



Benefits of Community Voice: A Framework for Understanding Inclusion of Community Voice in HCI4D

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Community voice is widely used in computer-supported cooperative work (CSCW) and human-computer interaction (HCI) work with underserved communities. However, the term is unresolved, denoting disparate activities, methods, and phenomena that are at their most useful when combined. We argue for a rethink by setting out a more nuanced understanding of “community” and “voice”. Building on our own experiences of HCI for development (HCI4D) work and the existing literature, we propose a framework for the benefits it can bring to those who actively engage with communities as part of their work. This framework can be understood in terms of its four constituent benefits for CSCW and HCI4D practitioners: (i) understanding context, (ii) creating empathy, (iii) leveraging local skills and knowledge, and (iv) building trust and buy-in. We reflect on how an improved understanding of these benefits applies to three prior projects with women living in Bangladesh and discuss the issues and need for more work on community voice. Finally, we discuss how this more detailed perspective on community voice helps us understand power dynamics and polyvocal communities in development contexts.

CCS Concepts: • **Human-centered computing** → **HCI design and evaluation methods**; **Empirical studies in HCI**; • **Social and professional topics** → *Cultural characteristics*.

Additional Key Words and Phrases: HCI4D, Bangladesh, policymakers, decision-makers, digital innovation, international development

ACM Reference Format:

Manika Saha, Stephen Lindsay, Delvin Varghese, Tom Bartindale, and Patrick Olivier. 2023. Benefits of Community Voice: A Framework for Understanding Inclusion of Community Voice in HCI4D. *Proc. ACM Hum.-Comput. Interact.* 7, CSCW2, Article 325 (October 2023), 26 pages. <https://doi.org/10.1145/3610174>

1 INTRODUCTION

In the computer-supported cooperative work (CSCW) and HCI for development (HCI4D) projects, “community voice” is an oft-used but ill-defined concept. While the term evokes beneficial relationships, these are rarely detailed. In the field of development the rhetoric of organizations such as the World Bank suggests that community voice is an accountability approach that enhances citizen–government relationships improving service delivery [8]. However [18], criticisms include the approach acts as propaganda or serves preconceived agendas [85]: that communities are rarely

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2573-0142/2023/10-ART325

<https://doi.org/10.1145/3610174>

engaged in decision-making [22, 86], that bottom-up, participatory approaches are fleeting and unsustainable [18], and that top-down approaches to participation only support communities sharing what decision makers want to hear [127].

In HCI the concept of community voice is widely used in ethnography [58, 123, 156], participatory design [141], disability research [72], and international development [18, 55, 131]. Researchers and practitioners who enable community voice to elicit the articulations of interests, values, and constraints and see themselves as facilitators of knowledge production and exchange [62, 131]. Yet, whatever the good intentions, the fluidity of the definition of community voice is convenient for researchers who adopt the standpoint that it is an inherent good [69] as it allows almost any activity to be pointed to as an example of success [82]. In reality, community voice has been used to describe virtually any collective interaction with a target population [36, 69], and this imprecision in its use not only raises questions as to its benefits but also makes developing effective ways to design for it problematic.

Research highlights the need for a framework to understand the disparate failures of development initiatives to produce effective development outcomes [1, 26, 45, 68, 76, 109, 110, 149, 150, 155]. Our previous research showed us that although community voice is turned to in search of a gestalt effect to address these issues, it falls short. In three prior development projects, we encountered substantial challenges in understanding and realizing the benefits of local stakeholder communities' voices. Despite working with large organizations with commitments to hearing community voices, problems building trust with local communities, recognizing important contextual factors, understanding their perspectives, and not taking advantage of local skills and knowledge led to serious mistakes in project delivery. Our experiences have shown that sometimes a community voice can dramatically alter the course of a project, but it is not reliably heard.

Our intention is to reconsider community voice, starting with the conceptualization that underpins it, to look at the nature of organizational commitment to it and the techniques that are employed to realize it in the hopes that we can address these issues. Therefore, in this work, we aim to establish a better understanding of the benefits that community voice can bring so that HCI4D researchers can see where they are under-delivering and explore methodological changes. We develop an understanding of the nature of community voice, particularly that it is polyvocal and lacks consensus, to allow researchers to understand the community they work with, its authenticity, and conflicts within it.

This paper contributes to the discussion of community voice by delineating its meanings in CSCW and HCI for development: voice as medium, voice as input, and voice as dialogue. We show that these perspectives shape our conceptualization of a "community" and present a framework of four distinct benefits: (i) understanding the context of a community, (ii) creating empathy with stakeholders and a space to talk to them, (iii) leveraging the skills and knowledge of the community, and (iv) building trust and buy-in. We reflect on how these benefits were or were not realized in the three projects that motivated the creation of this framework. Finally, we consider how this new perspective on community voice helps us understand power dynamics and polyvocal communities in development contexts.

2 WHO IS THE COMMUNITY?

We engage critically with the problematic uses of the term community, acknowledging its descriptive weaknesses and masking assumptions. "Community" has been celebrated within participatory development frameworks [148], building upon Western assumptions about community dynamics, mutual regard, and continuity [101]. It conjures images of grateful subjects at the end of the development pipeline of charitable projects. However, the concept has rightly been criticized in participatory

research for its homogenizing tendencies and blurring of distinctions between stakeholders within groups of people whose significant commonality is simply spatial proximity [50].

External actors use the concept to further their own agendas. Nelson *et al.* have observed that community is a concept used by state and institutional powers more than by people themselves, and it carries connotations of consensus [94]. Mohan *et al.* highlight the dangers as thus: “actions based on consensus may actually empower the powerful vested interests that manipulated the research in the first place” [87]. Gujit found that representations of “community” interests muffle dissent and inequities [50]. Civil society consists of institutions built from a community, and they use the community’s loaded, problematic ideals of harmony and collaboration to erase conflict [77]. At the heart of the concept of community and how it interacts with civil society, there is a paradox: ‘community’ is presumed to exist already yet it requires governments and other developmental agents to ensure that it is improved [77]. Civil society actors affirm the notion of community and help improve it in contrast to the nature of human communities.

In HCI4D, participatory development approaches with communities are criticized on ontological and epistemological grounds for treating the “locals” as harmonious groups in which consensus is readily available [87]. In reality, dissensus is a critical element of a healthy community debate as consensus [13, 16, 153], so we must seek out debate and methodologically find ways to respond to diverse, even contradictory opinions. In practice, disagreements about the distribution of development support can have real-world consequences communities have retaliated against members because of disagreements [13]. The issue is not resolved simply by hearing and mediating between voices in a town hall. If participation is genuine, it probably brings conflict into the picture and the absence of conflict in participatory programs is suspicious [27, 147].

The terminology for people who live in marginalized contexts and receive assistance from development organizations is debated. Historically, development practitioners used the term beneficiaries. However, “to be a beneficiary implies a relational weakness to the benefactor. It also implies that what she receives is *beneficial* or good” [59]. Terms such as citizen, constituent, consumer, client, stakeholder, and partner are used by various development organizations but do not always capture the authentic relationship between development organizations and the individual. Some words appear too transactional (client, consumer); others too imprecise (constituent, stakeholder, partner); yet others appear exclusionary or constrained (citizens) [59, 142]. No single phrase can capture the complexities of the relationship that local populations in development contexts have with development organizations.

Despite its limitations, we draw on the term “community” to refer to populations who live in development contexts and are engaged directly or indirectly with development organizations. We use the term “community stakeholders” to draw particular attention to community members who are actively taking part in development activities and “local community” to draw attention to those who mainly share Gujit’s “spatial proximity” [50] and, in reality, may have their own needs or agendas that undermine the community stakeholders. We adopt a critical perspective and, when discussing our own examples, try to give the reader a sense of the authenticity of the stakeholder community. Do members of the community have rich, routine interactions with one another? Is the community a label of convenience applied by the development organization to delineate a target population? We argue that this distinction is needed to reflect the complex relationship between local populations and development organizations.

3 “VOICE”: A REVIEW

Over the past decade, HCI4D and related fields debated how to embed or hear, a voice in research with disadvantaged groups [141, 150]. The language used suggests that “community voice” should be clear, singular, directly observed and interrogable but this idealization hides considerations of

authenticity, accuracy, and accountability and leans into problematic assumptions about the community [50, 87]. Prior work sought to empower marginalized community "voice" [5, 14, 70, 73, 152] using a wide range of methods. In particular, participatory or co-design approaches that provide excellent techniques to empower some stakeholder voices are widely used and sometimes uncritically assumed to be hearing community voice [60]. However, these paradigms are profoundly entrenched in a European or North American workplace epistemology that embeds values, frameworks, and models that we know are not suitable for use in developing communities [60, 151, 152].

Researchers have echoed many times the relationship between voice and empowerment for disadvantaged communities [42, 51, 115, 116]. However, the narrative of empowerment itself can be problematic as it often obfuscates questions of who, within a local community, is being empowered. More critical researchers reflecting on their own work have highlighted how "empowerment" has masked economic, generational, and gender conflicts [28, 48] alongside political [48, 109] and religious ones [109] where empowering one group is seen, or can, disempower another. Digital divides can also determine who, in reality, is empowered by work [48, 109, 110], and more critical reflections lead to asking whether the voice of the participants or the voice of the facilitator is being heard [109, 114]. The issue is fraught as small changes to a design method can have a significant impact on participation, changing how much participants perceive a technology as being "for them" or excluding less literate participants [110]. Matristic design has proposed that these issues be addressed through understanding, participation, collaboration, sacredness, and cyclic renovation of life [48]. Other work echoes the need for ongoing engagement to actually empower participants [109, 114]. This combination of issues and solutions highlights the need to integrate local and cross-cultural design approaches such as storytelling, inclusive decision-making, and participatory community meetings [105, 106, 154]. Bidwell and Winschier, who frequently work with rural African and Indigenous communities, provide concrete case studies to show how classic participatory design and HCI4D work diverge stressing the need for new methods to understand and integrate community voice [153].

Broadly speaking, whether work defines itself as HCI4D, ICT4D, participatory design, or co-design with disadvantaged stakeholders, we observe three distinct perspectives taken on voice: (1) the *medium* of voice - the avenue we use to communicate (e.g. speech) - used to engage with stakeholders in design work or by the technology in ICT deployments [161]; (2) functional considerations around giving communities of stakeholders *input* into processes that affect them including the methods used to talk with them and analyze their contribution to derive direction from it [31]; or (3) *dialogue* opening up or democratizing project delivery that explicitly places decisions in the hands of the community and attempts to build consensus on project direction through discussions [3].

Each of the different uses of the term highlights different beneficial attitudes, techniques, and positions, but although there are projects that use "voice" to refer to multiple facets of community-facing work [79, 133, 139, 159], we observe a tendency for many projects to focus on one of the three uses of the term meaning they can lose sight of the other benefits. We envisage projects engaging throughout their life cycle in *ongoing* community voice. In the following sections, we examine each concept of voice in turn and discuss the benefits of the attitudes they embed. We consider how the three different areas relate to other work on voice and the ways in which they are mutually re-enforcing, showing why all three should be deployed in combination.

3.1 Voice as a *medium*

Development projects that conceptualize voice as a medium recognize that, for community stakeholders on the ground, their speech is typically their primary form of communication due to variable levels of literacy in their local community [161]. The practitioner who considers voice as a

medium sees it a means of verbal and non-verbal communication encompassing everything from body language cues through to a show-and-tell tour of a village in contextual inquiry. The use of the medium is motivated by recognition of the importance of oral tradition and the role that speech and storytelling play in many developing communities [105, 106, 118, 120, 154]. Emphasizing voice as a medium prioritizes making engagement with community stakeholders as free of barriers as possible. Work conducted in this way recognizes the importance of accessibility in project design and delivery and that literacy requirements are a barrier to useful engagement [14, 161, 162]. Written communication has its own distinct benefits, such as allowing for the creation of detailed artefacts that enshrine knowledge and decisions [52], that are traded away to remove barriers. Projects that are solely configured to use voice as a medium must contend with the removal of powerful tools to record knowledge driving the adaptations of methodological tools that assume literacy for less literate populations [21] and socio-technical tools that do the same for illiterate communities [110].

Prior work in HCI has emphasized the importance of taking a broad perspective on the medium of voice. For example, when working with people with autism, Wilson *et al.* found that the medium of voice included words, sounds, bodily movement, touch, gesture, play, and creativity [150]. When working with older adults, Leong *et al.* went further to frame the medium of voice as something that embeds the speakers' values within it [76]. Beyond methodological consideration, HCI4D projects examine speech-based technologies and the benefits of audio as input to engage marginalized participants [6, 107], designing community development spaces around participant speech input [128, 137] or technologies such as interactive voice response (IVR) platforms [97, 104, 107]. Traditional spaces have been reconfigured in projects such as CGNet which supports citizen journalism [79] and Root.io, which creates community radio [30] for audio-driven engagement.

3.2 Voice as an input

Other development works discuss the role that voice plays as an *input* into research or project organization [11, 31, 67]. These projects are discussed as a form of consultation with community stakeholders. This is important because their input is not typically sought, and when it is, the methods soliciting it are not well-enacted [31]. Following this approach recognizes that input from stakeholders is key to successful project delivery. Input can be realized through a diverse range of activities with stakeholders, including focus groups, workshops, town hall meetings, or voting on project agendas. These projects embody the idea that communities of stakeholders have some right to be heard in work that impacts their lives. However, when input neglects voice as a medium, the richness of the data gathered can be undermined [100], and when there is no dialogue, valuable insights can be lost or appear in the process when they are too late to act on [9, 18].

Input can be gathered by foregrounding qualitative data to emphasize their narratives [71]. Governments' surveys are often used in formulating development programs, so local communities are initially involved in sharing their needs and challenges but are not consulted during program and project designs [100]. In academic development work, Brown and Mickelson conducted a pilot project testing the use of smartphones to track children's health and development in Rwanda [18]. They conducted surveys within the local community to determine their needs but did not involve community stakeholders or health workers during the design. Without dialogue, they were unaware of cultural norms in Rwanda; for example, discussing food was taboo. This illustrates the limitations of voice as the only input mode alone. Finally, some projects seek out community voices after delivering their interventions, gathering rich voices but doing so too late to realize the benefits [9].

3.3 Voice as *dialogue*

Voice is also framed as a *dialogue* between practitioners and stakeholder communities, empowering them not only to influence but also direct development work [3, 89]. The practitioner in these approaches does not remove themselves from the design and delivery but instead participates in a dialogue with community stakeholders using reflexive tools to understand their own biases and insertions into the process [150]. The use of dialogue here is distinct from discussion, as dialogue implies a back and forth with an impact on the work [153]. The techniques used for dialogue are diverse though superficially similar to those used in capturing voice as an input, but the treatment of community voice is different, and so are the questions put to stakeholders [136].

Voice in these works is perceived as analogous to democratization or empowerment [39, 134], adopting the perspective that these are essential rights for stakeholders. This is true even when we see the underlying reason for allowing stakeholders to drive an agenda as something other than democratization's inherent value [2, 136]. However, these approaches can be problematic because they position the researcher as one with an agency in the process echoing challenges with the conceptualization of community [59]. When the researcher is absent after the completion of the project, this risks normalizing the agency being removed or revoked.

This challenge is addressed through the capabilities approach of development thinkers such as Amartya Sen's and through frameworks such as participatory rural appraisal or assets-based inclusive design [3]. Feminist approaches also pursue this, for example, by creating spaces for and with marginalized participants [2, 61, 68, 76, 149, 150]. These focus on dialogue with underserved communities. In the same way, that voice as a medium is not just about hearing other people speak, and voice as a dialogue is not literally about back-and-forth conversations [76]. Participatory design in developing contexts has also envisaged digital platforms for communication and information playing a critical role in enabling direct influence on political and social matters [39, 136, 141]. Sun presents "Culturally Localized User Experience (CLUE)" by advocating a dialogic view of local culture to satisfy cultural expectations to produce a usable and meaningful technology for local users [125].

Participatory design in developing contexts has also envisaged digital platforms for communication and information playing a critical role in enabling direct influence on political and social matters [39, 141]. Participatory design has been used as a tool to support activism, where participant voice can be an impetus for change in local settings such as hashtag activism in Bangladesh to advocate for victims of riverbank erosion [160]. Community arts and design projects also seek to emphasize the voice of a particular community through qualitative, highly participatory exercises, such as the rich tradition of maker space work in HCI [117, 133]. Telhan *et al.* combined voice as both medium and dialogue as they sought to have their community voice research led by a team of community researchers [133]. Another example of this ambivalence, where audio (speech) submissions from a community and their agency to make contributions are both characterized as voice, is seen in [139]. Brown *et al.*, while working with children with autism, had a commitment to participant voice, even when working with participants who were non-verbal or had difficulty communicating their feedback [19].

3.4 Takeaways

In "Why Voice Matters", Nick Couldry distinguishes between voice as a *process* and voice as a *value* [29]. This distinction between habits and practices expresses people's capacity to create their own narratives (process) and a sociocultural orientation or worldview that privileges and discriminates in favor of such processes (value) [29]. Our voice as input and dialogue builds on this to suggest that the process can be changed by the value perspective of the question put to the

stakeholder community. Our reflections on current practices in ICT4D suggest a need to separate voice as a medium because of its salience, privileging it over other forms of communication for less literate populations.

We argue that the three types of voice are best when combined [79, 159]. Voice as a medium respects less literate participants' contributions, as input that could be constrained to simple survey responses becomes nuanced when captured by talking with people. Voice as a medium democratizes dialogue between researchers and community members making agenda-setting authentic and useful. Understanding voice as a dialogue can, in a project, also make conversations with stakeholders more authentic: the practitioners ask meaningful questions while seeking input, and because they place the community member on an equal footing with the practitioner, the discussions have a respectful framing. Voice as an input could be viewed as an inferior version of voice as dialogue. However, from a practitioner's perspective, voice as an input allows for broad engagement with local communities, as far more people can be surveyed than "work-shopped". This validates the insights gained as many practitioners are involved in projects that work with communities of tens of thousands where there is no realistic way to share control with all of them. Voice as input allows them to have some influence on the process. Combining input and dialogue means taking broader community perspectives into account through literature or data gathering in the formation of community voice-driven projects.

Finally, we restate that our categorization can be problematic, as many HCI4D projects fit into multiple categories. Equally, however, existing uses of voice can share mutually exclusive ideals. In other words, there are tensions around how "voice" is understood, which should not surprise us considering the contextual applications in which community voice is understood and the divergent communities from which voice is solicited. However, ICT and HCI for development work have been criticized a lot as their paradigms such as participatory and co-design are profoundly entrenched in "Western" epistemology by European or North American workplaces through embedded values, frameworks and models [60, 152]. Winschier (2006) confirms that traditional PD was not suitable to apply with marginalized communities (such as rural African communities) [151] and highlights the need to integrate local and cross-cultural design approaches, such as storytelling, inclusive decision-making, and participatory community meetings [105, 106, 154]. Hence, Winschier and Bidwell, who broadly work for rural African and Indigenous communities, echoed many times the need for a redesign and meaningful lens to understand and interact with community voice in participatory design [153].

4 A FRAMEWORK TO UNDERSTAND BENEFITS OF COMMUNITY VOICE

Having tried to understand community and voice separately, we now construct a framework to delineate the benefits that can be gained by hearing a communities' voice. We developed the framework based on our experiences running numerous development projects and as designers grounded in experience centered design [81]. Despite many development organizations, we collaborated to acknowledge the importance of community voice, but the projects did not hear it consistently. Where we did hear it, the voice felt diluted, incomplete, or at the periphery of the project. We propose that a better understanding of these benefits can help reflexively engage with a community, identifying where project needs have subsumed the communities, where voices are constrained, or where they are being discounted. The framework was derived by identifying a range of benefits in literature and our own work and practice, workshoping them with the authors' research groups, and then collecting, organizing and refining them to arrive at a complete, condensed set describing the four benefits to hearing community voice: understanding context, creating empathy, leveraging local skills and expertise, and building trust.

Prior work has tried to systematize community voice capture using a range of methods ranging from methodologically focused ones such as storytelling, [114], dialogical probes [121], and respectful spaces [73] to socio-technical approaches incorporating touchscreens [109], photography [48], and mobile apps [110]. Participatory design has also proposed frameworks to hear voices within vulnerable groups in the Western world including vulnerable young adults [68] and children with autism [76, 149, 150]. Despite work in this area, most explorations call for more work in this space to explore ethical considerations [45, 111, 155], postcolonial feminist solidarity [61], power imbalance and political implications of development work [48, 155], wider contextual understanding [45, 155] and intervention sustainability [110].

Our framework differentiates itself by taking a broader perspective, focusing on the benefits of community voice that practitioners can look for in their own work. We offer a framework to critique the methods drawing on the qualitative research tradition of reflexivity [40]. A reflexive approach, by which we engage with the output of the project in process, facilitates methodological refinement [40], and better rigor in data collection [32], and helps address ethical conundrums as they occur [49, 111]. We do not recommend specific methods because HCI4D work is diverse, but we try to help practitioners identify absent benefits in a process. This strikes us as more valuable as it is hard to realize that something you are unaware of should be there when it is entirely absent.

4.1 Understanding context

Understanding context is critical to successful HCI4D projects and design work in general [81, 158]. Understanding context can be especially challenging for practitioners in HCI4D because contextual understandings arrived at in the lived environments of relatively privileged, educated and wealthy organizations do not reflect in underserved communities [143, 144] and we must be aware what we insert into our work. Context in development projects is enormous [4, 92]. Even when designing for tightly constrained, familiar settings, with access to numerous stakeholders, we are unlikely to find a single person who understands all the contextual factors. Instead, we rely on our own tacit understanding to fill the gaps. Community voice addresses the problem of scale and lack of individual understanding by allowing designers to take input from many individuals, allowing community stakeholders to focus on the process and explain, in simple oral accounts, the most pertinent parts of their context. This understanding should be developed didactically with the community because it can correct practitioners and even guide their attention to ensure that they do not become focused on trivial factors [17].

The specific contextual factors considered in development work could be reduced to all the observable realities of day-to-day life in those settings including culture, societal norms, natural environment, built environment, legal considerations, and economic factors to name a limited subset. However, context goes beyond this. As Dopson and Firlie (2008) suggest, we should see context as an *interactive process* that changes continuously and occurs in the environment in which an organization sits and acts rather than being a backdrop [34]. They explain context as a process at two levels: (i) *outer or external context* which refers to the social, economic, political, and competitive environment in which organizations and actors work and (ii) *inner context* where history, culture, and religious issues shape interventions. When understood as a dialogue, community voice supports the exploration of its contextual model because it is an ongoing process as well. Outer context can be understood through input from the local community and inner context through voice as a medium's tight interweaving of narrative and personal storytelling. In contrast, Lau *et al.* model the pragmatic contextual "barriers and facilitators" of interventions [74] arranged within a four-layer circle framework covering factors in the external context, institutional factors, professional factors and intervention level factors [74]. Although more reductive, it appeals to a practitioner perspective on community voice as the barriers and facilitators mesh with the reality

of realizing change in a project, when more nuanced understandings of context might seem a luxury.

Understanding Context Takeaways

- Context is *outer*: the local community, understood with their input, and *inner*: stakeholder communities, understood through voice as medium and dialogue.
- Practitioners have to insert their western assumptions into projects when trying to understand context, pretending they are neutral will harm a projects chances of success.
- Allowing community voice to guide the practitioner and project's attention to contextual factors corrects the most misaligned assumptions, going some way to addressing the problem.

4.2 Creating empathy

Empathizing with others means we develop a capacity to put ourselves in their place becoming better equipped to listen to them and gain insights into their lives [157]. Tremblay and Harria explain empathy as “one’s capacity to gain a grasp of the content of other people’s interests, and to explain what one thinks, does, or feels in relation to our capacity to respond to others ethically” [135]. Sultana makes a connection between emotions, subjectivity, and lived experience and argues for emotional political ecologies as “resource access, use, control, ownership and conflict are not only mediated through social relations of power, but also through emotional geographies where gendered subjectivities and embodied emotions constitute how nature–society relations are lived and experienced” [124]. We consider empathy in this context from a pragmatist-dialogical perspective [157] where it is an attitude and a skill allowing practitioners to understand the lived experiences of others and respond from their own lived experiences and insights while also being able to engage in dialogue with them negotiating complex social situations and hierarchies. Hearing the voices and lived experiences of others is essential when creating empathy regardless of the theoretical perspective adopted, as it creates a virtuous cycle because empathizing with others makes it easier for them to give voice to their lived experiences since they know it will be accepted by the listener.

We predominantly understand subjective lived experiences through storytelling as people express experiences and practitioners interpret them to provide meanings to the world [37]. The medium of voice is particularly important, as stories, reasoning, emotional reactions, and values are relayed through verbal and non-verbal communication. Methodologically, subjective lived experiences are the building blocks by which empathy is created. Subjectivity has been described as “one’s understanding of self and of what it means and feels like to exist within a specific place, time, or set of relationships” while they recognize that emotions “may often be triggered in response to power structures, and are frequently experienced in relation to whether one violates or meets expectations related to social norms” [88]. There is a complex, dynamic interplay between experience and expression “life as experienced, how the person perceives and ascribes meaning of what happens, drawing on previous experience and cultural repertoires; and life as told, how experience is framed and articulated in a particular context and to a particular audience” [37]. The medium of voice offers fertile starting grounds for these accounts as it allows people to tell their stories in their own words. To tackle voice poverty while focusing on power dynamics among marginalized rural Africans, Bidwell (2010) suggests designing an advanced storytelling process by framing design dialogically [54]), using cell phones to localize storytelling [14]. Others have gone as far as to suggest that storytelling in marginalized communities is an inherent good that gives community members a sense of well-being [78].

On a more cautionary note, Bruner pointed out that stakeholders’ “narratives are not transparent renditions of ‘truth’ but reflect a dynamic interplay of life, experience, and ‘stories’ and these can

provide valuable insights into how people deal with certain situations, challenges and what they actually feel” [20]. Ho adopts the opposite perspective, describing feelings as someone’s contextual and situational experiences reflected in their emotional constructs to build meaning in their social relationships and everyday lives [57]. Bruner’s dynamics interplay the acknowledgment of a divergence between truth and internal feeling, or experience and expression, helping us understand the inner life of a stakeholder while Ho makes no claims at all that subjective feelings are grounded in emotion, only that they reflect them in some way. Both show that, taken in isolation, subjective accounts can undermine our understanding of external contextual factors.

Creating Empathy Takeaways

- *Empathy*, pragmatically, is the attitude and skills to understand and respond ethically to the lived experiences and interests of others by engaging in socially aware dialogue.
- *Subjective lived experiences* are the building blocks of empathy, and storytelling and dialogue are fundamental components of eliciting and understanding these experiences.
- Listening to accounts of lived experience is part of hearing community voice: how people talk and how they negotiate, conceptualize, and prioritize their challenges and needs.
- Subjective accounts give unreliable insights into external contextual factors - community voice’s multiple accounts allow triangulation of the ‘truth’ of them and lived experiences.

4.3 Leveraging local knowledge and skills

The local knowledge of communities and their skills can provide transformational input into development projects but, while local knowledge is widely touted by researchers in this area [25], practical documentation of its application in HCI4D projects is harder to come by. Gachanga (2005) observes that “despite acknowledgment of the important role Indigenous knowledge plays in sustainable development and peace building, many governments, donors, and NGOs appear to make little use of this valuable resource. Their recognition of Indigenous knowledge often amounts to little more than lip service, seldom translating into action or funding” [44]. Skills that are frequently needed in the community include the ability to translate into participants’ languages [162], identify potentially interested community stakeholders [33], find suitable sites to deploy interventions, navigate local holidays and traditions [102] and deal with the logistics of bringing equipment into a local community and leaving it there [99]. In addition, more specific skills will be needed based on the specific nature of the intervention. We can broadly break these areas down into traditional knowledge, embedded knowledge, skills, resources and local expertise.

Local knowledge is often referred to using terms such as “traditional knowledge”, “Indigenous knowledge”, “lifelong learning” and “knowledge society” [41, 145]. More specifically, it is a collection of common and shared experiences and local concepts that are structured by the surroundings along with beliefs and perceptions to deal with problems, and generate new information [41]. Warren’s framing of Indigenous knowledge shows its value: “contrasts with the international knowledge system generated by universities, research institutions, and private firms. It is the basis for local level decision making in agriculture, health care, food preparation, education, natural resource management, and a host of other activities in rural communities” [146]. Similarly, Sithole notes that little Indigenous knowledge has been captured and recorded for preservation, yet it represents an immensely valuable database [119]. Their framing suggests that Indigenous knowledge is inherently unknown and new to research. These skills are passed on through word of mouth while local expertise is often identified through social networks. Battiste and Henderson, in describing the sharing of this knowledge, illustrate why community voice is particularly suited to learning about

it: “through personal communication and demonstrations from the teacher to the apprentice, from parents to children, from neighbor to neighbour” [10].

Beyond helping with practical considerations of deployment or process, local knowledge provides a starting point for educational intervention as there is little point in teaching people what they already know. The importance of Indigenous knowledge in agriculture for disadvantaged groups is hard to overstate. For example, floating gardens are an ancient practice for growing crops, vegetables and spices in the wetlands of the southern floodplains of Bangladesh [7]. Using local traditional knowledge for agricultural practice, in collaboration with a local development project, local communities have developed a technique to build floating platforms to cultivate crops, vegetables and farm fish. In 2015, the UN’s Food and Agricultural Organization declared Bangladesh’s floating gardens to be a globally important agricultural heritage system [126]. Awori *et al.* investigate how digital technologies support practicing Indigenous knowledge and suggest directions for innovations that translate, formulate and support Indigenous knowledge in transnational contexts[5].

Local Knowledge and Skills Takeaways

- *Local or Indigenous knowledge and skills* are structured by common experiences, local concepts, beliefs, and perceptions and is not a static repository but an always evolving system.
- The knowledge is inherently new to external parties and so it has transformational power for development projects to help addresses local problems.
- The evolving knowledge is distributed between many people, transferred semi-systematically and orally so ongoing, dialogical community voice is the only way to capture it.
- Development interventions can support Indigenous knowledge, and it provides a critical starting point for educational interventions.

4.4 Building trust and buy-in

HCI4D projects cannot make lasting, effective changes without trust and buy-in from the stakeholder community and, ideally, the wider local community [56, 63, 103]. Buy-in has an even more substantial impact when accompanied by direct support built on local skills and knowledge. Trust is necessary because of the leap of faith that is needed to engage with projects and believe they will have an impact [46]; because they touch on sensitive topics that require personal disclosures; and because they can place participants in vulnerable situations [162]. Trust strengthens optimism, engagement, and support for the project in the community. This effect is akin to the phenomenon of buy-in in participatory design which stresses the importance of selecting engaged co-designers [53, 113]. Trust acts as a moderator in discussions with participants, making it easier to develop empathy with them and access local skills and resources. In addition, if a project can foster trust it will be more likely to receive unexpected or unsolicited for support and direction [46].

Trust is not a simple concept in HCI4D. For example, Cheema calls it “a basic consensus among members of a society on collective values, priorities, and differences and on the implicit acceptance of the society in which they live” [24] but the inherent conflict in communities discussed by Gujit [50] and Mohan [87] undermine this definition. Alternatively, Blind’s model of trust, proposes two distinct types; “social trust” when a person has positive attitudes toward other members of their community and “political trust” when a person feels confident in and able to appraise or criticize the government and its associated institutions [15]. If the stakeholder community is authentic, can we find social trust within it? If not and it is a convenient abstraction, can social trust even exist? More widely, do members of the stakeholder community have social trust in their local community or are they excluded or disempowered? In the context of development work, we can

see that the project itself is a form of institution, and Blind’s “political trust” would then imply that building trust means that stakeholders have confidence in both the work of the project and the viability of criticizing it. Seeking a community voice in dialogue helps realize both of these qualities. Allowing participants to have constant input into the project and demonstrating accountability shows respect from the project team for the local community setting up a virtuous cycle that encourages further engagement [46, 93]. Hearing community voice as a medium also builds trust and allows participants to set project agendas [80, 98].

Trust and community buy-ins are widely supported in HCI4D literature and projects [47, 84, 96, 140]. However, gaining trust is pragmatically challenging as project leaders need to find ways to solicit and motivate early engagement with the project while at the same time managing community expectations and trying to achieve a genuine, positive impact. Beyond this, international development work is typically constrained by its funding; the work cannot continue outside of its scope without people in the stakeholder community taking up the mantle and ensuring its sustainability - something they will only do if they have bought into the concept. Examples of sustained buy-ins are relatively rare - in part because they happen after the project that would be most suited to documenting them has finished. When it does occur, we see computer skills taught in developing contexts [90], digital education centers [129], and citizen journalism [79] all outlasting the period of funding that established them.

Trust and Buy-in Takeaways

- HCI4D projects need *trust and buy-in* from the stakeholder and local community for effective and lasting change because it strengthens optimism, engagement, and support for the project.
- Trust acts as a moderator in discussions with communities, making it easier to develop empathy with them and gain access local skills and resources.
- Hearing community voice in dialogue is a virtuous cycle, it realizes accountability, shows respect to the local community, and gives confidence in the viability of criticizing the project.

5 APPLICATION OF COMMUNITY VOICE

We developed a community voice framework in response to the challenges that we encountered in our own work. In this section, we take a reflexive look at the projects that motivated the framework’s development and show how its application was, as we started to formulate it, or could have been, when not fully formalized, beneficial. Table 1 has summary descriptions of the three projects: “Small Fish and Nutrition (Small Fish project)”, “Improving Food Security of Women and Children by Enhancing Backyard and Small Scale Poultry Production in Southern Delta Region (Poultry project)” and “Participatory Research and Ownership with Technology, Information and Change (PROTIC project)”. The projects ran between 2010 and 2021 in collaboration with large development organizations in Bangladesh. They were focused on intervention rather than research. Two were supported by donations and one by a philanthropic endeavor, and all of them at least touched on the challenges women faced in their rural communities. The projects had mixed Western/Bangladeshi management teams, technical support teams and technology development teams but fieldwork was conducted primarily by local personnel. The Small Fish project tried to diversify food sources for rural fishing villages, the Poultry project provided chicken and poultry sheds for women farmers and the PROTIC project tried to increase women farmers’ access to agricultural information through smartphones. All the projects combined equipment and resource donations with information disseminated through posters, leaflets, and manuals for training leaders in the communities. In the PROTIC project, our role was to develop and implement an interactive mobile phone information system and responsive community “hub” in Bangladesh for isolated communities in sand islands

	Small Fish project	Poultry project	PROTIC project
Project goal	Increase house-hold income and improve nutrition	Empower women by improving financial independence, health and nutrition, increasing their social status	Empower women with smartphone technology
Project duration	2010-2013	2011-2016	2016-2021
Target stakeholders	2000 (male and women farmers)	7,000 women farmers	300 women farmers (each district had 100)
Project site (districts)	Rangpur, Dinajpur and Sylhet	Barisal	Rangpur, Sunamganj and Shatkhira
Funded by	International fund for Agricultural Development (IFAD)	USAID-funded UN project	Philanthropy fund

Table 1. Background information on three development projects in Bangladesh in which the authors were involved between 2010 and 2021 summarizing their purpose, scale, and funding source. Note: The three projects are old and tier project websites no longer exist.

(char) and coastal communities. In each case, we saw some successful improvements in social standing, economic capacity, and the decision-making power of women farmers in Bangladesh. In the Small Fish and Poultry projects we led in project design and high-level implementation.

The Small Fish project encountered several challenges that left us with questions about why certain issues had emerged. During the Poultry project, we were sensitized to the problems and so were able to interrogate them when they emerged but we did not understand why some of our efforts seemed to work and others did not. During the PROTIC project, we were able to begin to understand the challenges we faced as we developed the community voice framework and at the end of PROTIC, we formalized the framework. We go through each of the benefits of the community voice framework to reflect on how it could have helped us understand failures and successes in the work that motivated its development.

5.1 Contextual Understanding

In PROTIC, misunderstanding the *context* created burdens for our participants as a quarter of the women involved did not have electricity at home, and so had to pay others to charge the smartphones we gave them. The issues arose because the program decision makers missed elements of the infrastructure that formed the community's *outer context* because they went through two levels of intermediaries to find participants. Although their voices were heard by the local intermediary practitioners, this understanding did not move through the organizations managing the project. This speaks to the challenge of voice as a medium: while compelling and authentic, it is hard to

share within and between organizations when teams cannot hear the voice directly. We needed representatives from each organization on the ground to hear and relay the voices or community stakeholders present in project management roles.

PROTIC also found out too late that in rural Bangladesh, nothing is seen as women's property, so their mobile phones were accessible to relatives. Additionally, as these women came from low-literacy backgrounds and had never used smartphones before, they were not aware of mobile security issues and practices. Thus, keeping a mobile phone outside for charging saw some of their personal information stolen and used to blackmail them, and their Facebook accounts had inappropriate, edited photos that made them look naked posted to them, causing serious social and familial tensions. In stakeholder's families, there is a complex relationship context where women need to share updates on what they do, with whom they communicate, and for what purposes. This *inner contextual* challenge was not captured early enough in the formulation of the project meaning that its goals were fundamentally misaligned with day-to-day lives. In-depth discussions that dig down to the level of the inner-context are the only way to address these issues and we needed spaces for our practitioners to hear voices in one-to-one settings where sensitive issues of inner context can be raised without power dynamic constraints. The Small Fish project encountered a simple but unanticipated challenge in the *outer context* when the dried fish it used to support nutrition were rejected by stakeholder communities because they only ate fresh fish. We were told about the relevant contextual factor of a fresh fish based diet, but we had not registered its significance and the fact that dried fish's flavor, texture, and density made stakeholders feel sick.

5.2 Empathy and Insight

In contrast to the contextual challenges, PROTIC did succeed in creating *empathy and insight* because we heard stories that spoke to our communities' feelings when dealing with extrinsic expectations and stories that built vivid impressions of their lives. We heard stories of forced marriage, giving birth, days of unpaid work at home and in fields, being ordered around by husbands and other family members, and limited expectations of ever having something of their own, recreation time, or good food and clothes. Moderating our understanding of these vivid stories, we could understand *lived experiences* through discourse on internal views and motivations. One participant might explain her belief that God created this specific situation for her which allows her to take a deep sense of satisfaction in the hard labor that her life involves. By going through her extrinsic and actual experiences, she has a strong emotional attachment to her husband, children and even the livestock with whom she spends her daily life. This perspective leads to a substantially different framing of her lived experience, which was not obvious to Western practitioners who come from privileged backgrounds. All three of our projects worked with stakeholders in communities where domestic violence is commonly experienced and a significant number of stakeholders excused this, feeling it was their husbands' right to discipline them and that it comes from a part of the relationship they see as loving or caring. In Small Fish, we offered training in the mornings. Stakeholders valued this, but it clashed with the time they would usually do domestic chores. If they came for the training, we placed them at risk of domestic violence. We should have offered the training at non fixed times to avoid this risk. In general, hearing these stories was difficult for researchers grounded in Western values. While we did not believe the violence was acceptable, we could understand that empowerment as a means to avoid it would not initially motivate all the stakeholders to participate in the projects; it was better to focus on empowering them to support their families, an almost universal value among our stakeholders.

5.3 Local Knowledge and Skills

In the Poultry project we failed to explore the community experts' *local knowledge and skills*. Traditional poultry houses and project-funded poultry sheds were very different. Though the new sheds looked modern, the ventilation was inappropriate and the floor design was unsanitary so chickens became sick or died from preventable diseases. The community shared their insights, saying that they generally build sheds with bamboo, wood, and straw, for better ventilation and used polythene underneath the floor for easier cleaning and sanitizing. Voice as an input was lacking: we needed to capture more data from the community, focusing on technical challenges. Our mistake had been modeling community engagement as being about buy-in but not respecting the community's insights and expertise in the practical problems of their day-to-day lives. The Small Fish and Poultry projects both encountered a similar problem when they failed to integrate local knowledge into training material. The training materials they created were inappropriate because they assumed, far from reality, no initial knowledge of farming practice and were overly academic and long-winded while not acknowledging practical insights from the community. In addition, in some places, the academic guidance even seemed incorrect where it clashed with local knowledge. For example, a recommendation that seeds could be planted at any time of the day did not perform as well as planting pre-dawn, and a crop that we recommended be planted in direct sunlight performed better in the shade possibly because the local environment was hotter than the place where the training materials had been developed. We also saw the importance of extra time and attention when moving from voice as a medium for communication to a written form of communication. Finally, we observed that our process needed to more proactively find local experts who had many years of experience farming to solicit their input. These mistakes all stem from subsuming communities' needs under the project, as our work favored glossy training brochures and modern looking infrastructure over well-grounded solutions.

5.4 Trust and buy-in

As the PROTIC project, neared its completion, participants began to worry about the cessation of the support they had come to rely on. The project had given them the opportunity to phone a local telecoms call center to ask questions about agriculture, use an Internet search engine, or attend in-person training sessions. The project had been better sensitized to community voice by reflecting on our work through the nascent idea of the community voice framework and had some successes because of it so the community had come to *buy-in* to it. As a result they took the initiative to address the endpoint and go beyond the scope of the project. Those who could write started to document practices, training, and common questions and answers so they would not be lost at the end of the project. The practice became widespread, and some women started to become community hubs that others would go to for advice and support in setting up their own farms. The value that the project offered and the extensive dialogue between practitioners and stakeholders, and between stakeholders, created deep trust and buy-in and even meant that the project started to create its own authentic community. Participants who had only been united through the project's artificial women farmers concept now had reason to talk with one another and share support. The project relied on voice as a medium to communicate with its participants but when the limits of voice as a medium in storing information became a problem, we saw that the buy-in motivated our community to work past it. In contrast, problems with our community voice process undermined *trust* during the initiation of the Poultry project, leading to serious problems. The commissioners did not consult with the local leaders and communities when they hired a vendor who had limited experience working with the stakeholder community. The chickens distributed were not brought from the same community where the project was implemented and most of them did not survive

due to their susceptibility to local poultry diseases. Many of the project beneficiaries were frustrated because this risk was one that local people would have readily anticipated had they been asked, but because of a lack of trust, they did not feel empowered to volunteer their knowledge or correct our approach. This major failure wasted resources and was only corrected only by substantially more investment.

6 DISCUSSION

Community voice offers a tool to understand power dynamics but also suggests sensitivity to those dynamics and how they might play out. In our discussion, we reflect on how we can understand multiple communities overlapping with each other and the individuals within them holding their own values and goals. We start by discussing polyvocality as it applies to community voice and then consider how power dynamics play out through community voice in development work. Finally, we consider the historic lessons available to us about the usage of community voice and think briefly about where it might go in the future.

6.1 Community voice and polyvocality

Terminology matters. When using the term community voice, do we mean a collective singular voice or do we have a pluralistic understanding (community voices) [50, 87, 94]? We suggest that most projects have at least two communities, a “stakeholder community” and a “local community”. The “stakeholder community” voice needs to be understood in a nuanced way. Many international development efforts construct artificial communities where dis-empowered groups are targeted for support but part of the reason they are disempowered may be not having a community: a tightly interconnected social communications network [107]. This is not to say that these concepts lack value, but they do not always fit with, and are certainly not analogous to, existing local communities. Broadly speaking, we see two types of challenges in conceptualizing community voice: first, thinking of it too broadly, privileging gatekeepers or the local community for the sake of convenience and diluting the most important accounts of *lived experience* and undermining *trust* within the community; second, thinking too narrowly and limiting the potential to find *local skills and knowledge* or understand the *contextual factors* influencing the community’s life. Our community voice framework suggests a more thoughtful approach to who your community is and opens the idea of redefining it as you work while committing to hearing community stakeholders’ voices before major work, as part of understanding *context* and *creating empathy*. Thought of another way, *input* into the process is welcomed from all, but the *medium* of voice should be used with the stakeholder community and *dialogue* should allow them to exert control. However, engagement with the local community outside of direct stakeholders still has an enormous amount of value as they can contribute their *local skills and knowledge* and help understand *external contextual factors*.

In discussing polyvocality, we also need to acknowledge that some of the voices we hear are the researchers’ own, and we should not ignore this, reify, or delegitimize them. It is crucial to turn to reflexive and critical accounts with listening and dialogue to engage with the role of authorial voice and subjectivity when conducting community-based development [13, 35, 75, 108]. To understand the role of researchers’ voices in a more nuanced way we can look to the work of Taylor, who pointed to a shift to an “inside” from “right there”, embracing researchers’ subjectivity through their own voices [130]. Alternatively, Le Dantec and Fox suggest accounting for this researcher voice with work before the work (community-based design work) “to create productive partnerships in community settings: developing relationships, demonstrating commitments, and overcoming personal and institutional barriers” [75]. Taylor *et al.* focused on a mechanism of personal debriefing and reflexivity for design research documentation practice [132].

The PROTIC project considered a community too broadly and lost important insights into *inner context* as a result. The initial work sought out community leaders, successful women farmers who were wealthier and had higher social status, and their accounts of *lived experience* missed some of the problems other people were exposed to because of low socio-economic status. In the Poultry project, we had issues defining a community too widely and not recognizing and prioritizing the stakeholder group for that work. Agriculture extension officers within the communities we worked with were the primary source of information because they were easy to work with, had access to ICT and were able to drop in on meetings with the project team. They also provided quality *input* on many of the problems the women farmers experienced. However, they lacked expertise in the practical challenges of animal husbandry and our reliance on their voices meant that other members of the local community, and even the specific stakeholder community, did not *trust* us and were not empowered to correct mistakes the project made with poultry sheds and poultry purchases.

In contrast, the Small Fish project avoided problems of a community focus that was too wide or too narrow by reflecting on and changing our understanding of the stakeholder and local community voices based on what we heard. Initially, we talked with members of the stakeholder community and heard their accounts of health and nutrition challenges. Based on these accounts of *lived experiences*, we understood the many unique challenges they faced and identified local healthcare workers who had experience supporting people and an understanding of the medical reality of these problems. We expanded our understanding of the local community to include them, and talked with them to gain insights from their expertise about the specific problems and solutions available to the community. However, their input was broad, listing scores of problems, while talking with the stakeholder community clearly identified priorities for them.

6.2 Power dynamics in the community

We must carefully consider the most power-effective voices while identifying and prioritizing the voices of disadvantaged stakeholder communities to ensure that their voices are heard for decision-making [43]. Influential people in local communities may be political leaders, community leaders, representatives of local development organizations, religious leaders, or school teachers and doctors. These people have *inputs* to share for project development but may be focused on maintaining hierarchical structures in their communities, so sometimes powerful voices can suppress disadvantaged community voices [64]. However, they also have useful insights for the development of the stakeholder community and can add value. As a result, capturing their voices has two benefits: first, we can capture insightful perspectives, and second, we can map out whose voices could be a barrier to listening to a stakeholder community's voice and respecting their priorities for project development.

In the Small Fish project, during fieldwork, we found that our local NGO staff and gatekeepers had rich insights into women farmers' challenges and contexts which were very useful for project design. However, we also found that they influenced the stakeholder community to share specific problems and focus development on solutions to the issues they prioritized. Bidwell and Hardy similarly observed a dilemma in their fieldwork with rural villagers from South Africa and regional Indigenous Australia when they applied participatory design and ethnographic methods to amplify community voice [12]. They suggest that in enabling local participation, more consideration should be given to power structures and time investment within a community. In the field, we ensured that they had limited access to group activities as part of creating safe spaces for *dialogue* and ensuring that we developed *empathy*. We should capture the most power-effective voices in a siloed manner, limiting their access to community discussions. By maintaining silos during community consultation, the stakeholder group can suggest potential project commissioners, individuals

who are trustworthy and situated in the community and have insights that can produce better suggestions.

6.3 Cultural expectations of voices and gender

A particularly prevalent power dynamic that plays out between groups rather than individuals is community expectations of voice. In all of the projects we reflect on, there has been a strong sociocultural expectation that women have less of a voice to share their perceptions and less agency in decision-making than men. This is a widely reported challenge in international development [65, 66, 123] and any attempt to solicit community voices needs to actively counteract this if they want to gather rich accounts of *lived experience* from women participants. Other CSCW and HCI4D work highlights the importance of focusing on marginalized people's culture and language as a tool to keep face assumptions, cultural communication, and the potential repercussions in cross-cultural design in check [45, 83, 111, 152]. Our experiences suggest that we should understand and consider sociocultural contexts and cultural expectations before designing community engagement with special care to capture and understand disadvantaged community voices, as well as foster trust-enhancing relationships with those stakeholder communities.

Based on our practical experiences, when working with disadvantaged stakeholders, we must actively place the stakeholder communities' voices at the center of the process to *build trust*. We argue that we can ensure representative community views by capturing voices from diverse groups. However, we emphasize that disadvantaged communities for whom a development project or program is initiated need to be prioritized when capturing voices. By centering these marginalized community voices, we can move toward a more equitable society in which marginalized groups can be an integral part of the traditional, multisectoral decision-making stakeholders' platform for informing programs and policies. Hence, when designing community participation, project commissioners, for example, should center disadvantaged communities.

6.4 Moving beyond research and practice rhetoric

Participatory development has become development's current day orthodoxy [69]. Community voice needs to go beyond posturing and be actuated within research and project practice (cf. [36]). Traditionally, within development, numerous tools and techniques are subsumed within community voice approaches [82, 95] and participatory researchers draw on non-literate and oral communication [101]. Despite these accommodations, Mercer *et al.* state that "their [participants'] involvement in decision-making throughout the process is often questionable" [82]. While participation has been lauded and the inclusion of local people in decision-making has been strongly encouraged, it remains a buzzword that is rarely fully realized [95].

The history of community voice is not as virtuous as we might expect. Colonial governments valued community voice "as a safety valve to silence colonial subjects demanding space" [91]. Voice can be elicited in an instrumental manner, serving the interests of outsiders by outsourcing the need for project labor or time to the time-poor community. For instance, women with heavy domestic responsibilities may not be able to sustain large amounts of time away from home [147]. Furthermore, non-participation should be considered a legitimate form of participation because marginalized groups may not voice their interests due to low expectations of change "born out of a general sense of powerlessness or earlier disappointments" [147]. Despite this tainted past, community voice approaches have a positive effect within contemporary usage as a means of subverting the dominance of top-down strategies within international development and developing new ways of engaging local people in decision-making [69, 82].

The future of community voice cannot be predicted but new technology and current research shows that there may be exciting avenues to both support and develop it. Erete *et al.* argued that

social media platforms strengthen communities' voices by increasing avenues for civic engagement beyond offline activities [38]. Others have looked at community media (e.g., participatory video [9, 138]) and framed it explicitly as a way to enable communities to share their voice more effectively. Varghese *et al.* argued that social media platforms strengthen communities' voices by increasing avenues for found that community media can be a rich source of ongoing *ongoing* community voice through periodic community involvement in data collection [138]. Srinivasan and Burrell explore mobile phone use among fishers in Kerala by exploring historical, geographic, political and economic conditions on the importance of price information to fishers and economists [122]. Others like Saha *et al.* take a more holistic approach, including operational concerns around *capturing citizens' voices*, as well as taking into account the broader program and policy landscape, looking at how community voice can be incorporated within that [112]. Campbell and Cornish argue that the need for "transformative communication" to hear community voice in meaningful ways is also crucial by emphasizing both the development of a community's voice and the importance of enabling environments to be heard [23]. They suggest that "transformative communication" for voice needs to create democratic and accountable leadership and recognize the rights of disadvantaged people's social, economic and political empowerment.

6.5 Framework limitations

The projects we based this work on are located in regions of Bangladesh that have their own unique characteristics and challenges for international development work which might have influenced the framework's development. Most significantly, the need for an understanding of the benefits of polyvocal community voice might be especially pronounced when working in this context, as gender norms, religious norms, social hierarchies, and significant wealth-inequality are prevalent in the rural Bangladeshi communities that we worked with. Following from this, development organizations in this region might be particularly prescriptive in their engagements with local communities as well. Our research team included several people from Bangladesh, and they were, among other roles, primarily responsible for data collection, leading to two potential concerns. First, they did not have to overcome language barriers to work with the community, whereas in many other developing contexts, multiple languages are spoken in a single target community. Second, this might introduce its own oversight challenges in the on-the-ground discussions we have had with our stakeholders. Finally, in contrast with some other locales in which we have performed HCI4D work, the communities in Bangladesh held proportionate views on international development efforts, not particularly distrusting them while being aware of their shortcomings or weaknesses.

7 CONCLUSION

In this paper, we have discussed the oft-used metaphor of "community voice", critiquing the constituent terms of "community" and "voice". We followed this with a conceptualization of the different types of voice evident in HCI projects working with marginalized or underserved populations, followed by a breakdown of the benefits that hearing authentic community voices brings. We then critiqued our own projects and put forward considerations for CSCW and HCI researchers working with communities that are interested in engaging with a more nuanced understanding of community voice.

The history of CSCW and HCI for development is mixed, with as many prominent failures as successes. If CSCW and HCI for development researchers can make use of a more rounded concept of community voice, thinking of it as a process in their work that starts and ends with their target communities, we may see more projects reaching the golden standard of sustainable developmental interventions. The benefits of hearing community voice are not realized for a wide range of reasons

of which misunderstanding its nature and benefits is only one part. However, we hope that CSCW and HCI for development researchers will be more motivated and better equipped to argue for the benefits of community voice in their work with an understanding of it in place.

REFERENCES

- [1] Mark S Ackerman. 2000. The intellectual challenge of CSCW: The gap between social requirements and technical feasibility. *Human-Computer Interaction* 15, 2-3 (2000), 179–203.
- [2] Michael Ahmadi, Rebecca Eilert, Anne Weibert, Volker Wulf, and Nicola Marsden. 2020. Feminist Living Labs as Research Infrastructures for HCI: The Case of a Video Game Company. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA, 1–15. <https://doi.org/10.1145/3313831.3376716>
- [3] Veronica Ahumada-Newhart, J. Maya Hernandez, and Karla Badillo-Urquiola. 2021. A Call for Action: Conceptualizing Assets-Based Inclusive Design as a Social Movement to Address Systemic Inequities: An Assets-Based Inclusive Design Framework. *Conference on Human Factors in Computing Systems - Proceedings* 34 (2021). <https://doi.org/10.1145/3411763.3450368>
- [4] Yaw Anokwa, Thomas N Smyth, Divya Ramachandran, Jahanzeb Sherwani, Yael Schwartzman, Rowena Luk, Melissa Ho, Neema Moraveji, and Brian DeRenzi. 2009. Stories from the field: Reflections on HCI4D experiences. *Information Technologies & International Development* 5, 4 (2009), pp–101.
- [5] Kagonya Awori, Frank Vetere, and Wally Smith. 2015. Transnationalism, indigenous knowledge and technology: Insights from the Kenyan diaspora. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems*. 3759–3768.
- [6] Saminda Sundeepea Balasuriya, Laurianne Sitbon, Andrew A. Baylor, Maria Hoogstrate, and Margot Brereton. 2018. Use of voice activated interfaces by people with intellectual disability. In *Proceedings of the 30th Australian Conference on Computer-Human Interaction*. ACM, New York, NY, USA, 102–112. <https://doi.org/10.1145/3292147.3292161>
- [7] MoA Bangladesh. 2015. Globally Important Agricultural Heritage Systems (GIAHS) Site Proposal: Floating Garden Agricultural Practices in Bangladesh. *Ministry of Agriculture, Government of the People’s Republic of Bangladesh* (2015).
- [8] The World Bank. 2018. Engaging citizens for better development. Independent evaluation group. <https://ieg.worldbankgroup.org/evaluations/engaging-citizens-better-development-results>.
- [9] Tom Bartindale, Delvin Varghese, Guy Schofeld, and Miki Tsukamoto. 2019. Our story: Addressing challenges in development contexts for sustainable participatory video. In *Conference on Human Factors in Computing Systems - Proceedings*. 1–12. <https://doi.org/10.1145/3290605.3300667>
- [10] Marie Battiste, James Youngblood, et al. 2000. *Protecting Indigenous knowledge and heritage: A global challenge*. ubc Press.
- [11] Rosanna Bellini, Patrick Olivier, and Rob Comber. 2018. “That Really Pushes My Buttons”. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*, Vol. 2018-April. ACM, New York, NY, USA, 1–14. <https://doi.org/10.1145/3173574.3173809>
- [12] Nicola Bidwell and Dianna Hardy. 2009. Dilemmas in situating participation in rural ways of saying. In *Proceedings of the 21st Annual Conference of the Australian Computer-Human Interaction Special Interest Group: Design: Open 24/7*. 145–152.
- [13] Nicola J Bidwell. 2009. Anchoring design in rural customs of doing and saying. In *IFIP Conference on Human-Computer Interaction*. Springer, 686–699.
- [14] Nicola J Bidwell, Thomas Reitmaier, Gary Marsden, and Susan Hansen. 2010. Designing with mobile digital storytelling in rural Africa. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 1593–1602.
- [15] Peri K Blind. 2007. Building trust in government in the twenty-first century: Review of literature and emerging issues. In *7th Global Forum on Reinventing Government Building Trust in Government*, Vol. 2007. UNDESA Vienna, 26–29.
- [16] David Bohm, Peter M Senge, and Lee Nichol. 2004. *On dialogue*. Routledge.
- [17] Eduard A Brett. 2003. Participation and accountability in development management. *The journal of development studies* 40, 2 (2003), 1–29.
- [18] Suzana Brown and Alan Mickelson. 2019. Why some well-planned and community-based ICTD interventions fail. *Information Technologies & International Development* 15 (2019), 13.
- [19] Scott Andrew Brown, David Silvera-Tawil, Petra Gemeinboeck, and John McGhee. 2016. The case for conversation. In *Proceedings of the 28th Australian Conference on Computer-Human Interaction - OzCHI '16*. ACM Press, New York, New York, USA, 605–613. <https://doi.org/10.1145/3010915.3010934>
- [20] Edward M Bruner. 1986. Experience and its expressions. *The anthropology of experience* 3, 1 (1986), 32.
- [21] Daniel G Cabrero. 2014. Participatory design of persona artefacts for user eXperience in non-WEIRD cultures. In *Proceedings of the 13th Participatory Design Conference: Short Papers, Industry Cases, Workshop Descriptions, Doctoral*

Consortium papers, and Keynote abstracts-Volume 2. 247–250.

- [22] Larissa Calancie, Leah Frerichs, Melinda M Davis, Eliana Sullivan, Ann Marie White, Dorothy Cilenti, Giselle Corbie-Smith, and Kristen Hassmiller Lich. 2021. Consolidated Framework for Collaboration Research derived from a systematic review of theories, models, frameworks and principles for cross-sector collaboration. *PLoS one* 16, 1 (2021), e0244501.
- [23] Catherine Campbell and Flora Cornish. 2012. How can community health programmes build enabling environments for transformative communication? Experiences from India and South Africa. *AIDS and Behavior* 16, 4 (2012), 847–857.
- [24] G Shabbir Cheema. 2013. Building trust in government: An introduction. (2013).
- [25] Marshini Chetty and Rebecca E Grinter. 2007. HCI4D: HCI challenges in the global south. In *CHI'07 extended abstracts on Human factors in computing systems.* 2327–2332.
- [26] Jessica Cohen and William Easterly. 2010. What Works in Development?: Thinking Big and Thinking Small. (2010).
- [27] Andrea Cornwall. 2011. *Locating Citizen Participation*. Technical Report. Institute of Development Studies. <https://doi.org/10.1360/zd-2013-43-6-1064>
- [28] Andrea Cornwall. 2016. Women's empowerment: What works? *Journal of International Development* 28, 3 (2016), 342–359.
- [29] Nick Couldry. 2010. *Why Voice Matters: Culture and Politics After Neoliberalism*. SAGE Publications. <https://doi.org/10.4135/9781446269114>
- [30] Chris Csikszentmihályi and Jude Mukundane. 2015. RootIO - Platform Design for Civic Media. *Research Through Design March* (2015), 25–27. <https://doi.org/10.6084/m9.figshare.1328001.RootIO>
- [31] Jiamin Dai and Karyn Moffatt. 2021. Surfacing the Voices of People with Dementia: Strategies for Effective Inclusion of Proxy Stakeholders in Qualitative Research. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA, 1–13. <https://doi.org/10.1145/3411764.3445756>
- [32] Wesam Darawsheh. 2014. Reflexivity in research: Promoting rigour, reliability and validity in qualitative research. *International journal of therapy and rehabilitation* 21, 12 (2014), 560–568.
- [33] David Dodman and Diana Mitlin. 2013. Challenges for community-based adaptation: discovering the potential for transformation. *Journal of International Development* 25, 5 (2013), 640–659.
- [34] Sue Dopson, Louise Fitzgerald, and Ewan Ferlie. 2008. Understanding change and innovation in healthcare settings: reconceptualizing the active role of context. *Journal of change management* 8, 3-4 (2008), 213–231.
- [35] P Dourish. 2006. Implications for design, Proceedings of CHI'06. In *The SIGCHI Conference on Human Factors in Computing Systems (Montreal, Quebec, Canada, April 22–27, 2006)*. ACM Press New York, 541–550.
- [36] Andy Dow, John Vines, Toby Lowe, Rob Comber, and Rob Wilson. 2017. What Happens to Digital Feedback?. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, Vol. 2017-Janua. ACM, New York, NY, USA, 5813–5825. <https://doi.org/10.1145/3025453.3025943>
- [37] Marita Eastmond. 2007. Stories as lived experience: Narratives in forced migration research. *Journal of refugee studies* 20, 2 (2007), 248–264.
- [38] Sheena Erete, Jessa Dickinson, Alejandra C. Gonzalez, and Yolanda A. Rankin. 2022. Unpacking the Complexities of Community-led Violence Prevention Work. In *CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA, 1–15. <https://doi.org/10.1145/3491102.3502122>
- [39] Marie Ertner, Anne Mie Kragelund, and Lone Malmberg. 2010. Five enunciations of empowerment in participatory design. In *Proceedings of the 11th Biennial Participatory Design Conference on - PDC '10*. ACM Press, New York, New York, USA, 191. <https://doi.org/10.1145/1900441.1900475>
- [40] Linda Finlay. 2002. Negotiating the swamp: the opportunity and challenge of reflexivity in research practice. *Qualitative research* 2, 2 (2002), 209–230.
- [41] Food and Agriculture Organization. 2005. WHAT IS LOCAL KNOWLEDGE. BUILDING ON GENDER, AGROBIODIVERSITY AND LOCAL KNOWLEDGE. (2005).
- [42] Paulo Freire. 2013. *Pedagogy of the oppressed*. Routledge.
- [43] Paulo Freire. 2018. *Pedagogy of the oppressed*. Bloomsbury publishing USA, New York, NY, US.
- [44] Timothy Gachanga. 2005. Education for peace in Kenya: Indigenous peace traditions and the millennium development goals. *At Issue Ezine* 1 (2005).
- [45] Aakash Gautam, Chandani Shrestha, Deborah Tatar, and Steve Harrison. 2018. Social photo-elicitation: The use of communal production of meaning to hear a vulnerable population. *Proceedings of the ACM on Human-Computer Interaction* 2, CSCW (2018), 1–20.
- [46] Lucy Gilson. 2003. Trust and the development of health care as a social institution. *Social science & medicine* 56, 7 (2003), 1453–1468.
- [47] Ulrike Gretzel. 2021. Smart tourism development. In *Tourism in development: Reflective essays*. CABI Wallingford UK, 159–168.

- [48] Margarita Grinko, Tanja Ertl, Konstantin Aal, and Volker Wulf. 2021. Transitions by methodology in human-wildlife conflict-reflections on tech-based reorganization of social practices. *Proceedings of the LIMITS 21* (2021).
- [49] Marilys Guillemain and Lynn Gillam. 2004. Ethics, reflexivity, and “ethically important moments” in research. *Qualitative inquiry* 10, 2 (2004), 261–280.
- [50] Irene Gujit and Meera Kaul Shah. 1998. *The Myth of Community*. Vistaar Publications, New Delhi, India. <https://doi.org/10.3362/9781780440309>
- [51] Anita Gurumurthy. 2018. Where is the ‘struggle’ in communications for social progress? *Global media and communication* 14, 2 (2018), 193–200.
- [52] Nicolai Brodersen Hansen and Peter Dalsgaard. 2012. The productive role of material design artefacts in participatory design events. In *Proceedings of the 7th Nordic Conference on Human-Computer Interaction: Making Sense Through Design*. 665–674.
- [53] Christina Harrington, Sheena Erete, and Anne Marie Piper. 2019. Deconstructing community-based collaborative design: Towards more equitable participatory design engagements. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–25.
- [54] John Hartley and Kelly McWilliam. 2009. *Story circle: Digital storytelling around the world*. John Wiley & Sons.
- [55] Richard Heeks and Molla Alemayehu. 2009. Impact assessment of ICT-for-development projects: A compendium of approaches. *Development Informatics working paper* 36 (2009).
- [56] Kenneth C Hergenrather, Steve Geishecker, Glenn Clark, and Scott D Rhodes. 2013. A pilot test of the HOPE Intervention to explore employment and mental health among African American gay men living with HIV/AIDS: Results from a CBPR study. *AIDS Education and Prevention* 25, 5 (2013), 405.
- [57] Elaine Lynn-Ee Ho. 2009. Constituting citizenship through the emotions: Singaporean transmigrants in London. *Annals of the Association of American Geographers* 99, 4 (2009), 788–804.
- [58] Melissa R Ho, Thomas N Smyth, Matthew Kam, and Andy Dearden. 2009. Human-computer interaction for development: The past, present, and future. *Information Technologies & International Development* 5, 4 (2009), pp–1.
- [59] Renee Ho. 2015. Do you still use the word “beneficiary”? – Feedback Labs. <https://feedbacklabs.org/blog/do-you-still-use-the-word-beneficiary/>. [Online; accessed 2020-08-02].
- [60] Isaac Holeman, Edwin Blake, Melissa Densmore, Maletsabisa Molapo, Fiona Ssozi, Elizabeth Goodman, Indrani Medhi Thies, and Susan Wyche. 2017. Co-design across borders special interest group. In *Proceedings of the 2017 CHI conference extended abstracts on human factors in computing systems*. 1318–1321.
- [61] Azra Ismail and Neha Kumar. 2018. Engaging solidarity in data collection practices for community health. *Proceedings of the ACM on Human-Computer Interaction* 2, CSCW (2018), 1–24.
- [62] Ashley Taylor Jaffee. 2016. Community, Voice, and Inquiry: Teaching Global History for English Language Learners. *The Social Studies* 107, 3 (2016), 89–101. <https://doi.org/10.1080/00377996.2016.1140626>
- [63] Justin Jagosh, Paula L Bush, Jon Salsberg, Ann C Macaulay, Trish Greenhalgh, Geoff Wong, Margaret Cargo, Lawrence W Green, Carol P Herbert, and Pierre Pluye. 2015. A realist evaluation of community-based participatory research: partnership synergy, trust building and related ripple effects. *BMC public health* 15, 1 (2015), 1–11.
- [64] Naila Kabeer. 1994. *Reversed realities: Gender hierarchies in development thought*. Verso.
- [65] Naila Kabeer. 1996. Agency, well-being & inequality: Reflections on the gender dimensions of poverty. *IDS bulletin* 27, 1 (1996), 11–21.
- [66] Naila Kabeer. 1997. Women, wages and intra-household power relations in urban Bangladesh. *Development and change* 28, 2 (1997), 261–302.
- [67] Marije Kanis, Saskia Robben, Judith Hagen, Anne Bimmerman, Natasja Wagelaar, and Ben Kroese. 2013. Sensor Monitoring in the Home: Giving Voice to Elderly People. In *Proceedings of the ICTs for improving Patients Rehabilitation Research Techniques*. IEEE, 97–100. <https://doi.org/10.4108/icst.pervasivehealth.2013.252060>
- [68] Anne Marie Kanstrup and Pernille Bertelsen. 2016. Bringing New Voices to Design of Exercise Technology: participatory design with vulnerable young adults. In *Proceedings of the 14th Participatory Design Conference: Full papers-Volume 1*. 121–130.
- [69] Ilan Kapoor. 2005. Participatory development, complicity and desire. *Third World Quarterly* 26, 8 (2005), 1203–1220. <https://doi.org/10.1080/01436590500336849>
- [70] Naveena Karusala, Aditya Vishwanath, Arkadeep Kumar, Aman Mangal, and Neha Kumar. 2017. Care as a resource in underserved learning environments. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (2017), 1–22.
- [71] Susanne Kirchner, Jessica Schroeder, James Fogarty, and Sean A. Munson. 2021. “They don’t always think about that”: Translational Needs in the Design of Personal Health Informatics Applications. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA, 1–16. <https://doi.org/10.1145/3411764.3445587>

- [72] Reuben Kirkham, Romeo Ebassa, Kyle Montague, Kellie Morrissey, Vasilis Vlachokyriakos, Sebastian Weise, and Patrick Olivier. 2017. WheelieMap: an exploratory system for qualitative reports of inaccessibility in the built environment. In *Proceedings of the 19th International Conference on Human-Computer Interaction with Mobile Devices and Services*. 1–12.
- [73] Lindah Kotut and D Scott McCrickard. 2022. Winds of Change: Seeking, Preserving, and Retelling Indigenous Knowledge Through Self-Organized Online Communities. In *CHI Conference on Human Factors in Computing Systems*. 1–15.
- [74] Rosa Lau, Fiona Stevenson, Bie Nio Ong, Krysia Dziedzic, Shaun Treweek, Sandra Eldridge, Hazel Everitt, Anne Kennedy, Nadeem Qureshi, Anne Rogers, et al. 2015. Achieving change in primary care—causes of the evidence to practice gap: systematic reviews of reviews. *Implementation Science* 11, 1 (2015), 1–39.
- [75] Christopher A Le Dantec and Sarah Fox. 2015. Strangers at the gate: Gaining access, building rapport, and co-constructing community-based research. In *Proceedings of the 18th ACM conference on computer supported cooperative work & social computing*. 1348–1358.
- [76] Tuck Wah Leong and Toni Robertson. 2016. Voicing values: laying foundations for ageing people to participate in design. In *Proceedings of the 14th Participatory Design Conference: Full papers-Volume 1*. 31–40.
- [77] Tania Murray Li. 2007. *The will to improve: Governmentality, development, and the practice of politics*. Duke University Press.
- [78] Dianna Madden, Yvonne Cadet-James, Felecia Watkin-Lui, and Ian Atkinson. 2012. Healing through ICT: Enhancing wellbeing in an Aboriginal community. *Journal of Tropical Psychology* 2 (2012).
- [79] Meghana Marathe, Jacki O’Neill, Paromita Pain, and William Thies. 2015. Revisiting CGNet Swara and its impact in rural India. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development - ICTD ’15*. ACM Press, New York, New York, USA, 1–10. <https://doi.org/10.1145/2737856.2738026>
- [80] Megh Marathe, Jacki O’Neill, Paromita Pain, and William Thies. 2015. Revisiting CGNet Swara and its impact in rural India. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development*. 1–10.
- [81] John McCarthy and Peter Wright. 2004. Technology as experience. *interactions* 11, 5 (2004), 42–43.
- [82] Jessica Mercer, Ilan Kelman, Kate Lloyd, and Sandie Suchet-pearsen. 2008. Reflections on use of participatory research for disaster risk reduction. *Area* 40, 2 (2008), 172–183.
- [83] Samantha Merritt and Shaowen Bardzell. 2011. Postcolonial language and culture theory for HCI4D. In *CHI’11 Extended Abstracts on Human Factors in Computing Systems*. 1675–1680.
- [84] IA Meyer and PR Gent. 2016. The status of ICT in education in South Africa and the way forward. *National Education Collaboration Trust* (2016).
- [85] Victoria J Michener. 1998. The participatory approach: contradiction and co-option in Burkina Faso. *World development* 26, 12 (1998), 2105–2118.
- [86] Beth Milton, Pamela Attree, Beverley French, Sue Povall, Margaret Whitehead, and Jennie Popay. 2012. The impact of community engagement on health and social outcomes: a systematic review. *Community Development Journal* 47, 3 (2012), 316–334.
- [87] Giles Mohan and Kristian Stokke. 2000. Participatory Development and Empowerment: The Dangers of Localism. *Third World Quarterly* 21, 2 (2000), 247–268. <https://www.jstor.org/stable/3993419>
- [88] Margaret C Morales and Leila M Harris. 2014. Using subjectivity and emotion to reconsider participatory natural resource management. *World Development* 64 (2014), 703–712.
- [89] Anna Moutafidou and Tharrenos Bratitsis. 2018. Digital storytelling. In *Proceedings of the 8th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-exclusion*. ACM, New York, NY, USA, 219–226. <https://doi.org/10.1145/3218585.3218684>
- [90] Donna Musiyandaka, Gideon Ranga, and Jacqueline Fungai Kiwa. 2013. An analysis of factors influencing success of ICT4D projects: a case study of the Schools Computerisation Programme in Mashonaland West Province, Zimbabwe. *The Journal of Community Informatics* 9, 4 (2013).
- [91] Pradeep Narayanan. 2004. Empowerment through participation: How effective is this approach? *Economic and Political Weekly* 38 (2004), 2484–2486. Issue 25.
- [92] Haslinda Sutan Ahmad Nawi, Azizah Abdul Rahman, and Othman Ibrahim. 2011. Government’s ICT project failure factors: A revisit. In *2011 International Conference on Research and Innovation in Information Systems*. IEEE, 1–6.
- [93] Timothy Neate, Aikaterini Bourazeri, Abi Roper, Simone Stumpf, and Stephanie Wilson. 2019. Co-created personas: Engaging and empowering users with diverse needs within the design process. In *Proceedings of the 2019 CHI conference on human factors in computing systems*. 1–12.
- [94] Nici Nelson and Susan Wright. 1995. *Power and participatory development: theory and practice*. ITDG Publishing.
- [95] Rachel Pain and Peter Francis. 2003. Reflections on participatory research. *Area* 35, 1 (2003), 46–54. <https://doi.org/10.1111/1475-4762.00109>

- [96] Marlon Parker, Julia Wills, and Gary Wills. 2013. RLabs: A South African perspective on a community-driven approach to community information. *Journal of Community Informatics* 9, 3 (2013).
- [97] Neil Patel, Deepti Chittamuru, Anupam Jain, Paresh Dave, and Tapan S Parikh. 2010. Avaaj Otalo: a field study of an interactive voice forum for small farmers in rural India. In *Proceedings of the 28th International Conference on Human Factors in Computing Systems - CHI '10*. 733–742. <https://doi.org/10.1145/1753326.1753434>
- [98] Neil Patel, Deepti Chittamuru, Anupam Jain, Paresh Dave, and Tapan S Parikh. 2010. Avaaj otalo: a field study of an interactive voice forum for small farmers in rural india. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 733–742.
- [99] Jennifer Pearson, Simon Robinson, Thomas Reitmaier, Matt Jones, Shashank Ahire, Anirudha Joshi, Deepak Sahoo, Nimish Maravi, and Bhakti Bhikne. 2019. StreetWise: Smart speakers vs human help in public slum settings. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 1–13.
- [100] Bridget Pratt. 2019. Inclusion of marginalized groups and communities in global health research priority-setting. *Journal of Empirical Research on Human Research Ethics* 14, 2 (2019), 169–181.
- [101] Sarah Radcliffe. 2016. Civil Society: Management, Mismanagement and Informal Governance. In *The Palgrave Handbook of International Development*. Springer, 227–242.
- [102] SU Rahman and David K Smith. 1999. Deployment of rural health facilities in a developing country. *Journal of the Operational Research Society* 50, 9 (1999), 892–902.
- [103] Anita Raj, Anindita Dasgupta, Irviene Goldson, Dumas Lafontant, Elmer Freeman, and Jay G Silverman. 2014. Pilot evaluation of the Making Employment Needs [MEN] Count intervention: Addressing behavioral and structural HIV risks in heterosexual Black men. *AIDS care* 26, 2 (2014), 152–159.
- [104] Aa Raza, Farhan Ul Haq, and Zain Tariq. 2013. Job opportunities through entertainment: virally spread speech-based services for low-literate users. In *Proceedings of the ...*, Vol. 2803. 10–1145. <https://doi.org/10.1145/2470654.2481389>
- [105] Thomas Reitmaier, Nicola J Bidwell, and Gary Marsden. 2011. Situating digital storytelling within African communities. *International Journal of Human-Computer Studies* 69, 10 (2011), 658–668.
- [106] Thomas Reitmaier, Nicola J Bidwell, JS Siya, Gary Marsden, and William D Tucker. 2012. Communicating in designing an oral repository for rural African villages. (2012).
- [107] Dan Richardson, Bronwyn Cumbo, Tom Bartindale, Delvin Varghese, Manika Saha, Pratyasha Saha, Syed Ishtiaque Ahmed, Gillian C Oliver, and Patrick Olivier. 2022. Critically Engaging with Embedded Values through Constrained Technology Design. In *DIS '22: Proceedings of the 2022 ACM Designing Interactive Systems Conference*. ACM, New York, NY, USA.
- [108] Jennifer Rode. 2011. Reflexivity in digital anthropology. 123–132.
- [109] Sarah Rüller, Konstantin Aal, Simon Holdermann, Peter Tolmie, Andrea Hartmann, Markus Rohde, Martin Zillinger, and Volker Wulf. 2021. ‘Technology is everywhere, we have the opportunity to learn it in the valley’: the appropriation of a socio-technical enabling infrastructure in the Moroccan high atlas. *Computer Supported Cooperative Work (CSCW)* (2021), 1–40.
- [110] Sarah Rüller, Konstantin Aal, Peter Tolmie, Andrea Hartmann, Markus Rohde, and Volker Wulf. 2022. Speculative design as a collaborative practice: Ameliorating the consequences of illiteracy through digital touch. *ACM Transactions on Computer-Human Interaction* 29, 3 (2022), 1–58.
- [111] Manika Saha, Tom Bartindale, Sharifa Sultana, Gillian Oliver, Shakuntala Haraksingh Thilsted, Syed Ishtiaque Ahmed, Delvin Varghese, and Patrick Olivier. 2022. Pictorial Consent: Fieldwork Reflections. In *Proceedings of 20th European Conference on Computer-Supported Cooperative Work*. European Society for Socially Embedded Technologies (EUSSET).
- [112] Manika Saha, Delvin Varghese, Tom Bartindale, Shakuntala Haraksingh Thilsted, Syed Ishtiaque Ahmed, and Patrick Olivier. 2022. Towards Sustainable ICTD in Bangladesh : Understanding the Program and Policy Landscape and its Implications for CSCW and HCI. In *Proceedings of the ACM on Human-Computer Interaction*, Vol. 6. ACM, New York, NY, USA. <https://doi.org/10.1145/3512973>
- [113] Elizabeth B-N Sanders and Pieter Jan Stappers. 2008. Co-creation and the new landscapes of design. *Co-design* 4, 1 (2008), 5–18.
- [114] Nitin Sawhney. 2009. Voices beyond walls: the role of digital storytelling for empowering marginalized youth in refugee camps. In *Proceedings of the 8th international conference on interaction design and children*. 302–305.
- [115] Joshua Schwab-Cartas and Claudia Mitchell. 2014. A tale of two sites: Cellphones, participatory video and indigeneity in community-based research. *McGill Journal of Education/Revue des sciences de l'éducation de McGill* 49, 3 (2014), 603–620.
- [116] Gita Sen. 1997. Empowerment as an Approach to Poverty. *Human Development Report* 97 (1997).
- [117] Ryoung Seo-Zindy and Richard Heeks. 2017. Researching the emergence of 3D printing, makerspaces, hackerspaces and fablabs in the global south: a scoping review and research agenda on digital innovation and fabrication networks. *The Electronic Journal of Information Systems in Developing Countries* 80, 1 (2017), 1–24.

- [118] Daniel Sinnig, Kristina Pitula, Richard Becker, Thiruvengadam Radhakrishnan, and Peter Forbrig. 2010. Structured digital storytelling for eliciting software requirements in the ICT4D domain. In *IFIP Human-Computer Interaction Symposium*. Springer, 58–69.
- [119] Jabulani Sithole. 2007. The challenges faced by African libraries and information centres in documenting and preserving indigenous knowledge. *IFLA journal* 33, 2 (2007), 117–123.
- [120] Alessandro Soro, Margot Brereton, Anita Lee Hong, and Paul Roe. 2015. Bi-cultural content publication on a digital noticeboard: a design and cultural differences case study. In *Proceedings of the Annual Meeting of the Australian Special Interest Group for Computer Human Interaction*. 217–221.
- [121] Alessandro Soro, Margot Brereton, Jennyfer Lawrence Taylor, Anita Lee Hong, and Paul Roe. 2016. Cross-cultural dialogical probes. In *Proceedings of the first African conference on human computer interaction*. 114–125.
- [122] Janaki Srinivasan and Jenna Burrell. 2015. On the importance of price information to fishers and to economists: Revisiting mobile phone use among fishers in Kerala. *Information Technologies & International Development* 11, 1 (2015), pp–57.
- [123] Alam M Sultana. 2010. Patriarchy and women’s gender ideology: A socio-cultural perspective. *Journal of Social Sciences* 6, 1 (2010), 123–126.
- [124] Farhana Sultana. 2015. 45. Emotional political ecology. *The International Handbook of Political Ecology*. UK: Edward Elgar (2015), 633–645.
- [125] Huatong Sun. 2012. *Cross-cultural technology design: Creating culture-sensitive technology for local users*. OUP USA.
- [126] Kalpana Sunder. 2020. The remarkable floating gardens of Bangladesh. <https://www.bbc.com/future/article/20200910-the-remarkable-floating-gardens-of-bangladesh>
- [127] Jo Ann Tacchi. 2009. Finding a voice: digital storytelling as participatory development. *Story circle: Digital storytelling around the world* (2009), 167–175.
- [128] Reem Talhouk, M. Balaam, T. Bartindale, K. Montague, S. Mesmar, C. Akik, A. Ghassani, M. Najem, H. Ghatas, and P. Olivier. 2017. Implications of Synchronous IVR Radio on Syrian Refugee Health and Community Dynamics. *Proceedings of the 8th International Conference on Communities and Technologies - C&T '17* 2017, June (2017), 193–202. <https://doi.org/10.1145/3083671.3083690>
- [129] Maureen Tanner and Andries du Toit. 2015. The influence of higher education institutions on the sustainability of ICT4D initiatives in underserved communities. *The Electronic Journal of Information Systems in Developing Countries* 71, 1 (2015), 1–16.
- [130] Alex S Taylor. 2011. Out there. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. 685–694.
- [131] Daniel C Taylor, Carl E Taylor, and Jesse O Taylor. 2011. *Empowerment on an unstable planet: From seeds of human energy to a scale of global change*. Oxford University Press.
- [132] Jennyfer Lawrence Taylor, Alessandro Soro, Paul Roe, Anita Lee Hong, and Margot Brereton. 2018. “Debrief O’Clock” Planning, Recording, and Making Sense of a Day in the Field in Design Research. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–14.
- [133] Orkan Telhan, Yasmin B. Kafai, Richard Lee Davis, KFai Steele, and Barrie M. Adleberg. 2014. Connected messages. In *Proceedings of the 2014 conference on Interaction design and children*. ACM, New York, NY, USA, 193–196. <https://doi.org/10.1145/2593968.2610450>
- [134] Mamello Thinyane, Karthik Bhat, Lauri Goldkind, and Vikram Kamath Cannanure. 2018. Critical participatory design: reflections on engagement and empowerment in a case of a community based organization. In *Proceedings of the 15th Participatory Design Conference: Full Papers-Volume 1*. 1–10.
- [135] Crystal Tremblay and Leila Harris. 2018. Critical video engagements: Empathy, subjectivity and changing narratives of water resources through participatory video. *Geoforum* 90 (2018), 174–182.
- [136] Carolien van den Berg and Belinda Verster. 2020. Co-Creating Social, Digital Innovation to Recognise Agency in Communities: A Learning Intervention. In *Conference of the South African Institute of Computer Scientists and Information Technologists 2020*. ACM, New York, NY, USA, 85–93. <https://doi.org/10.1145/3410886.3410912>
- [137] Delvin Varghese, Tom Bartindale, Kyle Montague, Matt Baillie Smith, and Patrick Olivier. 2022. Supporting Real-time Peer-Mentoring of Rural Volunteers. In *CHI '22: CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA, 1–13. <https://doi.org/10.1145/3491102.3517598>
- [138] Delvin Varghese, Patrick Olivier, and Tom Bartindale. 2020. Towards Participatory Video 2.0. In *Conference on Human Factors in Computing Systems - Proceedings*. 1–13. <https://doi.org/10.1145/3313831.3376694>
- [139] Delvin Varghese, Jay Rainey, Kyle Montague, Tom Bartindale, Patrick Olivier, and Matt Baillie Smith. 2020. Utilizing Participant Voice in Volunteer Training. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA, 1–14. <https://doi.org/10.1145/3313831.3376208>
- [140] Alida Veldsman and Darelle Darelle van Greunen. 2015. ICT interventions for socio-economic development—A practitioner’s view. In *2015 IEEE International Symposium on Technology and Society (ISTAS)*. IEEE, 1–6.

- [141] John Vines, Rachel Clarke, and Peter Wright. 2013. Configuring participation: on how we involve people in design. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, Vol. 20. ACM, 429–438. [https://doi.org/10.1016/S0142-694X\(98\)00026-X](https://doi.org/10.1016/S0142-694X(98)00026-X)
- [142] Wayan Vota. 2013. Please Stop Using the Term "Beneficiaries" in ICT4D - ICTworks. <https://www.ictworks.org/please-stop-using-the-term-beneficiaries-in-ict4d/>. [Online; accessed 2020-08-02].
- [143] Geoff Walsham. 2017. ICT4D research: reflections on history and future agenda. *Information Technology for Development* 23, 1 (2017), 18–41.
- [144] Geoff Walsham. 2020. South-South and triangular cooperation in ICT4D. *The Electronic Journal of Information Systems in Developing Countries* 86, 4 (2020), e12130.
- [145] Hilary Warburton and Adrienne Martin. 1999. Local people's knowledge in natural resources research.
- [146] Dennis M Warren et al. 1991. *Using indigenous knowledge in agricultural development*. Technical Report. World Bank.
- [147] Sarah C. White. 1996. Depoliticising development: The uses and abuses of participation. *Development in Practice* 6, 1 (1996), 6. <https://doi.org/10.1080/0961452961000157564>
- [148] Glyn Williams. 2000. Towards a Re-politicisation of Participatory Development : political capabilities and spaces of empowerment. *The Participation Reader* January 2004 (2000), 1–24. <https://doi.org/10.1080/0143659042000191438>
- [149] Cara Wilson, Margot Brereton, Bernd Ploderer, and Laurianne Sitbon. 2019. Co-Design Beyond Words: 'Moments of Interaction' with Minimally-Verbal Children on the Autism Spectrum. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*. 1–15.
- [150] Cara Wilson, Roisin McNaney, Abi Roper, Tara Capel, Laura Scheepmaker, Margot Brereton, Stephanie Wilson, David Philip Green, and Jayne Wallace. 2020. Rethinking Notions of 'Giving Voice' in Design. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. ACM, New York, NY, USA, 1–8. <https://doi.org/10.1145/3334480.3375171>
- [151] Heike Winschiers. 2006. The challenges of participatory design in an intercultural context: designing for usability in namibia. In *PDC*. 73–76.
- [152] Heike Winschiers-Theophilus and Nicola J Bidwell. 2013. Toward an Afro-Centric indigenous HCI paradigm. *International Journal of Human-Computer Interaction* 29, 4 (2013), 243–255.
- [153] Heike Winschiers-Theophilus, Nicola J Bidwell, and Edwin Blake. 2012. Community consensus: Design beyond participation. *Design Issues* 28, 3 (2012), 89–100.
- [154] Heike Winschiers-Theophilus, Shilumbe Chivuno-Kuria, Gereon Koch Kapuire, Nicola J Bidwell, and Edwin Blake. 2010. Being participated: a community approach. In *Proceedings of the 11th Biennial Participatory Design Conference*. 1–10.
- [155] Marisol Wong-Villacres, Aakash Gautam, Deborah Tatar, and Betsy DiSalvo. 2021. Reflections on assets-based design: A journey towards a collective of assets-based thinkers. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2 (2021), 1–32.
- [156] Marisol Wong-Villacres, Neha Kumar, and Betsy DiSalvo. 2019. The work of bilingual parent-education liaisons: Assembling information patchworks for immigrant parents. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–24.
- [157] Peter Wright and John McCarthy. 2008. Empathy and experience in HCI. In *Proceedings of the SIGCHI conference on human factors in computing systems*. 637–646.
- [158] Peter Wright and John McCarthy. 2010. Experience-centered design: designers, users, and communities in dialogue. *Synthesis lectures on human-centered informatics* 3, 1 (2010), 1–123.
- [159] MinYoung Yoo, Lauren Knight, William Odom, and Arne Berger. 2022. Storywork & Reciprocity: On the Design of an Audio Documentary that Extends HCI Research back to Participants. In *Designing Interactive Systems Conference*. ACM, New York, NY, USA, 1345–1357. <https://doi.org/10.1145/3532106.3533539>
- [160] Maruf Zaber, Bonnie Nardi, and Jay Chen. 2018. Responding to Riverbank Erosion in Bangladesh. In *Proceedings of the 1st ACM SIGCAS Conference on Computing and Sustainable Societies*. ACM, New York, NY, USA, 1–11. <https://doi.org/10.1145/3209811.3209823>
- [161] Kehkashan Zeb, Stephen Lindsay, Suleman Shahid, and Matt Jones. 2018. Verbal Design: A Participatory Design Approach with Illiterate Patient User Groups. In *Proceedings of the 2018 ACM Conference Companion Publication on Designing Interactive Systems*. 271–275.
- [162] Kehkashan Zeb, Stephen Lindsay, Suleman Shahid, Waleed Riaz, and Matt Jones. 2019. Sugar Ka Saathi—A Case Study Designing Digital Self-management Tools for People Living with Diabetes in Pakistan. In *IFIP Conference on Human-Computer Interaction*. Springer, 161–181.

Received January 2023; revised April 2023; accepted May 2023