

Design for Emergencies: Activating Communities in Emergency Management, Through Information Design

Design para Emergências: Ativando comunidades na Gestão de Emergências, por meio do Design de Informação

Diseño para Emergencias: Activando a las comunidades en la Gestión de Emergencias, a través del Diseño de Información

Carlson, Clinton; Ramírez, Rodrigo.

Activation, Emergencies, Communities, Community-based, Information design

Local communities are confronting diverse challenges emerging due to rapidly evolving disasters. These scenarios present complex localized communication challenges that require tools for collective decision-making and clearer communication of local priorities. This paper explores the value of combining information design knowledge with social innovation design as a means of co-creating through community. It defines tools that assist local communities in emergency management planning and aid in communicating their needs and priorities to regional or national Disaster Reduction/Management agencies. Also, through a case study it evidences how a practical design initiative for emergencies is being formed, through a participatory workshop initiative that seeks to activate communities. As an experience in progress, such applied research generates discussion and preliminary conclusions.

Ativação, Emergências, Comunidades, Baseado na comunidade, Design de informação

Comunidades locais enfrentam diversos desafios decorrentes da rápida evolução de desastres. Esses cenários apresentam desafios complexos de comunicação localizada que exigem ferramentas para a tomada de decisões coletivas e uma comunicação mais clara das prioridades locais. Este artigo explora o valor da combinação de conhecimento em design de informação com design de inovação social como meio de cocriação por meio da comunidade. Ele define ferramentas que auxiliam as comunidades locais no planejamento de gestão de emergências e auxiliam na comunicação de suas necessidades e prioridades às agências regionais ou nacionais de Redução/Gestão de Desastres. Além disso, por meio de um estudo de caso, evidencia como uma iniciativa prática de design para emergências está sendo formada, por meio de uma iniciativa de workshop participativo que busca ativar as comunidades. Como uma experiência em andamento, essa pesquisa aplicada gera discussões e conclusões preliminares.

Activación, Emergencias, Comunidades, Basado en la comunidad, Diseño de Información

Las comunidades locales se enfrentan a diversos desafíos emergentes debido a la rápida evolución de los desastres. Estos escenarios presentan complejos desafíos de comunicación local que requieren herramientas para la toma de decisiones colectiva y una comunicación más clara de las prioridades locales. Este artículo explora el valor de combinar el conocimiento del diseño de información con el diseño de innovación social como medio de co-creación comunitaria. Define herramientas que asisten a las comunidades locales en la planificación de la gestión de emergencias y facilitan la comunicación de sus necesidades y prioridades a las agencias regionales o nacionales de Reducción/Gestión de Desastres. Además, mediante un estudio de caso, se evidencia cómo se está desarrollando una iniciativa práctica de

diseño para emergencias mediante un taller participativo que busca movilizar a las comunidades. Como experiencia en desarrollo, esta investigación aplicada genera debate y conclusiones preliminares.

1 Introduction

It is increasingly evident that communities around the globe are facing an expanding list of potential emergencies at an accelerating rate (NOAA NCEI, 2023; FBI, 2023). The United Nations Office for Disaster Risk Reduction (UNDRR) calls for investment in disaster risk prevention and reduction to increase preparedness and response capacities. UNDRR states that “every US\$1 invested in risk reduction and prevention can save up to US\$15 in post-disaster recovery.” The recent disruption in foreign aid caused by the U.S. Government’s pause and reduction of support through USAID has the potential to impact emergency preparedness at a large scale. In a recent statement, The Global Network of Civil Society Organisations for Disaster Reduction (GNDR, 2025) said, “This decision has increased the vulnerability of those living on the frontline of disasters, undermining efforts to build resilience through locally-led initiatives. We hope the United States will reaffirm its global leadership by continuing to invest in strategic projects that advance localization, disaster risk reduction (DRR), and strengthen community resilience worldwide.”

It has never been more critical to provide resources that are affordable, accessible, and empowering to local communities in their emergency management and disaster risk reduction efforts. However, Community-Based Disaster Risk Management (CBDRM) approaches have faced many challenges in implementation. A recent UNDRR report indicates that current CBDRM approaches often fail to be truly inclusive and rarely guide Disaster Risk Reduction strategies at a larger scale (Sakic Trogrlic, et. al., 2022). Several studies suggest that current CBDRM approaches suffer from: 1) unclear and selective participatory practices; 2) vague recommendations for applying local knowledge; 3) cursory use of CBDRM methods with little impact on DRR strategies; 4) lack of funding support for better implementation of CBDRM approaches; and 5) a bias toward expert knowledge over local knowledge by DRR agencies (Sakic Trogrlic, et. al., 2022).

A shift to more agile, localized, and accessible CBDRM approaches is increasingly urgent as traditional, top-down models often fail to reflect the realities and resources of the communities they aim to serve. In response to this gap, *Design for Emergency*—an international design collaboration between Rodrigo Ramirez (Chile) and Clinton Carlson (United States)—has, over the past two years, tested and refined community-based workshops in partnership with emergency planning professionals and local communities.

These workshops are designed to support communities in envisioning, planning, and implementing context-specific strategies for disaster reduction and response. Facilitated both

in-person and remotely, they have been conducted across five countries (the United States, Chile, Mexico, Italy, and Japan), engaging diverse cultural and linguistic communities. The project's goal is not only to develop more inclusive tools but also to evaluate the effectiveness of design methods that adapt to community-specific needs.

Design for Emergency seeks to contribute to a deeper understanding of:

1. The practice, methods, and definition of designing *with* and *through* communities;
2. The role of information design in shaping participatory workshop experiences and outcomes;
3. The efficacy of workshop materials and facilitation strategies in community-based emergency management.

Central to these efforts are the theoretical frameworks of *community-activated design* and *information design*. These approaches ground the workshops, informing how content is structured, how participants engage, and how insights are surfaced and made actionable. This paper begins by outlining the principles of community-activated design before examining how information design was applied and iteratively refined through workshop development. The workshops serve as a case study of how design can strengthen community-based emergency preparedness and address long-standing communication gaps between communities and regional or national emergency response agencies.

2 Theoretical-Conceptual Framework

Complex challenges such as emergency management and disaster response require integrated, transdisciplinary solutions informed by a range of research, policy, and practice communities (Aitsi-Selmi et al., 2016). Disaster Risk Management (DRM), Community-Based Disaster Risk Reduction (CBDRR), and Community Development offer critical frameworks for understanding how risk, vulnerability, and resilience are addressed at both global and local scales.

Disaster Risk Management (DRM) calls for a shift from reactive to proactive strategies, emphasizing the importance of identifying and managing risks before emergencies occur (UNDRR, 2017). Its policy counterpart, **Disaster Risk Reduction (DRR)**, advances this approach through long-term planning aimed at reducing disaster risk and protecting development gains (Twigg, 2015). The UNDRR's Sendai Framework outlines a multi-stakeholder approach, underscoring that while states are responsible for leading risk reduction efforts, responsibility must be shared across sectors, including local governments and the public (UNDRR, 2017).

Community-Based Disaster Risk Reduction (CBDRR) builds on this foundation by centering local communities in the risk reduction process. Through participatory methods such as Vulnerability and Capacity Assessments (VCAs), communities themselves identify, analyze, and respond to risks based on their lived experiences and priorities (IFRC, 2006; NDMA, 2025). CBDRR promotes a bottom-up model that values local knowledge, strengthens preparedness, and fosters community ownership of emergency planning.

Parallel to CBDRR, the field of **community development** advances principles of empowerment, inclusion, self-determination, and social justice (Kenny & Connors, 2017). It recognizes that sustainable change is rooted in the agency of community members, who bring essential contextual knowledge to the table. Effective engagement, as Haldane et al. (2019) note, requires attending to power relations, trust-building, and the socio-political dynamics that shape each community's capacity to act.

Despite these intentions, many community-based frameworks fall short in practice. As we noted in the introduction, complex methodologies and an overreliance on outside expertise often alienate the very communities they aim to support. After reviewing existing DRR and VCA resources, we find that many—such as the Prevention Consortium's nearly 200-page *Tools for Mainstreaming Disaster Risk Reduction* and the International Federation of Red Cross and Red Crescent Societies' *VCA Toolbox* (fig. 1)—are evidence-based but inaccessible to small, under-resourced communities. While framed as participatory, these tools often operate as top-down systems that undervalue local knowledge, capacity, and time.

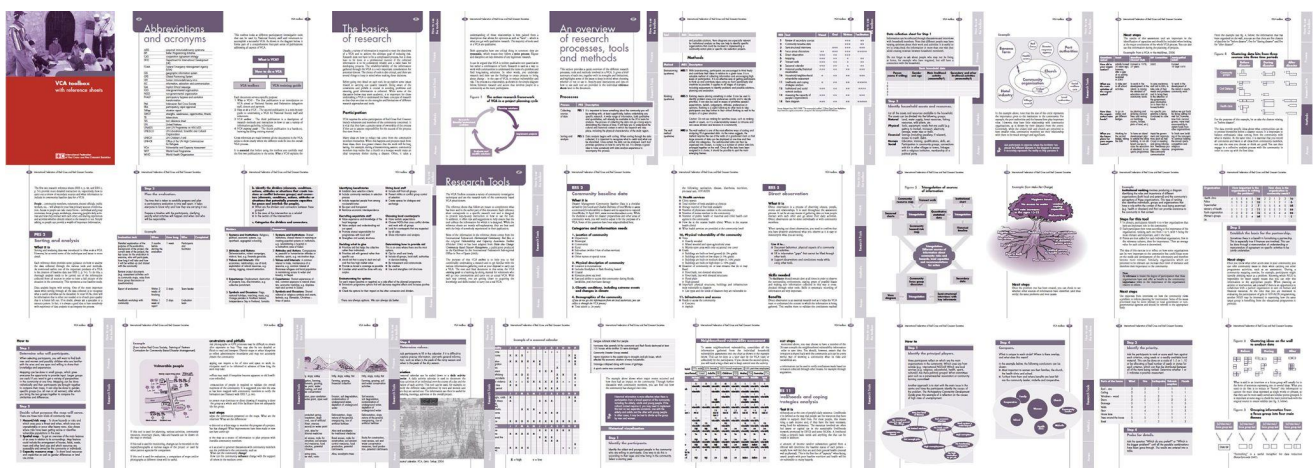


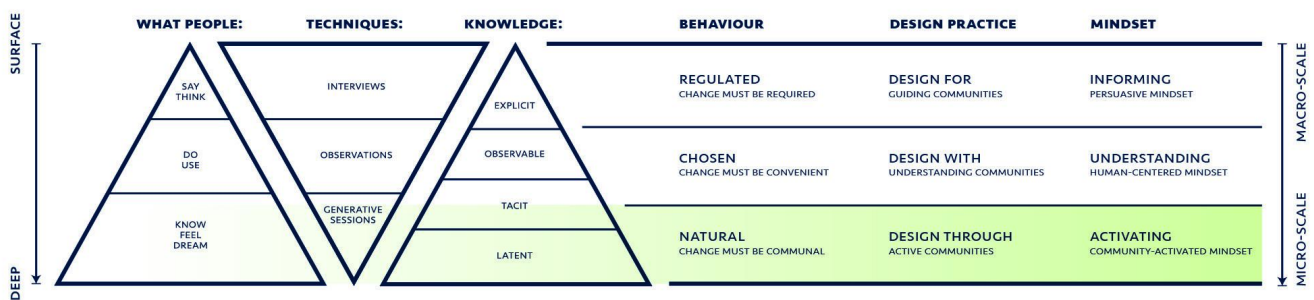
Figure 1: Example pages from the International Federation of Red Cross and Red Crescent Societies' *VCA Toolbox*

Community-Activated Design (Carlson, 2021) offers a more accessible, responsive approach to community-based emergency planning. Drawing from visual communication design, the collaborative practices of co-design (Sanders & Stappers, 2008), the relational focus of social innovation design (Manzini, 2015), and the redistributive goals of post-capitalist design

(Wiszinsky, 2022), Community-Activated Design supports collective action by emphasizing community agency, imagination, and expertise.

Designers who combine traditional visual communication skills, co-design methods, and a deep understanding of inclusive practice have the potential to play a crucial role in disaster risk reduction. However, the field of visual communication design has been slow to adopt codesign practices in meaningful, sustained ways (Taffe, 2018). Community-Activated Design addresses this gap by positioning designers not as external experts but as facilitators of dialogue and co-creation within communities.

Unlike traditional models that prioritize documentation, data collection, or standardized deliverables, Community-Activated Design centers tools, artifacts, and experiences that are activated by local advocates and adapted to local contexts. Its agility across linguistic and cultural differences, affordability, and emphasis on learnability make it well-suited for communities that are often excluded by more institutionalized approaches.



COMMUNITY-BASED DESIGN PRACTICE AND MINDSETS AT DIFFERING SCALES

Clinton Carlson (2025).

An adaption of Froukje Seeswijk, Pieter Jan Stappers, Remko Van Der Lugt, and Elizabeth B.-N. Sanders *Context Mapping: Experiences from Practice* (2008) & Ezio Mancini's *Noncatastrophic Transitions to Sustainability* (2015)

Figure 2: Community-Based Design Practice and Mindsets at Differing Scales with Community-Activated Design highlighted.

Figure 2 illustrates how Community-Activated Design sits within a broader spectrum of community-based design practices, emphasizing open-ended, generative methods that leave space for co-creation. We hypothesize that conventional CBDRR models, by focusing on evidence-based authority and reproducibility, can unintentionally signal a lack of community agency. Local participants often detect this shift, perceiving themselves more as research subjects than co-creators. Designers, too, may revert to designing *for* or *with* rather than *through* communities.

In contrast, Community-Activated Design insists that change emerge from within the community—through its knowledge, vision, and initiative—resisting hierarchical structures and promoting a more participatory ethos.

Design for Emergency applies Community-Activated Design principles to CBDRR and community development, potentially offering a more community-responsive alternative to existing methods. The following section explores how information design provides important insight into shaping the tools and outcomes of workshops that engage communities in disaster planning, resilience, and development.

3 The Role of Information Design

Information design can aid in emergency contexts as it aims to “make the complex easier to understand and to use” (Barrat & Walker, 2005) and has the capacity to increase engagement by creating common ground, enhancing understanding, and making information accessible within codesign contexts (Ramírez, 2022). Information design has the potential to aid communities in their collective efforts to plan for emergencies and assist them in more clearly communicating their needs—leading to more understandable and actionable messages for disaster response and prevention (Horn, 1999, Allard et al, 2014, van Manen et al, 2023).

Simplifying community-based application

Currently, many community-based approaches are inaccessible to local communities due to cost, complexity of implementation, or accessibility of educational resources. For instance, the resources highlighted previously in fig. 1 lack the clarity, simplicity, and hierarchy common in well-designed on-boarding documents. Clear information design can combine with collaborative methods that rely more on community expertise and dialogue to create more accessible, learnable, and adaptable community-based disaster risk reduction programs.

Facilitating Complex Conversations

By its nature, risk reduction actions such as preparedness, prevention and mitigation occur ideally before an emergency. Community-based approaches to risk management and risk reduction aim to facilitate dialogue and ideation which leads to actionable goals for the community and its supporting agencies. In this context, information design can aid complex dialogue by anticipating actions, framing conversations through graphic devices that facilitate a common understanding categorizing participant outputs through their situation, proximity, or scale—fostering more efficient understanding between participants.

Curating the Visual Representation of Community Objectives

As mentioned, community-based disaster risk reduction programs rarely guide disaster risk reduction strategies at a larger scale (Sakic Trogrlic, et. al., 2022). We hypothesize that the lengthy textual nature of existing community reports or protocols exacerbated by minimal hierarchy and visualization may be partially to blame for the breakdown in this critical exchange. Therefore, a key is curating community dialogue to clarify and encourage action within the community and their stakeholders applying information design principles. This is exemplified in the following section.

4 Case Study: Design for Emergencies

Design for Emergencies is a two-year cross-cultural design research initiative generated by academics from design programs in Chile and the USA. Their purpose is to explore how design can better assist in community-based design for an eventual emergency and to explore dialogue. Structured as a collaborative experience, participants are invited to share their experience, ask questions, provide feedback, or adopt approaches they believe might be relevant to their local contexts. In this case, workshop materials have allowed us to conduct a collaborative process in different communities across the globe, even providing the materials for others to utilize with minimal training. Over the course of the project, methods and tools have evolved and refined in an iterative, ongoing process.

Applying Community-Activated Design methods for helping communities collaborate in the design of more effective disaster risk management and response plans, the research has informed a set of components integrated as a set of instruments to facilitate dialogue. The initial hypothesis was to produce a unified visual system that utilized information design principles to allow participants to communicate more effectively and innovate more efficiently through rapid iteration, where visual devices help to deconstruct an experience of emergency. The outcome is the Resilient Communities Emergency Imagination Workshop (RCEIW).

The Resilient Communities Emergency Imagination Workshop (RCEIW)

The RCEIW is an affordable, accessible, and documenting set of visual instruments for creating dialog-by-doing, sharing common approaches, imagining their possible actions, and collaboratively structure a strategy to manage an emergency, defining future steps and priorities. As a bottom-up, participatory method of empowerment, RCEIW is oriented to individuals, small groups, and large groups—potentially increasing community safety, resiliency, and recovery. Thus, the materials and resources are open source, adaptable to local needs, and scalable to wider applications. Inspired by participatory principles such as ‘generative tools’ (Sanders, 2008) the RCEIW aims to be an adaptable resource through open access to all materials and training. Table 1 introduces their components.

Table 1 | Components of the RCEIW

1. Experience Maps	2. Emergency Imagination Maps	3. Actions Board
In this introductory component, participants identify stages that a community might go through during the experience of an emergency, using a timeline and seven conceptual layers that challenge participants to view the emergency through different lenses. Any stage having particular needs or actions can be noted. Stickers allow to add emotional associations.	Four scales of maps constitute the possibility to define a common strategy to manage how an imagined emergency might unfold in a specific scale and be successfully responded by the community: (1) A Rural/Mountain Town Map, (2) A City/Urban Map (3) A Campus Map, (4) A Building Plan.	This third component allow participants to integrate actions: (1) identifying actors as individuals, organizations, or policies, positioning them according to their proximity to the community; (2) Defining times involved (when) and how the actions of the agreed strategy will be developed, (3) Prioritizing actions and resources to be implemented by the community and agencies.

RCEIW materials are primarily designed to stimulate dialogue and give communities a voice in a co-creative way, through the use of information devices such as maps, icons and signs, to imagine stages, emotions, and experiences conducted by the participants interactions. Being inspired by challenge-based instruments such as the Disaster Imagination Game (JSDF, 1997), all components aim to leave gaps in the design process and allow for adaptation for local contexts, in a sequence of interactive work in periodic sessions, or as independent pieces to integrate existing community initiatives. Figure 2 illustrates the RCEIW board components, including the maps, stickers and action boards.

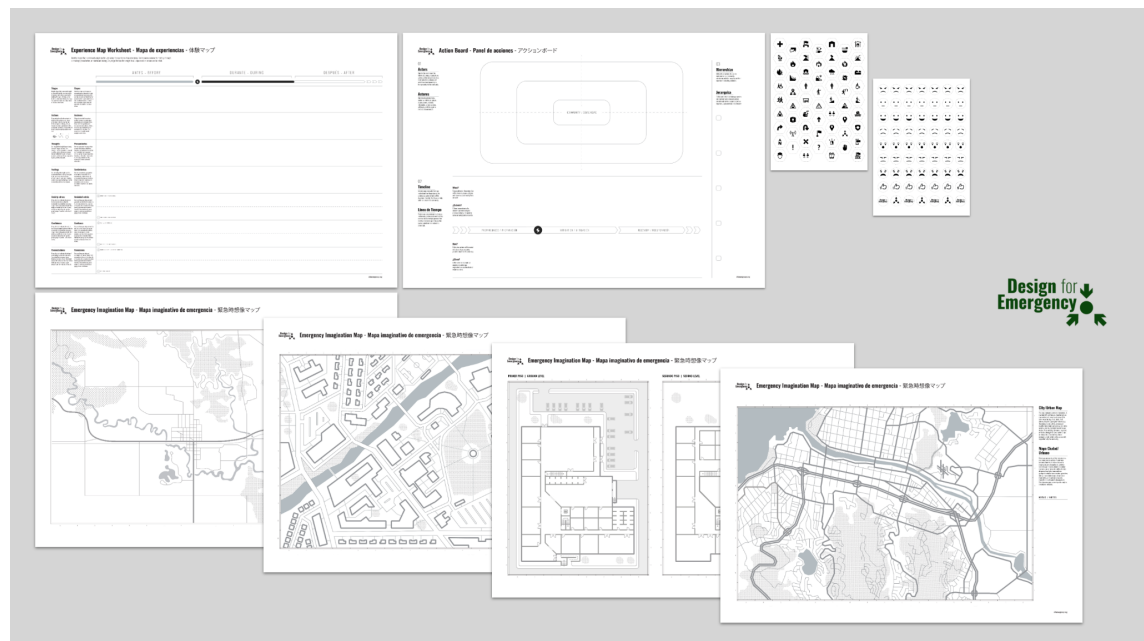


Figure 3: RCEIW board components.

The different components are designed as separate moments or sessions to facilitate approaching the experience of emergency, stimulate the discussion and define a common strategy to manage an imagined emergency that might unfold on a specific scale and how this can be prioritized to be successfully mitigated by the community. For example, Experience Map Worksheet allows combining textual and symbolic elements to create common approaches, and Emergency Imagination Maps are representational, synthesized spaces —challenging participants to utilize imagination to engage in the emergency scenario and focus less on the geographic specificity.

Information design principles such as those stated by Tufte (1990), and Pontis & Babwahsingh (2023) such as simplification, micro-macro reading, layering and separation, narratives of space and time, color relationships and Learning through Research are part of the elements considered to facilitate an active dialog facilitated by visuals. On the practical side, workshops utilize open-access visual tools such as Guemil Icons for Emergencies, and are produced in low-cost, sustainable materials. Figure 4 illustrates different aspects of the initial sessions conducted in Santiago, Chile and South Bend, USA.



Figure 4: Images from different RCEIW iterations using maps, implemented in South Bend Indiana and Santiago Chile (2023).

Results

The iterative design and testing of workshop materials have informed RCEIW as a set of instruments that invite participants to engage and interact around emergency management through community-activated design. So far, the workshop has been implemented by the researchers and external teams in the USA, Chile, Japan, and Mexico. The specific contexts of communities such as geography, language or risks nature, add new dimensions to the creative implementation. As an ongoing applied research project, the RCEIW constitutes evidence of how an integration of DRM, DRR, CBDRR, and community-oriented design methods might be facilitated by Information Design, generating new ways to give voice to communities. Also, it poses challenges that are discussed in the following section.

5 Discussion

Drawing from real-world community challenges, Design for Emergencies is a project that seeks continuous improvement and feedback, integrating domain principles from Risk Management, Information Design, and Community-Activated Design. As an example, RCEIW's Imagination Emergency Maps becomes a community-led emergency planning experience that uses cartography prompts as a fictional depiction of time and space, allowing participants to explore an hypothetical emergency scenario, facilitate ideation and thinking of solutions for their reality. Here, it demonstrates how design might be focused on the process—the dialogue—more than on defined outcomes—deliverables—or artifacts—a report. Figure 5 shows an iteration in the imaginative maps to create such dialogue, empowering users' ideas to layer and separate from the geographic limitations observed in their initial version (See fig 4).



Figure 5: Examples of an iterative process: At the left a Google Earth generated map at the first sessions, then at the right the redesigned simplified version in use.

The focus on dialogue allows for more attention to be given to the inclusion of diverse representation that might counter prevailing community power structures. It also allows for greater adaptation to account for localized issues, relationships, and realities. One interesting hypothesis is how RCEIW sessions would help communities to define priorities, take safe decisions or create resilient actions, projecting themselves as agents for change.

The international collaboration has provided the opportunity to evaluate the RCEIW's agility to respond to unforeseen cultural factors—leading to more adaptable and replicable interventions in a collaborative scope. Although the components are initially composed in both Spanish and English languages, the practical use of such information tools might also face limitations, for example how the participants interpret risks and hazards according to their local language, reality or culture, how they define a sense of layering in different moments (i.e. Before – During – After), the familiarity with aspects such as codes, symbols, labeling, or if they individually validate the actions proposed by their team, among others. Such limitations pose new challenges for adapting RCEIW to both different scenarios and communities' needs.

The RCEIW is continuously evolving, informing how DRM and Community-activated information design instruments can help to generate innovative instruments, transform into actions, and extending visual tools as a collaboration that involves interdisciplinary and international participants. As mentioned, local participants and stakeholders may benefit from creating new ways to approach emergency management, and scaling this to communities to integrate situated perspectives.

On the effectiveness of design methods for emergency contexts, a question arises: Is it possible to integrate an effective way to manage risks and emergencies by design, based on key aspects for communities such as collaboration and plurality? Here, transdisciplinarity extends the idea of overcoming disciplinary boundaries by allowing different ones to converge. In the words of Edeholt & Joseph 2022, "...what the design disciplines can bring to the table [of the future], are methods to explore the unknown based on the most relevant knowns made available on the 'interdisciplinary arena'" (p12). In particular, crossing disciplines emphasizes the incorporation of non-academic actors into processes of co-construction of knowledge for addressing complex problems, at global and local scales (Pohl & Hadorn 2008).

Therefore, the application of disciplines as mentioned, but especially driven by design as information and participatory practice can help define a more effective and efficient way for creating engaged, bottom-up empowered disaster response and prevention strategies.

6 Conclusion

Designing for Emergencies is a multifaceted undertaking and faces many complexities in real-world applications. Ideally, every group or organization may appropriate or adapt the RCEIW components toolkit for enhancing conversations and visualizing future scenarios. Working with different communities on different scales, we have had the chance to recognize and validate new ways to produce outcomes. The experience of emergency becomes a possibility to develop a truly Community-Activated Design.

For all the experiences shown, Information Design becomes a concrete, powerful principle for creating engagement, stimulating a common ground, and enhancing the communication of community needs in emergencies. Through dialogue and ideation within communities, we believe that the RCEIW may be an effective and resilient approach to designing for emergencies. The project also constitutes an opportunity for co-constructing knowledge, in order to conduct a meaningful transformation where the communities can raise their own voice.

Design for Emergencies is still an ongoing project, with many aspects to iterate and improve. Currently, a key question is about the impact we're generating in other fields related to Emergency Management, experts, responders, and authorities, but mainly the participants themselves as community members. A primary objective is transforming the RCEIW into a set of tools that can be relevant for others, easily learned, and accessible for any community to investigate their capacity to prepare for, reduce, or prevent emergencies by design.

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About the author(s)

Clinton Carlson, Associate Professor, Department of Art, Art History & Design, University of Notre Dame, USA <ccarlso6@nd.edu>

Rodrigo Ramírez, Associate Professor, School of Design, Pontificia Universidad Católica de Chile <rramireo@uc.cl>

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