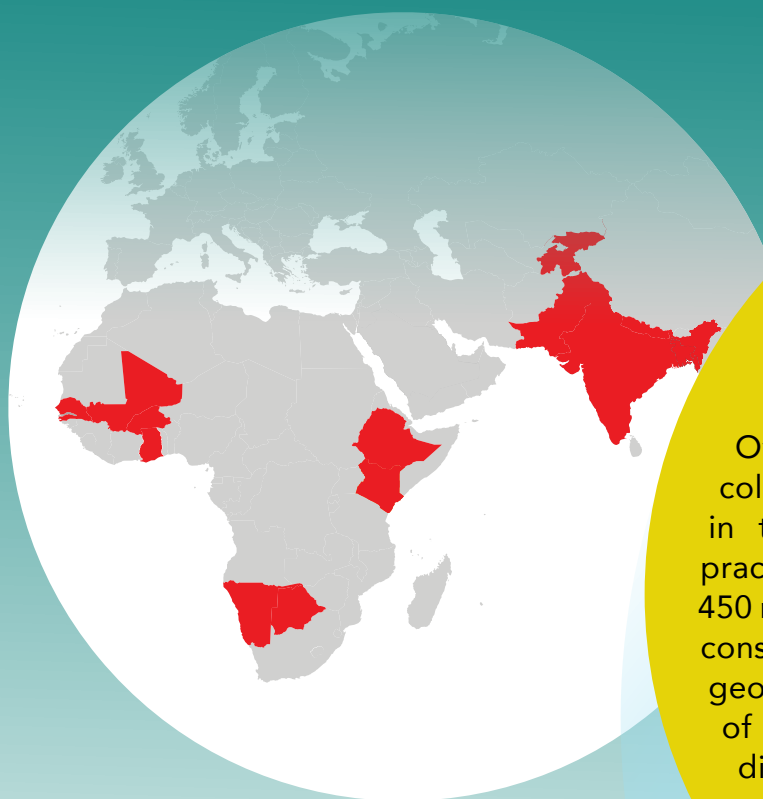




CARIAA
Collaborative Adaptation Research
Initiative in Africa and Asia

NOVEL INSIGHTS BRIEF

EFFECTIVE ADAPTATION



More than one billion people live in deltas, semi-arid lands, and glacier-dependent basins in Africa and Asia, hotspot regions that are the most vulnerable to climate change.

Over 7 years, the CARIAA program supported collaborative research to strengthen resilience in these hotspots by informing policy and practice. CARIAA brought together more than 450 researchers across 15 countries through four consortia, with selected study areas based on geographic and social similarities—with the aim of sharing knowledge and experiences across disciplines, sectors and geographies.

The CARIAA Novel Insights series provides a snapshot of the key insights that emerged from this work, on the most pertinent topics for climate adaptation.

WE NEED TO RETHINK HOW TO DEFINE ‘EFFECTIVE’ ADAPTATION, CONSIDERING WHO BENEFITS, WHEN IT IS NEEDED, AND HOW IT OCCURS.

Effectiveness depends on **who** benefits from adaptation and by whom it is done, **when** adaptation is needed and when benefits emerge, and **how** adaptation occurs (including enabling technologies and practices). CARIAA has amassed new insights on these three fundamental questions, based on the grounded experience of people and communities living in climate change hotspots.

BACKGROUND

Article four of the 2030 Agenda for Sustainable Development pledges “that no one will be left behind” and “to reach the furthest behind first”. Article seven of the Paris Agreement establishes a global goal on adaptation, calling for strengthened cooperation to identify effective adaptation practices. But there is limited agreement on what constitutes effective adaptation, due to a lack of clear methods, sources of evidence, and concepts (Tompkins et al 2018). Adaptations to coastal inundation in deltas, for example, comprise a different set of actions by different people and in response to different stresses, compared with adaptations to increased rainfall variability in semi-arid zones.

Access to climate financing inspires efforts to measure, report, and verify (UNEP 2017). Yet effectiveness cannot be judged solely by funders in terms of economic return, the dollar amount of income generated or loss avoided. Such decisions influence justice and social equity, including access to resources and funding availability, as well as the

sustainability, flexibility and robustness of adaptation options. Effectiveness in climate hotspots in Africa and South Asia is tied to considerations of for and by whom, when, and how adaptation occurs.

While donors or national treasuries focus on cost effectiveness, people and communities focus on how adaptation contributes to a future they value: the results in terms of livelihoods, vulnerability, and equity.

NEW INSIGHTS

WHO ADAPTS AND BENEFITS

Adaptation is intimately tied to considerations of social equity and justice. Like all regions, Africa and South Asia have a history of social difference where race, caste, gender, and other characteristics privilege some members and marginalize others. The burden of climate impacts, ranging from heat stress to water scarcity, falls disproportionately on those who are disadvantaged. Society shapes where people live, the risks they are exposed to, the material conditions at their disposal, and the power and capacity they have to create their future.

Adaptation needs are rooted in historical experience, and we need to be cognizant of the changing face of vulnerability. For example, limited and eroding livelihoods encourage male out-migration and increase the burden on women and girls, but also open opportunities for women to exercise greater agency and control over decisions and assets. Household structures influence wellbeing and the availability of adaptation choices, and these structures are shifting, with women and men renegotiating their roles, responsibilities and resource allocations.

People and communities judge adaptation partly by its effect on distributional and procedural justice, how actions enable people of different races, castes, genders and ages to realize dignity and a life they find meaningful.

WHEN TO ACT AND IMPLICATIONS OVER TIME

Individuals and communities make decisions about their future, and are more susceptible to climate impacts, at different moments. A drought or storm during sowing or harvest can be much more damaging than the same event at another time in the year. Similarly, past shocks accumulate over time to erode adaptive capacity and increase

vulnerability. Yet communities can also envision and pursue the future they want, supported by scenario planning and adaptation pathways that anticipate and navigate among alternatives. While adaptation often focuses on what to do to respond to climate impacts, such approaches draw on future thinking and risk management, to focus on when outcomes of adaptation actions emerge over time.

The concepts of critical moments and turning points examine the effectiveness of adaptation over time. Critical moments are when households and livelihoods are especially vulnerable. The timing and frequency of extreme climate impacts, such as heat waves and floods, can matter more than the average change in temperature or rainfall. For example, communities along the Soan River in Pakistan rely on rainfall in December for germinating wheat crops and are vulnerable in April when water is scarce.

Turning points describe when climate change impacts exceed a certain threshold, inducing policy failure or unacceptable change. For example, when might wheat yields in the Indus valley diminish due to heat stress?

To test these concepts, CARIAA researchers traced the history of how villages had responded to stress over time. Their experience shows that critical moments are not fixed: shocks in one year can affect susceptibility in future years, and slow-onset stress does not emerge at a single point in time.



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Photo credit, from top to bottom: Rajeshree Sisodia,
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CARIAA research also examined how African small and medium-sized enterprises respond to climate risks, finding that repeated exposure to extreme events was associated with a higher likelihood of response. Adaptation tended to enhance the business after one or two events, such as accessing loans or insurance, and switching crops or commodities. Yet repeated climate stressors tended to erode the business, triggering the sale of assets and reducing the number of employees. In this regard, the experience of African business shares a feature with Asian communities: namely, that a cascade of critical moments experienced over time can surpass the limits of adaptation. Lives and livelihoods are more vulnerable after floods disrupt agriculture, communication, value chains, and sanitation.

Transformative scenario planning in West Africa, India, and southern Africa brought together diverse and influential actors to reflect on their situation and work together for change. Scenarios are stories about potential futures: what could happen—created collectively as a step towards building trust and collective action. In East Africa, participatory scenario analysis sought to engage hard-to-reach populations traditionally excluded from decision making, to understand who stands to gain and lose from adaptation options, before engaging local and national governments to identify equitable responses. In India and southern Africa, scenarios involved landless poor and farmer movements, and used local languages. Participants challenged their perspectives and considered ways communities could exercise their agency to achieve desirable futures for land use, agriculture, and access to water. In Mali, communities developed proposals for local adaptation grants towards improving farmer access to seed and income opportunities for young women.

HOW ADAPTATION OCCURS

Three sets of adaptation technologies were refined and piloted by CARIAA. In Pakistan, smallholder farmers switched from diesel fuel and flood irrigation, to solar-powered water pumps and a package of techniques including drip irrigation, multi-cropping, kitchen gardens, and tunnel farming. The result was improved crop productivity and better use of scarce

water, and the approach is being scaled by the government to reach 30,000 farmers. In Bangladesh and India, flood-resistant housing and eco-san toilets have raised floors or platforms that allow people to stay dry above rising waters. In Pakistan and India, research examined how people are exposed to heat stress in rural and urban settings, and collected original data using mobile sensors. Different roofing materials were tested, including novel modular roofing panels in Sawda Ghevra outside New Delhi, and were found to lower indoor temperatures compared to corrugated roofs.

Work on African small- and medium-sized enterprises identified distinct adaptation strategies, including adjustments in finance, capacity, and production. Financial adjustments include getting a loan or mortgaging assets; capacity adjustments include sale of assets; and production adjustments include introducing a new commodity or crop. At the same time, the policy environment shapes the ability of firms to respond to climate risks. Financial barriers and insufficient market access increase the probability of business contraction, while access to information, government support and specific adaptation assistance all increase the probability of sustainable adaptation.



Novel evidence on the enablers of and barriers to adaptation confirms that the opportunities to adapt are limited by factors such as meagre size of landholdings (too small to warrant investing in adaptation), lack of irrigation and water infrastructure, climate and weather information that is poorly-timed or packaged, weak capacity in local government, and isolation of climate from the rest of the government apparatus. There are differences in the access that female-headed and male-headed households have to what they deem to be successful adaptations.

In South Asia, barriers to adaptation include remoteness of vulnerable communities, caste discrimination, water stress, and lack of income and livelihood diversity. Rather than merely listing barriers, it is key to identify ways of addressing them that permit interventions to secure better outcomes. At the same time, what is good adaptation in one place, can be maladaptation elsewhere, such as when upstream conservation of water leads to scarcity downstream. Factors that enable adaptation in hotspots include secure land tenure, access to markets and urban centres, access to information and social networks, and social protection schemes.

LOOKING FORWARD

Under the Paris Agreement, the goal on adaptation (Article 7) and preparations for a global stock-take (Article 14) are stimulating efforts to assess and report on progress. It is tempting to simply use existing tools for tracking investment or mitigation, yet people and communities living in hotspots focus on who adapts and benefits, when to act and implications over time, and how adaptation occurs.

Who adapts and benefits: Adaptation must contribute to social equity and justice. In prioritizing research and investment, it is essential to enhance the ability of communities, local organisations and governments to adapt to climate change in a way that minimizes vulnerability and promotes long-term resilience.

When to act and implications over time: Histories and futures vary between communities, and point to a need to consider how the implications of adaptation unfold over time, as well as a need for research that connects basin-wide modelling with household perception surveys.

How adaptation occurs: There are opportunities to refine and scale technologies and practice grounded in the reality of people living in hotspots. There is also a continued need to integrate climate into development plans and investment decisions, such as building roads in ways that conserve water courses, and ensuring irrigation districts will still be viable in 40 years.

There is a reason that adaptation is part of the Sustainable Development Goal 1 (No Poverty). Target 1.5 is to build the resilience of the poor and reduce their exposure and vulnerability to climate-related extreme events. Twenty years ago, the 1998 Nobel Prize in Economics recognized poverty as lack of capabilities, rather than merely counting income. As part of eradicating extreme poverty by 2030, ease of measurement cannot be our sole consideration of the effectiveness of adaptation.

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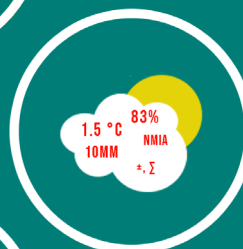
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