Rethinking Success in Early Warning Systems from a Community Perspective

Co-Designing Community Metrics to better understand success of Early Warning Systems

Transitions Research is a social science collective driving radical transitions at the intersection of technology, society, and sustainability. We aim to ensure these transitions are just, inclusive, and empower people while protecting the planet. Our work focuses on discovering sustainable pathways by generating anticipatory knowledge, co-creating solutions, and building capacities for societal action.

The **Climate Adaptation Innovation & Learning (CAIL)** project is financed by the Global Environment Facility (GEF) and implemented by the United Nations Industrial Development Organization (UNIDO), in partnership with Climate-KIC, GARI, and UNEP FI. CAIL aims to accelerate climate adaptation innovation and private-sector engagement through knowledge sharing, experimentation, and Communities of Practice.

Climate-KIC is Europe's leading climate innovation agency and community, working to mobilise systems change for climate-resilient societies. Through partnerships across governments, businesses, researchers, and practitioners, Climate-KIC supports innovation, learning, and action to bridge the gap between climate ambition and on-the-ground outcomes.

Why we need to re-examine "success" in Early Warning Systems

Early Warning Systems (EWS) have become a cornerstone of climate adaptation efforts. Over the last decade, investments in forecasting, modelling, digital platforms, and dissemination technologies have strengthened system performance across many contexts. Accuracy has improved, lead times have increased, and coverage has expanded. Through our work across the adaptation ecosystem, we have also encountered a growing set of questions that sit alongside these advances: how early warnings are interpreted, trusted, and used in everyday decision-making, particularly by communities facing multiple and compounding risks. These questions shape whether early warnings translate into meaningful action on the ground.

Success in EWS is commonly assessed through indicators that are institutionally legible and technically robust, such as forecasts issued, alerts delivered, systems deployed. These metrics provide important insight into system functioning. At the same time, they offer limited visibility into how warnings are experienced by different groups, how they are understood, and whether they enable people to act in ways that reduce risk.

This tension is not unique to early warning systems. Over the past several years, our work with adaptation organisations globally has repeatedly returned to a broader unease with how "success" is defined and measured in practice. Through learning engagements with over 200 organisations in the Adaptation Research Alliance (ARA), and subsequent deep dives into specific adaptation pathways such as heat adaptation with the broader adaptation community, we have consistently encountered the same concern: **the aspects of adaptation that matter most to people on the ground are often the hardest to see within prevailing evaluation frameworks**.

This exploration of early warning systems builds directly on that longer inquiry. We approached EWS not simply as a technical tool, but as a specific adaptation strategy — one that sits at the intersection of science, governance, and lived experience, and is widely promoted as a means of reducing climate risk. Our aim was to better understand what remains outside the frame when success in early warning systems is defined through existing metrics, and why those dimensions continue to be difficult to assess.

These reflections are grounded in a multi-stakeholder workshop convened on 2 December 2025 by Transitions Research and Climate-KIC, as part of the CAIL series. Held virtually, the workshop brought together community-based organisations, early warning system innovators, funders, and ecosystem partners across diverse geographies and risk contexts. The discussion formed part of our ongoing inquiry into what meaningful success looks like in climate adaptation, focusing on Early Warning Systems to surface perspectives often under-represented in formal evaluation processes, particularly those rooted in lived experience and community decision-making.

What sits outside the frame, and why it stays there

Across our conversations with community organisations, innovators, and funders and ecosystem enablers, we saw strong convergence around a set of factors that consistently shape whether early warnings are used in practice. These aspects are widely recognised as important, yet remain weakly reflected, or entirely absent in how success is currently assessed.

What follows reflects our synthesis of these conversations. It focuses on **three interlinked aspects of EWS success that tend to sit outside dominant assessment frames, and the structural reasons they are difficult to make visible**.

When information is delivered, but not understood

We repeatedly encountered situations where early warnings reached communities without necessarily translating into clear or actionable meaning. Messages may arrive on time, yet their implications remain unclear. Technical language, unfamiliar terminology, and abstract metrics can make it difficult to interpret what a warning means for everyday decisions.

In many contexts, people already recognise that climate risks are increasing. What is less clear is how to translate a specific warning into action, whether that involves adjusting agricultural practices, changing work patterns, protecting assets, or deciding whether to delay or proceed with an activity. Forecast horizons and thresholds do not always align with how people plan or respond to risk in practice.

From an assessment perspective, this is difficult to capture because understanding takes shape at the intersection of information and context. Language, literacy, prior experience, cultural frames, and livelihood realities all influence how meaning is constructed. These dynamics tend to unfold far from where data is generated or where system performance is tracked.

As a result, evaluation systems often rely on indirect signals of understanding, if they consider it at all. While efforts to simplify information, automate insights, or use familiar communication channels can improve accessibility, they do not by themselves tell us whether people actually grasp what a warning means for them, or whether it supports different choices.

👥 When reach hides exclusion

A second tension that surfaced strongly lies between access and inclusion. Early warning systems often demonstrate wide reach, yet this reach does not translate evenly into meaningful engagement. Gendered access to technology, low literacy, mobility constraints, and affordability shape who is able to receive, interpret, and act on warnings.

In many settings, access to phones or digital platforms is mediated through household or social arrangements, meaning individuals may be counted within coverage figures without directly engaging with the information themselves. These dynamics are particularly visible among women, informal workers, and marginalised groups.

Within assessment frameworks, these patterns are difficult to detect. Aggregated reporting can obscure differences within populations, and disaggregation requires time, resources, and proximity to end users that are not always built into project design or funding structures. As a result, inclusion is often treated as an assumed outcome of access, rather than as a distinct dimension of success that needs to be examined in its own right.

✔ When trust determines action but is missing from metrics

Trust surfaced consistently as a central factor shaping whether early warnings are acted upon. Across contexts, we heard that trust influences how people interpret information, how much weight they give to warnings, and whether they change behaviour in response.

Trust develops through repeated interactions and perceived relevance to lived experience. It can also erode quickly when forecasts do not align with local realities or when information sources are seen as distant or unfamiliar. The source of a warning matters here: government-issued information is often perceived as more legitimate than non-state sources, even when alternative systems are technically strong.

Despite its importance, trust is rarely examined directly within current assessment approaches. It is typically inferred through proxies such as participation, uptake, or observed outcomes. These signals provide partial insight, but they do not fully capture how trust forms, shifts, or is lost over time. Trust is also shaped by factors beyond information alone, including affordability, timing, social norms, and available alternatives.

(?) Why these aspects remain difficult to see

Taken together, these dimensions: understanding, inclusion, and trust — are challenging to assess not because they are secondary, but because they are social, relational, and deeply contextual. They do not lend themselves easily to standardisation or short-term measurement.

Most evaluation systems are designed around what can be counted at institutional scale: delivery, coverage, and technical performance. As information moves through layers of actors and systems, distance from lived experience increases, and the factors that shape real-world decisions become harder to observe.

For us, this points to a structural challenge rather than a technical gap. The question is not only how to refine indicators, but how to expand what we recognise as valid evidence of success and whose experiences those definitions are built around.

What this points towards: how different actors see their role in supporting the ecosystem

As the focus shifted from what is under-measured to how these gaps might be addressed, each stakeholder group reflected on **what they themselves could do** to support more meaningful, community-centred understandings of EWS success.

These reflections were grounded in a clearer appreciation of each group's position within the ecosystem, and of the constraints faced by others. Rather than placing expectations on one another, community organisations, innovators, and funders articulated ways in which they could contribute from their own roles.

Community organisations

Community organisations reflected on the role they already play, often informally, in observing, interpreting, and responding to early warnings in real time. They recognised their potential to act as custodians of grounded, local insight, particularly when community knowledge and citizen science are combined with technical systems. Community representatives emphasised their ability to translate warnings into locally meaningful advisories, connecting information to livelihoods, seasonal rhythms, and everyday decisions. They also highlighted the value of documenting how warnings are experienced during specific events, capturing what worked, what did not, and why.

Innovators and startups

Innovators and startups reflected critically on how their systems are designed and evaluated. Many recognised that while technical accuracy is essential, it does not on its own support action. Innovators pointed to their responsibility to design for actionability by ensuring that warnings are interpretable and usable by different groups. They explored ways of embedding feedback into system design, including voice-based inputs, event-level feedback, and the use of local intermediaries where digital access is uneven. Several innovators also reflected on the potential to integrate indigenous and local knowledge into technical systems, both to improve relevance and to strengthen trust and legitimacy.

Funders and ecosystem enablers reflected on how their own incentives, funding terms, and timeframes shape what is prioritised and measured. They recognised their ability to use funding platforms to bring different actors together, reduce fragmentation, and support shared learning across projects and geographies. Funders also pointed to their role in supporting learning beyond individual project cycles, particularly for dimensions such as trust and inclusion that evolve over time. Several reflected on the importance of scrutinising business and financing models, and of providing technical or organisational support to ensure that early warning services do not exclude those least able to pay.

A common thread

Across these reflections, a common thread emerged: each group identified ways in which it could help make currently invisible dimensions of EWS success more visible, **by adjusting how it works, what it values, and how it engages with others in the ecosystem.**

How these directions took shape

The directions outlined above did not emerge in isolation. They took shape through a deliberate progression of listening, reflection, and shared sense-making across stakeholder groups.
The initial phase of the conversations was oriented towards understanding how different actors experience early warning systems: the contexts they work in, the constraints they navigate, and the considerations that shape their decisions. Community organisations, innovators, and funders engaged with one another's perspectives, often encountering realities that sit outside their usual fields of view.

This cross-stakeholder understanding created a foundation for deeper reflection. With a clearer appreciation of one another's roles and pressures, each group turned inward to consider how their own practices, priorities, and assumptions shape what becomes visible, and what remains unseen in definitions of EWS success.

Community organisations reflected on where their proximity to lived experience gives them unique insight, and where their influence over system design remains limited. Innovators reflected on how considerations of scale, sustainability, and institutional alignment shape design choices and evaluation approaches. Funders reflected on how timeframes, incentives, and reporting requirements influence what is prioritised, measured, and learned.

It was through this sequence of **understanding first**, followed by **self-reflection**, and then **joint exploration of pathways forward**, that the directions in the previous section were co-created. The emphasis remained on recognising interdependence across the ecosystem, and on identifying ways each group could contribute from its own position rather than assigning responsibility elsewhere.

Concluding reflection: an invitation to the ecosystem

Early Warning Systems will continue to play a critical role in climate adaptation, and investments in their technical capabilities remain essential. At the same time, our work suggests that how success is defined and assessed will shape whether these systems ultimately serve those most exposed to risk.

The insights in this note point to a shared challenge.

The dimensions of EWS success that matter most in practice: **understanding, inclusion, trust, and the ability to act,** are often the hardest to see within existing assessment frameworks.

Making them visible means expanding what we recognise as valid evidence of success, and whose experiences those definitions are built around.

An invitation to the ecosystem

For funders, innovators, community organisations, and ecosystem partners, this is an invitation

- To invest in learning that extends beyond individual project cycles;
- To create space for feedback, reflection, and course correction; and
- To work with communities as partners in shaping what success looks like.

The challenge ahead in building better warning systems is to develop ways of recognising success that reflect how people actually experience risk, information, and choice.