

# POPULATION, ENVIRONMENTAL RISK, AND CLIMATE CHANGE (PERCC)

**There is strong and growing scientific consensus that increases in global temperatures are now inevitable and that the potential impact on humanity may be devastating.**

Evidence shows that the frequency and intensity of environmental hazards—such as floods, cyclones, and droughts—are increasing, leading to high volatility in many parts of the world. The impact of these events falls unequally on the most vulnerable individuals, households, and communities. They are often the least resilient and have the least capacity to cope in the short term and adapt over the long term. They are vulnerable because they are poor, live in high-risk areas, and have limited social capital and inadequate access to resources and institutions—all of which makes it harder for them to adapt to damaging climate events.

The social costs of the impending impact of severe climate changes must be addressed in smart, scientifically grounded adaptation, mitigation, and resilience strategies. The Population Council is well poised to improve scientific understanding of how population dynamics are key to those strategies, and to inform new comprehensive population and climate-change policies.

The **Population, Environmental Risk, and Climate Change (PERCC)** research initiative deepens the Council's mission with a new institutional commitment to improve the integration of the population and climate sciences. **PERCC asks the question: How do environmental changes affect demographic processes and what impact do they have on vulnerable populations?**

## The Four PERCC Research Questions

1

Who and where are the people most vulnerable to environmental risk and climate change?

2

What are the effects of environmental risks and climate change on health and well-being?

3

How do people respond to environmental risks and climate change? What are the implications of people's responses?

4

What interventions and policies facilitate adaptation and build resilience?

The PERCC team consists of Council researchers from around the world led by the Vice President for Social and Behavioral Science Research. The current PERCC research agenda spans a minimum of 5 years and covers 11 countries; peer-reviewed publications of early findings are expected by the end of 2019.

With new investments and recruitment, PERCC shares expertise and interests with the UN's International Panel on Climate Change, the Asian Demographic Research Institute, the CUNY Institute for Demographic Research, the University of Birmingham, the Earth Institute at Columbia University, and the UN Population Division, among others.

## The PERCC initiative uses multidisciplinary research approaches enriched by combining the demographic and climate sciences.

With a research agenda at the intersection of population and climate change, we are bringing new perspectives, data, methodologies, and tools to better understand many facets of adaptation, resilience, and mitigation. Following are some of the concepts we are developing that we believe will bring us closer to answering the Four PERCC Research Questions:



### Climate Change, Migration, and Health Outcomes in Cambodia

Cambodia is ranked as one of the world's most climate-vulnerable countries. Between 1990 and 2014, 72 percent of natural disasters that occurred in Cambodia were floods. Floods caused the greatest number of deaths (97.4 percent of disaster-related deaths) and caused the most economic destruction (91.1 percent of the total loss) for the country. But little is known about how major floods affect migration decisions and post-migration livelihoods, or how the impact of flooding affects sexual and reproductive health, maternal health, and family planning outcomes. As the frequency of floods and other natural disasters increase, such research could help government and nonstate actors improve their policies and programs.



### Effect of Exposure to Indoor and Outdoor Air Pollution on Health Outcomes in India

A recent study showed that air pollution killed more than one million Indians in 2017 alone. Human activities, especially unplanned urbanization and infrastructure development contributes significantly to both indoor and outdoor air pollution. We want to know if individuals in poor households are more likely to be affected by both indoor and outdoor air pollution than those in rich households. Does exposure to air pollution act as an effect modifier in predicting the health status of individuals? How do poor sanitation and living conditions interplay with the effects of air pollution in poor households? What are the different practices among poor households to mitigate exposure to air pollution?



### The Nexus of Climate Change and Gender

The burden of climate change is borne differently by different people, based on geographies, generations, age classes, income groups, occupations, and genders. Studies show that the world's poor, the majority of whom are women, are disproportionately impacted by climate-change events, and have less adaptive capacity due to gender-based inequities. By systematically integrating an understanding of gender-specific concerns (and solutions) into climate-change policies and programs, we can mitigate the detrimental effect of climate change on women's health and livelihoods. What is the relationship between climate change and gender with specific reference to livelihood, food security, water, sanitation, and energy conservation? What specific gender-centric approaches or strategies are being adopted by local governments in response to climate change?



### Extreme Weather Events and School Absenteeism in Kenya

There are a number of explanations of why school absenteeism might vary with climate events. Absenteeism might increase in the rainy season, particularly in situations where flooding occurs, due to transport difficulties (washed out or muddy roads) or increases in vector-borne or infectious diseases. Absenteeism might also increase in drought situations due to hunger or inadequate water at schools or increases in disease. The relationship between absenteeism and climate might also depend on the degree to which children are involved in subsistence agriculture. We explore whether climate events explain any variability in school absenteeism, analyzing linked rainfall and other environmental data with absenteeism data.



### Demographic Scenarios for Global Environmental and Climate-Change Assessments

Over the past few years, an international team has been building the new Intergovernmental Panel on Climate Change socioeconomic scenarios and their quantitative expressions for climate change research, the so called “Shared Socioeconomic Pathways” (SSPs). This project aims to develop a comprehensive set of demographic scenarios as a key component of the SSPs, for assessing the global challenges of climate-change mitigation and adaptation. It is based on the understanding that human interventions in environment and climate systems vary across different development levels; that the impacts of environmental and climate changes differ among various population groups; and that future populations will not be the same as today, nor will their mitigation efforts and adaptive capacities.

This work involves methodological innovations in projecting mega demographic trends, including population growth, urbanization, migration, aging, and household structure. The demographic projections are systematically carried out across geographic scales: global, national, subnational, and spatial (grid cells), and are consistent with the projected trends of climate change. This modeling helps answer questions such as who, where, when, and how human populations interact with the changing environment and climate systems—critical information for policy options in responding to climate-related risks.



### Climate Variability and the Realization of Fertility Intentions in Rural Mexico

Does climate variability affect the realization of fertility intentions? Population Council researchers have identified gaps in evidence on changes in population dynamics, more specifically changes in fertility and migration trends and patterns as a result of climate variability. Using data from the vast and robust Mexican Family Life Survey (a longitudinal, multithematic survey representative at the national, urban, rural, and regional levels), researchers are exploring how and if these changes can be understood as demographic strategies to cope with climate variability.

## The Population Council has extensive experience identifying and working with vulnerable subpopulations, with a focus on gender, the poor, and adolescents.

We implement a combination of methodologies, and highlight overarching focus areas that include:

**Quantitative methods**, including secondary data analysis and collection of primary data, such as longitudinal and specialized surveys (e.g., on difficult-to-reach populations) that may facilitate improved analyses in the near future.

**Qualitative research** to understand the levels of local knowledge and perceptions of environmental risk among the most vulnerable persons and communities, including understanding how and if they take steps to adapt (e.g., through seasonal migration), or generating evacuation plans in advance of potential threats.

**Innovative geospatial analysis** to overlay satellite imagery and remotely sensed data with large-scale surveys, such as censuses, the Demographic and Health Surveys, and Council-collected survey data, linking environmental and population data based on spatial location.

**Multilevel analysis** to collect and overlay individual, household, community, and regional data to understand the complex interactions between behavioral responses to climate events, community norms, and institutional support systems (or lack thereof).

**Demographic modeling** to project changes in the spatial distribution of population, and how this may affect climate-change patterns.

**Rigorous design**, including experimental and quasi-experimental research designs, can be implemented to test and scale interventions, including—where feasible—randomized evaluations.

**Multidisciplinary and multisectoral approach** from leading Council researchers with expertise in social science, public health, economics (climate finance), and demography.

We apply a **gender lens** to our research, understanding both the challenges and opportunities that may differentially impact women and girls.

With our country offices, we can also apply **local knowledge** and expertise to better understand the implications of our research.

We can integrate our findings with governments and organizations that are developing policy to maximize the effectiveness of the programs with local buy-in.

**Current policies in response to the increasingly destructive impacts of climate change are insufficient. We believe they lack the crucial insights of the population sciences, and we have a vision of how to enrich climate-change science and policymaking by integrating key population variables.**

A strategic integration of tools and approaches that identify the evidence gaps will yield policies, programs, practices, and technologies leading to more effective adaptation, resilience, and mitigation strategies. The PERCC initiative builds on the Population Council's six decades of Social and Behavioral Science Research.

**For more information on the Population Council's PERCC initiative, contact:**

**Tim Thomas**  
tthomas@popcouncil.org  
+1 646 436 6555