



CLIMATE AND HEALTH AFRICA CONFERENCE (CHAC) 2024

Achievements, Lessons Learned
and Future Priorities



Theme: Cultivating Resilience in Health: Towards Unified, Equitable Strategies for Climate Adaptation and Mitigation in Africa

Venue: Cresta Lodge Msasa, Harare, Zimbabwe

Dates: 29–31 October 2024, with pre-conference sessions on 27th-28th October 2024 and Post conference sessions on 1st and 2nd November 2024

Organised by: CeSHHAR Zimbabwe, in partnership with the Zimbabwean Ministries of Health and Child Care; Environment, Climate, and Wildlife; and supported by Wellcome Trust

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1. CONTEXT

The Climate and Health Africa Conference (CHAC2024) emerged against the backdrop of intensifying climate-health threats, systemic underinvestment in Africa's adaptive capacity, and continued underrepresentation of African expertise in global climate-health policymaking. Communities across Africa—despite being disproportionately affected by climate-induced hazards—remain under-resourced and underrepresented in decision-making forums.

Persistent challenges remain fragmented scientific disciplines, insufficient climate-health research funding, poor alignment of evidence with policy processes, and limited support for emerging African scholars. These constraints hinder co-creation of tailored solutions to mitigate the human impacts of climate change. Yet, the continent is also a wellspring of innovation and knowledge. CHAC2024 was conceived to harness this momentum and reposition Africa at the centre of global discourse, evidence production, and policy action on climate and health.

Zimbabwe was strategically selected as host due to its demonstrated leadership in climate-health adaptation, marked by recent cabinet-level endorsement of the National Adaptation Plan (2024–2030). As a country grappling with extreme climate variability, vector-borne diseases, and systemic health vulnerabilities, Zimbabwe represented both the urgency and opportunity inherent in the climate-health nexus. The joint stewardship of CHAC2024 by the Ministry of Environment, Climate and Wildlife, the Ministry of Health and Child Care, the Ministry of Defence, the Office of the Vice President, the Office of the President and Cabinet, and the active involvement of Cabinet Ministers illustrated a rare cabinet-level, intersectoral commitment to integrated policy responses. Hosting the conference in Harare offered not only political resonance but also a practical site to showcase context-specific innovations in climate-resilient health systems.



2. OVERVIEW

2.1. Vision

CHAC2024 envisioned a healthy future for Africa, supported by transformative, high-quality, regionally led climate and health science that catalyses urgent, evidence-based advancements in policy and action across sectors and societies.

2.2. Mission

To catalyse, strengthen, and coordinate capacity for high-quality, transdisciplinary climate and health research, and to promote actionable evidence uptake through inclusive, African-led processes. CHAC2024 aimed to bring together diverse disciplines—including climate and natural sciences, health sciences, meteorology, data sciences, economics, political science, and implementation science—and stakeholders from applied sectors such as WASH, energy, infrastructure, food systems, and environmental management. The mission also embraced collaboration with policymakers, civil society, creative sectors, community representatives, and individuals with lived experiences of climate-health impacts, ensuring equitable representation and co-creation.

The 1st International Climate and Health Africa Conference (CHAC2024), held from 29 to 31 October 2024 in Harare, Zimbabwe, marked a watershed moment in African-led climate and health dialogue. Organised under the strategic leadership of CeSHHAR Zimbabwe's Climate, environment and Health Department and co-hosted by Zimbabwe's Ministries of Health and Child Care and of Environment, Climate and Wildlife, and office of the President and Cabinet CHAC2024 emerged as a pan-African platform for fostering transdisciplinary research, co-developing climate-health policy innovations, and amplifying African voices in global negotiations leading to COP29.

Zimbabwe's selection as host underscored the country's commitment to climate-resilient health systems and demonstrated high-level political will, with cabinet endorsement and full government backing.

Cresta Lodge Msasa in Harare provided the venue for 489 delegates from 46 countries, including 34 African nations. These delegates represented a dynamic mix of scientists, early career researchers (ECRs), policymakers, civil society leaders, funders, and journalists, unified in their purpose to cultivate resilience in health systems through equitable climate adaptation and mitigation strategies.

2.3. Aim

CHAC2024 was conceived to achieve four primary objectives:

- Catalyse African-led evidence generation and translation into climate-health policy, by increasing the generation of context-specific, ethical, policy-relevant, and widely applicable scientific evidence.
- Establish robust multi-level networks and coalitions for climate resilience in health, enhancing connections across sub-regional and pan-African research and policy ecosystems, with specific emphasis on the inclusion of communities most affected by climate change.
- Elevate the visibility and agency of Africa in global climate-health dialogues, supporting greater participation and influence of African science and scientists in global decision-making and priority-setting processes.
- Empower the next generation of African researchers, through structured capacity building, mentorship, and sustained engagement, strengthening the capacity of emerging leaders and institutions to act upon the evidence generated.

2.4. Impact Highlights

- The 1st International Climate and Health Africa Conference (CHAC2024) marked a continental turning point in repositioning Africa as a leader—not a participant—in global climate–health discourse. We convened 489 delegates from 46 countries, including representatives from 34 African nations, catalysing a new era of geopolitical alignment and scientific sovereignty. The conference culminated in the Harare Declaration on Climate and Health in Africa—co-authored by ministers—which outlines a six-point continental agenda and has since informed Africa’s positioning for COP29.
- Scientifically, CHAC2024 generated 584 abstract submissions across five tracks, with 198 presented. This archive represents the most comprehensive consolidation of African-led climate–health evidence to date, spanning biological mechanisms, environmental exposures, adaptation, mitigation, and ethics. Gaps in biomedical and equity-centred research were identified, affirming the need for upstream investment in underexplored areas such as maternal thermoregulation, climate-sensitive diagnostics, and governance of ethics in implementation science.
- A pan-African cohort of 83 Early Career Researchers from 18 countries was supported through scholarships, structured mentorship, and the establishment of the CHAC Fellows Network—laying the foundation for an intergenerational research alliance. Beyond presentations, 21 satellite sessions and 14 exhibitions embedded multi-sectoral dialogue and innovation exchange.
- Thematic analysis revealed that adaptation and epidemiology dominate African climate–health research, while upstream biological studies and ethical frameworks are under-represented. Mitigation strategies showed promise, particularly in urban design and healthcare decarbonisation, but lacked systems-level integration. Ethics emerged as a powerful discourse, though largely conceptual, with few operational models presented.
- CHAC2024 proved that scientific convening can serve as a site of political action. Ministers became co-authors; communities became narrators of lived experience. Africa moved from climate-health documentation to diplomacy, from participation to leadership. We now have a policy declaration, an evidence base, and a generation of scholars mobilised for change. The discovery is not merely academic—it is structural: Africa is ready to lead, and CHAC2024 was its declaration of intent.

2.5. The Implications of our work

- CHAC2024 established a continent-wide infrastructure for climate–health science, diplomacy, and policy co-production, with transformative implications for African health systems, research ecosystems, and geopolitical agency. **The Harare Declaration**—co-authored by 34 African states—has already informed Africa’s preparatory positioning for COP29, presenting the continent as a unified, evidence-driven actor in global climate governance.
- Anticipated outputs include the consolidation of **the first pan-African archive of climate–health research**, grounded in 198 presented abstracts across five scientific tracks. This curated repository offers a foundational resource for future open-access publications, special issue collaborations, and indexed contributions to global literature. If strategically mobilised, it could seed comparative multi-country studies, influence systematic reviews, and anchor new Africa-led journal series.

- **The ECR Fellows Network** further institutionalises intergenerational scientific leadership, providing a platform for sustained collaboration, early career researcher (ECR) capacity strengthening, and proposal incubation. This cohort is well-placed to drive South-led research consortia, methodological innovation, and trial design responsive to regional contexts.
- **Policy implications are significant.** Countries have begun incorporating the Declaration’s six priorities—including data governance, health system resilience, equity, and climate-informed service delivery—into their Nationally Determined Contributions (NDCs), National Adaptation Plans (NAPs), and emerging Heat-Health Adaptation Plans. Subject to resource availability, we intend to collaborate with WHO-AFRO’s Clim-Health network and the Wellcome Trust’s regional policy hubs to co-develop a continental alignment toolkit. This tool will support ministries of health, environment, and finance in embedding climate-health evidence into strategic planning, resource allocation, and implementation frameworks. Technical dashboards, with periodic ministerial review and accountability mechanisms, may be embedded within existing structures led by the African Union’s Africa CDC and WHO-AFRO.
- **Changes in healthcare practice are already in development.** Pilot initiatives for facility-level adaptation (e.g. passive thermal design, decentralised energy), community-based mitigation with health co-benefits, and maternal-newborn diagnostics are underway, with implementation trials envisioned in years to come. These efforts will inform clinical guidelines, workforce protocols, and public health preparedness strategies.
- **CHAC2024 laid the foundation.** Its long-term impact will depend on how African policymakers, funders, and scientific leaders activate its outputs—as a blueprint for climate-resilient health systems governed by African institutions and responsive to African realities.





3. KEY ACHIEVEMENTS AND LESSONS LEARNED

3.1. Geopolitical leadership and epistemic sovereignty in Africa’s climate and health agenda



Flagship achievement

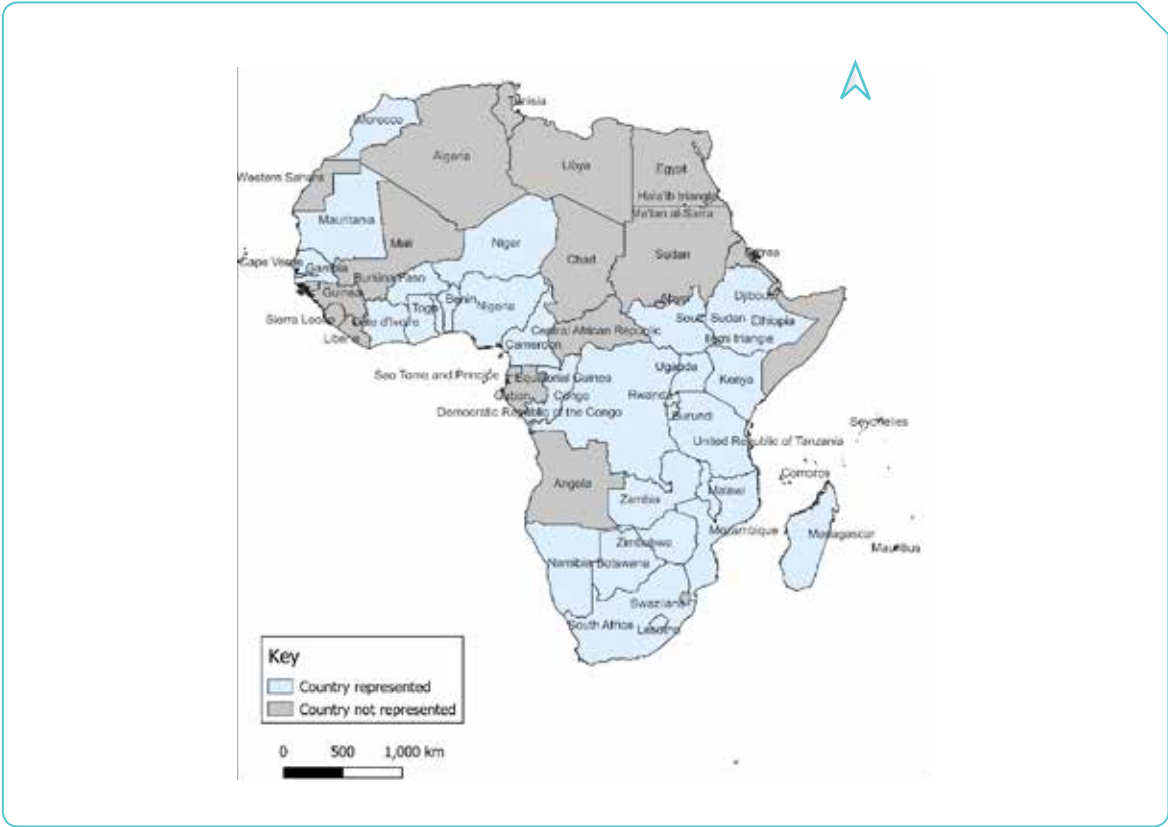
CHAC2024 successfully convened representatives from 34 African countries, demonstrating an unprecedented level of continental mobilisation and pan-African ownership over climate and health discourse. Ministers and policymakers co-authored the Harare Declaration, transforming the event from a scientific gathering into a continental platform for political negotiation and agenda setting. Africa did not merely participate—it led the agenda.



Key lesson learned

In the absence of a standing intergovernmental climate-health agency, horizontal diplomacy, epistemic solidarity, and scientific cooperation can serve as powerful levers for coordinated policy influence. CHAC2024 revealed that continental unity in evidence production and diplomatic engagement is both possible and potent when the platform is African-led and strategically framed to elevate African priorities. Future initiatives must intentionally centre African leadership and knowledge sovereignty to shift global climate-health power dynamics.

Figure 1: Climate and Health Africa Conference 2024 Country Representation



Continental Coverage and Political Will

34 of 54
African countries
represented



Achievement: Unprecedented geopolitical reach demonstrating cross-regional political mobilisation.

Lesson Learned: Strategic convening without intergovernmental infrastructure can catalyse continental alignment and action through science diplomacy.

From Participation to Co-Authorship

Ministers as Co-authors of the Harare Declaration

Achievement: Shifted ministers and state actors from observers to policy co-designers, advancing evidence-based governance.

Lesson Learned: Scientific convenings can serve as platforms for horizontal policy diffusion, especially when political mandates and research outputs are intentionally linked.

Scientific Sovereignty as Postcolonial Power

Africa-centred policy narrative amplified

Achievement: Conference became a continental sounding board for structural reform of global climate-health governance.

Lesson Learned: Positioning African scientists and policymakers as agenda-setters affirms epistemic justice and postcolonial agency in international fora like IPCC and UNFCCC.

The representation of 34 African countries at CHAC2024 signifies not merely geographic breadth, but the political will of a continent to reclaim and redefine its position in the global climate-health governance architecture. This continental engagement underscores a deliberate and strategic disruption of historical exclusion from global knowledge production systems, where African evidence and leadership have been peripheral, if not entirely absent.

CHAC2024 created a multi-country, multilingual, cross-sectoral platform that was as much about science as it was about sovereignty—of knowledge, of policy direction, and of Africa's future. The visible engagement across West, East, Central, and Southern Africa reconfigures the traditional donor-recipient dynamic, signalling instead a rising intellectual and diplomatic bloc with shared climate-health priorities and a common resolve to shape climate action agendas. That 34 out of 54 countries mobilised delegations—despite vast logistical, economic, and infrastructural disparities—speaks to an emergent continental consciousness: a refusal to be passive subjects of international frameworks and an insistence on leading the articulation of African resilience.

Ministers and state actors engaged not as observers but as co-authors of the Harare Declaration, using CHAC2024 as a stage to weave together fragmented climate-health responses into a coherent African vision. The conference thus bridged scientific outputs with political uptake, and research aspirations with diplomatic mandates.

Importantly, CHAC2024's political geography challenges the historic marginalisation of African expertise in global assessment processes such as the IPCC or UNFCCC. By convening this level of country participation, the conference functioned as a continental sounding board—amplifying calls for structural reform in global climate governance that has long overlooked the specificities of African vulnerability and the pluralities of African solutions.

In feminist and postcolonial terms, this gathering might be read as a form of continental insurrection—an epistemic uprising where African scientists, policymakers, and communities asserted their right not just to be heard, but to set the agenda. The map becomes more than a visual—it is a cartographic declaration of Africa's scientific agency, political readiness, and refusal to be a peripheral stakeholder in decisions that affect the health of its people and the future of its ecosystems.

3.2. Scientific advancement



Flagship achievement

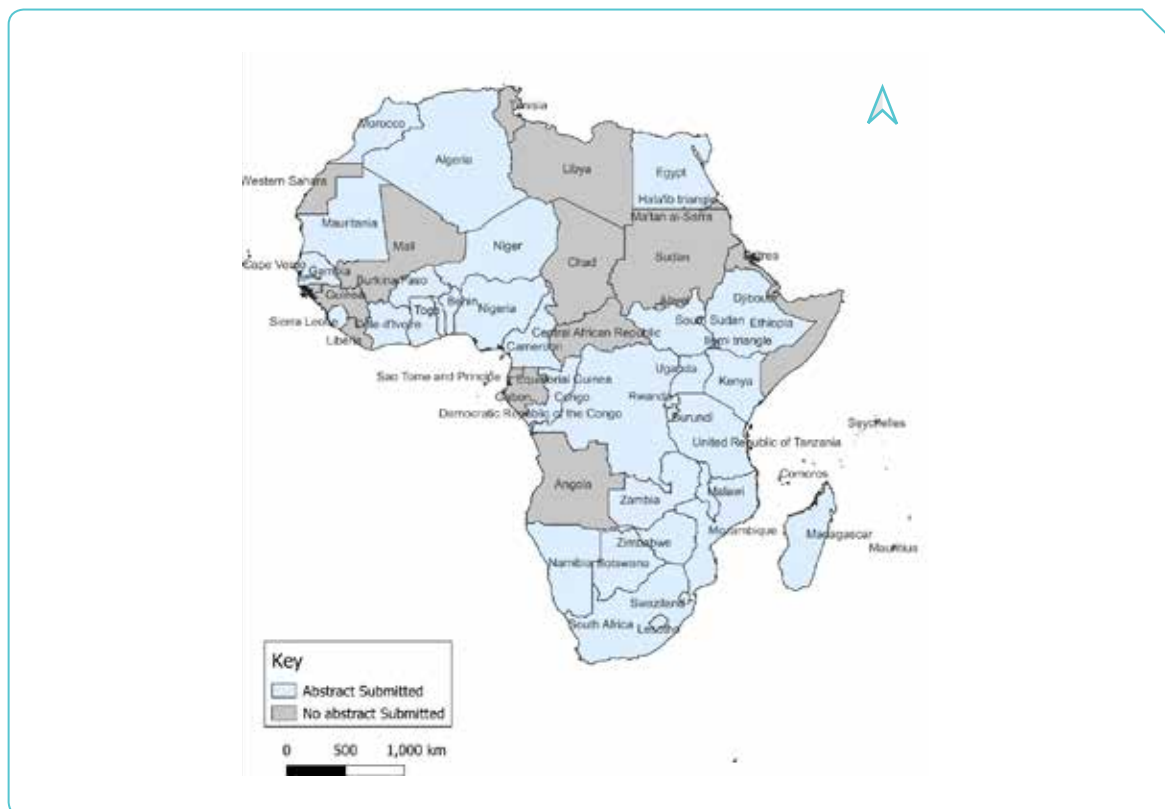
CHAC2024 catalysed an unprecedented consolidation of climate and health science on the continent, receiving 584 scientific abstracts across five critical tracks: biological mechanisms, epidemiology, adaptation, mitigation, and ethics. From this pool, 245 abstracts were accepted, and 198 were presented (88 oral and 110 poster presentations). In parallel, 21 satellite sessions and 14 organisational exhibitions extended the boundaries of conventional conferencing, embedding multi-actor, multisectoral dialogue into the scientific agenda. This culminated in the formation of a continent-wide scientific archive—a rich body of policy-relevant, context-specific, and ethically grounded evidence—with 198 abstracts currently under preparation for open-access publication and a special issue in partnership with Nature Medicine in development.



Key lesson learned

Scientific sovereignty requires intentional investment in African-led knowledge systems—rooted in ethics, plurality, and praxis. CHAC2024 demonstrated that when African scientists are centred as knowledge producers and curators, the output is not only voluminous, but also deeply resonant with local realities and globally instructive. It is no longer tenable for Africa's climate-health science to be extractive, externally driven, or context-detached. Instead, CHAC2024 offers a model for how continentally-anchored, ethically aligned research ecosystems can shift the locus of climate-health knowledge production—and power.

Figure 2: Climate and Health Africa Conference 2024 Abstracts submitted



Knowledge Generation by and for Africa

584

Abstracts
presented

245

Accepted

198

Presented

Achievement: Scale and diversity of scientific contributions reaffirmed the depth of African climate-health research capacity.

Lesson Learned: Demand for African-led platforms to disseminate research remains unmet globally—CHAC2024 began to bridge this gap.

From Contribution to access 198 Abstracts for public Access

Achievement: Transformation of conference content into permanent scholarly canon.

Lesson Learned: African data must not only be presented—it must be preserved, cited, and canonised within global science systems.

Practical interventions, ethics and equity in evidence

5 thematic tracks including ethics | 21 satellite conferences | 14 Exhibitions/symposiums

Achievement: CHAC2024 moved beyond data to interrogate the values underpinning research—centering equity, ethics, and community relevance.

Lesson learned: Climate-health science must be reflexive, inclusive, and designed for justice—not merely output.

Mapping scientific voice – continental submission reach

Achievement: Abstracts were submitted from over two-thirds of African countries, encompassing Anglophone, Francophone, and Lusophone nations.

Lesson Learned: This cartography of knowledge signals a continental research awakening, transcending linguistic, geopolitical, and economic barriers. It evidences the hunger—and capacity—for African scientists to speak in their own voices, to their own realities, on a continental stage.

This surge in scientific output from CHAC2024 does not merely reflect academic rigour; it affirms a wider epistemic shift. For decades, African climate-health realities were under-researched, or rendered through foreign lenses. CHAC2024 disrupted this trajectory by asserting that the continent is not a passive site of data collection but a **producer of globally consequential climate-health evidence**. The diversity of submissions—from early-career scholars to senior scientists, from Lusophone to Francophone to Anglophone communities—signals a pan-African scientific awakening that is as plural as it is profound.

Critically, the inclusion of an ethics track elevated a long-overdue reckoning with research justice—asking not only *what* we study, but *how*, *with whom*, and to *what end*. This reflects a decolonial ethic of knowledge production, where African communities are not merely subjects of study, but co-creators and beneficiaries of research.

This is more than a data point—it is a scholarly insurgency. A refusal to remain at the margins of scientific authorship. A declaration that African science is not just catching up—it is setting the pace. As the abstracts find their way into indexed repositories and high-impact journals, they collectively re-map the global climate-health research agenda, centering African voices, methodologies, and lived realities.

3.3. Early Career Researchers and capacity building



Flagship achievement

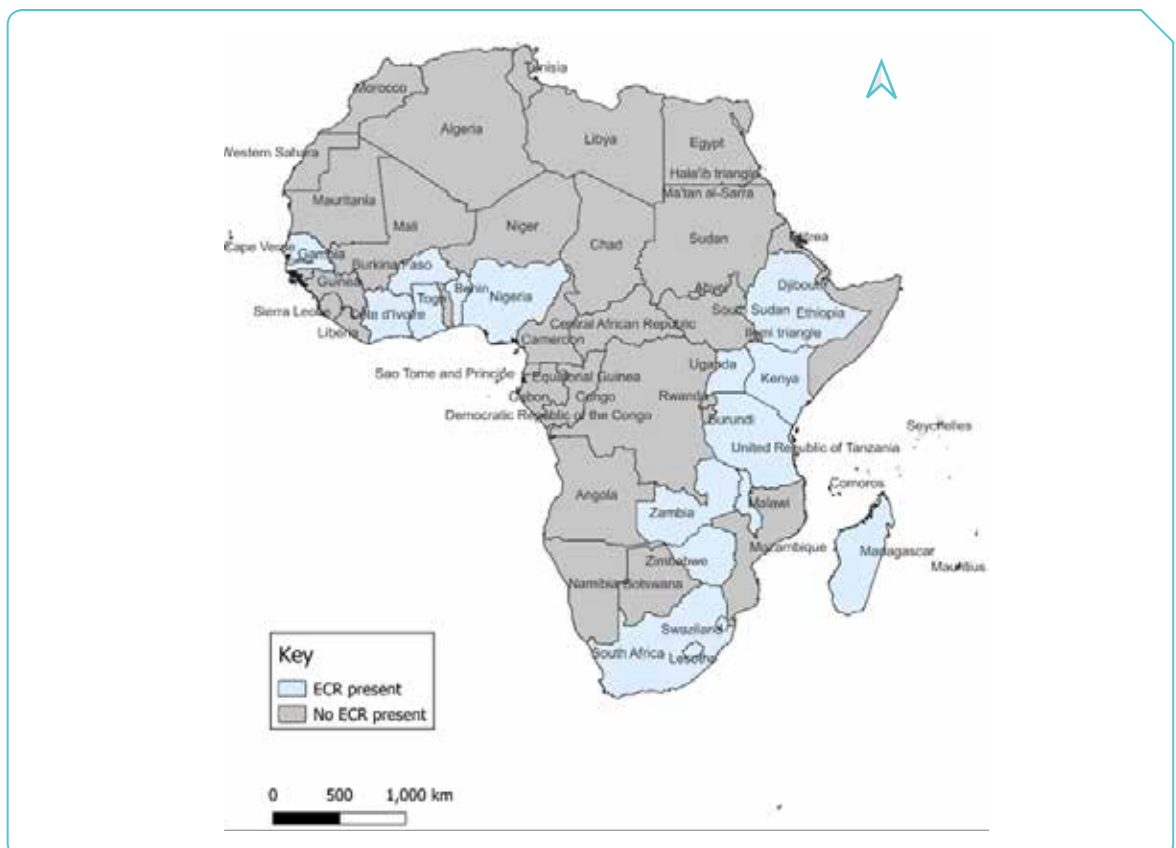
CHAC2024 placed early career researchers (ECRs) at the centre of Africa's climate and health transformation, offering fully funded participation to 65 ECRs from 18 African countries, selected from a competitive pool of 334 scholarship applications. An ECR cohort of 83 was constituted, actively contributing through oral and poster presentations, satellite sessions, mentorship events, and structured networking. Crucially, post-conference activities—including webinars, mentorship programmes, proposal labs, and the launch of the CHAC Fellows Network—have created an enduring platform for scientific collaboration, leadership development, and intergenerational continuity across the continent's climate-health community.



Key lesson learned

Supporting early career researchers is not an auxiliary gesture—it is a strategic imperative for system transformation. CHAC2024 demonstrated that ECR inclusion, when intentional and well-resourced, yields measurable outcomes: abstracts, successful fellowship applications, research, and cross-institutional partnerships. Inclusion must be infrastructural, not incidental. Africa’s climate and health response depends on enabling emerging scholars to not only enter the room—but to shape the discourse, co-lead the science, and co-create innovation and institutional arrangements for science and policy action.

Figure 3: Climate and Health Africa Conference 2024 ECR Representation



ECR Cohort Formation

334
Applications

65
Fully
funded

83
Active
participants

Achievement: Built a pan-African, interdisciplinary ECR network through competitive selection and embedded programming.

Lesson learned: Leadership pipelines must be designed—not assumed—to achieve meaningful generational renewal.

Structured Continuity

Mentorship | Webinars | CHAC Fellows

Achievement: Embedded long-term career support and collaboration beyond the conference.

Lesson learned: ECR programmes are most impactful when they evolve into sustained ecosystems, not isolated events.

Mapping the Next Generation

Geographical distribution of ECRs across Africa (figure 3)

Achievement: Representation from 18 African countries, including historically marginalised regions.

Lesson learned: ECR engagement must be geographically intentional—avoiding concentration in dominant research hubs.

CHAC2024 treated ECRs as core contributors to the scientific and political agenda. They shaped panels, led discussions, and authored outputs that informed the Harare declaration on Climate and Health in Africa. The cartographic representation (Figure 3) underscores the regional equity embedded in the programme design—stretching inclusion beyond capital cities and established institutions.

This was not participation by invitation—it was participation by transformation. A deliberate move to redress the epistemic imbalances that have historically excluded African ECRs from global forums, peer-reviewed platforms, and research funding cycles. The ECR Fellows Network is now formalising this momentum—anchoring it into an intergenerational alliance committed to co-creating, curating, and advancing African-led climate and health solutions.

CHAC2024 showed that Africa's climate resilience will be written by its emerging scholars—not in footnotes, but on the first page of every chapter that follows.

3.4. Scientific gaps and priority pathways



Flagship gap

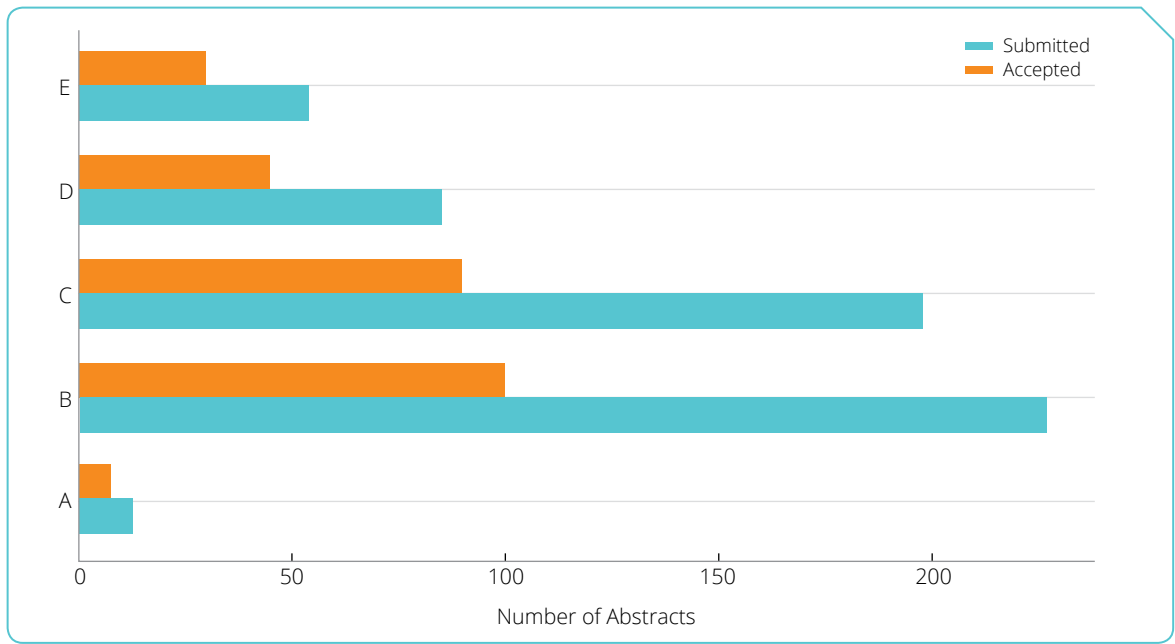
While CHAC2024 made historic gains in mobilising African scholarship, the distribution of submissions across scientific tracks reveals key epistemic blind spots. Track A (Pathophysiology and Biological Mechanisms) and Track E (Ethics and Climate Research Equity) received the fewest submissions and acceptances—13 and 54 abstracts submitted respectively, with only 7 and 34 accepted. This stands in stark contrast to Track B (Epidemiology and Environmental Exposures) and Track C (Adaptation Interventions), which dominated abstract volumes. These disparities are not simply numerical—they reflect deeper structural gaps in funding, research infrastructure, academic incentives, and methodological capacity.



Key lesson learned

Continental research ecosystems remain skewed towards observational, descriptive, and adaptation-oriented studies, while underinvesting in upstream biological mechanisms and normative frameworks like ethics and equity. Africa’s climate-health science will remain incomplete—and vulnerable to external interpretation—if these foundational gaps are not urgently addressed. A just and resilient future demands that Africa not only measures impact but also understands why they occur and how they should be governed ethically.

Figure 4: Track submissions and acceptances by volume

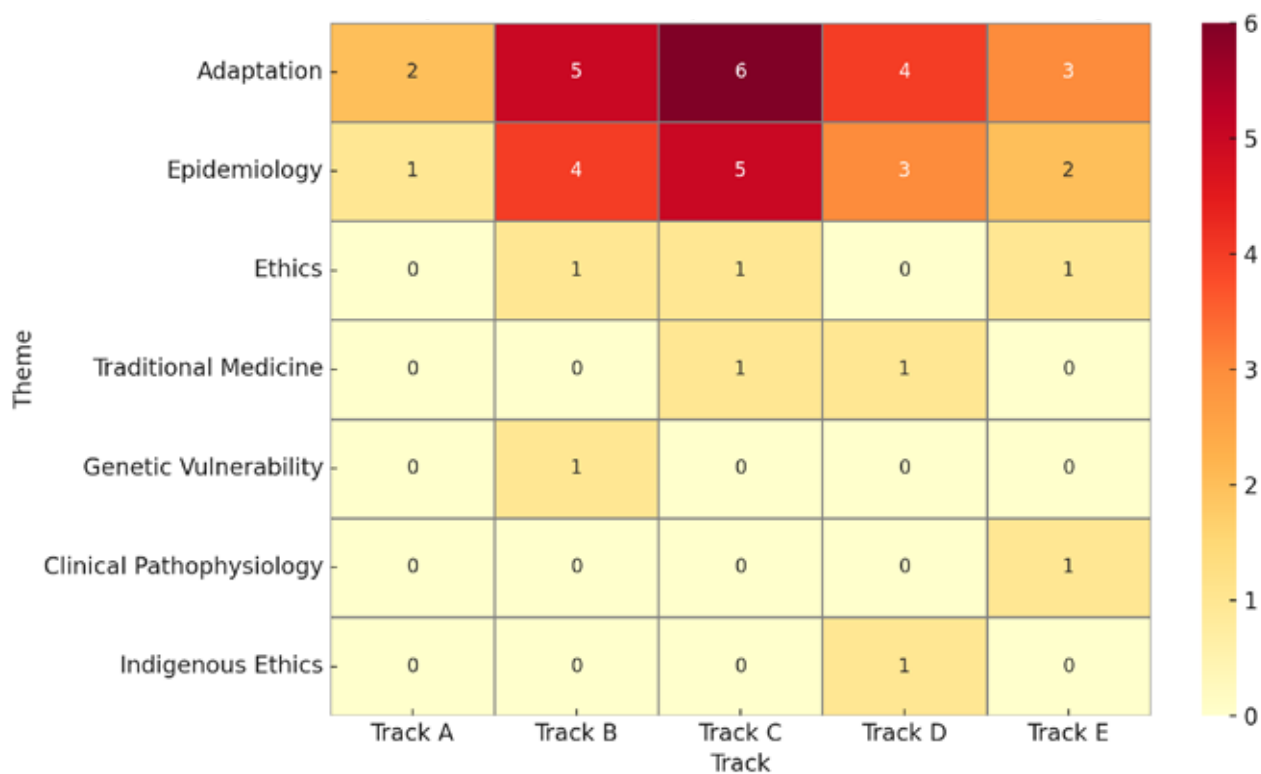


This horizontal bar chart highlights the imbalance across Tracks. Tracks B and C received the most submissions and acceptances, while Tracks A and E were significantly underrepresented indicating a gap in upstream biomedical and normative research areas.

Comparative heat map of track content coverage

This heat map visualises thematic saturation across Tracks. It reveals strong representation in adaptation and epidemiology, but critical gaps in traditional medicine, genetic vulnerability, clinical pathophysiology, and indigenous ethics—key areas for future investment and decolonial research leadership.

Figure 5: Comparative heat map of track content coverage



3.4.1. Track A – Pathophysiology and biological mechanisms



Flagship achievement

Despite receiving the fewest submissions (13), Track A carved out space for one of the most underfunded yet critical areas: the biological mechanisms through which climate change affects African bodies. Accepted abstracts highlighted cardiovascular stress, thermoregulation, and the influence of traditional healing on climate-related symptomology—pointing to the latent potential of this track to redefine biomedical framing of climate vulnerability in African contexts.



Key lesson learned

The biological impacts of climate change remain the least understood and least documented in Africa's climate-health scholarship. Without this lens, responses risk becoming superficial—treating symptoms rather than causes. Investing in this domain is no longer optional; it is essential for the development of pharmacological, diagnostic, and clinical adaptation strategies that work for African populations.

Heat map: scientific depth by subtheme (Track A)

Sub theme	Coverage
Cardiovascular and renal physiology	Medium
Neurological and thermoregulatory effects	Low
Reproductive and maternal physiology	Low
Traditional medicine and indigenous systems	None
Mechanistic modelling or multi-systemic links	None

Legend: High Medium Low None

Map illustrates absence of biological, gendered, or community-embedded biological research.

Gaps identified

- o Few studies explored gender-specific or reproductive biological pathways (e.g. maternal thermoregulation, foetal outcomes).
- o No genomic or immunological studies submitted.
- o Negligible research on how traditional healing systems intersect with climate-induced physiological stress.
- o No engagement with multi-systemic pathophysiology (e.g. simultaneous renal, cardiac, and neurological impacts under heat stress).

Several priority research areas should be pursued

Research Area	Specific Priorities
<i>heat tolerance thresholds</i>	Determine the physiological thresholds of heat stress in pregnant women, neonates, young children, and older adults through controlled exposure studies and longitudinal clinical monitoring.
<i>cardiovascular and renal function</i>	Assess the impacts of chronic dehydration and elevated ambient temperatures on cardiovascular stability and renal function, including early markers of acute kidney injury in heat-vulnerable populations.
<i>neurocognitive impacts</i>	Evaluate the neurocognitive effects of early-life and sustained heat exposure, focusing on cognitive development in children and the risk of accelerated cognitive decline in older adults.
<i>climate-chronic disease interactions</i>	Investigate the physiological interactions between climate-related stressors and chronic health conditions such as HIV, hypertension, and diabetes, including how heat exposure modifies the pharmacokinetics and pharmacodynamics of essential medications.
<i>climate-sensitive diagnostics</i>	Develop and validate climate-sensitive diagnostic tools and biomarkers, including point-of-care indicators for dehydration, systemic inflammation, and thermal stress, tailored to African physiological profiles.
<i>ethnopharmacology and traditional medicine</i>	Document and scientifically validate traditional and herbal remedies used for managing heat-related symptoms and explore opportunities for integration into formal clinical care models.
<i>infection prevention and control (IPC) under climate stress</i>	Investigate the effects of high temperature and humidity on infection transmission dynamics in healthcare settings, assess the effectiveness of IPC protocols under climate-stressed conditions, and identify design and operational adaptations to maintain hygiene standards and prevent infection.

Track A identified a clear opportunity for African institutions to lead in generating biological evidence for clinical and public health action. Strengthening this field will be essential for designing effective, context-specific interventions to protect vulnerable populations from the health consequences of a changing climate

Next steps should include:

- Establishment of climate-physiology research infrastructure at academic medical centres and teaching hospitals, including environmental chambers and wearable sensor capabilities.
- Development of multidisciplinary research cohorts involving clinical researchers, physiologists, and environmental health scientists.
- Design of early-phase clinical trials (Phase I and II) to assess physiological responses to controlled climate exposures and test adaptive therapeutic protocols.
- Inclusion of biological markers in longitudinal climate-health studies to track organ-level adaptation or failure.
- Exploration of pharmacokinetic interactions between ambient temperature and essential medications, including antihypertensives and antiretrovirals.

Scientific Undercurrent

13 Submissions recieved for Track A

Diagnostic Silence

0 Abstracts on indigenous pharmacology

0 Multi-systemic or genomic studies

Lesson learned: Without upstream biomedical science, African health remains reactive, not anticipatory.

Priority Research Areas

Heat stress during pregnancy and neonatal thermoregulation; Renal-cardiac failure linked to dehydration, Neurocognitive effects of early life heat exposure, ART and chronic disease interactions with thermal stress, Ethnopharmacology and climate-linked ailments.

Track A received the lowest volume of submissions (13), with only 7 accepted, indicating a critical underinvestment in the study of the physiological and biological mechanisms by which climate change impacts health in African populations. While modest in scale, the track contributed valuable early evidence on cardiovascular strain, heat-related dehydration, and maternal physiological vulnerability under thermal stress. These studies lay a foundation for a new field of inquiry—one that remains largely unexplored across the continent.

The limited representation of Track A underscores a broader structural gap: the absence of climate-linked clinical physiology as a recognised research priority in Africa. Most climate-health evidence currently originates from epidemiological observation or behavioural adaptation studies, with minimal investigation into biological mechanisms of disease, organ system responses to environmental extremes, or population-specific thresholds of physiological tolerance. As a result, policy and programme design may be proceeding without adequate understanding of the biological substrates of climate risk.

Without mechanistic understanding, health systems remain reactive, and clinical interventions may lack relevance or efficacy under climate-altered conditions. For example, the absence of studies on heat stress in pregnancy, paediatric thermoregulation, or interaction effects between chronic disease (e.g. HIV, diabetes) and ambient temperature limits the development of evidence-based guidelines and clinical protocols.

Moreover, there is a lack of integration between traditional medical knowledge and modern physiological science, which may offer insights into locally adapted responses to heat, hydration, and symptom relief. No submissions addressed herbal pharmacology or traditional thermoregulation practices, nor were there studies incorporating genomics, multi-organ modelling, or experimental methods to assess system-level biological impacts.

3.4.2. Track B – Environmental exposures and climate–health epidemiology



Flagship achievement

Track B received the highest number of submissions (227) and acceptances (94), reflecting a strong and growing evidence base on climate-related environmental exposures and adverse health outcomes across Africa. Accepted abstracts covered associations between temperature, rainfall, air quality, and disease burden, including vector-borne and respiratory illnesses. Several studies applied novel geospatial tools, exposure-response modelling, and time-series analysis, establishing this track as the most methodologically mature within the CHAC2024 scientific programme.



Key lesson learned

The growing strength of Track B demonstrates Africa’s capacity to generate epidemiological evidence using local climate and health datasets. However, most studies remain short-term, cross-sectional, and focused on singular exposures. Few explored the complex, multivariate nature of climate–health relationships, the intersection of social determinants, or the development of longitudinal surveillance platforms. Addressing these gaps will require deliberate investment in harmonised definitions, transdisciplinary methods, and spatial–temporal analysis frameworks across African geographies.

Heat Map: Scientific Depth by Subtheme (Track B)

Sub theme	Coverage
Exposure–outcome associations (single exposure models)	High
Longitudinal studies or cohort designs	Low
Syndemic modelling and multivariate exposures	Low
Spatial epidemiology and climate-health mapping	Medium
Integration of social vulnerability indices	None

Legend: High Medium Low None

Map illustrates absence of biological, gendered, or community-embedded biological research.

Gaps identified

- o Most studies used temperature or rainfall as isolated predictors without accounting for multiple or interacting exposures (e.g. heat + air pollution + food insecurity).
- o Few studies employed cohort designs to examine life-course or intergenerational effects of climate exposures.
- o No studies integrated social vulnerability measures (e.g. poverty, housing quality) to modify or stratify climate–health risk.
- o Minimal engagement with harmonised indicators, definitions, or cross-country surveillance platforms.

Priority research areas

Research Area	Specific Priorities
Multivariate exposure modelling	Develop and apply models that simultaneously analyse multiple environmental stressors, including heat, rainfall, humidity, air pollution, and seasonal shifts.
Longitudinal epidemiology	Establish prospective cohorts to assess cumulative and life-course climate exposures, especially in maternal, neonatal, and urban populations.
Vulnerability stratification	Integrate social determinants of health (e.g. income, housing, occupation) into exposure models to identify high-risk subgroups and compound vulnerabilities.
Spatial and real-time surveillance	Expand geospatial analytics and remote sensing for near-real-time health risk mapping, using district-level environmental and disease burden data.
Indicator harmonisation and comparability	Develop standardised definitions, metrics, and climate-health exposure indicators to enable comparison across regions and countries.
Environmental exposure tools for health systems	Create simplified exposure classification systems that can be integrated into routine health data collection at primary care level.

Next steps should include

- Invest in interoperable environmental–health databases that integrate climate variables with health outcomes at individual and community levels.
- Support capacity building for advanced epidemiological modelling, particularly time-series, distributed lag, and Bayesian geostatistical methods.
- Design collaborative research platforms to support multi-country cohort studies focused on climate-health interactions across diverse African ecologies.
- Embed environmental exposure modules into existing demographic surveillance systems (DSS), maternal and child health cohorts, and national health information systems.

Volume and Visibility

227
submissions

94
Accepted

Achievement: Strongest track in volume and methodological sophistication.

Lesson learned: Demonstrates Africa's growing epidemiological capacity in climate-health analysis.

Evidence Gaps

- o Limited multivariate and longitudinal analysis
- o Minimal integration of social vulnerability or systems thinking

Lesson learned: Future work must move from isolated exposures to syndemic and cumulative risk frameworks.

Research Priorities

Multi-exposure modelling; Longitudinal cohorts; Vulnerability mapping; Spatial surveillance; Harmonised indicators; Practical exposure tools for PHC.

Track B demonstrated that Africa's climate-health research capacity is well-developed in exposure-outcome analysis, particularly regarding temperature and rainfall. The volume and methodological diversity of submissions reflected strong technical ability in geospatial mapping, time-series modelling, and risk estimation. However, important scientific limitations remain.

The main limitation was the predominance of short-term and single-exposure studies, which do not capture the full complexity of environmental health risks. Most analyses focused on direct associations between climate variables (e.g. daily maximum temperature or rainfall deviation) and specific health outcomes (e.g. malaria incidence, respiratory admissions). While useful, these approaches may not reflect real-world exposure patterns, especially in settings where climate stressors interact with poverty, inadequate housing, occupational hazards, and limited access to healthcare.

Moreover, few studies applied longitudinal designs, limiting the ability to track delayed, cumulative, or intergenerational health impacts. This is a missed opportunity, particularly in maternal, neonatal, and urban cohorts where chronic exposure to heat, poor air quality, and food insecurity may have compounding effects. There is also a lack of integration between climate-health research and health system data platforms, which reduces the applicability of findings for health service planning and public health surveillance. Track B highlighted the need for standardised, scalable environmental exposure metrics that can be used within primary care and epidemiological surveillance frameworks. These tools would support risk screening, decision-making, and climate-informed health service delivery. For clinical trials and public health intervention research, environmental exposure data will need to be incorporated as modifiers or stratification factors in study design. For instance:

- o In a vaccine trial, ambient temperature and air quality might influence immunogenicity or adverse events.
- o In nutrition or maternal health interventions, seasonal food availability and heat stress may alter baseline risk or outcome measures.

3.4.3. Track C – Adaptation interventions and building climate-resilient health systems



Flagship achievement

Track C received a strong response, with 198 submissions and 79 abstracts accepted, highlighting the growing recognition of adaptation as a critical pillar of climate-health research. The studies presented addressed diverse topics including heatwave early warning systems, water and energy access in health facilities, health workforce resilience, and community-led adaptation strategies. Many abstracts focused on behaviour change communication, locally led innovations, and service delivery adaptations, showing that adaptation is not limited to infrastructure but extends to processes, governance, and health systems transformation.



Key lesson learned

Track C demonstrates that adaptation is a widely engaged area, but the field remains dominated by narrative, behavioural, and knowledge-based interventions, with fewer submissions presenting evaluated, implemented, or scaled adaptation models. There was limited empirical data on system performance, cost-effectiveness, or clinical and operational outcomes linked to adaptation measures. Additionally, few studies evaluated the integration of adaptation strategies into routine care, or examined the roles of national policy, infrastructure design, and cross-sectoral collaboration in operationalising resilience.

Heat Map: Scientific Depth by Subtheme (Track C)

Sub theme	Coverage
Behavioural and community-led adaptation	High
Facility-based adaptation (e.g. thermal design, WASH)	Low
Health systems performance and continuity under stress	Low
Workforce resilience and training	Medium
Policy integration and financing strategies	Medium
Cross-sectoral adaptation models (e.g. water-health)	None

Legend: High Medium Low None

This heat map highlights a strong focus on behavioural adaptation, with minimal integration of clinical or health system operational dimensions.

Gaps identified

- o Limited evaluation of climate-adapted care delivery models, particularly in maternal, newborn, and chronic disease services.
- o Few studies on infrastructure-based interventions (e.g. passive cooling, solar power, heat-resistant building materials).
- o Absence of implementation research on adaptive logistics, supply chains, and essential service continuity in heatwave or flood contexts.
- o Minimal costing or health-economic analysis of adaptation interventions.
- o Lack of adaptation metrics integrated into routine health information systems or district-level planning tools.

Priority Research Areas

Research Area	Specific Priorities
<i>Climate-resilient service delivery models</i>	Evaluate delivery models adapted for extreme heat and water stress, particularly for maternal, neonatal, and outpatient care in low-resource settings.
<i>Health facility infrastructure adaptation</i>	Assess design modifications such as natural ventilation, cool roofing, off-grid power, and water access systems that maintain function during climate shocks.
<i>Workforce readiness and capacity</i>	Study staff knowledge, deployment strategies, and burnout under climate extremes, and test training and scheduling approaches that enhance resilience.
<i>Integrated adaptation metrics</i>	Develop adaptation indicators for facility and community-level systems, and test integration into health information systems and emergency preparedness plans.
<i>Costing and resource planning</i>	Analyse the financial requirements of adaptation strategies and identify sustainable models for infrastructure investment and operating costs.
<i>Cross-sector implementation research</i>	Test interventions involving coordination between health, WASH, housing, and energy sectors to improve climate resilience and health co-benefits.

Next steps

- Design pilot implementation studies of facility-level adaptation packages, with evaluation of care continuity, patient outcomes, and service accessibility.
- Establish learning collaboratives across health districts to scale adaptation models and compare effectiveness in different climate zones.
- Integrate adaptation metrics into routine facility assessments and national health management information systems.
- Support the development of multi-sectoral adaptation plans with health system representation, focusing on infrastructure, supply chains, and governance.
- Develop cost-effectiveness and investment cases for resilient health systems tailored to national budgeting and donor frameworks.

System Adaptation activity

198
submissions

79
Accepted

Achievement: High engagement on adaptation themes, especially behaviour change and community resilience.

Lesson learned: Adaptation work needs stronger integration into clinical systems and infrastructure planning.

Gaps In Implementation Evidence

Few health system-wide interventions

- o Minimal infrastructure or operational metrics

Lesson learned: Health sector adaptation must move beyond awareness to tested, operationalised service delivery models.

Priority Research Areas

Health facility adaptation; Resilient service delivery; Workforce and training; Integration of adaptation metrics into HMIS; Costing and planning of infrastructure; Cross-sector adaptation trials.

Track C shows that adaptation is a widely recognised priority, but highlights the need for greater emphasis on tested, scalable interventions that can be implemented and evaluated within the health system. Most submissions focused on knowledge dissemination or behaviour change. However, the clinical and operational dimensions of climate adaptation remain underdeveloped.

There is an urgent need for implementation research and pragmatic trials evaluating the performance of adaptation interventions under real-world conditions. This includes testing whether interventions such as passive cooling, improved water infrastructure, or modified health workforce protocols result in improved clinical outcomes or service continuity.

Adaptation strategies should also be integrated into emergency preparedness frameworks and routine service delivery platforms. This will require clear metrics, training modules, financing strategies, and intersectoral governance arrangements.

As African health systems face increasingly frequent and severe climate disruptions, Track C confirms that adaptation must shift from concept to operational standard. Future research should prioritise health system performance under climate stress and the development of service delivery models that remain effective and equitable during periods of extreme environmental variability.

3.4.4. Track D – Mitigation actions and their co-benefits



Flagship achievement

Track D received 80 abstract submissions, with 30 accepted, making it the fourth most submitted and fourth most accepted track. While not the most dominant by volume, Track D offered critical insights into urban and community-led mitigation efforts, sustainable healthcare models, and integrated planning for carbon reduction with co-benefits for public health. Notable contributions explored urban green infrastructure, carbon assessments of healthcare delivery, sustainable dietary transitions, and innovative biophilic and circular economy approaches.



Key lesson learned

Despite diverse topics and strong community representation, Track D abstracts often lacked methodological depth in evaluating scaling potential, cost-effectiveness, or policy integration. Most studies were descriptive or focused on single-site evaluations. Systems-level mitigation governance, data-driven modelling, and intersectoral policy design remain underdeveloped areas.

Heat map: Scientific depth by subtheme (Track D)

Sub theme	Coverage
Urban mitigation and planning (green spaces, zoning)	High
Community-based adaptation and co-benefits	High
Health facility decarbonisation	Medium
Sustainable diets and food systems	Medium
Emissions from extractives and circular economy	Low
Climate mitigation policy integration	Low

Legend: High Medium Low None

This heat map highlights strengths in grassroots and urban mitigation efforts, but identifies gaps in circular economy, emissions policy, and systemic governance

Gaps identified

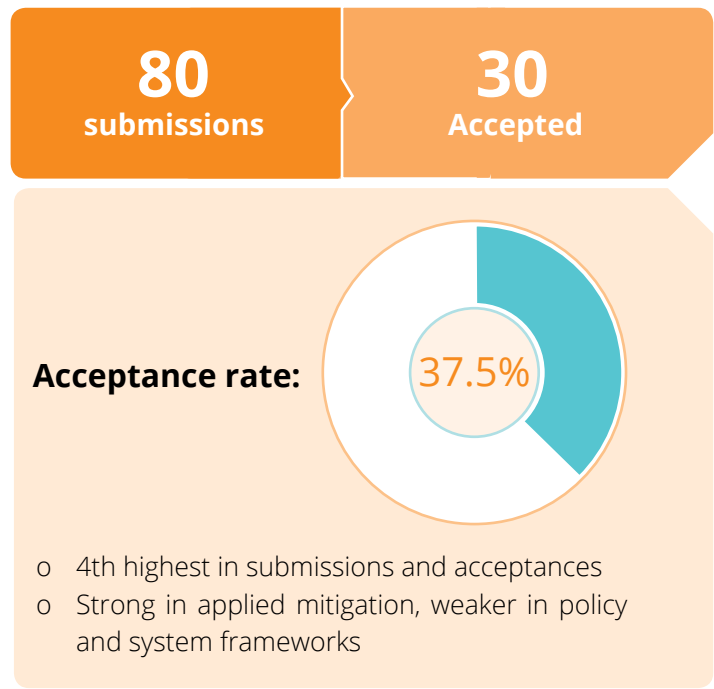
- o Limited integration of mitigation science with national health planning.
- o Few submissions quantified long-term or national-level health co-benefits.
- o Little engagement with circular economy models, e.g. mining or waste-to-resource systems.
- o Mitigation strategies were rarely framed within cost-effectiveness or policy contexts.
- o Underrepresentation of integrated carbon-health governance frameworks.

Priority research areas

Research Area	Specific Priorities
Carbon-health co-benefit modelling	Quantify health gains from mitigation using local climate and health data.
Urban-rural mitigation translation	Study how urban models (green infrastructure, zoning) adapt in rural contexts.
Policy-relevant mitigation strategies	Map policies and regulations enabling scale-up of successful mitigation practices.
Circular economy for mitigation	Assess waste-to-energy, wetland, and community recycling models.
Sustainable healthcare decarbonisation	Study carbon-neutral facility models and emissions accounting tools.

Next steps should include

- o Develop empirical models linking mitigation strategies to measurable health outcomes.
- o Embed mitigation-health indicators in city master plans and national adaptation strategies.
- o Promote South–South learning exchanges on local mitigation successes (e.g. Lusaka, Mombasa).
- o Integrate circular economy practices into national climate–health research priorities.
- o Establish standardised carbon accounting frameworks for healthcare and public institutions.



Track D revealed a vibrant landscape of African-led mitigation innovations rooted in cities, health systems, and communities. It demonstrated that mitigation could offer direct health dividends—when local solutions are scaled. However, the track underscored a strategic gap: most initiatives are not yet embedded in national climate-health strategies or supported by strong evidence frameworks.

To unlock their potential, Africa’s mitigation innovations must be formalised, modelled, costed, and scaled—with health co-benefits quantified and governance strengthened. Track D makes a compelling case for the co-benefit’s agenda, but the next generation of studies must systematise and institutionalise these gains within health and climate planning.

3.4.5. Track E – Ethics and climate research equity



Flagship achievement

Track E received 54 submissions, with 34 abstracts accepted, making it the third most represented track in terms of acceptances. It provided an essential platform for examining ethical considerations, equity, and justice in climate and health research across African settings. Accepted abstracts addressed benefit sharing, power asymmetries in research partnerships, community engagement, and the equitable design of climate-health interventions. Several contributions explored governance structures, decolonial approaches to knowledge production, and the integration of traditional knowledge systems in research ethics.



Key lesson learned

Track E reaffirmed the relevance of ethics and equity in shaping climate-health research but also revealed a conceptual and methodological gap. Most abstracts were narrative or theoretical, with limited empirical evidence or implementation of ethical frameworks in real-world studies. There was minimal engagement with regulatory infrastructure, trial governance, or the operationalisation of ethical principles in data collection, consent, compensation, or dissemination. Ethics continues to be discussed as a conceptual concern, rather than as a core component of clinical trial design, implementation science, or systems governance.

Heat map: Scientific depth by subtheme (Track E)

Sub theme	Coverage
Research governance and ethics infrastructure	Low
Community engagement and co-production	Medium
Traditional knowledge and epistemic inclusion	Medium
Equity in intervention design	Low
Trial ethics and regulatory frameworks	None
Cross-country ethics harmonisation	None

Legend: High Medium Low None

This heat map shows moderate engagement with community and inclusion themes, but limited application of ethics in trials and operational systems.

Gaps identified

- o Minimal operational research on how ethical principles is implemented in climate-health studies.
- o No studies presented models for integrating ethics into climate-adapted clinical trial protocols or community-based intervention research.
- o Lack of standardised frameworks for ethical review of climate-health studies, particularly in multi-country settings.
- o Underrepresentation of data protection, informed consent, and benefit-sharing policies tailored to climate-health contexts.
- o No empirical evidence on ethics committee capacity or harmonisation across research institutions.

Priority research areas

Research Area	Specific Priorities
<i>Operationalisation of ethical frameworks</i>	Develop, test, and evaluate practical ethics tools for use in climate-health implementation research, trials, and surveillance.
<i>Ethics in intervention and trial design</i>	Integrate ethics into protocol development, focusing on community consent, vulnerability, fair compensation, and post-trial obligations.
<i>Community engagement models</i>	Study the effectiveness of different models for community co-production, engagement, and governance in climate-health programmes.
<i>Equity-centred intervention planning</i>	Evaluate whether and how climate adaptation or mitigation interventions reach or exclude marginalised groups, with equity metrics embedded in design and monitoring.
<i>Ethics review capacity and harmonisation</i>	Assess ethics review board capacities in LMICs to handle climate-health research and explore harmonisation mechanisms for multi-country studies.
<i>Data governance and protection</i>	Develop and test data protection protocols, especially for community-level environmental-health surveillance and longitudinal studies.

Next steps should include

- o Build ethics modules into implementation trials and feasibility studies to assess acceptability, informed consent processes, and community benefit structures.
- o Establish regional working groups on climate-health ethics to develop guidance for regulatory bodies and review committees.
- o Include ethics and equity indicators in outcome measurement frameworks for adaptation, mitigation, and health systems research.
- o Support capacity-building programmes for research ethics committees focused on data sharing, trial governance, and environmental health research review.
- o Design and test community-led governance structures for climate-health research projects to ensure transparency and accountability.

54
submissions

34
Accepted

Achievement: Affirmed the role of ethics and equity in climate-health research discussions.

Lesson learned: Ethical principles are widely endorsed but inconsistently applied or operationalised in research practice.

Trial and governance gaps

- o No submissions on trial governance frameworks
- o Limited engagement with regulatory systems or ethics boards

Lesson learned: Ethics must move from theoretical positioning to embedded practice within trial and study design.

Research Priorities

Ethics in protocol development;
Community engagement effectiveness;
Equity in delivery; Ethics board capacity;
Data governance tools.

Track E emphasised that ethics and equity are central to the future of climate and health research. However, despite strong theoretical framing, there remains a gap between principles and practice. Most contributions did not go beyond conceptual discussion. There is an absence of applied ethics models within trial protocols, programme evaluations, or health system adaptation strategies.

To bridge this gap, ethics must be treated as an integrated research stream, not a peripheral narrative. Implementation studies and trials must include embedded ethics components, such as participatory governance, culturally appropriate consent processes, and explicit benefit-sharing plans. Ethics review capacity also needs to be enhanced—particularly in multi-country research contexts—through harmonised guidelines, training, and regional coordination.

For future studies, trial design should incorporate equity and ethics as core implementation parameters, evaluated through defined indicators. Community engagement must be formalised through measurable co-production frameworks, and ethics governance needs to adapt to evolving demands posed by climate-health research, including real-time surveillance, mobile data platforms, and participatory sensing tools.

Track E highlighted the foundational role of ethics in ensuring that climate-health science is not only methodologically sound but also fair, inclusive, and aligned with human rights and social protection objectives. As the field matures, its ethical architecture must evolve in parallel.



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4. POLICY TRANSLATION, MINISTERIAL ENGAGEMENT, AND THE HARARE DECLARATION ON CLIMATE AND HEALTH



Flagship achievement

- o The Harare Declaration on Climate and Health in Africa, adopted on 31 October 2024 by representatives from 54 nations—including 30 sovereign African states—marked a significant milestone in continental policy alignment. Co-developed through inclusive daily consultations at CHAC2024 and endorsed by ministers, government officials, researchers, community leaders, and development partners, the Declaration formalises Africa’s collective policy agenda for climate-resilient health systems. Its six priorities—ranging from strengthening African-led research to ensuring active health representation in global climate negotiations—are now formally integrated into COP29 briefings, with implementation commitments pledged by multiple African governments and regional institutions. For the first time, a unified African policy position on climate and health was presented with structured pathways for national, regional, and global action.
- o CHAC2024 served as a strategic springboard for Africa’s climate-health positioning ahead of COP29. Through the Harare Declaration, ministerial dialogue, and multi-partner engagement—including with WHO-AFRO, Africa CDC, and UN agencies—Africa articulated a coherent evidence-based agenda that will inform several high-level events during the health-focused segments of COP29. These include the COP29 Health Pavilion, the WHO–UNICEF High-Level Events, the One Health Roundtable, and the launch of the Baku Principles of Human Development for Climate Resilience.
- o This alignment marks a major step forward in embedding African health priorities into UNFCCC negotiations and related policy frameworks. Notably, Africa’s leadership is reflected in its participation in the Baku COP Presidencies Continuity Coalition and the operationalisation of the Health Impact Investment Platform (HIIP)—an unprecedented opportunity to channel structured finance into African health resilience.



Key lesson learned

The adoption of the Harare Declaration demonstrated that African-led, multisectoral dialogue—grounded in evidence and structured convening—can yield coherent and actionable policy outputs that extend beyond conference resolutions. However, translation of commitments into national planning instruments remains incomplete. The policy process highlighted gaps in implementation tools, indicator frameworks, and cross-ministerial coordination necessary to operationalise climate-health priorities. Sustained technical support, policy alignment instruments, and intergovernmental accountability mechanisms will be essential to maintain policy momentum, ensure equitable financing, and institutionalise health within climate governance across Africa and within UNFCCC structures.

Heat Map: Scientific and political integration depth

Policy Dimension	Coverage
Evidence integration into national frameworks	Medium
Regional coordination mechanisms	High
Cross-sectoral commitments	Medium
Global platform alignment (COP/IPCC)	Medium
Formalised ministerial review and endorsement	High

Legend: High Medium Low None

This heat map reflects the success of CHAC2024 in creating structured linkages between scientific outputs and formal policymaking platforms

Gaps identified

- o Limited documentation of implementation mechanisms for Declaration commitments at the country level.
- o Absence of monitoring and accountability frameworks to track uptake of scientific evidence in revised national strategies.
- o No alignment tools provided for countries to map CHAC evidence against existing NDC/NAP policy cycles.
- o Inconsistent participation from ministries of finance, energy, and agriculture, limiting full multisectoral integration.

Priority implementation areas

Domain	Specific Priorities
National policy alignment	Support country-level revision of NDCs and NAPs to incorporate climate–health evidence from CHAC2024.
Cross-sectoral integration	Establish coordination frameworks that link ministries of health with climate, agriculture, finance, and water sectors.
Research-to-policy interface	Create national policy briefs and technical summaries based on CHAC tracks to inform ongoing strategic planning.
COP engagement pathways	Provide structured preparatory inputs from African health research consortia into UNFCCC and IPCC processes, with dedicated regional health caucuses.

Next steps

- o Develop policy alignment tools to assist countries in mapping CHAC2024 evidence against existing adaptation and mitigation policy instruments.
- o Establish a monitoring and reporting framework under the Harare Declaration with periodic ministerial updates and technical reviews.
- o Facilitate regional policy labs that convene researchers, planners, and policymakers to translate CHAC outputs into strategic programming.
- o Formalise CHAC as a recurring technical–ministerial interface, aligned with WHO-AFRO, Africa CDC, and African Union frameworks.
- o Ensure structured pre-COP regional coordination of African health policy positions and technical evidence submissions.

Harare Declaration Adoption

Endorsed by
Ministers from

20+
countries

Achievement: Grounded policy priorities in African scientific evidence.

Lesson learned: Political engagement is highest when evidence is presented through structured dialogue, not side events.

Science-policy alignment

- o No country-level implementation tools yet developed
- o Limited cross-sectoral uptake outside health

Lesson learned: Institutional translation requires frameworks, timelines, and accountable mechanisms beyond ministerial statements.

Implementation priorities

NDC/NAP alignment; Cross-sectoral coordination; Regional metrics; Monitoring dashboards; Pre-COP briefings; Technical policy labs.

The Harare Declaration marked a milestone in institutionalising African leadership in climate and health policymaking. It represents a shift from ad hoc participation to structured, evidence-based engagement with national, regional, and global frameworks. However, policy impact is not guaranteed by declaration alone.

There is now a need to operationalise the Declaration's six priorities through policy alignment tools, strategic planning support, and monitoring frameworks. A critical next step is to ensure technical outputs from CHAC2024 are converted into country-specific programming inputs for heat adaptation plans, NDCs, NAPs, and budget frameworks.

To sustain political momentum and accountability, a regional ministerial follow-up mechanism is needed, supported by technical dashboards and evidence updates. In parallel, African climate-health evidence must be systematically channelled into UNFCCC and IPCC processes through structured caucuses and health sector side events.

The Harare Declaration is a foundation. Its effectiveness will depend on how rigorously countries apply its principles, how proactively ministries coordinate across sectors, and how effectively the health research community maintains a role in strategic policymaking cycles



5. CONCLUSIONS AND CONTINENTAL PRIORITIES FOR INVESTMENT

CHAC2024 generated critical momentum in advancing Africa’s climate and health science agenda. The conference convened a multidisciplinary coalition across research, policy, implementation, and funding communities, and produced tangible outputs including the Harare Declaration, ministerial commitments, and a preliminary evidence base for integration into policy cycles. However, the evidence surfaced also exposes a stark reality: Africa’s climate–health research ecosystem remains in an early phase of development, with significant structural, methodological, and implementation deficits.

From a clinical research perspective, the distribution of evidence presented revealed a disproportionate focus on descriptive studies and behavioural adaptation, with minimal engagement in mechanistic, longitudinal, and trial-based approaches. Tracks A and D—representing biological mechanisms and mitigation, respectively—were particularly under-represented, limiting Africa’s ability to model, trial, and scale interventions with measurable physiological or emissions-related endpoints. Furthermore, ethics, equity, and trial governance were discussed in principle but remain inconsistently applied in study design or regulatory oversight.

To advance toward a climate-resilient, evidence-based health system across the continent, future investment must be structured around the following priority domains

Continental Priorities for Research and Systems Investment

Research Area	Specific Priorities
Direct climate–health impacts	Controlled trials assessing clinical outcomes from heatwaves, floods, and drought-related injuries; maternal and neonatal vulnerability studies including biomarkers, thermoregulation thresholds, and adverse birth outcomes.
Ecosystem-mediated pathways	Vector ecology modelling and surveillance trials for diseases such as malaria and Rift Valley Fever; integrated food–nutrition–infection studies evaluating malnutrition, food insecurity, and zoonotic spillover risks.
Health system resilience	Implementation trials evaluating infrastructure performance, patient outcomes, and workforce adaptation in climate-stressed facilities; adaptive care protocols tested under thermal, hydrological, and power stress scenarios.
Data equity and access	Development and operationalisation of African-owned data platforms; cross-country harmonisation of exposure and outcome metrics; protocol registries, clinical dashboards, and indicator alignment with WHO/UNFCCC frameworks.

Strategic outlook and call to action

Africa must now move from climate-health documentation to climate-health preparedness. This requires a shift in research funding models toward multi-level intervention trials, trial-readiness infrastructure, and embedded evaluation of adaptation and mitigation co-benefits within health systems. Research designs should increasingly include stratification by climate vulnerability, local environmental parameters, and equity-focused implementation endpoints. Moreover, to ensure accountability and scalability, climate-health studies must integrate:

- o *Clinical endpoints (e.g. maternal complications, dehydration, vector-borne infection rates)*
- o *Facility-level indicators (e.g. service downtime, infrastructure failure points)*
- o *System-wide metrics (e.g. workforce attrition, health system recovery time)*

Policymakers, funders, and institutions must co-invest in building a regulatory and operational environment that enables not just innovation but repeatable, ethically governed, and impact-driven research.

Final Position

CHAC2024 laid a credible foundation for Africa's climate-health evidence and policy architecture. But it also clarified that the architecture is incomplete. The continent is still in the early stages of designing, funding, and governing the kinds of evidence systems needed to withstand escalating climate risks. If Africa is to lead not only in adaptation but in innovation, then its investments must shift toward what is currently missing—not what is already measured.

In this regard, the CHAC2024 evidence base is not an endpoint. It is a starting dataset—a roadmap for future clinical trials, operational research, and health systems investment. The goal ahead is clear: to deliver a climate-ready public health system that is designed with African data, built on African priorities, and governed by African institutions—ready not just to survive the climate crisis, but to shape its scientific response globally.



