



**zef**

Center for  
Development Research  
University of Bonn

**ZEF POLICY BRIEF**  
**NO. 52 - SEPTEMBER 2024**

**CLIMATE  
AND HEALTH**

**BY ANA MARIA PEREZ ARREDONDO  
& CHRISTIAN BORGEMEISTER**

## RELEVANCE AND SETTING

Accelerated global change affects many areas, including the health of humans, animals and their shared ecosystems. It is therefore necessary to promote health and to respond to, monitor and prevent disease, using both pathogenic and salutogenic approaches to health. On the one hand, by understanding and addressing the social, economic, environmental and institutional determinants of health. On the other hand, by building capacity for surveillance, diagnosis and treatment.

At ZEF, integrated and interdisciplinary health approaches are used to understand the complexity of health and disease. ZEF's research on climate and health focuses on understanding and addressing the complex interactions between environmental change and human health. In addition, ZEF and its partners work to identify risks at the interface of humans, plants, animals and the environment, and to develop interventions to achieve optimal health for all.

## ZEF'S CONTRIBUTIONS

ZEF's contributions cover a wide range of critical health issues, including zoonotic and vector-borne diseases, antimicrobial resistance, health and nutrition, health resilience, the regenerative impact of urban green and blue spaces, social determinants of health, and holistic approaches to health. A major focus is the impact of climate change on health outcomes. Ongoing research at ZEF examines how rising temperatures, extreme weather events and changing rainfall patterns exacerbate health problems such as heat stress, respiratory problems and vector-borne diseases. This work is crucial for developing adaptation strategies to protect vulnerable populations from the adverse effects of climate change.

In addition, waterborne diseases and environmental health are important components of ZEF's research. Climate change can lead to the spread of waterborne pathogens, affecting water quality and public health.



ZEF's research identifies the pathways through which climate change affects waterborne diseases and develops interventions to mitigate these risks.

The intersection of food security and nutrition with climate variability is another critical area. ZEF studies how climate change affects agricultural productivity, food availability and nutritional quality. By understanding these dynamics, ZEF can develop recommendations on strategies to enhance food security and improve the nutritional status of communities, particularly in regions most vulnerable to climate change.

Through these interrelated research areas, ZEF provides comprehensive insights and practical solutions to the health challenges posed by climate change, promoting a holistic approach to sustainable development and health resilience.

## THE BIGGEST CHALLENGES

Addressing complex health topics such as zoonotic and vector-borne diseases, antimicrobial resistance, and health resilience presents several significant chal-



ges. One major hurdle is the integration of knowledge across diverse disciplines—biological, ecological, epidemiological, and social sciences. Achieving this interdisciplinary approach is crucial but difficult due to the complexity of the topics involved.

Data collection and quality also present substantial issues. Reliable data are often challenging to obtain due to logistical, financial, and infrastructural constraints, and inconsistent data collection methods can undermine comprehensive analysis. Additionally, understanding the effects of climate change on health and addressing these issues within various socioeconomic contexts requires tailored strategies and long-term data, further complicating research efforts.

Moreover, while ZEF's research generates valuable recommendations, the effectiveness of holistic health approaches hinges on translating these findings into

## MAIN RESULTS AND ACHIEVEMENTS

ZEF research has made significant progress in elucidating the complex relationship between climate variability and health outcomes.

Notable research contributions to date include:

- The severe impacts of extreme weather events on child nutrition and health, highlighting the vulnerability of affected populations.
- The importance of integrating climate considerations into health policies through research on inter-sectoral collaboration for One Health to prevent future epidemics.
- The presence of multi-drug resistant bacteria in urban wastewater.
- The potential benefits of urban green and blue spaces for mental health and well-being.

Furthermore, ongoing research projects address:

- Arboviral disease vectors and zoonosis to understand disease transmission and guide control measures.
- Climate change impacts on the ecology of water-borne diseases.
- Lifestyle factors such as diet and the food environment that contribute to the spread of antimicrobial resistance.
- The food environment and its impact on dietary choices and nutrition.
- The effects of climate variability on health outcomes.
- Community-based strategies for urban health design that can improve health outcomes.

Together, ZEF's diverse research efforts are advancing our understanding of climate-related health challenges, driving policy change, and building community resilience.

actionable policies and ensuring their sustainability. This process necessitates the active involvement of practitioners who can implement research-based solutions, raise public awareness about the links between health and climate, and encourage behavioural changes to improve health outcomes.

## POLICY RECOMMENDATIONS

- Explore interdisciplinary synergies in health research: Researchers should investigate the interactions between biological, ecological, social, and economic factors to develop comprehensive and sustainable health interventions that address the complexity of health challenges in various environments.
- Incorporate cultural diversity in health studies: Future research must critically assess and integrate diverse cultural perspectives to ensure that health strategies are inclusive, equitable, and culturally sensitive, leading to more effective and locally relevant solutions.

■ Investigate gender dynamics in health and environment: Researchers should explore how gender dynamics influence vulnerability and resilience to environmental stresses. This will help develop gender-sensitive policies and interventions that adequately address the needs and challenges faced by different gender groups.

- Assess healthcare system resilience: There is a need for research to evaluate the capacity of healthcare infrastructure, workforce, and policies to withstand and respond to environmental changes and crises, ensuring that health systems are resilient and adaptable in the face of climate-related health risks.
- Examine the environmental impact of healthcare: Researchers should focus on assessing and reducing the environmental impacts of healthcare practices, including waste management, resource use, and carbon emissions, to promote more sustainable and environmentally-friendly healthcare delivery.

## IMPRINT

Center for Development Research (ZEF)

University of Bonn

Genscherallee 3

53113 Bonn | Germany

**Contact:** +49 (0) 228 / 73 6124

[presse.zef@uni-bonn.de](mailto:presse.zef@uni-bonn.de) | [www.zef.de](http://www.zef.de)

**ISSN:** 1438-0943

**About the authors:** Ana Maria Perez Arredondo is a Senior Researcher and Coordinator of the Graduate School 'One Health and Urban Transformation' at ZEF. Christian Borgemeister is a ZEF-Director and Professor at the University of Bonn.

**Layout:** Katharina Zinn/  
La Familia Communications

**Photo credits:** Segbedji Geraldo Favi

Over the past 25 years, ZEF researchers have aimed to find science-based solutions to promote sustainable development and planetary health. ZEF's research divisions and groups have conducted inter- and transdisciplinary research in, for, and with emerging economies and on global issues with its collaborating research partners around the world. In this special "ZEF 25 Years" Policy Brief series we focus on some of our core research themes.

