

RESEARCH FOR IMPACT APPROACHES IN CLARE

Laura Rawden , Suzanne Carter

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Research for impact approaches in CLARE

Bridging science and action

CLARE Working Papers, # 1

Laura Rawden and Suzanne Carter



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About CLARE Working Papers

CLARE is a flagship research programme on climate adaptation and resilience, funded mostly (about 90%) by UK Aid through the Foreign Commonwealth and Development Office (FCDO), and co-funded by the International Development Research Centre (IDRC), Canada. CLARE is bridging critical gaps between science and action by championing Southern leadership to enable socially inclusive and sustainable action to build resilience to climate change and natural hazards.

Titles in this series are intended to share initial findings and lessons from research and background studies commissioned by the programme. Papers are intended to foster exchange and dialogue within science and policy circles concerned with climate change adaptation and resilience. As an interim output of CLARE, they have not undergone an external review process. The views expressed herein do not necessarily represent those of the UK government, IDRC or its Board of Governors.

Feedback is welcomed as a means to strengthen these works: some may later be revised for peer-reviewed publication.

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Abstract

Achieving research impact in the adaption and resilience field requires novel and inclusive approaches that can lead to transformational impact. This working paper provides insight into the methods being used by 19 research projects under the CLARE programme. The approaches mentioned here are not exhaustive but reflect on five broad types of approaches, namely: Co-creation labs, climate risk narratives, visual storytelling, citizen science, and behavioural science and psychology. Specific examples from each project are provided, detailing the problems they are seeking to address, the tools and methods applied as well as the communities and stakeholders they are working with to find joint solutions. Some early results are shared in the form of mini case studies, pointing to the effectiveness of the approaches.

Key words

Co-creation; transdisciplinary; climate risk narratives; citizen science; behavioural science and psychology; visual storytelling

Acronyms

ARA	Adaptation Research Alliance
BASIN	Behavioural Adaptation for water Security and INclusion
Benin health	Early warning and response for climate-sensitive waterborne disease outbreaks in Benin
BIMA	Building Insurance Mechanisms Adaptation
CLARE	CLimate Adaptation and REsilience
CLARITY	Climate adaptation and resilience in tropical drylands
ClimateREEFS	Fisheries sustainability on coral reefs
ECONOGENESIS	Understanding the gender equality, social inclusion and distributional implications of the economics of climate change
GRIN	Decision support for climate risk preparedness – towards gender-responsive crop insurance in West Africa
IDRC	International Development Research Centre
INACCT Resilience	Designing inclusive African coastal cities' resilience
INFLOW	Improved anticipation of floods on the White Nile
MECHANICS	Methods to enhance capability in high-resolution information for adaptation: Initial case studies
PALM-TREES	Pan-African and transdisciplinary lens on the margins: Tackling the risks of extreme events
PASSAGE	Strengthening pastoralist livelihoods through effective anticipatory action
REBUMAA	Resilience building through multi-stakeholder engagement in anticipatory action for climate-induced disaster

RECOVER	Resilience to Climate Vulnerability and Environmental Risk
REPRESA	REsilience and PReparedness to tropical cyclones across Southern Africa
R4I	Research for Impact
RURBANISE	Resilience of informal communities to rapid urbanisation
SUCCESS	Successful intervention pathways for migration as adaptation
SURF-IT	Spatial surge forecasting using artificial intelligence and community knowledge
T-labs	Transformational Labs
UK FCDO	UK Foreign Commonwealth and Development Office
WOSFER	Building WOMen Smallholder Farmers' empowerment and adaptive capacities



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Introduction

The Climate Adaptation and REsilience (CLARE) initiative is a framework research programme enabling socially inclusive and sustainable action that builds resilience to climate change and natural hazards in Africa and Asia-Pacific.

Through needs-driven, action-focused research, CLARE is bridging critical gaps between science and action. The goal is to facilitate the development of new tools and to support partner governments, communities, and the private sector in using evidence and innovation to drive effective solutions to the climate challenge.

CLARE aims to deliver on those goals through a portfolio of co-produced, Southern-led projects that use inclusive and co-produced adaptation and resilience research to lead to tangible impact. Achieving research impact in the adaption and resilience field requires novel and inclusive approaches that can lead to transformational impact.

This working paper provides insight into the research for impact methods being used by 19 research projects under the CLARE programme. Taking stock of the approaches used by these projects as part of their research for impact pathways highlights how action research can aim for high-impact and transformational change. The approaches mentioned here are not exhaustive but reflect on five broad categories, namely: Co-creation labs, climate risk narratives, visual storytelling, citizen science, and behavioural science and psychology. Below is a description of how different projects are incorporating that approach into their work.

Specific examples from each project are provided, detailing the problems they are seeking to address, the tools and methods applied as well as the communities and stakeholders they are working with to find joint solutions. Some early results are shared in the form of mini case studies, pointing to the effectiveness of the approaches.



Commitment to Research for Impact

CLARE supports transdisciplinary research that is co-created by diverse coalitions of actors working across boundaries and borders. All projects in the CLARE portfolio are underpinned by a commitment to the Adaptation Research for Impact (R4I) Principles.

These six Principles galvanise action that enhances the potential of action-oriented research for supporting vulnerable communities to adapt. CLARE is striving to put all six Principles into practice, with a strong complementary focus on gender, equity and inclusion. The CLARE research teams cover many disciplines and involve non-research organisations (e.g. grassroots, humanitarian and NGOs).

As a result, CLARE enables adaptation actions that are timely, scalable and context-specific for reducing vulnerabilities to climate change.

Adaptation Research for Impact Principles

Developed by the Adaptation Research Alliance (ARA), the Adaptation Research for Impact (R4I) Principles are aimed at supporting and influencing a broader community of practice for those working on adaptation action and research.

1. Research is needs-driven, solutions-oriented and leads to a positive impact on the lives of those at risk from climate change (who or what is the research for?)
2. Research is transdisciplinary and co-produced with users (how should research be carried out?)
3. Research emphasises societal impact (how is research valued?)
4. Research builds capacity and empowers actors for the long-term (what can research enable?)
5. Research processes address structural inequalities that lead to increased vulnerability and reduced adaptive capacity of those at risk (how can research address root causes of risk?)
6. Learning-while-doing enables adaptation action to be evidence-based and increasingly effective (How can research-action links be strengthened?)

Deeper understanding of lived experience

Complementary to its research for impact approaches, the CLARE programme is also ensuring greater inclusivity and understanding around people's lived experience and how this intersects with early warning and adaptation actions.

Research that uses **local or indigenous knowledges** allows for community-based insights, learning, and approaches to be incorporated into research, including the project design and methodology¹. In CLARE, many projects utilise co-production processes, where researchers and local/indigenous communities work together in an environment built on equality, mutual learning and respect, and where one group does not hold greater authority in the engagements. Using this approach for adaptation and resilience efforts can support transformative action by empowering local communities and facilitate community buy-in.

Inclusion lens for economic impacts

The project [Understanding the gender equality, social inclusion and distributional implications of the economics of climate change](#) aims to identify new information on the economic costs of climate change, the costs and benefits of adaptation, and bankable adaptation finance projects, through a gender equality and social inclusion lens in Rwanda, Tanzania and Nepal. Researchers will gather quantitative data on the costs of climate change by gender and across social groups using in-depth interviews, focus group discussions, and a household survey. This will be supplemented with modelling to scale these results up to the national level.

Empowering women in agriculture

The [Building WOMen Smallholder Farmers' empowerment and adaptive capacities \(WOSFER\)](#) project also uses intersectional risks to better develop suitable adaptation strategies. Aiming to strengthen the adaptive capacity of women smallholder farmers in the cattle corridor of Uganda, the research will apply a project-level Women Empowerment in Agriculture Index on household survey data to measure changes in women's empowerment, including an additional module on resilience (Resilience Index) to capture changes in women's resilience to the effects of climate change. The project is anchored around co-production of knowledge, intersectionality, gender transformative and capacity strengthening approaches. The generated evidence on what works to empower women and build their resilience to climate shocks will be used to inform policy and programming for gender transformative climate interventions.

Considerations of **gender, inclusion and empowerment** enable adaptation and resilience strategies to encompass the needs and voices of all, especially the most vulnerable^{2,3}. In practice, this can take a variety of forms, from drawing on the experiences and impacts of a changing climate on marginalised communities to designing innovations that impact specific groups such as women or those living in informal settlements. Using this lens enables researchers to address climate change challenges while also challenging systemic barriers that perpetuate inequality.

¹ Filho et al, 2022

² CLARE, 2024

³ Eerdewijk et al, 2016

Gender responsive crop insurance

The Decision support for climate risk preparedness – towards gender-responsive crop insurance in West Africa (GRIN) project is exploring gendered vulnerability of smallholder farmers and their preferences for weather and climate forecasts. These insights are collected through household surveys across several communities. The project team also works with stakeholders from communities, meteorological offices, and private sector actors to explore the factors influencing the uptake of insurance. Through this understanding, the project will pilot gender-responsive crop insurance that is bundled with weather information needed by communities.



Approaches to Research for Impact in CLARE

CLARE projects are using a variety of research for impact approaches that support transformative, inclusive, and co-produced outcomes. These approaches provide promising means for ensuring adaptation and resilience that meet the needs of ever-changing social and environmental contexts in the Global South. Figure 1 shows the broad approaches in dark blue circles with specific methods and tools spotlighted in the light blue circles.

The following sections examine these approaches in detail, giving an overview of the approach itself, how it is being applied within specific project designs, and the results expected from using these novel and potentially transformative ways of working.



Figure 1: Research for impact approaches in CLARE

Co-creation Labs

Co-creation labs⁴ involve working collaboratively to create new ideas in response to a particular problem. By bringing together a range of stakeholders, including marginalised communities, these labs encourage the sharing of ideas in an atmosphere of trust, encouraging learning, exploration and reflection from a variety of viewpoints and lived experiences. By supporting collective learning and co-designed approaches, the labs ensure no one is left behind in climate resilience planning.

The Co-creation Lab approach is highlighted in the Resilience to Climate Vulnerability and Environmental Risk (RECOVER) project and its Real-World Labs. A variety of stakeholders are brought together in Real World Labs to catalyse ‘communities of practice’ which explore, develop, seek solutions, identify best practices, exchange knowledge, gain an enhanced understanding of the management of climate risks and co-create innovative locally adapted climate solutions.

With these labs, RECOVER researchers aim to support small island economies to increase their resource self-reliance, reduce vulnerability to climate risks, and increase climate adaptation capacity.

Another example of this approach is the project, Climate adaptation and resilience in tropical drylands (CLARITY). CLARITY is undertaking ‘Transformational Labs’ (T-Labs) at its hubs in India, Tanzania, and Niger-Nigeria to collectively identify pathways towards more equitable and sustainable water futures, and climate resilience interventions defined by community, private sector and government actors, as well as wider development and policy drivers. T-Labs are inclusive spaces where stakeholders, practitioners and researchers come together to co-design and test ideas and innovations, co-produce new knowledge, and co-evaluate solutions. See the box ‘Groundwater sources under pressure in drylands’ for more detail.

CLARITY is needs-driven and solutions-oriented as it is rooted in pressing critical challenges in the context of changing climates in complex, adaptive socio-hydrologic systems in tropical drylands where the research team has established long-term relationships with stakeholders (communities, practitioners and policy makers)

Groundwater sources under pressure in drylands

Near Bengaluru, India, groundwater supplies the domestic water supply for Chintamani Town and smallholder irrigation farmers outside of the town. Groundwater depletion resulting from prolonged, intensive and ungoverned groundwater abstraction restricts water access to very deep (>100 m) wells, depriving poorer households and farmers that are then reliant on crop production from rain-fed agriculture. As basins close (when all available water is used), the Karnataka Department of Water Resources is actively exploring demand-side solutions that can maintain farmer incomes.

In central Tanzania, intensive groundwater withdrawals from a wellfield provide the only perennial supply of freshwater to Dodoma, the nation’s rapidly growing capital. As groundwater levels decline in response to rising abstraction representing <50% of the estimated demand, the Tanzanian Ministry of Water is urgently considering supply-side and demand-side interventions while residents seek to adapt to increasing interruptions in their water supply for domestic and agricultural uses.

In southeastern Niger, groundwater withdrawals currently sustain smallholder irrigation and domestic water supplies to the city of Maradi and are projected to increase dramatically under national adaptation plans to address water and food security. As transhumant herders and irrigation farmers compete for water and the renewability of abstracted groundwater (as the research team has revealed) relies upon leakage from episodic river flow resulting from extreme heavy rainfall and dam releases upstream in northern Nigeria; questions of governance are vital and involve both national (government ministries, NGOs) and international (Niger Basin Authority) actors.

⁴ Bussey et al, 2023

through engaged, transdisciplinary research. Involving local, regional and national participants, as well as development practitioners, local and international researchers, and citizen scientists, CLARITY researchers aim to use T-labs to recognise that innovation is already happening on the ground. Thus, they seek to capture the complex and characteristic challenges of dryland water management under rapid development, and where the need for solutions is so pressing.

The T-Labs approach embeds research in programmes that are already being pursued by governments. CLARITY will have immediate impact by providing much-needed technical support to local planning authorities and implementing organizations. By co-creating the research with key stakeholders, including poor and marginal water users, the CLARITY team will have a seat at the table to inform and influence policy and practice more directly.

Resilience of informal communities in rapid urbanization (RURBANISE) is conducting a transdisciplinary policy lab, with community members and government representatives as participants. The project also evaluates climate adaptation and risk management policies in institutions at the local, regional and national levels. Participatory assessments of the effectiveness of existing policies will show how current policies respond to the needs of the most disadvantaged groups as well as the gaps in these responses. Through the lab, policy recommendations from the grassroots level can be better institutionalized. Other policy actors can learn from these experiences in building resilience in informal settlements.



Maynard Nyirenda, SD and DODMA

REsilience and PREparedness to tropical cyclones across Southern Africa (REPRESA) also uses a similar approach in its 'Living Labs' which bring new in-depth research and lived experiences together using a co-development approach to improve both immediate responses and long-term resilience to flood impacts from tropical cyclones.

The five interconnected Living Labs include participants from communities, academia, and humanitarian agencies in Mozambique, Malawi and Madagascar. Through the focus on practice and policy, REPRESA labs support the co-creation, iteration and adoption of the project's research findings in ways that enhance effectiveness of early warning system messaging and strengthen context driven, locally led adaptation options.

In its Learning Labs, the Designing inclusive African coastal cities' resilience (INACCT Resilience) project looks to strengthen urban resilience planning within the coastal cities of Beira in Mozambique and Ethekwini in South Africa, through a gender responsive lens. Both cities have high flood risk, particularly for vulnerable communities and informal settlements.

In the example of Beira, rapid urbanization, driven by displacement during conflicts, has pushed vulnerable populations into informal settlements situated in the city's floodplains. These areas, highly exposed to the impacts of climate change, require a thorough understanding of multidimensional vulnerability and a focus on strengthening socio-economic services and social structures to build resilience. Learning labs and participatory research enable the co-production of data and solutions in a way that prioritizes the needs of the most affected people.

Learning Labs involve a variety of stakeholders, including marginalised voices, with knowledge and evidence shared in an environment of trust. Thus, these labs enable policies and strategies to be tailored to address their unique needs, vulnerabilities, and contributions.

The Strengthening pastoralist livelihoods through effective anticipatory action (PASSAGE) project aims to enhance early warning systems and anticipatory action for drought risk among pastoralist communities in the greater Horn of Africa, especially for the most vulnerable.

Through its Learning Hubs, researchers bring together a diverse and inclusive set of actors to better understand the differentiated impacts, to co-produce indicators, and to identify effective anticipatory actions. They also aim to co-develop narratives and dissemination channels to improve the access to and use of risk information for women, men, youth, and other marginalised groups.

The Improved anticipation of floods on the White Nile (INFLOW) project approach has been adapted as a result of the record Lake Victoria levels in 2024 and is now also using a Living Labs approach. INFLOW researchers are embedded within conversations that are taking place between agencies operating within the country.

Through the Living Labs approach, INFLOW is informing the provision of scientific information to the UN's South Sudan Flood Task Force and using conversations with humanitarian practitioners working on the ground (e.g. South Sudan Red Cross, Medecins sans Frontiers) to adapt the focus of the research to best support decision-making needs. For example, this engagement has helped to inform the lead-times at which forecasts are needed and research on the best method for monitoring flood extent from satellite.



Climate risk narratives

Climate Risk Narratives^{5,6} are ‘stories of change’ told from the future describing a changed climate with associated impacts. The approach is a valuable way to facilitate engagement with stakeholders, and support research activities, outputs and outcomes. In CLARE, research often includes personal accounts of climate change, with stories that may be both traumatic and hopeful. These narratives are descriptive and make an emotional connection to climate change and the environment from the perspective of the storyteller. Made possible through different methods of expression, such as art and photography, these approaches enable decision-making around a changing climate that considers different knowledge, values, and viewpoints.

The [Strengthening pastoralist livelihoods through effective anticipatory action \(PASSAGE\)](#) project uses climate risk narratives as a core method to co-produce knowledge and enhance anticipatory actions for drought resilience in pastoralist communities in the Greater Horn of Africa. These narratives are developed collaboratively with the communities, integrating both local and traditional knowledge to reflect vulnerabilities, capacities and lived experiences.

PASSAGE leverages these narratives to, *inter alia*: capture the pastoralists’ lived experiences of climate variability and its cascading impacts on livelihoods; empower local stakeholders by ensuring that the narratives reflect their needs, in their preferred languages and communication methods; and co-develop early warning systems and anticipatory actions that are tailored to the specific climate risks faced by the communities.

Through these climate risk narratives, PASSAGE ensures that adaptation strategies are informed by indigenous knowledges, making them more context-specific and enhancing their effectiveness. The PASSAGE project heavily emphasizes the integration of indigenous knowledge into its research, particularly through its risk narratives and early warning systems. The project's engagement with local communities ensures that traditional knowledge is respected and that research outcomes reflect the real-world needs and capacities of those most affected by climate change.

[Climate adaptation and resilience in tropical drylands \(CLARITY\)](#) has adopted several approaches, including the use of Climate Risk Narratives. These capture peoples’ lived experiences of climate variability and change, focusing on women, as well as poor and marginalised groups. The narratives provide a means for people to describe the challenges and opportunities they face in responding to increasing uncertainty with regard to changing patterns of availability, access and use of water in complex, risk-prone environments.

Derived from the knowledge gained through their T-Labs, CLARITY aims to develop mind maps, narratives, and audio-visual data stories that capture peoples’ lived experiences of climate variability and change, focusing on women (often the main drawers of water), as well as poor and marginalised groups. Building on these outputs, the aim is to identify technically and socially ‘plausible’ pathways that have the potential to work in a climate-constrained environment while reflecting these voices.

In CLARITY’s T-Labs, stakeholders are already actively exploring some potential pathways that are both ‘bottom-up’ (e.g. rainwater collection, self-supply (private) wells, local recharge wells) and ‘top-down’ (e.g. crop choices, managed aquifer recharge, transboundary water governance through benefit sharing). However, the equity, sustainability and resilience of these stakeholder-driven solutions (hypotheses) to climate change often remain untested. Furthermore, policy may not consider longer-term (intergenerational) implications. CLARITY is aiming to analyse and model these dynamic

⁵ Jack and Jones, 2019

⁶ GNDR

processes to understand their impacts on people and places over time and space in the T-Lab locations and beyond.



Also using a similar approach is [Pan-African and transdisciplinary lens on the margins: Tackling the risks of extreme events \(PALM-TREES\)](#). Involving communities from six African countries (South Africa, Cameroon, Ghana, Kenya, Nigeria and DR Congo), PALM-TREES aims to use climate risk narratives to examine when and why events are considered ‘extreme’ by communities and how they contribute to their vulnerability.

In Kitui county, Kenya, heavy rainfall occurs intermittently, particularly before the short rainfall season (September-October). This can cause flooding in some areas, destroy crops already planted and stop people from travelling from home. The flooding prevents agro-pastoral communities from producing food at the start of the wet season or accessing markets to purchase food after the long dry season. These events can also cause fatalities as there is a risk of drowning in rivers. These periods of intermittent heavy rainfall can last one to two weeks. At the same time, the increasing number of hot days is also taking its toll, with communities highlighting that these are similarly prevalent at the start of the short rainy season. These examples highlight that it is not just the intensity of an event that matters but its timing, and that compounding physical stressors may be shaping new experiences of climate-related vulnerability.

In PALM-TREES co-production takes place between researchers and communities, where participants share narratives that involve changing perceptions of risk, traditional knowledges and coping strategies related to climate extremes. The project aims to ensure climate science, policy, and practice is inclusive of marginalised voices. Specifically, it aims to understand how vulnerable individuals with complex social identities beyond gender are impacted by climate extremes, and to include their views in local climate adaptation plans⁷.

[Fisheries sustainability on coral reefs \(ClimateREEFS\)](#) is conducting extensive climate change vulnerability assessments within coastal communities that rely heavily on fishing in declining coral reefs. Working with communities in four locations in Indonesia and the Philippines (each with about 500 households surveyed) provides an understanding of how climate change is (or not) impacting their lives, how they perceive the threat, what they already do about it, and how these responses differ across genders. The next step is relating these assessments with what is already known about climate change adaptation of regional reef fisheries, and deepening them with gender perspectives and culturally specific contexts. These assessments underpin the subsequent engagement with the villages

⁷ CLARE, 2024

to co-develop adaptation pathways, which are new and existing strategies that individuals and communities can apply to adapt.

Visual storytelling

Visual storytelling⁸ approaches make data and knowledge more easily understood by using a visual format. Using methods such as art, photography, or animation, researchers can get richer insights from communities where language, culture, and power dynamics may present challenges. The approach also enables knowledge and data to be presented as a narrative or story, which is more accessible to a wider audience of those able to effect change.

To support the inclusion of diverse and marginalized voices, the [Successful intervention pathways for migration as adaptation \(SUCCESS\)](#) project uses Visual Storytelling. Specifically, it does this through participatory [PhotoVoice](#) methods, where photographs are taken and selected by participants to capture their view of the impact of current interventions.

The goal is to facilitate migrant and non-mobile populations in generating and curating their own data. This enables co-created tools that support communities to better self-diagnose the drivers of change that impact their lives and livelihoods, and empower them to advocate for solutions better suited to their needs and circumstances.

Alongside data gathered on what interventions work and for whom, researchers aim to also shed light on the perspectives and aspirations of local and marginalized populations, and those experiencing socio-structural constraints. The insights and inputs collected from the PhotoVoice methods will be used to inform policy recommendations and programme interventions, ensuring inclusion of diverse and marginalized voices.



⁸ Moezzi et al, 2017



Designing inclusive African coastal cities' resilience (INACCT Resilience) adopts impactful and collaborative methodological approaches by combining traditional methodologies (e.g. interviews) with creative arts-based methods such as PhotoVoice and playdough modelling.

PhotoVoice or participatory photography is being used by INACCT Resilience. The visual nature of the method helps to overcome language and cultural barriers and power dynamics. This enables researchers and other stakeholders to gain a better understanding of informal settlement residents' lived experiences of climate extremes.

This is highlighted in one participant's narrative, who described their experience of flooding:

"We lost our houses and our land. It altered the landscape which led to very small spaces. Because of the change of landscape no one could retrieve the houses and we had to start afresh. Losing everything disturbs your mind, not knowing where to start. Your health deteriorates, you are traumatised, angry and confused."

PhotoVoice provides an important platform for informal settlement residents to share their experiences and perspectives by using photos to engage with local government officials, NGOs and other stakeholders. INACCT Resilience has enabled this by displaying PhotoVoice outputs during learning labs, art exhibitions and other engagements. This affords opportunities for the narratives to influence policy and practice.

The Fisheries sustainability on coral reefs (ClimateREEFS) project also incorporates visual storytelling in its work to support socially equitable climate change adaptation pathways for coastal communities

Arts-based approaches to knowledge sharing

INACCT Resilience is exploring how art can be used as a mechanism to co-create resilience strategies and relive stories of trauma from flooding without causing further harm, by employing the interactive and creative art of playdough sculpting.

For example, in one collaborative engagement, held within an informal settlement in eThekweni, South Africa, participants were asked to mould representations of community-based flood early warning systems using play-doh to convey to researchers the barriers and facilitators thereto; how they perceived flooding disasters; and how this had changed their lives.

The artistic approach encouraged participants to share narratives about their ideas, emotions and experiences in a creative and tangible form that supports more vibrant storytelling. It also enabled participants to overcome barriers of power dynamics in storytelling where language, lived experiences, and biases may have otherwise been limitations.

It was also successful due to long-standing relationships built by researchers and community leaders, which established an atmosphere of trust, and where community leaders set the tone for the exercise and conversation.

This novel and interactive approach helps to fully explore and capture the nuanced and often implicit aspects of urban resilience. It can also help transcend unequal power relations and give voice to those who are reluctant to participate in traditional formal settings due to factors such as cultural, political and gendered norms.

in Indonesia and the Philippines that depend on coral reef resources. Researchers engage with local communities in conversation groups and use photo evidence from underwater surveys to enable stakeholders to understand the status of their reefs. This approach engages their interest and creates stewardship, enabling co-creation of local adaptation approaches, such as modifying fishing approaches and locations, local resource protection, and diversifying income-generating activities from adaptive reefs.

The project will also involve intersectional and gender-focused social surveys, with particular attention to vulnerable and marginalised groups. This research will inform stakeholder engagement work by its NGO partners, including [Rare](#) in the Philippines and Indonesia, and the Coral Triangle Center in Indonesia. The project has piloted a gender integration strategy into community climate change risk assessments to acknowledge, elevate, and formally establish the role of women in coastal fisheries and dependent economies.

Participatory community mapping is a visual storytelling approach used by [Resilience of informal communities in rapid urbanization \(RURBANISE\)](#). RURBANISE aims to strengthen effective responses for climate adaptation and resilience in response to hazards including extreme weather events like typhoons, sea-level rise and increased heat and rainfall, which acknowledge the lived experiences and capacities of residents of informal settlements in the Philippines. RUBANISE aims to deepen understanding of the ways in which residents of informal settlements in the Philippines are vulnerable to climate-related risks by actively engaging those communities in the process.

By mapping their own perceived risks, vulnerabilities and capacities, the residents of partner communities shed light on forms of exclusion and discrimination that affect them, and identify critical vulnerabilities within their settlements. The data gathered also informs policy gaps in existing governance from a community-based perspective. Specifically, data on experiences of hazards and capacities for recovery will be gathered through participatory mapping workshops. This, along with hazard surveys, will support the development of 3D risk mapping, including visual representations of climate change risks in each community.



Citizen science

Citizen science⁹ is when non-experts take an active role in the research process. Through the collection and interpretation of data, as well as participatory mapping and inclusive messaging design, citizens of all types can contribute to adaptation and resilience strategies. Not only is the direct involvement of citizens an effective driver of climate action within communities at the frontlines of climate change, this approach also enables researchers and policy-makers to gather large amounts of data that cover vast collection areas that may otherwise have been limited by researcher resources.

The Building Insurance Mechanisms Adaptation (BIMA) project is using a citizen science approach in its work to strengthen climate resilience among agro-pastoral communities in Kenya through enhanced index-based livestock insurance. Specifically, BIMA aims to strengthen the analytical capacity of existing community-based observation networks to accurately measure biophysical attributes and integrate these with the satellite-derived and socio-economic data generated by other stakeholders in the project.

The project will also use gender, inclusion and empowerment approaches to understand factors that shape demand and the uptake of insurance products among women in Kenya. Researchers aim to implement a gender-responsive household survey to determine gender-based division of tasks, decision making powers, access and control of resources related to livestock rearing, as well as the appetite for livestock insurance products and how this could be bundled with other products that can enhance and change women's status. BIMA is also raising awareness about climate risks, insurance benefits and adaptation strategies among communities, and plans on using simulations to build trust through a meaningful dialogue process, co-creation, and collective action.

Citizen science approaches are also used in the project, Early warning and response for climate-sensitive waterborne disease outbreaks in Benin (Benin Health). Researchers aim to develop local capacity and collaboration between women cooperatives, young researchers, and local government stakeholders, enabling their leadership in co-designing climate change warning measures for health risks.

The project will use gender, inclusion and empowerment approaches to develop a targeted early warning and response system that can mitigate climate-sensitive waterborne disease risks in coastal and lake settlements of Benin. Specifically, the project will establish local gender sensitive 'innovation' working groups to co-design an inclusive bottom-up early warning system and co-develop contextualised preparedness and response plans that match the needs of different social groups against climate-induced waterborne pathogens.

They aim to train women and other stakeholders to educate up to 1,200 vulnerable members of the community about those measures. Communities, women cooperatives, local authorities, religious leaders, and government agencies will also take the lead in outreach and dissemination of study findings to raise awareness among the population on the best practices for implementation, such as talk shows, round table discussions, and interviews with authorities/opinion leaders.

⁹ <https://www.nature.com/articles/s41599-022-01040-8>

Spatial surge forecasting using artificial intelligence and community knowledge (SURF-IT), aims to provide resilient solutions by combining both indigenous and scientific knowledge to protect local communities against tidal surges in selected coastal areas of Bangladesh.

The project relies on both primary (community knowledge, drone surveys and tide stations) and secondary data. Local knowledge is harvested through community workshops, focus group discussions and participatory mapping. In parallel, tide stations, drone surveys and secondary data are also gathered and used to validate local knowledge scientifically. Gathered data is then used to run a model powered by artificial intelligence to provide accurate impact-based forecasts for tidal surge in selected communities. The forecasts are used by communities to take preventive measures to reduce loss and damage.

The project, Improved anticipation of floods on the White Nile (INFLOW) will examine how flooding in South Sudan and Uganda impacts people, particularly women and children, in conflict-affected communities. In addition to the Living Lab approach described under co-creation labs, the project is working with the South Sudan Flood Task Force to encourage citizen scientists to gather geo-referenced photographs of the flooding to help ground-truth satellite images and improve understanding of flood dynamics.

Researchers are also carrying out exploratory cross-sectional surveys to address how access to early warning systems for floods may be affected by gender and other differential factors, such as literacy barriers or mobile phone ownership. The goal is to understand how flood impacts are experienced by different subsections of communities, and how to improve representation in existing flood risk models. In addition, project partners are talking to community elders in South Sudan and refugees from South Sudan in Uganda. This will feed into improved anticipatory action plans within the humanitarian sector, such as through the distribution of early warning messages.

Tapping into centuries-old knowledge

Southwest coastal regions of Bangladesh experience annual tidal surges and devastating cyclones frequently. In response, local communities for centuries have taken various risk reduction activities based on indigenous knowledge and practices. The SURF-IT project is tapping into this knowledge base and using various scientific methods such as drone surveys and real time observation of tides to produce remarkably accurate small-scale community-based surge predictions.

For example, indigenous knowledge handed down over generations revealed that communities were at lower risk of surge impacts if they were located on the right-hand side of forecasted cyclones. Similarly, community knowledge also helps to identify real time information about embankments allowing researchers to identify weak points across embankments and map them out using drones. Local knowledge on where the tides hit hardest and which areas are prone to erosion provide crucial information which is being used in the model to provide accurate forecasts.

Already a dummy model has been created and tested during Cyclone Romel in May 2024 which showed encouraging results. Using community knowledge and geomorphological data the researchers were able to identify 30 points along the embankments which were at risk of breaching. Although the predictions were not completely accurate, it allowed local people and stakeholders to have a better understanding of where to distribute resources and strengthen embankments to limit potential impacts. This has helped the project to gather valuable information going forward and with real time data coming in from tide stations and drone surveys, the project is hopeful to be able to provide highly accurate forecasts for tidal surges.

The Resilience building through multi-stakeholder engagement in anticipatory action for climate-induced disaster (REBUMAA) project aims to improve forecast-based financing in Nigeria, Benin and Togo. This is done by addressing knowledge gaps in how to manage, coordinate and implement anticipatory action amongst different stakeholders, with an emphasis on the inclusion of women.

The project facilitates the co-creation of gender-sensitive anticipatory action approaches, with a strong focus on community engagement throughout all stages of developing flood early action protocols. Community perspectives are integrated and strengthened by a variety of community engagement activities in the targeted regions. For example, on-the-spot visits are carried out to gain a deeper understanding of local livelihoods and assess specific flood risks faced by vulnerable groups, particularly women.

To identify gender-sensitive early actions and raise awareness about flood risks, an *Enhanced Vulnerability and Capacity Assessment* is conducted. This assessment is carried out by community members themselves using participatory tools to collaboratively identify vulnerabilities and capacities in relation to flooding. For instance, the *Problem Tree* method is applied to pinpoint key challenges and trace them back to their root causes, providing a clearer understanding of the underlying drivers of vulnerability. Co-created knowledge and lessons learned from these activities aim to generate best practices and case studies for designing and implementing forecast-based financing approaches that are gender-sensitive and community-driven.

Strengthening pastoralist livelihoods through effective anticipatory action (PASSAGE) also engages communities (pastoralists in the Greater Horn of Africa) in participatory data collection for the development of anticipatory action plans, with a specific focus on understanding how traditional coping mechanisms interact with new climate risks. This enables community members to contribute directly to the research and decision-making process.

This citizen science approach acknowledges the importance of traditional coping mechanisms and local knowledge in managing drought risks, while integrating these insights with modern climate forecasting models. Community members are trained to gather data on drought impacts, water and other climate-related challenges. In doing so, solutions are contextually relevant but local communities are also empowered by enhancing their capacity to adapt to evolving climate risks.

By engaging pastoralist communities in risk assessments and the development of early warning systems, PASSAGE fosters a sense of ownership and accountability. The project highlights how traditional knowledge, combined with scientific tools can create more resilient and effective adaptation strategies.

Participatory approach strengthens community resilience by: ensuring that anticipatory action plans are co-developed, culturally appropriate, and widely understood; promoting inclusive decision-making, where women, youth and marginalized groups are empowered to contribute their perspectives on climate resilience; and building a long-term legacy of community-led climate adaptation that enhances local capacity to manage future climate risks.

The Methods to enhance capability in high-resolution information for adaptation: Initial case studies (MECHANICS) project is focused on how finer scale climate model information (km-scale) can aid adaptation planning and decisions. One of the two case studies is in Lusaka, Zambia, looking at flood risks in unplanned informal settlements. Working with flood maps drawn from the communities lived experience in combination with the fine scale model data the research will determine how marginalised people are vulnerable down to the ward level. This knowledge can ensure localised disaster preparedness plans are put in place.

Behavioural science and psychology

Effective solutions that enhance resilience require changes to behaviour. Behavioural science and psychology approaches¹⁰ can enable researchers to better understand what strategies motivate people to change their behaviours and as a result design effective intervention. Using improved insights on how to motivate change, researchers and practitioners can, among other things, strengthen communications strategies or awareness campaigns that resonate with target communities and build momentum and capacity for adaptation in relevant organisations.

The Behavioural Adaptation for water Security and INclusion (BASIN) project draws on concepts and methods from behavioural science and psychology approach, aiming to develop information campaigns and activities that influence the uptake of effective and equitable interventions for adaptation to support water security in Burkina Faso, Malawi and Tanzania. Recognising that barriers and opportunities exist at multiple scales, the project is examining adaptation behaviours and practices from the individual to the systemic, at organisational and political levels, and from communities to national institutions. Through a collaborative co-design process BASIN emphasises broad research contributions and direct impact through enhancing operations of NGO partners. BASIN aims include enhancing retention of volunteer community water champions, enhancing community uptake and use of climate information for water security, and addressing political inaction on water security and adaptation.

Asking what and who needs to change to address water insecurity and inequality, researchers map factors that drive behaviour and use these to inform interventions in both policy and practice. The project will also provide an African context for behavioural science perspectives, which have so far, primarily been based on Western scholarship.



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¹⁰ Scott, et al (2015)

Concluding thoughts

This working paper has outlined a variety of approaches taken by CLARE projects as they seek to ensure their research achieves impact, supporting transformative, inclusive, and co-created outcomes. These approaches provide promising ways of ensuring adaptation research connects with the real issues faced by different communities, appreciating the nuances of their situation and building together for improved resilience to short- and long-term impacts. Further learning will emerge as projects continue and stories of impact will be shared in subsequent CLARE publications.

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