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Resilience

*Designing Inclusive African Coastal City Resilience*

# Innovative, inclusive and gender-responsive engagement methodologies

## *Insights emerging from the INACCT Resilience Project*

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# 1. PURPOSE OF THE DOCUMENT

The main purpose of this document is to use the experience gained through the INACCT Resilience Project to provide key insights for effectively facilitating innovative, inclusive and gender-responsive engagement when working to build climate change resilience. The document draws from the lessons learned from interactive engagements including focus groups, Learning Labs and related events that have been convened for the INACCT Resilience Project in the cities of Durban, South Africa and Beira, Mozambique. These engagement processes have implemented and tested multiple approaches to ensure the inclusion of diverse voices and perspectives. This is critical for ensuring the development and implementation of innovative responses to the climate change challenge.

The document begins by contextualising the importance of co-production in the governance of climate resilience, before framing key principles for co-production and drawing on case studies to illustrate practical tools and learnings in relation to these. Thereafter, the 'Learning Lab' concept and its usefulness in creating spaces for innovation through inclusion is considered in detail. Additional approaches such as inter-community learning exchanges are also described. Importantly, the INACCT Resilience Project has a specific focus on flooding in the informal settlements of Durban and Beira and therefore the examples shared reflect this focus.

The insights presented are intended to support practitioners working at the interface of local government, communities and research institutions, including municipal officials, NGOs, intermediaries and researchers engaged in climate resilience and disaster risk reduction. Integrating inclusive and gender-responsive approaches has the potential to strengthen climate change adaptation processes and outcomes through the inclusion of different forms of knowledge and build relationships and improved understanding across stakeholder groups.

# 2. CONTEXT: CO-PRODUCTION AND INCLUSIVE GOVERNANCE

Centralised and technocratic forms of governance can no longer address complex urban challenges alone, given the complexity of environmental and social risks [1]. In this context, the co-production of knowledge, as both method and practice, is increasingly being used within a broader framework of transdisciplinary research to move systems towards greater resilience and sustainability. Designing resilience in African cities requires that such co-production of knowledge happens with the most affected communities. Co-production differs from participation or lobbying in that the central focus is on meaningful joined-up thinking, with shared processes and inputs supported by all actors involved in the process [2].

Co-production is a collaborative process involving active partnership, where different actors (for example government, citizens and others) work together to design, deliver and evaluate how services are delivered [3]. Such partnerships, collaboration and the co-production of knowledge and response between the state and citizens in the context of climate change adaptation can improve municipal service delivery and strengthen state-citizen relations and local adaptive responses to recurrent climate risks [4]. The role of intermediaries, such as universities, NPOs and NGOs, is essential for building new governance platforms and relationships which facilitate strengthened adaptation to climate change and reduced risk [5]. However, it is also important to be aware that co-production processes are power-laden, characterised by competing interests and trade-offs that require constant negotiation during such processes [6].

*[1] Sutherland (2025)*
*[2] Simon et al (2018)*
*[3] Sorrentino et al. (2018)*
*[4] Sutherland (2020), Williams et al. (2019)*
*[5] Sutherland et al. (2019)*
*[6] Mehta et al. (2021)*

# 3. FACILITATING CO-PRODUCTION THROUGH GENDER-RESPONSIVE AND INCLUSIVE ENGAGEMENT

## 3.1. THE IMPORTANCE OF GENDER-RESPONSIVE AND INCLUSIVE ENGAGEMENT

Inclusive and gender-responsive engagement aims to create spaces for diverse voices and perspectives to be heard, so that these insights can help inform better planning and decision-making. This requires paying careful attention to those who may be silenced in certain contexts and then facilitating processes that allow these voices to be heard in relevant ways.

Gender significantly shapes how individuals experience, respond to, and recover from climate-related risks. It is thus increasingly recognised that addressing the interlinkages between climate change and gender equity and social inclusion (GESI) is fundamental for effective adaptation. Gender does not act in isolation —it intersects with various other identity factors such as age, race, ethnicity, disability, socio-economic status, and sexual orientation. These intersecting elements influence people's roles in society, the extent to which they face marginalisation, and their responsibilities [7]. They also shape access to essential resources and information, as well as influence life opportunities. Together, these factors shape how different individuals and groups are able to cope with, adapt to, and recover from climate-related challenges. Therefore, prioritising GESI issues in research approaches and methods of engagement more broadly is an essential and foundational part of gender-responsive and justice-driven climate resilience.

The GESI-climate nexus is illustrated in Figure 1, where the drivers and enablers of social in(equality), inclusion or exclusion translate into different dimensions of society, with resulting outcomes that can either increase or decrease climate change vulnerability and the opportunities to engage with climate change programmes. For example, certain social and cultural norms may mean that some are excluded from education opportunities, thus reducing opportunities to access knowledge and networks that could reduce vulnerability to climate change.

Case Study 1 illustrates some of these complexities [8].

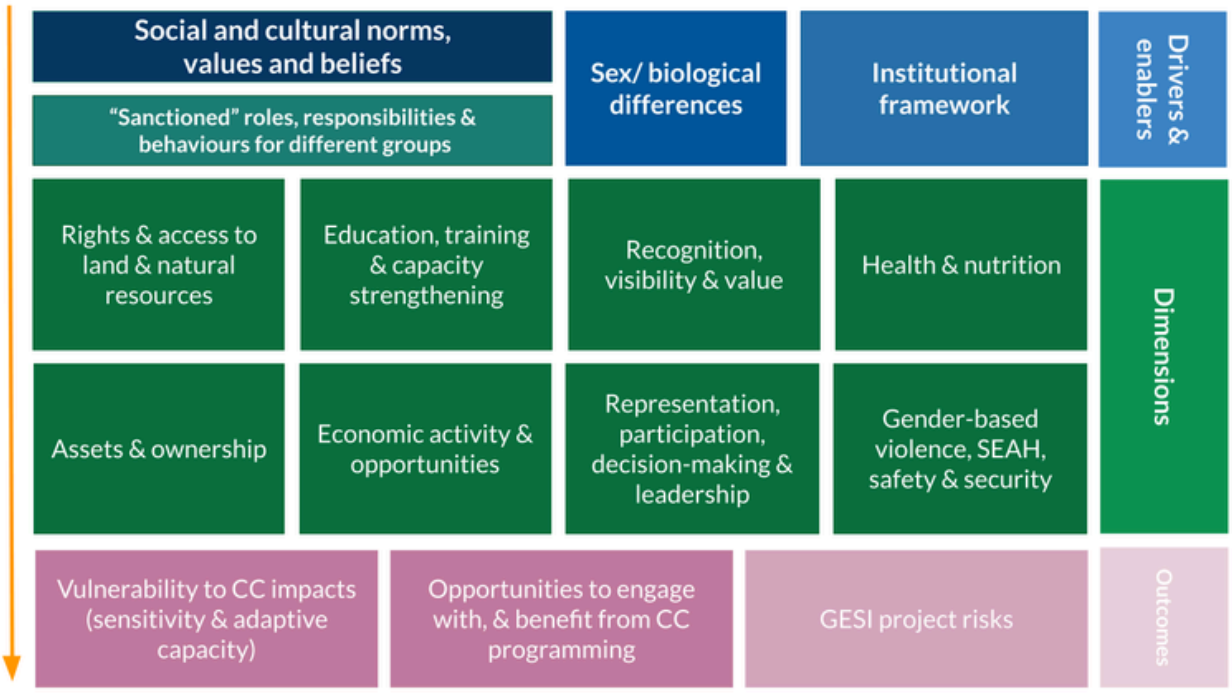



***Figure 1: An illustration of the drivers and enablers of inclusion or exclusion, the dimensions across this plays out in society, and the outcomes from a climate change perspective***

*[7] UN Women (2025)*

## CASE STUDY 1: THE INFLUENCE OF GENDER AND SOCIO-CULTURAL NORMS ON DISASTER PREPAREDNESS AND RESPONSE IN BEIRA, MOZAMBIQUE

In Beira, Mozambique, gender and other socio-cultural norms and beliefs significantly influenced the disaster preparedness and response behaviours of communities impacted by Cyclone Idai in 2019. Gender norms perpetuate low levels of education, training, and capacity-building opportunities for women and girls. This limits their participation in community-based cyclone early warning systems and restricts their access to disaster information and evacuation advice, increasing their vulnerability to climate change impacts.

In combination with women's low education levels, expectations around unpaid care and domestic work - another product of cultural and social norms - contributes to insecure livelihoods and restricted access to financial resources. These constraints negatively affect adaptation outcomes and can exacerbate existing inequalities. Meanwhile, social and cultural norms around masculinity emphasise self-reliance and stoicism, often discouraging men and boys from seeking help. This can lead to risky behaviours and mental health challenges, further increasing the vulnerability of this group during disasters.

It is crucial to recognise that disaster responses are influenced by complex, multi-dimensional behavioural factors, and the relationship between gender and climate impacts is not straightforward. Climate-related disruptions also hold potential for transformative change, challenging entrenched norms and creating opportunities for new and more equitable outcomes. Participatory and inclusive engagement processes which meaningfully integrate the insights and challenges of those most impacted by climate change are foundational to unlocking the transformative potential of local climate action [9]. The principles and methods outlined in this document are designed to achieve this meaningful integration.

### Additional examples of exclusion, reflected during the INACCT Resilience Project

In the INACCT Resilience project, the following examples have emerged where certain voices and perspectives may be silenced or diminished:

- In some communities, **women are still afraid to speak in front of men.** In such instances, female-only focus groups can help facilitate more open conversations around topics such as disaster responses that can inadvertently undermine the safety of women (e.g. Shared facilities after a disaster event can create safety risks for women).
- **Teenage boys and young men** are often overlooked in disaster response and resilience efforts, leaving them vulnerable to substance abuse, crime and social isolation.
- **Age dynamics:** In some communities, younger members dominate discussions and the perspectives of elders are disregarded. In other contexts the opposite occurs, where young people feel their ideas are not heard or valued.
- **Urban/rural dynamics:** Many of the residents of informal settlements in Durban originally come from rural areas where traditional knowledge and values are more prevalent. When these ideas are brought into the urban environment, they may be stigmatised and disregarded.
- **Leadership and power dynamics:** In some contexts, communities do not feel comfortable voicing their opinions when their community leaders are present. Sometimes this is out of respect for their leadership whilst at other times it may be out of fear of reprisal.

*[8] References: PCICR (2019); Brown et al. (2019); Haneef & Tembe (2019); UN Women (2022); Blanchard (2024)*
*[9] Sutherland (2025)*

## 3.2. PRINCIPLES FOR GENDER-RESPONSIVE AND INCLUSIVE ENGAGEMENT

Gender-responsive and inclusive engagement is rooted in a number of guiding principles which centre justice and social inclusion – both in its process and methodology as well as its intended outcomes. These principles, described in further detail below, underpin the various methodological approaches which can be leveraged to action and facilitate gender-responsive and inclusive engagement.

### Trust and accessibility

Trust and accessibility are interconnected components of conducting GESI-focussed and inclusive research. Although these components are largely influenced by 'soft' interpersonal skills and skilled facilitation, there are several practical considerations which are important:

- Convene engagements in a **neutral and accessible** space to set the stage for inclusive and equal engagement. When choosing a venue, always consider whether all stakeholders can travel to and from the chosen location with relative ease, and whether the venue itself is accessible for all participants – particularly the elderly and people with disabilities.
- If stakeholders speak more than one **language**, it is important to offer translation services as well as translated materials. Portable headsets are a useful and time-efficient means of live translation, although they are not always necessary.
- **Trusted intermediaries and facilitators** play a critical role in brokering trusting governance platforms. They should encourage equal participation of all participants, which is often aided by a strategic agenda including interactive sessions and moments of reflection. Intermediaries should ideally be familiar with existing power dynamics, and must actively facilitate engagements in a manner that puts everyone on an equal footing.
- Ensure that all participants have **access to the same information** ahead of any engagement to ensure that everyone is equally informed and able to prepare accordingly.

*The INACCT Resilience launch and Learning Lab in Beira, Mozambique (March 2024).*

*The INACCT Resilience art exhibition and Learning Lab in Durban, South Africa (March 2024).*


*Aerial photograph of Quarry Road West informal settlement in Durban, an area particularly vulnerable to floods.*

## Facilitating balanced and inclusive discussions

In order for engagement and knowledge generation processes to be inclusive and co-produced, it is critical to facilitate balanced discussions. Methodologically, this encourages equal participation, challenging the social norms and hierarchies which tend to overpower or otherwise sideline the voices of marginalised individuals or groups.

Gender-segregated or otherwise separate focus group discussions may be necessary if individuals feel more comfortable expressing themselves in the presence of their own gender group or community, for example. Multi-stakeholder dialogue is often highly generative and insightful, and this approach can also help to overcome existing power dynamics, such as leaders always speaking first. The relevance and efficacy of this approach is highly contextual. For example, INACCT's experience in Durban, South Africa, revealed that social and cultural norms meant that women from one informal settlement only felt comfortable speaking in women-only focus groups, while women from another community already occupied leadership roles and were confident speaking in the presence of men.

Importantly, equal representation of different genders or other marginalised groups does not necessarily ensure the equal representation of these groups' distinct perspectives in engagements. This needs to be considered when designing engagement methods.

## Integrating different forms of knowledge

Integrating local community-based knowledge and technical knowledge facilitates a deeper, more nuanced understanding of issues, informed by diverse perspectives, amongst stakeholders. This principle is elaborated on further in the case studies focused on Photovoice and CBFEWS and as a specific co-production tool/approach in Section 4.

# 4. TOOLS AND APPROACHES TO FACILITATE INCLUSIVE AND GENDER-RESPONSIVE ENGAGEMENT

There are a number of tools and approaches that can be used to help create more neutral spaces where power dynamics, community and gender roles can be 'levelled' in ways that allow all voices to be heard in non-threatening (and sometimes anonymous) ways. Examples of some of these approaches are shared below, with illustrative case studies taken from the INACCT Resilience Project. The following tools and approaches were applied and tested through the INACCT Resilience Project to help create more inclusive and gender-responsive engagement processes.

## 4.1. COMMUNITY-BASED RESEARCHERS

The use of community-based researchers helps to facilitate greater trust in the research process and ensure that previously marginalised voices are included in data collection processes (See Case Study 2).

## CASE STUDY 2: COMMUNITY CO-RESEARCHERS IN QUARRY ROAD WEST INFORMAL SETTLEMENT

### Rationale for the approach

Community researchers are individuals from a specific target community who are employed or involved in a research process as researchers themselves, either within their own community, or in research relating to a similar community. Employing community-based researchers helps to lend credibility and trust to the research process, whilst also building the capacity of the researchers to understand the issues that are being researched (e.g. climate change, sanitation systems etc) and how these outputs will be used to shape further research, policy and/or practice. The development of co-researcher skills in a group that is usually the subject of research helps equip these community members with new knowledge and positions them more strongly to engage with actors like local government, universities and others. It also positions community researchers more strongly as data producers and interpreters, thus shifting the usual power dynamics associated with external researchers and data ownership and ensuring that the data is understood through the voices and perspectives of those who are sometimes excluded from such processes.

### Approach/ Methodology

The Quarry Road West informal settlement in Durban has been the subject of a number of research and innovation projects over the last ten years. A small group of men and women from this settlement were trained by University of KwaZulu-Natal (UKZN) researchers on how to undertake a survey, and were then deployed as researchers to gather survey data for a climate change and sanitation project in their own community and in Pholani informal settlement where similar research was being undertaken. Guidance was provided by the UKZN researchers throughout the process.

### Key insights / knowledge gained

Conducting research in a similar settlement outside of their own, also allowed the researchers to reflect on and compare their own experiences with those of others in a similar context. During a focus group after the surveys were completed, their experience brought new insights into how the data was interpreted and understood.

### Key learnings

The growing confidence of the co-researchers from Quarry Road West has been evident in their ability to lead and guide discussions during subsequent field trips.

## 4.2. CAPACITY AND KNOWLEDGE STRENGTHENING

Targeted capacity and knowledge strengthening around issues like climate change and early warning systems can build confidence as part of facilitating engagement between communities and local government officials. Specific initiatives like community risk mapping can achieve similar outcomes, with community members feeling more empowered to engage based on their own documented knowledge of the spaces in which they live. In Quarry Road West informal settlement, training on the Community-Based Flood Early Warning System has helped to strengthen knowledge and capacity in the broader community (Case Study 3).

## CASE STUDY 3: COMMUNITY-BASED FLOOD EARLY WARNING SYSTEM (CBFEWS) TRAINING

### Rationale for the approach

In order for Quarry Road West's CBFEWS to be truly impactful and inclusive, it is critical that residents, beyond the core co-research team, are meaningfully involved in its development, as well as effectively trained in its implementation. Therefore, to facilitate effective scaling and uptake, a training manual outlining the CBFEWS was co-developed with residents to support community members in anticipating, preparing for, and responding to flood events.

The collaborative process of developing the "Wake Up and Be Safe" training manual is a critical component of capacity building for inclusive flood resilience in vulnerable informal settlements such as Quarry Road West. It is both a critical resource, and a valuable mechanism for ensuring that residents are meaningfully involved in its design, implementation, and iteration.

### Approach/ Methodology

The "Wake Up and Be Safe" training manual draws on scientific, local and indigenous knowledge. It is designed to train members of Quarry Road West informal settlement, using community-based researchers as trainers, on how the CBFEWS works, how they can participate in it, and how they can use it to stay safe. Importantly, the training manual has a "train the trainer" approach, facilitating widespread capacity building to support maximum inclusivity and impact. Once the initial draft of the manual was developed, it was shared with the community-based researchers and CBFEWS leaders to facilitate a practice drill exercise, testing the implementation of the guidelines. Observations and outcomes from the practice drill were collected in order to analyse the degree to which the first iteration of the system was effective, inclusive, and accessible. This feedback was then integrated to improve the system, with changes captured in an updated training manual. Examples of changes made to the CBFEWS include the implementation of a more streamlined flood response toolkit, roles and responsibilities more clearly identified and clear visuals developed for facilitating training.

### Key insights/ knowledge gained

- The co-development and collaborative implementation of "Wake Up and Be Safe", through the use of the training manual and practice drills, highlights that inclusive, place-based governance approaches can strongly support the design of contextually-appropriate and accessible climate resilience responses.
- The involvement of Quarry Road West community members throughout the development of the CBFEWS supported a sense of ownership, thereby promoting buy-in and uptake. This is central to ensuring the sustainability of the CBFEWS beyond the lifecycle of associated projects such as INACCT.
- Critically, given the core objective of strengthening flood response and resilience, residents need to be sufficiently prepared to effectively implement and respond to the procedures outlined in the plan. Effective and inclusive flood response often requires rapid action, and therefore the ability to confidently execute "Wake Up and Be Safe" in a manner that leaves no one behind is essential.

## 4.3. ARTS-BASED METHODS

Arts-based methods can be used as an alternative, creative and interactive non-verbal form of expression that helps remove some of the dynamics that can otherwise hamper participation [10]. As examples:

- Play dough modelling is a hands-on and tactile experience that allows individuals to express ideas, emotions, and identities through material moulding. By creating physical objects, participants engage with their own embodied knowledge, often revealing experiences, emotions and viewpoints that are difficult to verbalise.
- Arts-based methods such as play dough and photovoice are accessible to a broad range of participants, across all ages as they are not limited to specific languages or terminologies, making it an equitable medium for dialogue and expression, thereby fostering more inclusive participation.
- Marginalised groups may feel excluded by formal or academic narrative processes and play dough modelling and photovoice opens up space for inclusive engagement and expression, on individuals' own terms.

Despite their considerable potential for impact, arts-based approaches are not yet widely integrated into transdisciplinary climate research, with more traditional 'scientific' approaches dominating [11]. One key limitation is that they are often viewed as not being 'serious' or 'legitimate' forms of research and data collection. However, as the INACCT project has demonstrated they have considerable scope for being taken seriously, and can lead to highly impactful insights.

For example, community members expressed that during a Learning Lab they were initially sceptical of the arts-based approaches but through engaging with them they realised their seriousness and the co-developed outputs (e.g. playdough model of early warning system) made them 'validated' as co researchers representing their communities. Examples of inclusive arts-based methods are illustrated in Case Study 4 and Case Study 5.

*[10] Bentz, 2020; Bradshaw, 2018; Gabrys and Yusoff, 2012; Kasumovic, 2023; Liguori et al, 2021; Parsons & Pratt, 2024*
*[11] Kasumovic (2023); Liguori et al. (2021)*

# CASE STUDY 4: PHOTOVOICE TO UNDERSTAND FLOOD RISK AND RESPONSE IN INFORMAL SETTLEMENTS

## Rationale for the approach

INACCT Resilience aims to collate insights on existing and possible future response mechanisms to reduce disaster risk, particularly in relation to flooding. Photovoice provided a creative way for community members in Quarry Road West and Pholani informal settlements (Durban) to share a visual narrative of their lived flood experiences, helping to strengthen communication around these issues and ensure inclusivity. The Photovoice contributions highlighted the locally grounded experiences of informal settlement residents, offering nuanced information which could be viewed by officials for integration into local climate resilience planning and disaster response. Community members shared innovative hazard response actions and highlighted ongoing challenges while city officials shared their systems perspectives related to issues such as institutional barriers to service delivery.

## Approach/ Methodology

INACCT Resilience has been working with the two communities for some time and therefore used a project focus group to explain the Photovoice methodology to community members and prepare them appropriately. Photovoice involves the following steps:

- **Step 1:** Frame the research questions in a clear way. For example, 'How do rain and floods affect you? (please take photos and write a short story of the areas/things that get damaged, people that are most affected, parts of your home/life that are badly affected)'; 'Please take photos (and write a short story) of what you and your community have done to reduce the impact of the rain and floods on you (e.g. carpets, gutters, sandbags etc)'.
- **Step 2:** Community takes photos in response to the questions – Those participating need to have access to a phone with a camera, and data is provided so that they are able to WhatsApp the photos (each with a short description/ reflection attached) to the individual who is collating these responses.
- **Step 3:** Convene shared reflection on the ideas emerging. Participants and researchers convene to reflect on the ideas emerging and create space to build on and nuance these further.
- **Step 4:** Consolidate and integrate the insights emerging. Researchers consolidate the ideas emerging and integrate these into the research process in relevant ways.

## Key insights / knowledge gained

The Photovoice exercise provided important insights into community-based flood resilience initiatives that are often not reflected in the literature and actors playing important flood response roles in certain communities. It also provided insights into peoples' lived, and very personal, experiences of the floods and the impact on their lives.

## Key learnings

Although the photos were collated in a 'Photovoice exhibition' (Figures 2 and 3) during one of INACCT's Learning Labs, additional opportunities to engage and elaborate on the emerging findings and observations with the participants, would have added value.


'We work together as a community and we have decided to use the sand bag strategy to close or fix the open places after the floods. We tried to prevent water from moving with the sand bags, although this strategy is not 100% safe but it makes a difference. This is a wall of sand bags stopping the soil from moving with houses....We put mats because land is steep. We have put carpets /mats in the pathways and behind the houses. This picture shows the strategy for preventing movement of soil using bags and tyres'.

'I would like to thank our neighbours, they helped the people who lost houses by arranging with the municipality to take them to the community hall. They were asking for help from different organisation to assist the community. People received clothes, food, blankets'.

*Figure 2: Examples of the photos taken by residents of Quarry Road West and Pholani informal settlements, and the reflections that accompanied these.*

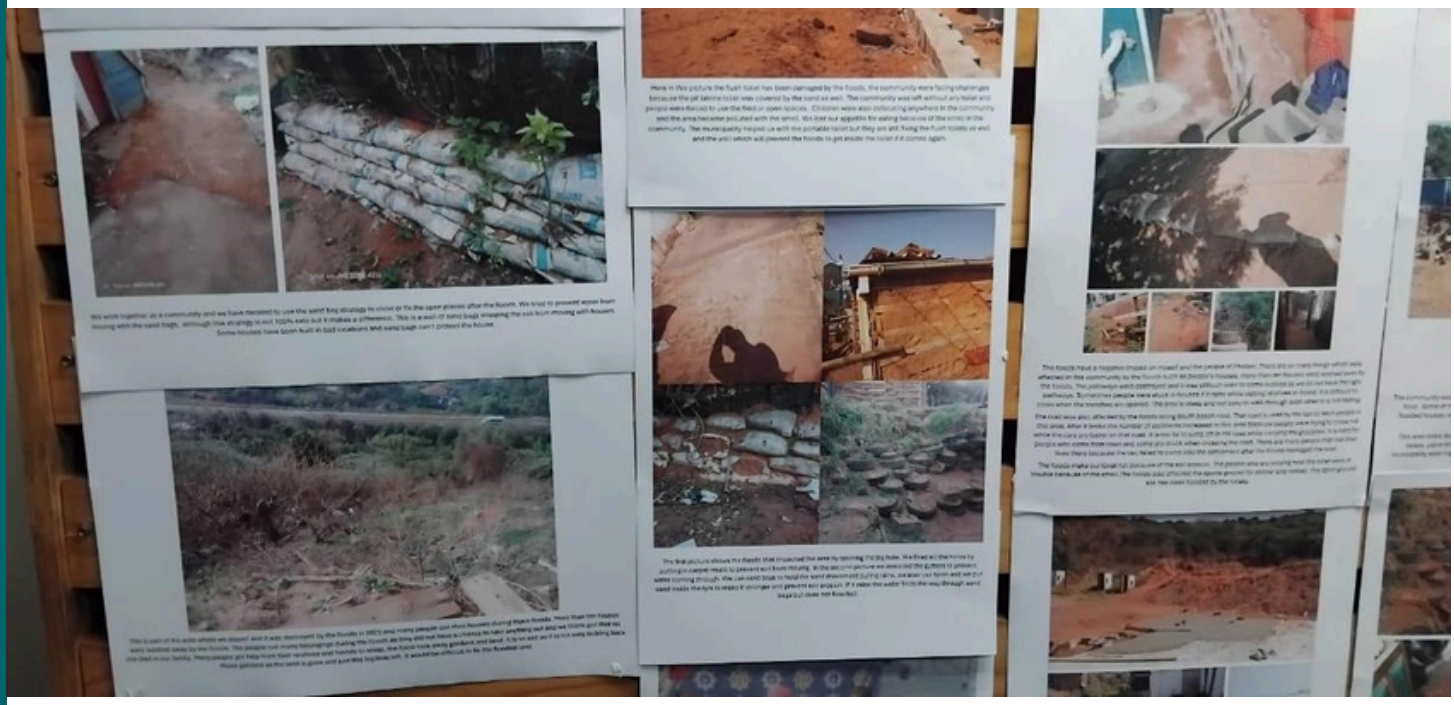


*Figure 3: The Photovoice exhibition during a Learning Lab in Durban between community members, municipal officials and other actors. The exhibition provided an important contextual backdrop and reference point for the conversations throughout the day.*

# CASE STUDY 5: PLAYDOUGH METHOD TO DESIGN FLOOD EARLY WARNING SYSTEMS

## Rationale for the approach

The use of the playdough methodology helps to put all community members on an 'equal footing' so that embedded community power and other (e.g. gender) dynamics do not undermine involvement in the process. The creativity of the exercise also provides space for different types of verbal and non-verbal inputs, which can make it easier for some to participate.

## Approach/ Methodology

- The 'playdough exercise' asked participants to use their playdough and materials to design an early warning system for Quarry Road West informal settlement (close to a river and flooding) and Pholani informal settlement (located on a steep slope subject to flooding and land slippage). They were also asked to reflect on the actors that would need to be involved and the possible barriers to implementation.
- Mixed groups were convened across communities and gender, thus also helping to strengthen connections across the communities.
- Each group was provided with an A2 sheet of paper and a selection of writing materials, playdough and other creative items.
- A representative from each group provided feedback on the design once the group had completed this. Examples of the design outputs are shown in Figures 4 and 5.

## Key insights / knowledge gained

The use of the playdough methodology also made it easier for men and women to participate equally. Group feedback after the playdough activity was shared by men and women across the groups. The use of the playdough method also helped ensure that all community members participated equally, regardless of whether they were community leaders or not, thus neutralising intra-community vertical power dynamics.

## Key learnings

Mixed groups across communities worked well in sparking ideas and hearing different experiences. If the work was to be deepened to develop more detail, having community-specific focus groups could work better.

*Figure 4: Community members from Quarry Road West and Pholani engage actively in designing early warning systems for their respective informal settlements.*

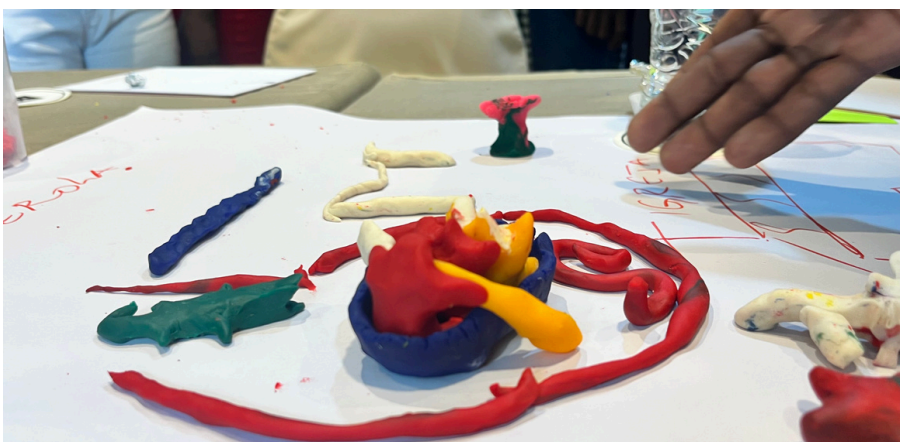

*Figure 5: Some of the early warning systems designed by the four groups using playdough.*

## 4.4. LEARNING EXCHANGES

A learning exchange is a structured but informal process of peer-to-peer engagement that enables diverse actors to share lived experience, practical knowledge, and reflections in order to co-produce more inclusive and contextually grounded solutions.

The informal and relational nature of learning exchanges and field visits provides an important foundation for inclusive participation, as they allow individuals and communities – particularly women, youth, and other marginalised actors – to interact with each other, officials and researchers in either their own, or a more neutral context. Such immersion helps to break down institutional barriers, validates community knowledge, and fosters trust. By prioritising relationship-building before technical dialogue, the process contributes to more equitable co-production and ensures that early warning and resilience strategies are informed by those most affected by climate risks. Insights from a cross-border Durban–Beira community exchange undertaken through INACCT and the Capacity Strengthening Responsive Fund underscore the value of this approach. Community representatives from flood-prone informal settlements in both cities shared lived experiences of early warning dissemination, evacuation decision-making, and post-flood recovery, highlighting common challenges despite different governance and hazard contexts.

Peer-to-peer dialogue enabled participants to reflect on practical innovations—such as locally led warning interpretation, the use of trusted community intermediaries, and informal communication networks—that are often overlooked in formal planning processes. Importantly, the exchange created space for mutual learning not only between cities, but across scales, as municipal officials and researchers gained deeper appreciation of how community knowledge, social cohesion, and trust shape the effectiveness of early warning systems in practice.



# CASE STUDY 6: LEARNING EXCHANGE BETWEEN INFORMAL SETTLEMENTS IN DURBAN

## Rationale for the approach

In Durban, a field visit took place prior to a Learning Lab event. This was done to strengthen relationships between residents of Quarry Road West and Pholani informal settlements, and to provide initial ideas and reflections to underpin the subsequent early warning discussion.

## Approach/ Methodology

- Pholani residents were transported to Quarry Road informal settlement
- An initial context-setting debrief was convened in a local tavern whose owner had given approval ahead of time for the venue to be used.
- A settlement walk was undertaken, with specific focus on the areas most affected by floods.
- Questions were responded to during the course of the walk and an opportunity for reflections was provided.

## Key insights / knowledge gained

This approach helped to build confidence amongst residents, allowing them to feel better prepared and encouraged to participate in subsequent engagements. It also facilitated sharing of experiences and knowledge which could help strengthen early warning systems.

## Key learnings

- Learning exchanges take time and preparation. It is important to create enough space for participants to engage – a simple agenda helps to allow for this.
- Prepare with the teams before the exchange, particularly in the community that is 'receiving' visitors. The programme, roles and responsibilities need to be agreed ahead of time.
- Transport and other logistics can be challenging and back-up options should be on hand.
- It is important to include a covered venue as an engagement point. This allows early discussions to be held in relative quiet, and provides shelter if the weather changes. Ensure that the hosts of such venues are acknowledged and compensated.

## 4.5. INTEGRATING DIFFERENT FORMS OF KNOWLEDGE

In addition to being a core principle for gender-responsive and inclusive engagement, knowledge integration can also be a powerful tool to facilitate such engagement. Co-production recognises that all participants have valuable knowledge and experiences to contribute. Yet, despite institutional provisions (in national policy and regulation) for including indigenous knowledge in resilience planning, utilisation of this knowledge and community inputs remains limited, and often non-existent in urban areas[12]. In contrast, other researchers have shown how the co-production of knowledge has supported the building of resilience to climate change through community-based climate adaptation and risk reduction[13]. Knowledge co-production and shared learning also have the power to shift the discourses and practices of elite and powerful actors by making other forms of knowledge visible so that the role of traditional custodians of planning knowledge and practice (including, for example, the state) is reduced[14].

As part of the INACCT Resilience Project, emerging insights provide examples of the types of local and technical knowledge that are important in the context of climate change and flood resilience, and provide some initial thoughts on how these different forms of knowledge might be integrated effectively in the context of community-based flood early warning systems (CBFEWS).

### Examples of important local and indigenous knowledge in the context of CBFEWS include:

- Understanding community structures and communication channels so that this can help inform the design of early warning systems and other interventions.
- Community-based risk mapping to understand hazards and how these are experienced, and to identify areas of high exposure and vulnerability.
- Timestamped photographs taken by community members help develop correlations between technical rain and stream gauge readings and how and when the impacts of flooding will be felt further downstream.
- Indigenous knowledge related to weather signals (e.g. changes in water colour, environmental cues, or sensory observations) and responses (e.g. banging pots) can provide important entry points for conversations around climate hazards and responses.
- Important technical knowledge in the context of CBFEWS includes scientific data from the South African Weather Service, Lidar and rainfall and streamflow gauge readings.

### Important considerations when integrating different forms of knowledge include:

- The need to validate and acknowledge (for example in a Learning Lab or workshop context) the value of different forms of knowledge so that participants feel comfortable and confident to share their insights.
- The value of intermediaries who can help interface between different forms of knowledge, understand both, and find relevant ways to integrate these.
- Exploring ways to build from (and where possible link) existing knowledge (e.g. traditional beliefs and practices) with technical. For example, practices of banging pots and pans to chase away rain and lightning could provide an important audible warning as part of an early warning system.

*[12] Mazeka et al (2019)*
*[13] Membele et al (2022)*
*[14] Sutherland (2025)*

# CASE STUDY 7: PALMIET CATCHMENT COMMUNITY-BASED FLOOD EARLY WARNING SYSTEM, DURBAN

Community-based flood early warning systems (CBFEWS) can provide locally-specific and timeous information through state agencies and research institutions co-producing knowledge with communities on levels of flood risk and flood response strategies under different flood warnings. This work has been effectively demonstrated in the Quarry Road West informal settlement in the Palmiet River catchment in Durban, South Africa, in response to an urgent need identified by informal settlement residents. The system relies on technical information (e.g. from the South African Weather Service, the municipal Forecast Early Warning System and radar), real-time community data, and the translation and integration of these different types of data, to communicate more accurate flood warnings and updates via Whatsapp groups to those in the catchment, particularly the most vulnerable.

## Rationale for the approach

The existing CBFEWS in the Palmiet catchment in Durban has developed organically and from the bottom up, and has adapted over time. However, from early in the process, the importance of including local knowledge in a flood early warning system, was recognised. Local knowledge contributes insights that have been developed through lived experience, offering a nuanced perspective which may be overlooked by external researchers or generic approaches to flood resilience. The inclusion of local knowledge and stakeholders can therefore help inform the design of early warning systems and ensure relevance to end-users, including around how warnings are framed and communicated.

## Approach/ Methodology

Initially, the technical and local knowledge components of the CBFEWS developed separately. The Forecast Early Warning System (FEWS) of eThekwini Municipality links hydraulic models (PCSWMM), weather forecast data, rainfall data, coastal models and warning systems to generate more accurate indications of where flooding will take place within the eThekwini Municipal Area. In the early days, local knowledge on rainfall levels, river levels and flood risk, was produced by partners working in the Palmiet Catchment and integrated by researchers from the UKZN. Over time, and as connections were strengthened between the Palmiet stakeholders and municipal officials responsible for the FEWS, local observations (e.g. of changing river levels and the direction of river flow) helped to refine and strengthen the forecasts at the catchment level, allowing vulnerable residents to be alerted sooner and with a greater degree of accuracy about when floods would affect them, and with what severity. The integration of technical and local knowledge would not have been possible without the working relationships and communication channels that had already been established in the area, which could then be strengthened and adapted for the purposes of communicating early warnings.

# CASE STUDY 7 CONTINUED

## Key insights / knowledge gained

With over a decade working together, and with the city having experienced a number of floods since the CBFEWS was established, there have been important observations and learnings around what local knowledge, data and networks are most critical in helping to inform and strengthen flood early warning systems. These include:

- Local understanding of areas of risk and vulnerability helps focus and direct response and evacuation efforts.
- Time-stamped observations of changing river levels help develop correlations between upstream river and rainfall levels and when these will translate into downstream impacts.
- Understanding time lags between stream gauge readings and downstream impacts helps communities know how much time they have to vacate depending on their location and catchment gradients relative to the gauges.
- Local thresholds related to river levels and impacts
- The Quarry Road West informal settlement residents, working with researchers and city officials, are beginning to understand critical 'threshold points' at which impacts are experienced. For example, when the water level at the upstream Birdhurst stream gauge is over 1.7m, the river downstream at Quarry Road West starts to break over river-banks and scour them, undermining homes and structures.

## Key learnings

Important learnings relating to inclusive approaches include the need to:

- Consider context: The biophysical and socio-economic context of settlements can affect whether risk is evenly distributed or concentrated in specific areas. This has implications for how impacts will be experienced, who will be affected, and how settlements prepare for and respond to flood events.
- Identify inclusive and trusted communicators: Identify key people (community champions/ 'foot soldiers') in the community to pass warnings to the rest of the community to avoid confusion. It is important that these individual are respected and trusted and that they are non-partisan in terms of who they will share information with. This is critical in ensuring that warnings are widespread and that they are acted upon in relevant ways.
- Translate warnings to ensure that there is clear understanding of the level of the warning and the likely impact.
- Build capacity to understand the level of risk that is being communicated and the potential impact, so that responses can be tailored accordingly (Figure 6). Community-initiated responses are critical, rather than simply waiting for government to intervene.

*Figure 6: Quarry Road West residents educating neighbours on early warning systems, and conducting 'drills'*

## 4.6. LEARNING LABORATORIES

The Learning Laboratory (or 'Learning Lab') methodology is a transdisciplinary approach, that facilitates co-engaged learning and a space for inclusivity and social learning across a diversity of stakeholders and participants. This approach can take different forms and is intended to facilitate the combination of multiple forms of knowledge, including expert, tacit and local knowledge, to better understand the systemic aspects of urban climate adaptation in the design of plans and solutions[15]. Learning Labs therefore provide a mechanism or approach to support co-production and the integration of different forms of knowledge and create spaces for learning, experimenting and generating new knowledge. Learning Labs are structured to surface insights from all stakeholders through balanced and focused group discussions and can be partnered with other engagement methodologies such as creative arts-based activities.

This section draws on the insights obtained from the INACCT Resilience Project and from stakeholders who participated in a Learning Lab facilitated by ICLEI Africa at the 'Urban Action Festival 2025' (by 'RISE Africa) in Cape Town on 19th May 2025. The session was titled 'Not just another learning lab: Challenging the concept, rethinking the practice', and was designed to provide space for critical reflection on the Learning Lab concept and its usefulness in the African context. After consolidating these insights, a case study is shared to illustrate how such a Learning Lab could be put into practice.

### What is a 'Learning Lab'?

Building on the earlier definition, Learning Labs provide spaces to build (or re-build) trust, share knowledge, challenge perspectives and co-create innovative solutions. They are often used as integration, consolidation or reflection points along a broader journey involving multiple different stakeholders. They are also used as 'safe spaces' to learn and experiment with new ideas, outside of the usual confines of daily work and routines. In a Learning Lab everyone, regardless of expertise or social status, has valuable knowledge to contribute, learn and gain and therefore such processes have the potential to build real community across traditional divides.

*[15] https://pccommissionflo.imgix.net/uploads/images/EU_PCC-PeerToPeer-Learning_Stakeholder-Report_2024-05-26-201627_zgqh.pdf*

## Important considerations when structuring and planning a Learning Lab

These considerations include:

- Finding meaningful ways to acknowledge and affirm different perspectives and forms of knowledge so that all participants feel empowered to contribute.
- Possible dynamics relating to power, positions, gender and other factors that could affect people's ability to participate and learn.
- Different ways of learning. Learning styles will vary across participants and therefore incorporating different modalities of learning, can help create safe opportunities for everyone to contribute.
- The relevance of a Learning Lab in a given context. Learning Labs are generally part of ongoing learning and project processes and might not be appropriate in contexts where processes are extremely short, or where outcomes have already been decided.
- Finding ways to measure and monitor the effectiveness of the Learning Lab approach. For example, one might explore the extent to which the use of Learning Labs in the INACCT Resilience project helped deliver on strengthened flood responses, improved engagement between informal settlement residents and local government officials, or the growth of active and capacitated community networks.
- The importance of field visits (where relevant) to visualise spaces, features and connections.

Importantly, Learning Labs promote a particular approach to engagement and learning. These principles can be included in a range of processes which might not necessarily be called Learning Labs. In such instances, it is the principles rather than the process name, that is most important in promoting inclusive engagement and co-production.

# CASE STUDY 8: INACCT RESILIENCE LEARNING LAB AT 'THE STATION', DURBAN

## Purpose of the approach

The purpose was to broker a conversation platform between informal settlement communities and local government officials to engage more closely on climate change impacts and how to build resilience in vulnerable locations, particularly in relation to capacity building and the upscaling of CBFEWS.

## The approach/ methodology that was adopted

The Learning Lab was hosted at a workshop venue in central Durban and transport was provided to ensure accessibility for participants. The Learning Lab started with inputs from both municipal officials and informal settlement residents, sharing their perspectives on climate resilience. This was followed by a Photovoice exhibition, displaying community images from the 2022 floods, before small group discussions were convened to create space for residents to engage directly with municipal officials around specific questions and issues. The first discussion question (framed from an informal settlements perspective) asked for inputs on what would be most helpful to informal settlements in relation to climate change education and improving early warning systems. The second question (framed from a municipal official perspective) asked for input from officials on what informal settlement information/insights would be most helpful to them, to inform planning. In this way, the conversations were balanced across actor groups, and revealed interesting insights.

## Important outcomes included:

- Positive engagement and participation from all, fostering a sense of co-production.
- Insights shared into priority future actions for officials and informal settlements. For example, opportunities to use existing climate change learning materials to build capacity in informal settlements.
- Shifting perspectives: There was a very real sense of validation of different forms of knowledge and how these could help shape future actions, along with improved understanding of the perspectives (and challenges) of different actor groups.
- Improved understanding of climate change and related hazards (like flooding).
- Rebuilding of trust: In most cases, trust relationships between government and citizens have been eroded. Learning Labs, if structured appropriately, help re-build trust through engagement. This sentiment was reflected during the Learning Lab.
- Insights generated across two communities in different contexts can assist with designing and upscaling early warning systems to other settlements.

## Key learnings

The use of different ways of engaging (plenary, photovoice and smaller group discussions) helped facilitate engagement. The framing of the discussion questions was also important in keeping the focus on practical actions that everyone could relate to.

## Key insights / knowledge gained

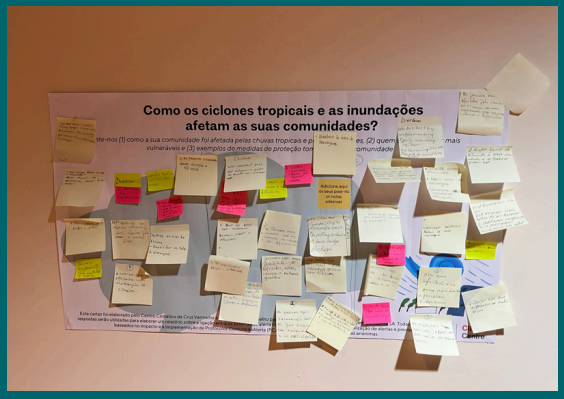
- Community-based knowledge: Community members shared low-cost and simple practices like using carpets to slow the movement of water and limit soil erosion.
- Technical knowledge: City officials provided a systems perspective on issues, explaining how actions in one place (e.g. hardening of surfaces as populations grow; mis-management of waste etc) affect others downstream. They also outlined their challenges in delivering services to the growing number and size of informal settlements.
- Improved understanding of different perspectives across all participants, through knowledge sharing.

## 4.7. REFLECTIVE AND ITERATIVE METHODOLOGIES

Gender-responsive and inclusive methodologies are adopted to produce outcomes which encourage inclusive participation and the fair and equal distribution of benefits. In order for these methodologies and overarching frameworks to yield their desired outcomes, it is critical to continuously and methodically assess, reflect on, and integrate emerging lessons. This can be facilitated in various ways. For example, gender-responsive Monitoring and Evaluation (M&E) can encompass aspects such as the methodology, indicators, data collection and analysis approaches that are applied. Data disaggregated by gender and other social categories such as age, socio-economic status, and disability etc. is foundational to this. Other indicators could support the measurement of change in a situation, for example relating to the level of participation of different groups during engagement processes.

# 5. CONCLUDING THOUGHTS

Co-production requires careful thought and genuine consideration of a number of factors that would otherwise exclude voices and perspectives from being shared. Co-production processes also require careful planning and documentation and can require additional investments of time and other resources. However, such approaches also help to shift away from traditional 'tick-box' stakeholder engagement processes, to processes that recognise that current development pathways are not sustainable or equitable and that it will require the insights and knowledge of all people, to find new ways forward. In this way, such approaches help to break down existing barriers to engagement and connect people in more genuine and constructive ways to maximise opportunities for innovation.

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