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Final published version

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Citation (APA)

Kuś, A. (2026). Spaces of Knowing: Co-creating Embedded Architectural Research Through Everyday Encounters. In P. G. Bajet Mena, M. Benedito Ribelles, M. Giramé, B. Ramis Frontera, P. Sarquella, & C. Torres González (Eds.), *Becoming. Architectures for a planet in transition: Proceedings of the UIA World Congress of Architects 2026 Barcelona* (Vol. 1, pp. 504-515). Universitat politècnica de Catalunya. <https://doi.org/10.5821/ebook-9791388098666>

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Title

Spaces of Knowing: Co-creating Embedded Architectural Research Through Everyday Encounters

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Abstract

The accelerating impacts of climate change disproportionately affect low-income and marginalized groups, including residents of self-organized housing in the Caribbean. This paper examines how embedding architectural research through everyday encounters can co-create socially useful and locally grounded knowledge. Drawing on a participatory action research project in self-organized housing on St. Martin, which combined structured research activities—interviews, co-creative sessions, and workshops—with unstructured activities, this paper focuses on the latter: sustained informal engagement through everyday encounters using the “deep hanging out” method. These encounters occurring in spaces of knowing such as shops, neighbourhood bars, and porches revealed tacit skills, incremental building practices, and socio-economic dynamics shaping housing resilience—insights often overlooked in structured research activities. Informal engagement helped flatten hierarchies, build trust, and often led to formal participation. The findings show how everyday encounters can strengthen reflection and facilitate the co-creation of contextually relevant, climate-resilient housing knowledge and design solutions.

Keywords

climate change, self-organized houses, climate-resilient housing, situated knowledge, situated learning, participatory action research

Article DOI

doi.org/10.5821/conference-9791388098666.78

1. Introduction

Climate change has intensified environmental hazards worldwide, including flooding, storm surges, extreme heat, droughts, and hurricanes (Kelder et al., 2025; Wilby, 2007; Zięba et al., 2020). A large body of research has linked these changes to human emissions of greenhouse gases, underlining the need to rethink the practices that drive climate change as well as strategies for managing its unavoidable consequences (IPCC, 2001, 2022; United Nations Environment Programme, 2025). The built environment plays a central role in this process. It is estimated to account for nearly 40% of global carbon emissions, through material extraction, manufacturing, transport, and the energy required to operate buildings—thereby significantly contributing to and amplifying climate change (Röck et al., 2020; WorldGBC, 2019). Importantly, these emissions are disproportionately generated by high-income countries, highlighting global inequalities in both responsibility for and vulnerability to climate impacts (Duan et al., 2022; Streltsov et al., 2020).

The impacts of climate change are unevenly distributed. Low-income and marginalized residents—who contribute least to global emissions—are disproportionately exposed to hazards, compounding existing social and spatial inequalities (Pelsmakers, 2022; Schipper, 2020; UN Habitat, 2024). This inequality is particularly evident in self-organized housing—dwellings incrementally constructed by residents themselves when affordable formal housing is unavailable (Goethert, 2010; Greene & Rojas, 2008; Mota, 2021; Wakely & Riley, 2011). Such housing is often located on hill slopes, in flood-prone areas, or other environmentally hazardous sites, and is frequently vulnerable to hazards due to structural risks and material quality (Archer, 2016; Rosowsky, 2011; Schröder et al., 2020; Twigg et al., 2017).

In response to the urgency of climate change and rising inequalities, international policies have promoted sustainable development agendas aimed at ending poverty and protecting planetary resources by balancing social, economic, and environmental sustainability (UN, 2015). Architectural research plays an important role in this effort, particularly in relation to self-organized housing in hazard-prone areas. It can address vulnerabilities related to environmental risk, structural safety, social exclusion, and limited access to services and infrastructure—and the implementation of its findings is crucial to tackling climate-related challenges (Bulbaai & Halman, 2021; CCCCC, 2009; Collodi et al., 2021; Flinn, 2020; Lewis, 2022; Lizarralde et al., 2021; Middelbeek et al., 2014).

Yet many architectural research practices have been criticized for perpetuating extractive dynamics in data collection, tokenistic participation, questionable ethics, and limited practical impact (Abenia, 2024; Gomez-Barris, 2016; H. Harriss et al., 2023; Igwe et al., 2022; Kapp et al., 2008; Yaneva, 2018). Common shortcomings include privileging Eurocentric paradigms and epistemology; excluding or romanticizing low-income groups; extracting information without reciprocity; and producing outputs that are irrelevant or inaccessible to the communities studied—thereby reinforcing existing inequalities (Chami & Ebrahimi, 2025; Coelho et al., 2025;

Frichot, 2024; Kouritzin & Nakagawa, 2018; Tuhiwai Smith, 1999). Furthermore, there are concerns about research carried out by external researchers relying on short-term fieldwork constrained by limited funding, institutional protocols, rigid methodologies, and formalized ethics approvals (De Oliveira, 2023; Ghosh, 2018; Schoon, 2025; Tomer, 2020). These constraints shape the positionality of both researchers and participants, narrow the scope and duration of engagement, and foreground formal, short, and efficiency-driven activities at the expense of deeper, context-sensitive collaboration.

As global temperatures approach and surpass the critical 1.5 °C threshold, adaptation, preparedness, and resilience have become urgent priorities, demanding research approaches that are both embedded and context-sensitive. Embedding research involves deepening understanding of complex local conditions by engaging those most affected as equal research partners, foregrounding their situated knowledges, and collaboratively producing knowledge (Cunliffe & Scaratti, 2017; Gibson-Graham et al., 2016; Hakkarainen et al., 2022; Tang Yan, 2025). Participatory, context-embedded approaches that centre residents' experiences and agency are especially vital in hazard-prone regions such as the Caribbean, where affordable housing is scarce and self-organized housing remains the primary shelter option for low-income groups (Carrasco & Brien, 2022; L. Harriss et al., 2020; Hendriks et al., 2018; Kuš et al., 2024, 2025; Lyons et al., 2010; Maynard et al., 2017). Co-creating knowledge and housing design solutions with local building professionals and residents—here referred to as research partners—can strengthen resilience and improve the safety of homes built outside formal systems, where individuals rely on their own knowledge and skills to construct and repair dwellings.

This paper responds to these intersecting challenges by examining how architectural research can advance embedded, co-creative approaches. Drawing on a collaborative project on St. Martin Island, it explores how combining structured research activities with everyday encounters can generate knowledge that is socially useful, locally grounded, leading to strengthening partnerships, and producing more inclusive and tangible outcomes.

2. Methods

The paper is situated within a four-year collaborative research project on St. Martin Island in the Caribbean that co-created a design framework for resilient housing in hazard-prone contexts. The larger project adopted a transdisciplinary approach, integrating knowledge from housing studies, resilient design, and collaborative methods, and employing co-creative practices that engaged partners throughout problem formulation, method development, testing, and dissemination (Butt & Dimitrijević, 2022; Gaziulusoy et al., 2016; Grindell et al., 2022; Kim et al., 2022; Sanders et al., 2008). It was grounded in participatory action research (PAR) principles, implemented through iterative cycles of planning, action, observation, and reflection (Orlowski, 2019; Regeer et

al., 2024; Thompson Klein et al., 2001; Wadsworth, 1998). The reflection stage was particularly significant: it enabled evaluation of actions taken, informed subsequent activities, and supported co-production of knowledge with local research partners. Emphasis on embedding the project and contextualizing reflection ensured that insights remained closely tied to the realities of the study context and provided the foundation for this paper.

While the broader project encompassed a range of structured and unstructured activities within the PAR cycles, this paper focuses specifically on the unstructured dimension—everyday encounters—and their role in strengthening contextualization, collaboration, and reflection. It examines how such encounters can deepen contextual understanding, support the building of collaborative partnerships with residents, enhance reflection within PAR, and ultimately contribute to more socially relevant project outcomes.

To explore this focus, we investigate how structured research activities—such as ethnographic housing studies, interviews, co-creative sessions, and co-design workshops on resilient housing—can be complemented and contextually embedded through insights gained from unstructured activities such as everyday encounters in meeting places, small-scale businesses, and neighbourhood bars. We employ the method of “deep hanging out,” a localized practice of sustained informal engagement in which the researcher simultaneously participates, observes, and analyses daily routines to experience the context firsthand (Geertz, 1998; Snodgrass et al., 2024; Walmsley, 2018). This approach is implemented in settings where situated knowledge is generated and shared among residents, highlighting the importance of informal spaces of knowledge creation, engagement with situated knowledges, and the benefits of such practices for embedding architectural research. In addition, drawings, photography, and fieldnotes from everyday encounters were used to document and reflect on insights. Throughout the research, the team disclosed its positionality, aims, and scope to residents to ensure transparency and build trust.

This paper presents three types of spaces of knowing in St. Martin, drawing on fieldnotes collected through the deep hanging out method. By organizing the places from more public to more private settings, it discusses the relevance of these informal spaces of knowing for embedded architectural research and underscores the importance of such activities in participatory, context-sensitive inquiry.

3. Embedding Architectural Research Through Situated and Informal Learning

Embedding architectural research—integrating studies into their local context to generate socially useful knowledge that can be translated into practice—requires rethinking not only what knowledge is produced but also how it is created (Cunliffe & Scaratti,

2017). Rather than viewing knowledge as something produced in research and later transferred into practice, embedded approaches emphasize impact and relevance during the very process of knowledge generation itself (Willmott, 2012).

Central to this is the understanding that knowledge is situated—shaped by where, how, and by whom it is created and used (Gherardi, 2008; Haraway, 1988). Approaches that embrace situated knowledge can generate insights within the very contexts under study, grounding architectural research in local realities. This understanding aligns with the concept of situated learning, which highlights that knowledge is acquired through participation in authentic activities within specific contexts (Genat, 2009; Lave & Wenger, 1991). Just as learners develop expertise by engaging—albeit with limited responsibility—in the practices of experts, researchers can also gain deeper contextual understanding by participating in the everyday activities of partners within the study’s context.

Much of learning occurs informally, outside structured workshops or interviews, in the course of everyday practices, interactions, and problem-solving (Ellinger, 2004; Nistor et al., 2019; Wang, 2024). Informal learning can complement structured activities by supporting collaboration, knowledge sharing, and problem-solving related to context-specific challenges (Horak & Paik, 2023; Noy et al., 2016). Informal conversations often ease communication and generate insights that more closely reflect the realities, experiences, and perceptions of research partners (Swain & King, 2022; Warren et al., 2002). They typically occur outside formal research settings—in spaces and moments not constrained by protocols or timelines, such as before or after structured research activities, or during participation in residents’ daily routines.

In architectural research, this means producing knowledge through situated learning and engagement, in which researchers and research partners (residents, practitioners, local contractors) co-participate in informal everyday encounters rather than remaining separate observers (Genat, 2009). Such practices can help to embed research through contextualization and reciprocal knowledge exchange with those most affected by the issues under study. Extending engagement into spaces where residents conduct their daily lives—shops, parking areas, bars, and neighbourhoods—can significantly enhance situated learning and deepen the embedding of architectural research (Aelbrecht & Stevens, 2023; Almazán & Yoshinori, 2013) (Figure 3).



Figure 1 Collage of everyday encounter settings in St. Martin, showing some of the spaces where informal interactions with residents took place.

Building on these concepts, this research on self-organized housing in hazard-prone areas of St. Martin extended engagement beyond structured research activities into the spaces where residents conduct their daily lives. These spaces of knowing, where regular and voluntary gatherings occur outside of institutional settings, are vital for knowledge exchange (Aelbrecht & Stevens, 2023; Almazán & Yoshinori, 2013; Brown et al., 1998; Ferris, 2022; Oldenburg, 1999; Oliver-Didier, 2016). In such spaces, the rigid boundaries between researcher and participant can dissolve, opening opportunities for mutual understanding, collaboration, and the co-creation of knowledge.

4. Spaces of knowing

PUBLIC SPACES: SHOPS, FOOD STALLS, PARKING AREAS

The first type of space comprises locations frequented daily by residents and researchers alike, such as shops, restaurants, food stalls, and parking areas. In economies strongly tied to tourism, as in the Caribbean, the location and character of these places matter. Visiting venues where residents carry out daily tasks creates opportunities for encounters and informal conversations. Even mundane activities—such as waiting in line—can lead to exchanges about local economic conditions, geographic vulnerabilities, or community histories.

Repeated presence in such spaces helps to build familiarity and curiosity, which in turn fosters more meaningful dialogue or follow-up meetings. In this research, conversations in these everyday settings provided valuable contextualization: residents shared situated knowledge about their neighbourhoods, local responses to hurricanes, and the ways these sites had changed over time, including economic shifts and population movements.

SMALL-SCALE BUSINESSES AND NEIGHBOURHOOD BARS

The second type of space consists of small-scale businesses, often attached to homes, such as repair workshops or small neighbourhood bars (Figure 2). These venues function as informal social hubs where residents gather after work. In our study, small bars proved to be particularly important for interaction and connection. Conversations in these familiar settings enabled residents to express frustrations about housing policies, dissatisfaction with institutional decisions, and concerns about legal uncertainties related to land tenure or residency status.



Figure 2 Examples of neighbourhood meeting places: (a) an informal meeting spot next to a neighbourhood bar, (b) a communal space within a housing cluster, and (c) a small car-repair workshop.

Such discussions also revealed the collective and sometimes fragmented dynamics within neighbourhoods, shaped by residents' different origins, livelihoods, and income sources. Conversations about the origins of bars or surrounding houses illuminated the efforts residents invested in acquiring materials and refurbishing structures to suit their needs. These insights shed light on the intertwined nature of housing, small businesses, and livelihoods. Importantly, the more personal character of these encounters went beyond what structured research activities typically allow. They also gave researchers visibility in the community and helped counter perceptions of researchers as outsiders, government agents, or institutional actors collecting data which can lead to relocation or eviction—an especially sensitive issue in contexts of legal insecurity. In some cases, informal interactions led to invitations to continue discussions in domestic settings, which in turn supported structured research activities such as interviews and co-creative sessions.

DOMESTIC ZONES: HOUSES, PORCHES, AND YARDS

The most intimate spaces identified were domestic zones, such as houses, porches, and yards (Figure 3). For external researchers, meaningful engagement in private settings can be challenging. However, everyday encounters in public spaces—grocery stores, parking areas, neighbourhood bars—often built the trust needed to be invited into domestic spaces.

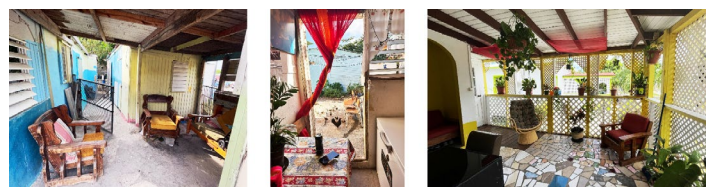


Figure 3 Domestic settings—porches and yards—where residents spend leisure time and where researchers were invited for more personal discussions.

On St. Martin, residents frequently spend time on shaded porches in front of their houses, offering a semi-private environment where conversations can unfold without intruding into private interiors. These settings allowed us to discuss neighbourhood dynamics, social relations, and housing practices. Residents shared details about material sourcing, construction methods, hazard mitigation strategies, and rebuilding efforts, as well as the role of external agencies in these processes. Time spent in domestic zones also

made visible the household and neighbourhood dynamics underpinning resilience, such as care, mutual aid, resource sharing, and informal childcare.

Across these three types of spaces, informal conversations enabled by everyday encounters enriched the research by providing situated knowledge, revealing social dynamics, and fostering collaboration. They also bridged formal and informal participation, enabling the collaborative integration of situated knowledge into the project's structured activities and formal outputs.

5. Discussion

EMBEDDING ARCHITECTURAL RESEARCH THROUGH EVERYDAY ENCOUNTERS IN HAZARD-PRONE HOUSING CONTEXTS

Residents living in self-organised housing in hazard-prone areas are among the most exposed to the accelerating impacts of climate change. Conventional, short-term research methods frequently miss the incremental practices, local priorities, aspirations, and situated knowledge, often resulting in top-down or ill-suited solutions. Embedding research within residents' daily life helps counter this gap. By working alongside rather than merely observing residents, researchers can co-produce knowledge that is more actionable, equitable and responsive to local realities. This approach complements structured methods such as interviews or workshops, while also reducing power imbalances and strengthening trust.

In St. Martin, these spaces of knowing—grocery stores, food stalls, and neighbourhood bars—create opportunities to meet residents on their own terms, facilitating mutual learning and enriching understanding of the local context and housing challenges. Such settings enabled listening and learning from residents' situated knowledge of hazards, housing, and neighbourhood change—insights that are often constrained by the formalities and time limits of structured research activities. Meeting residents in their own spaces reduces the power imbalance of university offices or formal venues, strengthening trust and reciprocity, which leads to more grounded data and genuine knowledge co-production.

Sustained presence in these meeting spaces provided more nuanced understanding of the realities shaping residents' housing practices. It exposed the micro-politics of neighbourhoods—networks of mutual aid, tensions between groups, local gatekeepers, and informal economies—that influence how housing is built, maintained, and repaired. These dynamics are crucial for understanding the social and economic circumstances, personal housing aspirations, and building practices underpinning resilience.

Conversations in public or semi-public spaces frequently led to invitations into homes, yards, or porches. This gradual movement from public to private spaces enabled deeper engagement and reflection on housing practices. These informal engagements also

acted as bridges, encouraging residents' participation in structured co-creative sessions and interviews.

IMPLICATIONS FOR ARCHITECTURAL RESEARCH

This study shows how complementing structured research activities with engagement in everyday encounters implemented through a deep hanging out method strengthens architectural inquiry. Such informal engagement embeds research, humanises it, and deepens it by incorporating lived realities of people affected by the problem studied. Insights from informal encounters can illuminate vulnerabilities, adaptive strategies, and locally acceptable solutions, thereby improving the relevance and feasibility of the study.

In experience of this research, everyday encounters and deep hanging out method are most effective when combined with structured research activities—such as interviews, co-creative sessions, or workshops—creating a richer and more grounded evidence base. Informal engagement complements rather than substitutes structured activities, ensuring that knowledge generated informally is translated into tangible outputs and actions. Everyday encounters also extend the reflective component of participatory action research beyond formal sessions and into the spaces where people live and work, helping rebalance hierarchical researcher-residents dynamics.

This practice carries important implications for architectural research and for challenging extractive approaches. It underscores the need to invest in long-term, trust-based relationships to enable genuine co-production of knowledge; to produce outputs that are accessible and relevant to the communities involved; and to rethink academic metrics of success and value of locally grounded studies producing socially useful knowledge.

LIMITATIONS AND ETHICAL CONSIDERATIONS

Implementing informal engagement in the research process also has limitations and ethical challenges. It demands significant time, effort, and resources from researchers and in some cases can be burdensome for residents. Information gathered informally may reflect only partial perspectives and therefore requires triangulation with other data sources. Sustained informal engagement alone does not guarantee that findings will be tangible or relevant to residents; formal activities remain essential for validating and acting on insights.

Such research activities demand transparency, informed consent, and clarity of purpose to avoid becoming extractive. Researchers must remain aware of their positionality, power relations, and the potential risks for residents—for example, related to legal status, land tenure, or institutional mistrust. Moreover, informal engagement for research purposes raises risks regarding the confidentiality of shared information, bringing a heightened responsibility to transparency of the research purposes and protection of sensitive

details, especially in communities with legal, social, or economic vulnerabilities. Ethical care and reflexivity are therefore integral to any engagement strategy.

6. Conclusion

The accelerating impacts of climate change—felt most acutely by low-income and marginalized groups, including residents of self-organized housing in the Caribbean—demand architectural research practices that are embedded and contextualized. This study highlights how embedding architectural research in everyday life of residents can generate knowledge that is both socially useful and locally grounded. In the context of St. Martin Island, we combined structured research activities—such as interviews, co-creative sessions, and co-design workshops—with sustained informal engagement through everyday encounters in spaces including shops, parking areas, and neighbourhood bars. Applying the method of deep hanging out allowed to engage with situated knowledge and facilitate knowledge co-creation on resilient housing.

Everyday encounters proved essential for deepening contextual understanding, revealing tacit skills, incremental building practices, and lived experiences of self-organized housing residents. They helped flatten hierarchies, build trust, and expose the social and spatial dynamics shaping housing resilience—networks of mutual aid, local gatekeepers, and informal economies. They also served as bridges to formal participation, opening residents' interest in participating in interviews, workshops, and co-design sessions.

At the same time, these practices demand ethical care, reflexivity, and significant investments of time and resources. Informal engagement complements but does not replace structured research activities; rather, it strengthens contextualized reflection within participatory action research, enhances collaboration, and helps to co-create contextually relevant knowledge and research outputs. In hazard-prone settings such as the Caribbean, embedding research through everyday encounters offers a pathway toward more resilient and equitable housing solutions grounded in the knowledge, priorities, and agency of the residents.

Acknowledgments

The researcher wishes to express sincere gratitude to the doctoral thesis supervisory committee—Nelson Mota, Ellen van Bueren, and Antonio Carmona Baez—for their guidance and support throughout the development of the research project. Thanks are also extended to colleagues at TU Delft and to the staff of the University of St. Martin for their invaluable assistance during the research process. The researcher further thanks the Islander(s) at the Helm group for their participation in the research interactions and discussions on research methods that informed and strengthened this study. Appreciation is given to Marlenny Richardson, Jocselyn Mora, Kinga Kus, and Raymond Jessurun for their contributions to the field studies. Moreover, the researcher would like to thank Raily Yance for his support, insights, and valuable reflections during informal, everyday encounters that shaped this paper. Above all, heartfelt thanks are extended to the residents and local builders who generously shared their time, knowledge, and expertise.

The researcher acknowledges their positionality within the study. Their perspective is shaped by social and geographical context, academic training, as well as personal background. As an external researcher who does not live in the context under study, the researcher recognizes that their social, economic, and educational privileges differ significantly from those of the residents whose housing circumstances are being studied. Conducting this study required ongoing reflection on the power relations, assumptions, and values brought to both fieldwork and data interpretation.

The researcher also acknowledges that the photographs and collage included in this paper are not intended as a comprehensive overview of the Island's housing situation but rather as illustrative snapshots of its complexity.

This research is a part of a research program titled Island(er)s at the Helm: Co-creating Sustainable and Inclusive Solutions for Social Adaptation to Climate Challenges in the (Dutch) Caribbean, which is supported by funding from The Dutch Research Council (NWO), file number NWOCA.2019.021. It is important to note that these funding institutions did not play a role in the design of the research or the writing of this paper. The opinions expressed in this paper are independent and do not necessarily represent the perspectives of the funding organizations.

The research has been approved by the HREC TU Delft ethics committee with the reference number 3389.

During the preparation of this paper the author used Grammarly and ChatGPT to refine and improve the language and readability (copy-editing) of the writing. After using this tool, the author revised and edited the content as needed.

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