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Building resilience in communities most vulnerable to environmental stressors

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BUILDING RESILIENCE
IN COMMUNITIES MOST VULNERABLE TO ENVIRONMENTAL STRESSORS

Resilience is defined as a set of capacities that enable a person, household, or community to withstand and recover from adversity or turbulent change. [1,2]

The complex interplay between environmental risks, built infrastructure, governments and institutions, and sociocultural factors can either promote or undermine resilience. Attention to building resilience and adaptive capacity in development programming is critical to ensure equitable and sustainable trajectories out of poverty.

THE CASE FOR
BUILDING RESILIENCE

Evidence suggests that the frequency and intensity of environmental hazards such as floods, cyclones, and droughts may be 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.

These groups 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 access to resources and institutions—all things that make it harder for them to recover after damaging climate events.

Exposure to sudden or repeated environmental shocks and stressors negatively affects human health outcomes, including mental health,[3] access to resources such as food and water,[4,5,6] livelihood and economic opportunities,[7] migration and displacement,[8] and may also impede efforts to end harmful social practices such as child marriage and gender-based violence.[9]

Conversely, humans may cause environmental degradation, such as deforestation or soil erosion, through the use of environmentally damaging farming practices and poor urban planning. This cycle leads to a reliance by vulnerable individuals and communities on environments that may not be able to sustain their needs. Climate change exacerbates many of these interactions.

Attention to building resilience and adaptive capacity in development programming is critical to ensure equitable and sustainable trajectories out of poverty.

Yet, often the most vulnerable are also the most difficult to identify and track in research; programs and policies do not always reach them or address their needs. Reaching these populations is challenging for many reasons, including that they are mobile, poor, or are a subgroup (for example, adolescent girls) that may be hidden from view.

Without the ability to identify and serve these populations, humanitarian aid after disasters and longer-term development programs may systematically but inadvertently exclude them when creating policies and programs. This will leave vulnerable groups that are unable to plan for and adapt to change, and are exposed to loss of housing, property, life, employment, and opportunity for economic and social development.

Cover: Rising sea temperatures in Tanzania are causing massive die-offs of seaweed—a main source of income for rural women.
Opposite: India faces depleting groundwater levels, making water scarcity a critical challenge.
Top: A devastated community in the Philippines, which was badly hit by Super Typhoon Haiyan.

RESEARCH TO FILL CRITICAL EVIDENCE GAPS

The Population Council is prioritizing research to strengthen the evidence on resilience among those who are vulnerable to environmental stressors. The research is designed to fill gaps and generate the evidence decision-makers need to develop and implement effective programs and policies that can build the resilience and adaptive capacities of those most vulnerable to environmental shocks and stressors.

To date, there is little subnational and local area data available to measure the exposure and risk of individuals, households, and communities to environmental shocks and stressors. Where data exist, they are often not disaggregated by critical measures of vulnerability including sex, age, poverty status, or social capital. Programs and policies are being slowly developed, but are often not rigorously evaluated or evidence-based.

To fully understand and address the needs of vulnerable communities, the Council is building on its existing research, deep global research expertise, and proven approaches in reaching and working with vulnerable populations to examine how humans interact with their environments and explore how to test and develop successful strategies for building resilience.

Residents in a drought-ridden region in northern Ethiopia use a pump to collect water.

For over six decades in more than 50 countries, the Population Council has conducted innovative scientific research and promoted evidence-informed policies, programs, and practices to improve the well-being and reproductive health of current and future generations, and to help achieve a humane, equitable, and sustainable balance between people and resources. We leverage this research to develop, test, and scale up evidence-based programs and interventions to strengthen resilience in the communities where we work.

OUR RESEARCH FOCUS

→ **Measure and identify environmental shocks and stressors and the people** who are most likely to be affected by them.

→ **Develop, evaluate, and deploy innovative interventions and policies that build resilience** to the effects of environmental shocks and stressors.

→ **Understand the sources of and variation in resilience and adaptive capacities** among high-risk, vulnerable individuals, households, and communities.

OUR EXPERTISE

→ **Geospatial analysis techniques, to visualize environmental shocks and stressors and overlay them with population data to determine risk.** This includes using spatial statistics to analyze the relationships between environment (derived from satellite imagery and other remotely sensed data) and human populations (from censuses and large-scale surveys), disaggregating by key characteristics of vulnerability where possible.

→ **Mixed-methods behavioral and social science research.** We employ innovative demographic methods, longitudinal panel surveys, qualitative studies, and implementation science to assess vulnerability and resilience in households and communities and to develop and test program solutions. We aim to measure and understand how household and community responses evolve over time and whether negative effects are compounded by multiple intersecting shocks.

→ **Identifying and targeting vulnerable populations to address their specific needs, which are often missed in larger-scale programming.** We have developed the Girl Roster, a tool to quickly identify high-risk adolescents in need of interventions, and are founding members of the Girls in Emergencies Collaborative to work with girls immediately after natural event disasters or in conflict settings where they are at high risk. We also have developed strategies to prevent child marriage, a practice that can be exacerbated by environmental shocks and stressors.

→ **Extensive local knowledge of country context and partnerships.** We currently have offices in 14 countries and work in a total of 45—this local presence has built long-standing partnerships with governments, NGOs, universities, and civil society groups that will enable us to reach vulnerable communities and carry out our research.

POPULATION COUNCIL
RESEARCH AND RESOURCES

◉ **GUATEMALA**

◉ **SIERRA LEONE**

GUATEMALA

Working in Santa Catarina Palopo to describe the watershed risks and shifts in fertility and mobility

SIERRA LEONE

Exploring solar technology and its applications to improve livelihoods and resilience among adolescent girls

ETHIOPIA

Applying DHS data to understand how drought affects migration, education, child marriage, and health

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RESOURCE

COMMUNITY RESILIENCE

Council case studies from four settings highlight community responses to different climate-related events: drought in Ethiopia, floods in Mozambique, cyclones in the Philippines, and forest fires in Indonesia.

The case studies highlight different responses, including financial responses (borrowing money from family or selling productive assets) and social practices (such as taking children out of school).

Findings suggest programming to strengthen community resilience should center around community networks and social capital, and should support community-driven responses.[10]

⬇ **evidenceproject.popcouncil.org/wp-content/uploads/2017/12/Climate-Resilience-Case-Studies_Working-Paper.pdf**

RESOURCE

URBANIZATION

The Council's research uses spatial data to describe and measure urbanization, population distribution, and related climate-change threats.[11]

With the skyrocketing number of urban dwellers, cities will struggle to provide water due to hydrologic changes and increased need; modeling found that by 2050, one billion people will reside in cities with perennial water shortage (not accounting for access issues or quality of water). In the first global survey of large cities' water sources, researchers found that previous analyses overestimated global water stress because they did not account for infrastructure; however, despite significant infrastructure, one in four cities remain water stressed due to geographical and financial limitations.[12]

⬇ **https://doi.org/10.1016/j.gloenvcha.2014.04.022**

PAKISTAN

BANGLADESH

INDIA

ETHIOPIA

TANZANIA

PAKISTAN

Mapping the aftermath of the 2010 floods on populations at risk, their perceptions of risk, and resilience-building strategies

INDIA

- Researching the climate-induced disasters in Odisha and opportunities to address impacts on livelihoods and health

- Measuring urbanization in high-risk flood-prone areas

- Identifying the exposure of rural women in Bihar and Uttar Pradesh to climate-induced calamities and adaptive actions taken to address that exposure

TANZANIA

Combining family planning and conservation efforts helps build resilience

BANGLADESH

Measuring the risks between:
- Floods and child marriage
- Water salinity and pre-eclampsia risk

RESOURCE

NATURAL DISASTER RISK

DesInventar is an open access database of extreme-event disasters reported in the media that Council researchers have been validating against satellite imagery and remotely sensed data, to visualize and map floods, cyclones, and landslides. Census data can be overlaid to map the population exposed to risk and determine the impact.

It is challenging to build fully integrated early-warning systems, disaster preparedness plans, and vulnerability-reduction strategies in developing countries because the data are imprecise or not available at a subnational level. There is bias in what natural disasters are reported, who is exposed, and who is harmed. Often, population is not disaggregated by characteristics such as age, education, or gender, although the resilience literature highlights that risk is not uniform. Due to its finer spatial scale and comprehensive design, DesInventar may be a useful tool for tracking natural disasters, but requires additional systematic validation to ensure that the data are reliable.[13]

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