 science products. These preprocessed data were used to calculate standardized Land Surface Temperature (LST) and spectral indices (NDVI and NDBI). ArcGIS Pro was used for spatio-



temporal analysis, calculating UHI intensity by normalizing LST against rural baselines. Thermal exposure risk was modeled via spatial overlay of LST intensity and WorldPop population distribution data to identify high-vulnerable zones. Analysis revealed a clear climate-driven escalation of thermal stress. UHI maximum intensity rose from 8°C (2005) to 10°C (2025). Visual and spatial overlay in ArcGIS revealed that the highest LST increases consistently co-occurred with areas of significant vegetation loss and built-up expansion for institutional and residential construction. High-risk zones were identified in Deduako, Appiadu, Kotei, Anwomaso, Kentinkrono, and Nsenie, representing the intersection of high population density and extreme thermal exposure. UHI intensification is positively associated with built-up expansion, creating hazardous thermal microclimates. Addressing green space lost through targeted municipal interventions is essential to mitigate growing public health risk in rapidly developing peri-urban communities.

IPN-02 Climate change, Social Protection, and Population Wellbeing in North-Western Ghana

IPN-02-01 Improving Water Security Through Social Protection: Findings from a Natural Experiment with Ghana's Livelihood Empowerment Against Poverty (LEAP) Program

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Water insecurity in sub-Saharan Africa significantly drains women's time and energy, worsening the financial constraints that already limit their economic empowerment. Despite this, little research has examined the role of social protection programs and cash transfers in addressing water insecurity in the context of climate variability. This study examined the combined impact of Ghana's Livelihood Empowerment Against Poverty (LEAP) program on household water access and its ability to enhance household water infrastructure. We conducted a natural experiment by comparing the experiences of water insecurity among 267 LEAP beneficiaries and 290 extremely poor households on the Ghana National Household Registry (GNHR). Experiences of water insecurity were measured using the 12-item Household Water Insecurity Experiences (HWISE) scale. The data was collected in six communities served by community-based piped supply programs in the Upper West Region of Ghana. Simple and multiple linear regression were applied to assess the relationship between participation in LEAP and water insecurity, and bivariate and multivariate logistic regression were used to evaluate the likelihood of owning durable water storage containers. The results show a strong positive association between LEAP beneficiary households and water insecurity, as well as being enrolled in LEAP and owning a water storage container. Women's active participation in group credit schemes also independently reduced the likelihood of water insecurity and more than doubled the odds of owning a water storage container. This research indicates that cash transfer programs, in conjunction with community-based credit programs, could address some of the structural barriers to water insecurity in communities with piped water systems. Social protection programs could incorporate women-centered savings schemes to enhance water security benefits, reduce gendered time poverty, and support

Sustainable Development Goals 5 and 6.

IPN-02-02 Modelling Predictors of Physical and Mental Health among Cash Transfer Beneficiaries and Non-Beneficiaries in Resource-Limited Settings: Findings from Ghana's LEAP

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Achieving good health in low-resource settings is hindered by structural poverty, environmental deprivation, and limited access to basic services. In the Upper West Region of Ghana, these challenges are acute due to climate variability and climate change-associated severe weather events. The Livelihood Empowerment Against Poverty (LEAP) program, a national social protection initiative that provides unconditional cash transfers to extremely poor households, seeks to mitigate these disadvantages. Existing evidence on LEAP's influence on physical and mental health outcomes is inconsistent, with growing concerns over the adequacy of benefit amounts. This study modeled predictors of poor physical and mental health among participants in three rural Ghanaian districts. A community-based cross-sectional study was conducted in 12 rural communities across three districts in Ghana. Stratified random sampling was used to select both LEAP and non-beneficiaries from the Ghana National Household Registry. Data from 1,109 participants were collected via interviewer-administered questionnaires, capturing socio-demographic characteristics, LEAP enrollment, water and sanitation conditions, food insecurity and physical and mental health. Bivariate analyses and multivariable logistic regression models were used to identify independent predictors. Poor physical health was independently associated with LEAP enrollment, age, frequent water shortages, and concerns regarding sanitation safety. In contrast, access to multiple water sources was associated with lower odds of poor physical health. Poor mental health was associated with LEAP enrollment, age, sex, frequent water shortages, sanitation safety concerns, and severe food insecurity. Findings reveal that LEAP enrollment was associated with poorer physical health, suggesting that transfer amounts may be insufficient to offset persistent health risks. Interventions that integrate cash transfers with targeted WASH, food security, and mental health support may better address the multi-dimensional nature of poverty.

IPN-02-03 Predictors of Food Insecurity among Households in Ghana: Comparison of Livelihood Empowerment Against Poverty (LEAP) Beneficiaries and Non-Beneficiaries

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Food insecurity remains a major public health challenge in sub-Saharan Africa, driven by poverty, climate vulnerability, and limited investment. In Ghana's Upper West Region, chronic undernutrition persists despite social protection interventions such as the Livelihood Empowerment Against Poverty (LEAP) programme. This study examined predictors of severe food insecurity among LEAP beneficiaries and non-beneficiaries,



with emphasis on access to agricultural extension services and community group participation. A cross-sectional survey was conducted among 1,109 individuals from 12 rural communities in the Upper West Region. Stratified random sampling was used to select LEAP and non-LEAP households from the Ghana National Household Registry. Data were collected through structured interviews with household decision-makers. Food insecurity was measured using the Household Food Insecurity Access Scale (HFIAS) and categorized as food secure or severely food insecure. Multivariate logistic regression and complementary log-log models were used to identify predictors, including interaction effects. Of 1,109 respondents, 48.0% were LEAP beneficiaries. LEAP beneficiaries were more likely to experience severe food insecurity than non-beneficiaries (aRR = 1.75; 95% CI: 1.44-2.13; $p < 0.001$). Access to agricultural extension services (aRR = 0.70; 95% CI: 0.52-0.93) and membership in agricultural or trade groups (aRR = 0.65; 95% CI: 0.48-0.87) significantly reduced risk. Among LEAP households, combined access to extension services (aRR = 0.58) and trade group participation (aRR = 0.33) further mitigated severe food insecurity. Higher education was protective, with tertiary-educated individuals less likely to be food insecure (aRR = 0.44), while religious affiliation showed differential risk patterns. LEAP alone is insufficient to address food insecurity among vulnerable households. Integrating cash transfers with agricultural services and community-based livelihood programmes can enhance resilience. Strengthening linkages between LEAP and agricultural development initiatives is essential for achieving sustainable food security and advancing SDG 2.

IPN-02-04 **'I Receive Free Money Yet Cannot Afford Water': Linking Cash Transfers to Improved Water Security in Northern Ghana**

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The United Nations (UN) pledge to 'leave no one behind' and achieve universal access to water under Sustainable Development Goal 6 necessitates greater attention to the needs of marginalized groups such as women and girls in resource-poor settings. This is particularly important because women and girls often bear the primary responsibility for securing water for household use. In many low-resource settings, these challenges are being intensified by climate change, which is increasing water insecurity through recurrent drought, erratic rainfall, and other climate-related shocks. In Ghana, the Livelihood Empowerment Against Poverty (LEAP) Programme was launched by the government in 2008 to alleviate poverty by improving household consumption and investment in human capital. LEAP is a cash transfer programme that provides bimonthly cash transfers and health insurance to extremely poor households. While LEAP has been reported to improve household socioeconomic vulnerabilities in relation to food, nutrition, and health, it remains unclear whether it improves household water security, especially in the resource-poor and climate-vulnerable context of Ghana's semi-arid Upper West Region (UWR). Drawing on the capability approach and using LEAP as a case study, this study



examines how cash transfers influence women's access to water. We conducted in-depth interviews with women ($n = 25$) in the UWR of Ghana. Results from the thematic analysis show that cash transfers received by the women enabled payment for water, maintenance of water infrastructure, and the purchase of water storage and collection containers. Participants also reported coping with water insecurity by borrowing money from friends and family to pay for water, borrowing water for domestic purposes, and fetching water on credit at public water points. These coping strategies often resulted in stigma from non-LEAP beneficiaries. The findings underscore the need for a more responsive and climate-sensitive LEAP policy to address the water challenges faced in LEAP communities.

IPN-02-05 **The Impact Doesn't Matter: Neighborhood Ties and Relocation Intentions of Residents in Flood-prone Locations in Two Ghanaian Cities**

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Flooding events – intensified by climate change – increasingly displace populations across developing countries, compelling governments to scramble for solutions, especially in urban areas. Environmental migration has emerged as a coping and adaptation strategy. Yet, beyond flood risk alone, multiple factors shape residents' decisions to stay or relocate from flood-prone areas. This study examined the determinants of relocation intentions among residents in two Ghanaian cities, based on logistic regression analysis of survey data from 1,122 respondents. Results show that participants who experienced flooding in the last five years or during the last rainy season were significantly more likely to report intentions of moving to safer locations. However, neighborhood social connection was found to be negatively associated with relocation intentions. For instance, higher levels of social capital were associated with lower likelihood of relocation intentions. Longer stay in the current residential neighborhood was also associated with lower intentions to relocate. Respondents who owned their dwellings were less likely to express intentions to relocate compared to their counterparts who rented. Interestingly, respondents who reported higher burden of flooding were less likely to express relocation intentions. These findings show the complexity of the decision-making process involving the relocation intentions of disaster victims and are relevant for relocation programs in a context where flooding occurs annually.

IPN-02-06 **Cash Transfers and Women's Empowerment in the Context of Climate Change among Extremely Poor Households in Ghana**

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The Livelihood Empowerment Against Poverty (LEAP) program is a social protection initiative implemented in 2008 to provide cash transfers to extremely poor households to alleviate poverty and promote human development in Ghana. However, as an unconditional cash transfer program, beneficiaries are expected to perform co-responsibilities related to education, health, nutrition, and savings. In regions with water and sanitation challenges and climate variability, poor access to water, sanitation, and hygiene (WASH) may be impacting LEAP beneficiaries' livelihoods and the co-responsibilities mandated by the program. Therefore, using a descriptive case study, we explored the implications of WASH on beneficiaries' livelihoods and their health and education co-responsibilities. Women (n = 25) and girls (n = 19) were interviewed in two communities (Wechiau and Kandeu) in the Wa West district, Ghana. Key themes that emerged included agricultural and trading livelihood impacts and the impact of WASH on educational and health co-responsibilities. Findings revealed that inadequate WASH facilities pose a threat to beneficiaries' health, absenteeism from school, and frequently result in school dropouts which undermine the intended goals of LEAP. The study recommends urgent investment in infrastructure to provide safe water, improved sanitation, and hygiene for beneficiaries to promote sustainable development and better education and health outcomes among beneficiaries.

SYMPOSIUM Climate, Healthcare Systems & Infrastructure in Ghana (SOSCHI)

Capturing the Quantitatively “Unmeasurable”: Agenda-setting for Climate-Healthcare Systems Indicators in Ghana

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Climate change is increasingly shaping health system performance in ways that extend beyond discrete emergencies, yet evidence on how these effects is experienced and managed within routine healthcare operations remains limited. This study adopts a qualitative, systems-oriented approach to examine how climate hazards enter, interact with, and are reproduced through everyday health system functions. Structured around the World Health Organization health system building blocks and grounded in the experiences of frontline healthcare workers and managers, the analysis conceptualises climate change as integrated operational condition. Findings reveal that climate-related disruptions generate cascading effects across workforce wellbeing, service delivery, infrastructure, logistics, governance, financing, and patient access. A single climate event can trigger interconnected failures in staffing, transport, energy, water supply, information systems, and healthcare utilisation, thereby amplifying existing inequities and vulnerabilities. The study further demonstrates that resilience is often socially produced through improvisation, personal sacrifice, and community support rather than through robust institutional preparedness. Consequently, practices frequently interpreted as

evidence of resilience may conceal deeper structural weaknesses. Contradictions within current adaptation efforts are also identified, including committed workforces operating without climate-focused training, digitalised systems constrained by heat and energy instability, and fragmented financing arrangements that inhibit proactive investment. Governance bottlenecks, centralised decision-making, delayed reimbursements, and donor dependence emerge as major barriers to anticipatory adaptation. Nevertheless, existing adaptive assets, including community mobilisation, disease surveillance capacity, flexible staffing arrangements, and incremental infrastructure improvements, provide important foundations for transformation. The study contributes a transferable conceptual framework linking climate hazards to health system performance through governance and financing pathways and argues that climate resilience constitutes routine planning, budgeting, workforce development, and accountability systems for equitable and sustainable health outcomes.

OSE-06 Mental Health & Psychosocial Well-being I

OSE-06-01 Perception of the Influence of Climate Change on Mental Health and Psychological Wellbeing of Undergraduates

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Climate change, fueled by human activity, elevates global temperatures and triggers environmental shifts. These shifts produce psychological repercussions, notably for children. Children and undergraduate students are confronted with climate-related stressors that jeopardize their mental and physical health. Accordingly, this study investigated undergraduate students' perspectives on how climate change affects their mental health and well-being. A correlational methodology assessed relationships among variables. Participants responded to instruments including the climate change anxiety scale ($r = 0.90$), the mental health scale ($r = 0.78-0.95$), and the psychological well-being scale ($r = 0.78$). Multiple regression analyses interpreted the findings. Two hundred eighty-five students (121 males, 164 females) were sampled using stratified random methods. Five faculties were chosen randomly, with 50 students selected from each. Results demonstrated that mental health and psychological well-being jointly influenced attitudes toward climate change ($f(2,282) = 6.313$; $p < .005$), accounting for 12.8% of variance. Individually, mental health emerged as the strongest predictor ($\beta = .324$; $p < .001$), while psychological well-being remained significant ($\beta = .268$; $p < .001$). The study concluded that climate change affects all individuals, and undergraduates are particularly vulnerable to its psychological consequences, which compromise their mental health and well-being.

OSE-06-02 Climate Change, Displacement and Mental Health in Africa: A Social Work Perspective on Psychosocial Well-Being

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Climate change has increasingly become a major driver of environmental disasters such as floods, droughts, desertification, and



rising temperatures across Africa. These environmental disruptions have led to population displacement, loss of livelihoods, food insecurity, and increased poverty. While the physical and economic consequences of climate change have been widely discussed, the mental health and psychosocial impacts on affected populations remain relatively underexplored. This paper examines the relationship between climate-induced displacement and mental health outcomes among vulnerable populations in Africa. Using a social work perspective, the study highlights how environmental stressors contribute to psychological distress, trauma, anxiety, and depression among displaced individuals and communities. Particular attention is given to vulnerable groups such as women, children, the elderly, and rural populations whose coping capacities are often limited. The paper also explores the role of psychosocial support systems, community resilience, and culturally responsive interventions in addressing climate-related mental health challenges. Drawing on insights from Social Work, Mental Health, and Climate Change Studies, the study argues that social workers are uniquely positioned to provide psychosocial support, strengthen community coping mechanisms, and advocate for policies that integrate mental health into climate adaptation strategies. The paper concludes by recommending the inclusion of social workers in climate response frameworks and the development of integrated mental health interventions for climate-affected populations in Africa.

OSE-06-03 **Beyond Exposure: Climate Hazard Impacts on Subjective Well-Being in Coastal Ghana**

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Climate change poses growing threats to well-being across sub-Saharan Africa, yet limited research has explored the psychosocial pathways through which climate hazards affect well-being. Using survey data from the 2025 ITHACA project (n = 689) collected in Ghana's Volta Delta, this study examines associations between climate hazard exposure and subjective well-being and explores differential effects across sociodemographic groups. Subjective well-being was measured using a 17-item scale validated through principal component analysis, which confirmed a dominant single-factor structure alongside three sub-dimensions (personal functioning, services access, and social support). Ordinary least squares regression with variance inflation factor diagnostics confirmed model robustness. Results show that the number of hazards experienced does not significantly predict well-being; rather, it is the experience of being negatively impacted that influences lower well-being ($\beta = -0.430$, $p < 0.001$). Among specific hazards, droughts ($\beta = -0.386$, $p < 0.001$) and rising temperatures ($\beta = -0.279$, $p < 0.001$) exhibited the strongest negative associations with well-being, whereas acute flooding events, including river flooding, flash flooding, and storm surge, showed no significant effects. Sub-dimension analysis revealed that personal functioning (such as daily activities and sleep quality) was most sensitive to negative climate impacts, whereas cumulative hazard exposure specifically eroded social support ($\beta = -0.135$, $p < 0.001$), a dimension unaffected by impact type. Stratified analysis showed that cumulative hazard exposure was positively associated with well-being among males ($\beta = 0.071$, $p = 0.005$) but not females, suggesting gender



differences in climate resilience. Middle-income respondents demonstrated greater vulnerability than low-income groups ($R^2 = 0.309$ vs 0.144), suggesting differential buffering capacities. These findings underscore the need for interventions to shift focus from exposure reduction to targeted support for negatively impacted communities, emphasising slow-onset hazards, gender-responsive programming, and the psychosocial needs of households facing economic precarity under climate stress.

OSE-06-04 **Climate Pressures and Social Media: Double Whammy for Mental Health - Eco-Digital Mindfulness-Based Interventions**

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The aim of this study was to investigate the combined impact of climate pressures and social media usage on mental health of Nigerian university students. The study adopts a mixed-methods research design. The population of the study comprises undergraduate students from Nigerian universities. A multi-stage sampling techniques was used to select 500 students for the study. Data were collected using standardized questionnaires including "Climate Anxiety Scale", "Social Media Use Questionnaire", and "Mental Health Inventory". Instruments were validated through expert review and pilot testing, with reliability coefficients ranging from 0.78 to 0.92. Results in hypothesis 1 revealed that there is a significant interaction effect between climate anxiety and social media usage on mental health outcomes. The interaction effect is significant for depression, anxiety, and stress. Results in hypothesis 2 indicate significant difference in mental health outcomes across climate anxiety groups. Results in hypothesis 3 indicate significant differences in mental health outcomes across social media usage groups. Results in hypothesis 4 revealed that Eco-Mindfulness-Based Intervention had a significant effect on reducing climate anxiety and improving mental health outcomes. The study concluded that Eco-Mindfulness-Based Intervention reduced climate anxiety and improved mental health outcomes among Nigerian university students.

IPN-03 Addressing climate vulnerability through nature-based solutions using transdisciplinary engagement with wetland communities (AV-STEC)

IPN-03-01 **Gender Differences in Climate Vulnerability: Evidence from Selected Communities in the Black and White Volta Basins of Ghana**

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Notwithstanding the growing attention to climate change and its attendant vulnerabilities, there is only a handful of empirical studies in Ghana, dealing with how these vulnerabilities differ on the basis of gender. With the aid of a sequential explanatory mixed-methods approach, this study examines the social and gender variations in

climate-induced vulnerabilities in selected districts along the Black and White Volta basins in Northern Ghana. Generally, our findings show that females were more vulnerable to climate change-related vulnerabilities than their male counterparts in all the three districts of our study. For instance, the severity of drought exposure was significantly higher among females, relative to males, just as floods affected more females than males in the study districts. Similarly, females generally encountered acuter constraints, than males, in their efforts to implement adaptive strategies, because of entrenched social norms and path dependencies that reinforce unequal access to vital resources, such as land and credit facilities. Accordingly, the need to address matters of climate vulnerability from gender and social inclusion perspectives cannot be overemphasized.

IPN-03-02 **Spatio-Temporal Changes in Wetlands and the Role of Ecocultural and Socioeconomic Factors in Conservation along the Black and White Volta Rivers, Ghana**

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Wetland and riparian ecosystems along the Black and White Volta Rivers in Ghana's Central Gonja District are vital social-ecological systems sustaining biodiversity, hydrological regulation, and the livelihoods of riparian communities. These ecosystems face accelerating degradation driven by land use and land cover (LULC) transformation, climate variability, and the fading of customary governance systems, including traditional taboos, sacred site stewardship, and community-level resource management norms. This study employed an interdisciplinary design integrating multi-temporal Landsat imagery spanning 2005 to 2025, analysed through GIS-based maximum likelihood classification, with primary data from a household survey of 385 respondents across four communities. Data were analysed using descriptive statistics, chi-square tests, and binary logistic regression, anchored in the Social-Ecological Systems and Indigenous Knowledge Systems frameworks. Spatial analysis revealed that wetland cover declined sharply from 2.51% in 2005 to 0.22% by 2025, while agriculture expanded from 18.06% to 25.6% and settlements grew from 1.62% to 3.97%. Long drought (41%), pollution (17%), and deforestation (16%) were the most perceived drivers of these changes. Ecocultural systems including sacred sites, taboos, and rituals were present across all four communities but showed no independent association with conservation participation after adjustment. Education emerged as the strongest predictor, with JHS-level respondents 4.7 times more likely to participate (aOR=4.7, $p<0.001$), while access to alternative livelihoods was the only socioeconomic factor retained after full adjustment (aOR=2.4, $p<0.001$). Females were 50% less likely to participate (aOR=0.5, $p=0.009$). Respondents identified financial support (31.8%) and education and training (31.0%) as their primary motivations for wetland protection. These findings underscore the urgent need for legally enforced riparian buffer zones, gender-responsive conservation programmes, and the institutionalisation of indigenous ecocultural governance within formal conservation frameworks along the Volta Basin.



IPN-03-03 **Flooding and Mental Health: A Study of Affected Communities along the White Volta Basin**

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Flooding has increasingly become a critical climate-related risk in Ghana, with communities along the White Volta Basin repeatedly facing disasters driven by upstream dam overflow, particularly from the Bagre Dam, heavy rainfall, and poor drainage infrastructure. While the physical and economic impacts are widely documented, the psychological consequences for survivors remain underexplored. This study examines the role of socio-demographic characteristics, flood exposure and risk perceptions in determining mental health outcomes among flood-affected communities along the White Volta Basin. A cross-sectional survey of 393 participants across four communities revealed that the majority (84.2%) had experienced Bagre Dam flooding, with 60.4% reporting three or more flooding events and 65.3% rating the most recent incident as severe. Among the impacts, financial hardship was the most widely reported severe consequence (78.9%), followed by displacement (74.3%) and property damage (57.7%). Regression analysis identified key predictors of poorer mental health outcomes: older age (60+: $\beta = 5.69$, $p = .019$), being unmarried, lower educational attainment, perceiving floods as increasingly frequent ($\beta = 5.10$, $p < .001$), and experiencing severe displacement ($\beta = 3.21$, $p = .020$). Conversely, being married ($\beta = -7.83$, $p < .001$), having secondary or higher education ($\beta = -3.81$, $p = .009$), and engaging in trading or artisanal work were associated with better mental health. Flood risk perceptions were notably high, with 72.5% feeling vulnerable to future floods and 65.3% believing flooding was becoming more frequent, though only 65.9% felt that local warning systems provided adequate preparation time. The findings highlight the intersection of socio-demographic vulnerabilities, coping mechanisms, and institutional preparedness in shaping psychological resilience. The study provides evidence for policy interventions that integrate psychosocial support into disaster risk reduction frameworks, strengthen transboundary early warning systems, and build community resilience in flood-prone regions of Ghana.

IPN-03-04 **Gender Dimensions of Nature-Based Adaptation Strategies to Floods in Ghana's Wetlands**

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Riparian wetland communities in Ghana's Savannah Region face recurrent flooding driven by climate variability and controlled spillages from the Bagre and Bui dams. These events produce significant socio-ecological impacts, including livelihood disruption, wetland degradation and the intensification of existing socioeconomic inequalities. Although Nature-Based Solutions (NbS) are promoted as sustainable and cost-effective alternatives to grey infrastructure for flood management, their implementation remains insufficiently inclusive, often marginalizing women despite their critical ecological knowledge, adaptive roles and differentiated vulnerabilities. This study examines the gender



dimensions of nature-based flood adaptation in three riparian communities in the Central Gonja District. Grounded in an integrated analytical framework combining the Social Vulnerability Framework, Feminist Political Ecology and Community-Based Adaptation theory, it investigates: (1) socioeconomic and structural factors influencing gendered adoption of NbS; (2) the role of cultural norms, patriarchal governance systems and land tenure inequalities in shaping participation and (3) gender-differentiated flood risks and adaptation needs. A gender-sensitive mixed-methods approach was employed, including household surveys (n = 397), focus group discussions, key informant interviews and participatory mapping. Preliminary quantitative findings reveal a pronounced gendered governance paradox. While women play central roles in ecological resource management and caregiving, they remain systematically excluded from NbS decision-making. This exclusion is driven by intersecting structural constraints, including insecure land tenure, male-dominated income control, limited NbS awareness, and restrictive socio-cultural norms, which collectively marginalize women's knowledge and undermine equitable community resilience outcomes.

IPN-03-05 **The Impacts of the Bagre Dam Spillage on Biodiversity along Ghana's White Volta**

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Wetlands and riparian zones are crucial ecosystems for conserving biodiversity and supporting community livelihoods. Their ecosystem functions and goods form the basis of vital provisions such as water and food. Despite their contribution to human well-being, wetlands and the riparian zones along the White Volta River in Ghana and Burkina Faso are increasingly becoming exposed to both natural and anthropogenic threats, resulting in severe environmental events such as droughts and floods, chiefly from the spillage of the Bagre dam. Ecological data were collected to assess the extent of use and dependence of wetland communities on wild plant and animal resources, and how these resources are affected by flooding events. Three communities Yinduuri, Sariba and Yapei were selected for the study. One of the three study sites did not experience floods during the spillage event in 2025 and was thus considered a control site. Visual and acoustic encounter surveys were employed to document anurans. A combination of point and transect counts were used to document avian species. Interviews using semi-structured questionnaires and focus group discussions were also conducted within communities. The results indicate that a total of 136 plant and animal species were used by the communities. Community members indicated that flooding events increased encounters with venomous snakes, which led to human-wildlife conflicts. Sixteen herpetofauna species were used as food, in traditional medicine, or caused human-wildlife conflict. A significant interaction between exposure and period indicates a strong flooding effect on used herptile abundance. Biodiversity increased in abundance after flooding, which was not observed at the control site. Abundance in flooded sites was recognizably lower both before flooding (rainy season) and during



the dry season, suggesting that the observed increase could be attributed to flooding events.

IPN-03-06 **Flood-Induced Changes in Water Quality and Aquatic Biodiversity along the White Volta River in Northern Ghana.**

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Flooding in the White Volta Basin, caused by heavy rainfall and spillway releases from the Bagre Dam in Burkina Faso, significantly shapes river hydrology and water quality in northern Ghana. In the agricultural landscapes surrounding the basin, floodwaters can mobilise nutrients and trace metals from nearby farmlands into river systems, potentially influencing aquatic biodiversity and ecosystem health. Despite the well-documented hydrological influence of dam releases on downstream river systems, the concurrent effects of flood disturbances on water quality and aquatic biodiversity in the White Volta Basin remain poorly understood. This study investigates flood-induced changes in water quality and their impact on aquatic biodiversity. Nine points of access along the White Volta River were sampled. In-situ measurements of physico-chemical parameters, including temperature, pH, turbidity, conductivity, total dissolved solids, and salinity, were undertaken during pre-flood (dry season) and post-flood (wet season) periods. These measurements provide valuable insights into spatiotemporal variations in water quality resulting from flooding at the study sites. Preliminary analyses reveal marked differences in the pH, turbidity and dissolved oxygen between the pre- and post-flood periods. Additional analyses to evaluate nutrient concentrations and selected heavy metal concentrations associated with agricultural runoff were conducted using atomic absorption spectrophotometry (AAS). To assess the impacts on aquatic biodiversity, macroinvertebrate sampling was also conducted to provide biological indications of ecological condition. Fish catch data obtained through collaboration with local fishers were used to estimate catch per unit effort (CPUE) and assess fish condition as indicators of ecosystem productivity and potential environmental stress. By linking flood dynamics to changes in water quality and aquatic biodiversity, the study contributes to a better understanding of how flood disturbances influence freshwater ecosystem health in the White Volta Basin and provides ecological baseline information for future monitoring and management of flood-affected river systems.

OSE-07 Mental Health & Psychosocial Well-being II

OSE-07-01 **Emotional and Psychological Impacts of Climate Change among Adolescents in Ghana**

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Climate change is increasingly recognized as a significant threat to the mental health of adolescents worldwide. This critical developmental stage makes adolescents particularly vulnerable to emotional distress arising from climate-related risks, including heightened levels of depression, anxiety, fear, and feelings of powerlessness. In Ghana,

these threats are further exacerbated by the country's susceptibility to recurrent climate-related events, particularly flooding and increasing heatwaves. Despite growing concern, empirical evidence on the psychological impacts of climate change among adolescents in Ghana remains limited. This study examined the emotional and psychological impacts of climate change among adolescents in Ghana. A cross-sectional survey was conducted among 2,342 adolescents aged 13–17 years attending selected senior high schools in the Cape Coast Metropolitan Area. Data were collected using a self-administered questionnaire assessing emotional responses to climate change, including anxiety, anger, fear, worry, and feelings of powerlessness. Data were analysed using Stata, with a p-value of 0.05 considered statistically significant. Findings revealed that a substantial proportion of adolescents experienced climate-related emotional distress: 75.5% reported worry, 42.5% anxiety, 47.3% fear, 22.2% anger, and 27.2% feelings of powerlessness. Gender differences were evident, with female adolescents consistently reporting higher levels of worry, anxiety, fear, anger, and powerlessness than males. Age-related differences were statistically significant for anxiety ($p=0.004$), worry ($p=0.019$), and fear ($p=0.011$). Socioeconomic status was significantly associated only with feelings of powerlessness ($p=0.001$). Adolescents in Ghana experience high levels of climate-related emotional distress, with notable disparities by gender, age, and socioeconomic status. These findings highlight the need for targeted adolescent mental health interventions, psychosocial support, and climate education integrated into public health and adaptation strategies to build resilience in vulnerable populations.

OSE-07-02 **Climate Change, Mental Health, and Resilience Among Youth in Ghana: A Multi-Zone Longitudinal Mixed-Methods Study with Intervention**

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Climate change is increasingly recognised as a significant psychological stressor, yet its mental health effects on youth remain underexplored within African contexts. In Ghana, the youth across ecologically distinct zones face qualitatively different climate hazards: chronic coastal erosion in Keta, erratic rainfall and environmental degradation in Dunkwa-on-Offin, and recurrent drought and extreme heat in Bongo District. Each of these climate hazards carries distinct psychosocial consequences during a critical period of psychological development. Although global literature documents rising climate-related distress among young people, empirical evidence from sub-Saharan Africa is limited, and little is known about how resilience processes operate across varied ecological and seasonal contexts. Psychological mechanisms linking climate exposure to mental health outcomes, including eco-anxiety, perceived loss of control, and disrupted social connectedness, remain poorly understood in this population. This study will investigate the mental health outcomes, resilience resources, and climate-related psychological distress of youth aged 15 to 24 across Ghana's three ecological zones. Guided by pragmatism and employing an explanatory sequential mixed-methods design embedded within a longitudinal, quasi-experimental framework, Phase 1 will measure resilience and mental health outcomes across three seasonal waves,



while Phase 2 will deepen quantitative findings through semi-structured interviews. The study will further evaluate the effectiveness of a culturally adapted resilience psychoeducation intervention relative to a waitlist control group to generate Ghana-specific psychological evidence on climate-related vulnerability and resilience, with direct implications for youth mental health policy, school-based psychosocial support, and climate adaptation programming across sub-Saharan Africa.

OSE-07-03 **Climate Stress, Food Insecurity and Mental Health in Kenya's Drylands**

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Climate change is intensifying health risks in Eastern African drylands by disrupting rainfall patterns, food production, livestock systems, livelihoods and household food access. While nutrition impacts are increasingly recognized, the psychosocial consequences of food insecurity and depleted coping capacity remain under-documented. We examined how climate-related shocks and food-security coping intersect with nutrition vulnerability and mental health outcomes among households in Kenya's drylands. We analyzed cross-sectional quantitative data from the Visibilize4ClimateAction study conducted in Turkana (arid), Samburu (semi-arid) and Laikipia (dry sub-humid) counties, Kenya. The study included 2,198 household heads and caregivers. Data covered sociodemographic characteristics, livelihoods, climate and household shocks, household food insecurity, food-security coping using the reduced Coping Strategies Index (rCSI), and mental health outcomes using GAD-7, PHQ-9 and PCL-5. Food insecurity was widespread. 76.6% of households were severely food insecure, with an overall mean HFIAS score of 12.84. Severe food insecurity was near-universal in Turkana (97.4%) and lowest, though still substantial, in Laikipia (56.0%). Coping data showed further depletion of adaptive capacity: 47.3% of households were in crisis-level coping, 44.3% stressed and only 8.4% minimal. Depression affected 20.8% of respondents, PTSD 16.6% and anxiety 14.3%. Crisis-level coping was the most consistent predictor of poor mental health, increasing the odds of anxiety (OR 4.39), depression (OR 3.80) and PTSD (OR 3.43) (all $p < 0.001$). Excessive rains/flooding and livelihood loss were also associated with poorer mental health outcomes. In Samburu, drought was strongly associated with anxiety (OR 3.06, $p = 0.001$), depression (OR 1.90, $p = 0.005$) and PTSD (OR 2.45, $p < 0.001$). In Kenya's drylands, climate-health vulnerability follows a linked nutrition and mental health pathway. Food insecurity is not only a nutrition concern but also a marker of depleted adaptive capacity and mental health burden. Adaptation strategies should integrate food-security support, livelihood protection and psychosocial care.

OSE-07-04 **Characterizing the Effects of Climate Change on Health Along the Volta Basin of Ghana: A Qualitative Study**

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Anecdotal evidence and limited scientific research in communities along major river bodies suggest that extreme weather events have negatively influenced agriculture and emerging and reemerging infections and diseases. Skin lesions without a known causative pathogen have surfaced in some communities along the Volta Basin of Ghana. Despite all these reported changes, there is limited understanding of community perspectives of climate events and how they respond to it. This study therefore characterized the effect of climate change on health on communities along the Volta Basin of Ghana. The study was conducted in Kpando-Torkor, a major fishing community in the Kpando Municipality along the Volta Lake. The study employed a progressive mixed qualitative exploratory approach using Focus Group Discussions and Photovoice interviews to capture images for further discussions on salient issues that emerged from the earlier FGDs. The study purposively sampled fishermen, fishmongers, and health workers living in the community. A thematic analysis approach was employed. Qualitative software ATLAS.ti (version 7.5) was used for coding and analysis. The community recognized changes in the pattern of weather over the period and linked them to the frequent extreme weather events. Participants reported an emerging skin-piercing worm-like organism surfacing at the edges of lake. Participants also acknowledged the presence of stone-like substances in the Volta Lake that trap their nets and make fishing difficult. Also, changes in weather patterns have contributed to a reduction in fish species and harvest, crop yields, resulting in reduced income and food availability. The study findings highlight the severe impact of climate change on the health, livelihoods, and overall well-being of fishing communities along the Volta Lake. The above findings limits achieving SDG three (3) and SDG thirteen (13) in Torkor and neighboring communities.

OSE-08 Data, Methods & Modelling**OSE-08-01 Modelling Health Vulnerability under Climate Constraints: An Approach Using Urban AI and Administrative Data**

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Analyzing health vulnerability under climate stress in precarious urban environments poses major challenges, both in terms of spatial accuracy and the integration of multidimensional data. Traditional approaches often struggle to capture the complexity of interactions between building morphology and environmental risks. Using administrative data from the Ministry of Housing and Urban Development (MINHDU/BUCREP) collected in 2025 in Douala and Yaoundé in precarious housing neighborhoods, this article aims to model the Health Vulnerability Index (IVS) using an urban artificial intelligence approach. Based on an explanatory analysis using Random Forest and XGBoost algorithms, the results show that vulnerability is overwhelmingly dictated by environmental risks, which alone account for 94.1% of the variance in the index. The analyses reveal marked territorial disparities, with the city

of Douala presenting more severe epicenters of critical vulnerability linked to its coastal location. Furthermore, certain counterintuitive results, notably the positive link between road width and increased vulnerability, highlight the importance of low-lying flood-prone areas in the structuring of risk. These conclusions make an essential methodological contribution to the prioritization of public interventions, calling for greater precision in urban data collection in order to better anticipate climate-related health crises.

OSE-08-02 **Modelling Climate Change-Driven Heat Trends and Future Projections in the Greater Accra Metropolitan Area, Ghana**

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Climate change is intensifying heat exposure in rapidly urbanising African cities, posing significant risks to health and urban resilience. This study examines historical temperature trends and future climate projections in the Greater Accra Metropolitan Area (GAMA) to assess emerging heat-related risks and inform climate-health adaptation strategies. We analysed high-resolution ERA5 climate reanalysis data (1991–2025) for GAMA. Daily maximum and minimum temperatures and relative humidity were extracted and subjected to quality control using linear interpolation. Heat-Index and Universal Thermal Climate Index were computed. Historical heat trends were analysed using time-series regression models in STATA to quantify temperature changes. Spatial heat exposure patterns were mapped using Inverse Distance Weighting interpolation in ArcGIS Pro. Future heat exposure (2025–2060) was projected using CMIP6 climate datasets under alternative emissions scenarios. Findings show a statistically significant warming trend in GAMA of +0.263 °C per decade ($p < 0.001$), corresponding to an overall increase of approximately 0.92°C. Annual mean temperatures rose from 27.0°C in the early 1990s to 27.8°C in the mid-2020s, with mean daily maximum and minimum temperatures ranging from 29.5–30.8°C and 24.2–25.7°C. Findings indicate a unimodal heat cycle with peaks in February–March (~29.2°C) and troughs in July–August (~25.3°C), with recent decades consistently warmer, particularly during the dry season. Extreme heat events increased substantially, with hot days rising by 12.1 days per decade ($p=0.002$) and extreme heat-index days by 20.4 days per decade ($p<0.001$). The annual mean heat index increased by +0.604°C per decade, exceeding the 32°C caution threshold by 2024. Spatial analysis reveals the highest temperatures recorded in Tema West, Kpone-Katamanso, Krowor, Ledzokuku, and Ashaiman. Heat exposure in Greater Accra is rising rapidly due to climate change and urbanisation, highlighting the need for climate-informed urban planning, heat-adaptation strategies, and strengthened public health preparedness to protect vulnerable populations.

OSE-08-03 **Opportunities and Limitations of Integrating Machine Learning and Agent-Based Models for Climate Risk Modelling**

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Climate-related threats such as droughts, floods, changes in rainfall, and extreme heat are becoming more frequent. These pressures threaten productivity, food security, and rural livelihoods, especially in semi-arid or climate-sensitive areas. To support disaster risk management and adaptation strategies, effective climate risk modeling is essential. However, current modeling methods often focus on either predictive accuracy or behavioral representation, rarely addressing both at the same time. This systematic review assesses the potential and constraints of combining Machine Learning (ML) and Agent-Based Models (ABM) for climate risk modeling. A PRISMA-based review protocol was employed to analyze 68 peer-reviewed studies and institutional reports published from 2005 to 2024. Studies were chosen by searching structured databases and then screened based on set criteria for inclusion. A comparative coding framework evaluated predictive accuracy, behavioral realism, spatial and social complexity, scenario simulation capability, and the degree of methodological integration. Machine Learning (ML) methods do an impressive job of predicting climate hazards and modeling complex, non-linear environmental relationships that influence crop production. However, they usually do not explicitly represent decision-making and adaptive behaviors. Conversely, agent-based models (ABMs) offer highly detailed simulations of various agents, social and economic interactions, and adaptation strategies, but often face challenges with calibration and limited predictive validation. There are a few fully functional hybrid ML–ABM. Opportunities include using data to calibrate behavioral rules, integrating hazards in real-time, and enhancing scenario-based analysis. Major constraints include data scarcity, high computational demands, validation challenges, and inconsistent methodological standards. The combination of ML and ABM has a lot of potential to improve climate risk modeling by adding depth to behavior and strength to predictions. Future progress depends on datasets that work together, strict validation frameworks, and collaboration between different fields to make things more stable, scalable, and useful for policy.

OSE-08-04 **Integrated Analysis of Social Media and Temperature Data to Characterize Thermal Sensitivity and its Health Implications in Abidjan (Côte D'Ivoire)**

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Extreme heat events in sub-Saharan Africa represent a growing concern for urban populations due to their impact on thermal comfort and overall well-being. However, data on heat perception remains limited. In this context, social media data provides an innovative approach for analyzing expressions of thermal discomfort and identifying heat sensitivity thresholds. The methodological approach is based on the extraction and integration of social media data and meteorological data from 2022 to 2025, complemented by a household survey (2023). The survey made it possible to identify and validate keywords related to heat perception, determine the most widely used social media platforms in



Côte d'Ivoire, and contribute to the validation of the derived thermal sensitivity thresholds. A total of 66,000 messages were initially collected and subsequently filtered to 757 relevant posts after data cleaning and geographic validation. A percentile-based approach was applied to identify temperature levels associated with variations in heat-related discourse. The results show a clear increase in thermal discomfort-related messages with rising apparent temperatures. Three thresholds were identified: vigilance (37.2°C), alert (38-39°C), and emergency (39.9°C), reflecting increasing levels of perceived thermal stress. This study highlights the value of social media data for analyzing urban heat perception. Although no direct health data were used, the findings are relevant for public health, as thermal discomfort is an indirect indicator of heat stress and population vulnerability. These thresholds may contribute to early warning systems and heat risk management in Abidjan.

OSE-09 Transdisciplinary Topics

OSE-09-01 Climate-Driven Water Scarcity and Disability: Gendered Time Poverty, School Dropout, and Health Impacts in Northern Nigeria

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Climate change is intensifying droughts across Northern Nigeria, exacerbating water scarcity and disproportionately affecting vulnerable populations, including 25 million Nigerians living with disabilities (PWDs). Extended water collection times, primarily borne by female caregivers, contribute to gendered time poverty, school absenteeism, and adverse health outcomes. Limited empirical evidence exists on these intersecting impacts in the Sahel. This study quantifies the effects of climate-driven water scarcity on caregiving burden, school dropout, and long-term health among disability-affected households. A mixed-methods cross-sectional study was conducted from 2022–2025 across drought-affected communities in Adamawa, Yobe, and Borno States (n=1,204 households; 18% including ≥1 PWD). Household surveys captured water access time, school attendance, caregiving burden, and health outcomes. Satellite-derived drought indices (SPEI) and local water point functionality data were integrated. Multivariate logistic regression evaluated associations between water scarcity, school dropout, and health outcomes. In-depth interviews with caregivers and adolescents with disabilities explored lived experiences and adaptive strategies. Ethical approval was obtained from the National Health Research Ethics Committee (NHREC), Abuja, Nigeria. PWD households spent significantly more time collecting water during droughts (mean 3.7 vs. 2.4 hours/day; $p < 0.001$). Adolescents with disabilities in water-insecure households had 2.3 times higher school dropout risk (AOR 2.31; 95% CI 1.62–3.29). Caregivers reported musculoskeletal strain (48%), dehydration-related illness (34%), and psychological distress (29%). Female caregivers carried 72% of water collection burden. Reduced water access was strongly associated with adverse health outcomes among PWDs (AOR 1.89; 95% CI 1.34–2.66). Climate-driven water scarcity disproportionately affects persons with disabilities through increased caregiving burden, educational exclusion, and negative health outcomes. Disability-inclusive climate adaptation, resilient water infrastructure, and social protection interventions are critical to promote

health equity and resilience under worsening climate extremes.

OSE-09-02 **Tangent Topp-Leone Distributions for Advanced Modelling of African Climate-Driven Health Outcomes**

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With the changing disease dynamics in Africa due to increased temperatures and extreme weather conditions, there is an immediate need to establish data frameworks that are applicable in the African region to ensure the health system is resilient to the changing disease dynamics. Conventional statistical distributions often fail to model the skewed, heavy-tailed, or complex hazard patterns that are common in contemporary biomedical and climate-sensitive health data. This research, therefore, in response to the health issues presented in the conference theme “Our Health in Peril,” presents two novel distributions, namely the Tangent Topp-Leone Chen (TTLC) and the Tangent Topp-Leone Fréchet (TTLF). The proposed distributions were developed using the Topp-Leone family of distributions, and the trigonometric functions were incorporated to provide better modeling capabilities for the various data variation complexities. The proposed distributions provide the characteristic statistical properties, namely the Probability Density Function (PDF), Cumulative Distribution Function (CDF), and the Survival and Hazard functions. The parameters were estimated using the maximum likelihood estimation method, and the properties of the estimators were evaluated using the Monte Carlo simulations. The proposed distributions were evaluated using various biomedical datasets, and the results show that the proposed distribution, the Tangent Topp-Leone Fréchet (TTLF) distribution, is the best distribution compared to the existing models based on the goodness-of-fit criteria. Furthermore, an interactive Shiny app was developed to show the potential of the proposed distribution in predicting survival probabilities. The proposed distributions provide better alternatives for modeling the complex data variation, and the proposed models fit the conference sub-theme “Data, Methods, and Modelling” for researchers modeling the health outcomes driven by the changing climatic conditions, hence contributing to the formulation of the climatic actions that ensure the health of the people is protected from the increased climatic risks and the deepening health vulnerabilities in the African continent.

OSE-09-03 **Assessing Nutrient Profile and Adequacy of Commercial Food Products Targeted at Children 0-36 Months in Ghana.**

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Adequate nutrition during infancy and early childhood is essential for optimal growth and development. In Ghana, climate change constrains household access to diverse, nutrient-rich foods, particularly in urban areas, increasing reliance on commercial complementary foods perceived as convenient and nutritious. However, variability in nutrient quality and displacement of locally available options underscore the need to assess nutrient adequacy, strengthen regulation, and promote climate-resilient, home-prepared alternatives. This study assessed the nutrient profile and adequacy of selected commercial food products



targeted at children aged 0–36 months in Ghana using label information. A cross-sectional design evaluated label information of commercially produced complementary foods sold in the Greater Accra and Volta Regions. Fifty-six products were purchased and categorized into ten sub-groups, including milk desserts, fruit purees, vegetable purees, cereals, and formulas. Nutrients (fat, protein, carbohydrate, sodium, added sugars, and salt) were analysed per 100 g for cereals and per serving size for purees. Levels were compared with WHO/FAO Recommended Daily Allowances (RDAs) for children aged 0–6 months, 6–11 months, and 1–3 years. Data were analysed using SPSS version 22 and Excel version 14.0. Means, standard deviations, frequencies, and percentages of products exceeding RDAs were determined. Of the 56 products, 55 were analysed. Overall, 29% contained sugars, 7.3% contained salt, and none listed sweeteners. While 83.6% included age information, none provided specific age ranges; 16.4% lacked age indication. Only 3.6% were designed for infants as young as four months. Appropriate age-specific portion sizes were provided by 14.5% of products. Fruit-with-milk purees (≥ 6 months) showed excess carbohydrates, and vegetable-with-animal-protein purees showed excess fat. Findings highlight nutrient excesses, labelling gaps, and limited age-appropriate guidance. Strengthening food systems, improving formulation and labelling, and enhancing regulatory oversight are critical to safeguard infant and young child nutrition in climate-vulnerable settings.

OSE-09-04 **Economic Instability and Mental Health Outcomes in a Low-Income Economy: Evidence from Malawi**

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Economic instability in low-income countries often extends beyond income volatility, shaping population-level mental health outcomes. This study examines the dynamic relationship between unemployment, vulnerable employment, and depressive disorders in Malawi, a structurally constrained economy characterized by high informality, limited fiscal space, demographic pressures, and exposure to recurrent macroeconomic shocks. Using national time series data from 1991 to 2021, the study applies a partial structural change model within a log-linear regression framework to account for evolving economic conditions. Structural break tests identify significant shifts in 1998, 2008, 2012, and 2018, corresponding to major economic and policy transitions. Results indicate that unemployment maintains a strong and persistent positive association with depressive disorders, generating a substantial increase in disability adjusted life years (DALYs) at the population level. Vulnerable employment initially appears protective, suggesting insecure work functioned as a coping mechanism. However, after 2012, this relationship reversed, with precarious employment positively associated with depressive disorders, reflecting rising psychological strain under inflationary and structural pressures. The findings demonstrate that the mental health consequences of economic instability are dynamic and context-dependent. In labour markets



dominated by informality and weak absorption capacity, both joblessness and precarious employment generate measurable health costs. While focused on Malawi, these structural conditions are characteristic of many low-income countries, suggesting that integrating employment policies, social protection, and mental health systems is essential for building resilience in economically vulnerable settings.

OSE-09-05 **A Review of Policies that Enhance Climate Adaptive and Resilient Communities in Ghana**

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of populations that depend on rain-fed agriculture, and thus their livelihood opportunities. With evidence that Africa contributes the least to global warming, and yet possesses the least capacity to adapt and build climate resilient communities, the incorporation of nature-based actions, easily understood and implemented by local populations as a part of Africa's climate change policies may perhaps be the answer to Africa working to combat the effects of climate change through effective policy. Through an in-depth systematic documentary analysis, of selected policies implemented over a ten-year period in Ghana, this study explores how adaptive and resilient such policies have been. It further investigates the incorporation of local participation and nature-based strategies in context-specific situations in the implementation of these selected policies. Preliminary findings from the policy reviews revealed that most policies aim to be resilient and are not comprehensively adaptive to local contexts. Again, sociological perspectives that are crucial for understanding and addressing climate change challenges in Ghana are absent in most policy documents. Social capital which plays a very significant role in enhancing local participation and nature-based strategies is low. An interplay between social dynamics, power relations and the importance of addressing socio-economic disparities whilst fostering collaboration among diverse stakeholders is also found to be of importance in enhancing climate adaptive and resilient strategies. The study concludes that aligning policy goals with community-specific requirements is crucial for developing effective strategies to build long-term adaptive and resilience against climate change in affected populations in Ghanaian communities.

OSE-10 Adaptation, Early Warning, and Indigenous Knowledge

OSE-10-01 **Machine Learning-Based Early Warning of Climate-Sensitive Diarrhea Risk in Rwanda**

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Diarrhea remains a leading cause of morbidity among children under five in Rwanda, with climate variability increasingly recognized as a key driver. Previous studies have documented associations between temperature, rainfall, and diarrhea incidence but relied on Acoarse ground-based climate data and conventional statistical models, limiting their ability to capture spatial heterogeneity, non-linear dynamics, and predictive utility. This study addresses these gaps by developing

Rwanda's first machine learning based early-warning system for climate-sensitive diarrhea. We integrate high-resolution satellite-derived climate variables including rainfall (CHIRPS), land surface temperature (MODIS), and soil moisture (SMAP) with district-level health surveillance data (2014–2024) and contextual covariates from Demographic and Health Surveys (DHS). Using a retrospective ecological time-series design across all 30 districts, we train and compare Random Forest, XGBoost, and Long Short-Term Memory (LSTM) models to predict monthly diarrhea incidence. Temporal validation (training: 2014–2021; testing: 2022–2024) enhances real-world applicability, while SHAP-based interpretability enables attribution of climate-related risk drivers. Preliminary results suggest that climate-diarrhea relationships are highly non-linear and seasonally contingent. For example, heavy rainfall following dry spells substantially elevates risk through flooding-mediated contamination, whereas moderate rainfall may dilute pathogen concentrations. The model consistently identifies high-risk periods (March–May and October–December) and geographic hotspots in Rwanda's northern and western provinces, corresponding to known water, sanitation, and hygiene (WASH) vulnerabilities. By transforming open-access Earth observation data into actionable, district-level risk forecasts, this study directly supports climate-resilient health systems and anticipatory public health action such as pre-positioning oral rehydration supplies and deploying community health workers ahead of predicted outbreaks. The proposed framework is scalable and cost-effective, offering strong applicability to other climate-vulnerable African settings and directly responding to the conference theme "Our Health in Peril."

OSE-10-02 **Development of an Artificial Intelligence Model for Early Warning of Cholera in Far North Cameroon**

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In the Far North Region of Cameroon, a Sahelian ecosystem integrated into the Lake Chad basin, seasonal flooding, water scarcity, population displacement, and recurrent cross-border transmission from Nigeria and Chad have sustained cholera outbreaks since 1971. With reactive surveillance systems proving insufficient, predictive digital solutions have become a vital resilience lever. This study explores Explainable Artificial Intelligence (XAI) for cholera risk governance, designing a hybrid model to anticipate outbreaks 14–28 days before the first reported case while answering: where, when, and why outbreaks occur. The hybrid dataset (2015–2024) integrates weekly district-level morbidity records (11 districts, 1,847 cases, 97 deaths) and high-resolution environmental variables (rainfall, flood risk, temperature) from Google Earth Engine. The approach combines: (1) a systematic review (1971–2025, 32 sources); (2) SARIMA for seasonal capture (July–October peak, 52-week cycle); (3) XGBoost for exogenous features (rainfall, flood risk, border proximity, cross-border cases, 7 hotspot indicators); and (4) SHAP for interpretability. The hybrid model achieved a mean absolute error of 4.2 cases per week (RMSE: 6.8, R^2 : 0.83), outperforming SARIMA alone (MAE: 8.7) and XGBoost alone (MAE: 6.1). At 2-week lead time, sensitivity was 82% and precision 76%. SHAP analysis revealed: WHERE: Kolofata (SHAP: 0.42), Kousseri (0.38), and Mokolo (0.34) had highest risk; WHEN: a sharp threshold at 150mm



cumulative 14-day rainfall (below: risk 0.08; above: risk increases to 0.65); WHY: top contributors were rainfall (+0.35), Nigeria cross-border cases with 14-day lag (+0.28), border proximity (+0.18), and open defecation (+0.09). This research lays groundwork for predictive health in Cameroon. Recommended: automated SMS alerts for three highest-risk border districts, integration of the 150mm rainfall threshold into pre-season preparedness, and incorporation into the National Epidemic Response Plan. The methodology is transferable to other Lake Chad Basin settings.

OSE-10-03 Living with Non-Communicable Diseases in a Changing Climate: Coping Strategies of Smallholder Farmers in Ghana

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Smallholder farmers are disproportionately exposed to climate change and smallholder farmers living with non-communicable diseases (NCDs) face additional challenges with coping and managing their conditions. Yet existing studies have not adequately examined how smallholder farmers concurrently cope with climate change and NCDs. As part of a larger research program, this study explores the strategies employed by smallholder farmers living with NCDs to cope with the concurrent impacts of climate change and NCDs. Primary data for the study were collected from three study sites in northern Ghana through a cross-sectional survey involving 726 smallholder farmers, and fifteen in-depth interviews with smallholder farmers living with non-communicable diseases (NCDs). We analyze the survey data using a binomial regression approach in SPSS (v29), and the interviews using inductive coding and thematic analysis in NVivo (v14). In the survey, severely food-insecure participants (OR = 0.39, 95% CI [0.25-0.62]) are less likely to cope through self-support strategies than those who are food secure. Participants with borderline dietary diversity (OR = 3.29, 95% CI [2.21-4.90]) and those with acceptable dietary diversity (OR = 2.78, 95% CI [1.84-4.21]) are also more likely to cope through self-support strategies than those with poor dietary diversity. Six coping strategies also emerged from the interviews, suggesting that participants living with NCDs in a changing climate cope with their circumstances through: (1) engaging in domestic agricultural activities; (2) engaging in other occupations; (3) spirituality/worship/prayer; (4) support from family and friends; (5) adhering to healthcare professionals' advice; and (6) engaging in physical activities/exercise. We conclude that interventions to help smallholder farmers manage their NCDs amid climate change should examine how existing coping strategies can be strengthened by addressing barriers to effective coping.

OSE-10-04 Bridging Knowledge Systems: Indigenous Flood Adaptation in Ghana's New Policy Framework

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Flooding remains one of Ghana's most persistent environmental challenges, affecting communities across all agro-ecological zones in the country. Recent evidence shows extensive documentation of indigenous flood adaptation strategies and early warning systems. This knowledge systems however remain largely disconnected from formal disaster governance. This disconnection persists despite policy commitments to "community resilience" in Ghana's current Disaster Management and Risk Finance Strategy Framework (2025–2030), which explicitly identifies floods as a priority hazard and signals a shift from reactive response to proactive risk management. This paper proposes qualitative multiple-case study to investigate how indigenous flood adaptation knowledge can be systematically integrated into Ghana's national disaster management framework. It will address the following questions: (1) What are the existing indigenous flood adaptation strategies in selected flood-prone communities (2) How does the identified strategies align with the Disaster Management and Risk Finance Strategy Framework's (2025–2030) provisions? (3) What mechanisms and barriers shape the integration of indigenous knowledge into the operations of the National Disaster Management Organization (NADMO) at multiple levels of governance? Theoretically, this work will advance understanding of knowledge integration in disaster governance, particularly examining how indigenous and scientific knowledge systems can interact productively without subordinating indigenous knowledge. In practice, it will produce actionable recommendations for operationalizing the framework's community resilience pillar, supporting district-level planning, and informing Ghana's commitments to sustainability. By examining integration opportunities within a concrete, and time-sensitive policy window, this study addresses a critical gap at the intersection of indigenous knowledge scholarship and disaster governance practice. Findings will inform ongoing policy implementation while contributing to broader conversations on equitable climate adaptation and recognition of indigenous knowledge systems as rights-based foundations for resilience building. In addition, the findings will contribute or shape Ghana's effort to meeting SDG 11 and 13.

END

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Climate-Health Interactions



CCPOP-Ghana Series In Pictures



2019: GMet Team meets CCGPOP-Ghana Convener (middle), GMet on a Panel, Presentations and some Side Event Participants in a Group Photo.



2018: Accra's Mayor, Hon. Adjei Sowah delivers a Keynote Address, amidst activities of dance and fun.



2016: RIPS honours Prof Ernest Aryeetey, Vice Chancellor, University of Ghana for his Exceptional Support to CCGPOP-Ghana at the Opening, graced by the Moroccan Ambassador to Ghana, H.E. Madam Nezha Alaoui, & Edith Adera of IDRC, Canada.



2015: Head of the EU in Ghana, VC, University of Ghana, Ghana's Environment Minister & Scientists network following the Official Opening.



2014: The Chief of Mission of the United Nations-IMO in Ghana engages Prof Audrey Gadzekpo following the Official Opening.



2013: Day 1 Scenes of Ugandan Parliamentarians, the Chair (Prof Akosua Adomako-Ampofo) & Dr. Joe Oteng Adjei Ghana's Environment Minister.



2012: The Maiden Event featured among several dignitaries the Brazilian Ambassador, Ghana Madam Vida Gala, VC University of Ghana, Prof Ernest Aryeetey, VC of UCC Naana Jane Opoku Agyemang & Ms Joyce Aryeh as Distinguished Plenary Speakers.