CHAPTER

8

Probing for resilience: Exploring design with empathy in Zanzibar, Tanzania

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OUTLINE

1. Introduction

Sustainable Development Goal 11—making "cities and human settlements inclusive, safe, resilient and sustainable" (United Nations, 2018a)—constitutes a major challenge in developing countries. In these contexts, rapid urbanization, coupled with the absence or ineffectiveness of local housing policies, has resulted in an increasing number of people living in informal settlements that are prone to disasters and add to urban sprawl. This development

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is neither inclusive, safe, nor resilient. The vulnerability of both the environment and the inhabitants increases the need for focusing on resilience.

In this regard, resilience is widely defined as the capacity of a system, community, or society to resist and absorb disturbance, to adapt to change, and to transform while maintaining its core characteristics and continuing to develop (Stockholm Resilience Center, 2015; UNISDR, 2017; Walker & Salt, 2006). Walker and Salt (2006) consider resilience as a key to achieving sustainability in *social-ecological systems*—complex integrated systems in which humans and nature are bonded into a whole. They argue that the more resilient a system is, the better it can provide services essential to life, which can be considered a characteristic of sustainability. Resilience emphasizes the importance of viewing the system as a unity instead of breaking it into smaller parts that are considered independently. Walker and Salt (2006) suggest that partial solutions in isolated components of the system may eventually result in more serious problems, which can be reflected in other spatial or temporal scales.

Social scientists have criticized the concept of social-ecological systems for "undertheorizing" the involved social entities; researchers in the field are debating whether society is too complex an entity to be conceptualized as a component of social-ecological systems (Stojanovic et al., 2016). We argue, however, that there are benefits considering communities in developing countries as unified social-ecological systems, stressing the connection between society and the ecological realm. We think that it is important to emphasize social aspects when striving for sustainable societies to enable, for example, human health and well-being, affordability, and cultural preservation in a community. Nevertheless, we claim that it is possible to achieve these while also protecting the environment and ensuring the future provision of ecosystem services that the social realm depends on. When social and ecological aspects are considered equally important components of a social-ecological system, they reinforce one another and support the resilience of the system.

A resilient social-ecological system, through the contribution of its active members, has the capacity of turning disturbances into opportunities for innovation and development (Folke, 2006). To this end, as noted by the architect Charles Correa (1994), people's engaged participation is an essential aspect of our habitat. In this regard, one of the core principles of resilience building, according to authors associated with the Stockholm Resilience Centre, is "broadening participation" to address both social and ecological aspects of improving resilience (Simonsen et al., 2015). In previous research, Sandman, Levänen, and Savela (2018) argued that inhabitants' engagement in the architectural design process plays an important role when striving for sustainable societies. Likewise, we assume that resilience can be improved by the engagement of people by architects in the formal processes of spatial change. When community members are effectively engaged in the development of their habitat, they are empowered and inspired to embrace endeavors that promote the community's resilience, which further improves the system's sustainability. In this chapter, we refer to resilience from the perspective of urban development and a community's adaptation to change, and not particularly to resilience related to disasters.

In a design process, when engagement is guided thoughtfully with sensitivity, it enhances the relationships between stakeholders and builds trust and a shared understanding (Akama & Yee, 2016; Mattelmäki, Vaajakallio, & Koskinen, 2014). Yet, architects would need to build their professional capacity to meet the challenges of engaging inhabitants to improve resilience in rapidly evolving societies. In developing countries, where there might be insufficient

professional resources and where stakeholder engagement can be challenging, future inhabitants might not be empowered, might not have the time and energy to invest in the project, or might not be accustomed to taking part in a design process. In these contexts, entanglements, obstacles, or gaps between stakeholders often appear in architectural design projects (Hussain, Sanders, & Steinert, 2012). Thus, approaches that bring attention to bridging these gaps are needed. We hypothesize that a way to surmount these constraints is to enhance empathy and understanding between people—architects and community members alike. If the design process is conducted with empathy, we argue that it supports resilience building.

Empathy can be defined in many ways. Most theorists agree that empathy is the ability to "ascribe mental states to others," taking the perspective of another, or the process of being affected by another person's emotions (Maibom, 2017, p. 1). Here, we refer to empathy broadly as experiencing and appraising the world from another's point of view, not only with an emphasis on emotions. Experiencing the world naturally involves emotional states, but it also involves practical, habitual, and cultural components. As architects seldom design for themselves, this ability ought to be a core competence in the profession. The importance of empathy is even greater in developing-country settings, where the clients may be in vulnerable situations due to prevailing sociocultural structures (Hussain et al., 2012). As such, we argue that without empathic engagement it can, for instance, be difficult to identify social factors and local architectural features to be honored in the design process. Both are important aspects if the intention is to maintain and foster resilience and sustainability.

Through our interest in empathy, we paid attention to the empathic-design discourse. Empathic design is an approach that encourages empathic understanding between designers and users (Koskinen & Battarbee, 2003). It suggests that the designer should have an open-minded attitude, observational skills, and curiosity (Leonard & Rayport, 1997). We studied this approach originating in product design to identify possible applications in the field of architecture, given that product-design processes are often faster and more flexible than architectural ones. Indeed, the latter can be long, substantial, and heterogeneous, due to an extensive number of stakeholders and legal codes governing these practices (Mazé, 2007).

Empathic engagement in architecture in developing countries is the central topic of the first author's doctoral research at Aalto University, Finland. This chapter presents one of the aspects covered under this broader topic. Here, we focus on *design probing*, a method utilized in empathic design and participatory design, which can encourage multiple ways of empathic engagement. It has been promoted as a valuable tool when designing in socially critical contexts with and for vulnerable users (Debrah et al., 2017). Through two design studies developed in Zanzibar, Tanzania—one of the world's least developed countries (United Nations, 2018b)—, we illustrate how design probing can support the work of architects in developing countries. Focusing on these contexts, we examine the advantages of design probing to broaden participation within architectural design. As such, this chapter presents two ways of employing design probing and discusses its practical use. We elaborate on the experiences and benefits of the method and demonstrate how the probing exercises can inspire and inform the design, support personalized local solutions, and enforce empathic engagement.

2. Broadening participation through empathic and creative methods

Broadening participation improves legitimacy, increases knowledge, and helps detect disruptions; in particular, early engagement helps in defining priorities and needs (Simonsen

et al., 2015). Moreover, as regards architectural design processes, broadening participation can assign the inhabitants an active role to reach results suitable to their actual needs. To support their engagement with inhabitants, architects need to find efficient, yet empathic, methods suitable for challenging situations in fast-growing cities in the developing world, when there are time constraints and other limitations. In the architecture literature, not much is written on alternative methods for inhabitants' empathic engagement, whereas in the context of design research, the concept of empathy and empathic-design methods are well known.

In our previous research, we have gained insight into the potential of an empathic approach to architectural design (Sandman, Maguire, & Levänen, 2020). We identified four complementing registers of empathic understanding and engagement within the design process. Firstly, the architects' imagination plays a strong role. Architects imagine themselves as inhabitants or users of a space (Pallasmaa, 2015). Secondly, architects observe the users' lives, their habits, and activities (Steen, 2011). Thirdly, architects involve users in the design process in a sensitive manner and ask them to share their views, thoughts, and dreams (Koskinen & Battarbee, 2003; Mattelmäki et al., 2014). Fourthly, architects meet users on an intimate level and reflect together on similarities and differences in their experiences (Akama & Yee, 2016). In this fourth option of empathic engagement, all registers merge and deepen.

In the product-design discipline, multiple methods and approaches of empathic design have been developed during the last three decades (Mattelmäki et al., 2014; Sanders & Stappers, 2008; Steen, 2011). Whereas the definition of empathic design is broad and includes a variety of methods, what is common to all of them is the foundation of curiosity and willingness to step into other people's shoes (Koskinen & Battarbee, 2003). Furthermore, empathic design is defined as an approach that focuses on what ought to be (Steen, 2011). This falls back on the philosopher David Hume's well-known is—ought problem: What ought to be cannot be based on what is (Hume, 1739/1896). Therefore, methods that exclusively study what is are not enough in a design context, in which the aim is to create something new.

Design probing is an empathic-design method that has proved its value as part of a larger participatory agenda. It is a tool for understanding human phenomena and unveiling design opportunities (Mattelmäki, 2006). Mattelmäki (2006) described probes in her doctoral thesis through three features: the focus of the assignments on the user's perspective in a broad sense—from the cultural environment to feelings and needs—, the participants' self-documentation, and the exploratory character of the exercise, seeking to identify new opportunities. Consequently, the emphasis of probes is to inspire what ought to be, in contrast to capturing what is (Boehner, Gaver, & Boucher, 2012); between the *is* and the *ought to be*, there is space for creativity. In this respect, design probes are meant to support both users and designers in expanding their creativity. Undeniably, creativity is the main driver in the different phases of the probing process. Firstly, designers create the probes as inspiring as possible to be distributed to participants who, secondly, creatively accomplish the tasks, and thirdly, designers utilize the material received from participants as creative inspiration for the design task (Gaver, Dunne, & Pacenti, 1999). The motivator for creativity, in this case, is empathy, as all the phases of the probing exercises concern the experience of the users.

The registers of empathic engagement and understanding, previously presented, can also be detected throughout the entire process of design probing. To design the probes, designers imagine themselves in the place of users, based on their own experiences. In this stage, the

capacity to involve personal experiences to deepen the imagination is valuable (Pallasmaa, 2015; Smeenk, Tomico, & Van Turnhout, 2016). In the second stage, designers create inspiring tasks for users to let them share important aspects of their lives. Here, designers engage with users with sensitivity to be able to reach their emotions and aspirations (Gaver, Boucher, Pennington, & Walker, 2004; Mattelmäki, 2006). When applying design probing, there is always uncertainty; it is not possible to know what responses will be received, as the intention is not to guide the participants in any sense. This aspect that honors uncertainty also requires a sensibility from designers who utilize probing (Boehner et al., 2012). Moreover, when the users receive the probes and are confronted with their design features, they can obtain an intimate insight into the creativity of the designer.

In the third stage, designers seek to understand the responses empathetically, not merely intellectually (Gaver et al., 2004). Here, the aim is to bridge the gap between the stakeholders identifying similarities and recognizing differences in their understandings and experiences. In this stage, a relationship on an intimate level might be established between designers and users. This is possible even if a distance between them is inevitable. The probes tend to "create relationships [between designers and participants] that are a little like designing for friends: We know them well" (Gaver et al., 2004, p. 6). Therefore, probing can be perceived as part of an ongoing empathic dialogue that nurtures understanding between designers and the people and places they are designing for (Boehner et al., 2012).

Furthermore, the designer, when receiving back the probes, acquires an opportunity to be part of certain aspects of the users' lives that would have stayed obscured otherwise, due to the distance between them. As pioneers in design methods and probing, the psychologist and design researcher William Gaver et al. (2004) explained that for the participants, the activity can make the familiar seem interesting when viewed through different lenses. On the other hand, for the designer, it can illustrate something peculiar and through personal insight make it familiar (Gaver et al., 2004). The participants, upon receiving the probes, do not know the exact intention behind the exercises because of the distance between them and the designer. Thus, they can personally interpret the exercises and respond with creative freedom. Likewise, for the designer, this detached, still close, view into somebody's life can be a fruitful standpoint for innovative design ideas; such an *intimate distance* leaves the freedom required for creativity (Gaver et al., 2004).

Regardless of the seemingly open approach, there is within the design discourse a discussion about the purpose of probing. Gaver et al. (2004) criticized the application of probing for obtaining information instead of getting inspiration. They argued that applying probes to get objective answers in research frameworks endangers the original intentions of the method, which values uncertainty, play, and exploration. Furthermore, they argued that most research techniques tend to disguise subjectivity through controlled procedures, whose results can be considered impersonal whereas probes take the opposite approach. In their own probing processes as designers, Gaver et al. (2004) refrained from believing that they could scrutinize the heads of the users and instead made use of their subjective interpretations (Gaver et al., 2004). Encouraging this subjective engagement and empathic interpretations, Gaver et al. (2004, p. 56) still conceded that probes can be used for collecting research materials; however, they anticipated that probes' original motivation, to retain a "pervasive sense of uncertainty," should be respected. We thus explored in our research

variations of this method to contribute to empathic engagement in architectural design processes in developing-country settings.

3. Experimenting with design probing

We were introduced to Zanzibar through Dr. Muhammad Juma, the director of the Department of Urban and Rural Planning (DoURP) in 2014 while the first author was teaching the Aalto University's master course Cities in Transition in Dar es Salaam, Tanzania. When we learned about the DoURP director's aspirations for sustainability and the concerns regarding insufficient numbers of professionals, we decided this place would be the focus of both Helena's doctoral studies and the subsequent edition of the course. In 2018, the course, then renamed Interplay of Cultures, started to collaborate with the DoURP to engage with urban challenges in Zanzibar Town. These issues include the need to accommodate more inhabitants in the central parts of the city and to plan for sustainable new areas as urbanization is accelerating. The department is concerned with the risk of losing intangible cultural heritage if uncontrolled development forces present inhabitants to move to the outskirts of the town. Additionally, unrestrained urban sprawl has been encroaching on valuable agricultural land, which is a threat to the densely populated island (Juma, 2014).

During our collaboration with the DoURP in Zanzibar, we utilized design probing as a method to engage with communities at the beginning of the design process. In this chapter, we present two examples in which probing was used in different ways. The first example is an urban-design exercise for the Chuini neighborhood on the northern outskirts of Zanzibar Town, carried out by Miia Suomela for her master's thesis in architecture, as a continuation of the Interplay of Cultures course that she attended in 2018. The master plan for Zanzibar proposed that Chuini be developed into one of six subcenters to ease pressure from the city center. In this case, the probing was conducted as an inspirational exercise motivated primarily by ecological sustainability due to the environmental vulnerability of the area.

The second example is the densification and affordable-housing design in the Ng'ambo neighborhood of central Zanzibar Town undertaken as part of Helena Sandman's aforementioned doctoral thesis. In this case, the design probes were motivated by social sustainability, and the main aim was to gather information about the inhabitants' perception of their homes. In both exercises, design probing was only one of the participatory methods applied in the design and was executed at the beginning of the process to initiate contact with the community on a personal level. By *personal*, we refer to both the promoted face-to-face meetings between individuals and ourselves and the intention that the inhabitants share their individual views without being influenced by their families or neighbors, as there might be unknown hierarchical levels within these groupings.

As we used design probing for empathic engagement and for bringing stakeholders closer to each other, we also want to clarify that in our case the distance was cultural, linguistic, and geographic, as we came from a different part of the world. The qualitative approach of our research was interpretive and subjective and took advantage of embodied and situated knowledge while recognizing existing limitations. For instance, our knowledge of the Swahili language was limited, and therefore some of the discussions were conducted with the aid of a local research assistant and a young architect of the DoURP.

3.1 Probing for ecologically resilient urban design in Chuini

In the first design-probing exercise, we focused on ecological sustainability and sought to get inspiration for the design. The selected site, the Chuini neighborhood, is characterized by rapidly expanding informal settlements, agricultural activities, proximity to the ocean, and lush greenery. The master plan for Zanzibar Town assigned Chuini to be developed mainly into a residential area and proposed it to host ninefold its current population of 10,000 people in 2035. Given that all existing agricultural land, mostly wetland, is proposed to be sacrificed for development, the planning exercise in Chuini focused primarily on ecological resilience.

The DoURP is studying alternative patterns of densification in Chuini, aiming to develop the region in such a way as to preserve the greenery and to maintain and enhance its ability to retain stormwater and mitigate floods. Preserving the agricultural activities is crucial for the ecological resilience of Chuini but, as a source of food and income, they are also a vital component of the community's socioeconomic resilience. Given the fragility of this social-ecological system, the challenge is to respond to the urgent densification needs in a socially sustainable way while protecting the environment and ensuring the future provision of ecosystem services.

The design probing aimed to gain an understanding of the experiences and thoughts of the inhabitants of Chuini regarding their environment. We assembled a simple probe kit that included a card with an introduction of the master's thesis, instructions on how to proceed with the kit, a pen, and three packs of cards, each of them including five postcard-sized pieces. On the front of each card, there was a picture and on its back a question, in English and Swahili, and some blank space for writing or drawing an answer. The first set of cards asked: "When you think of your neighborhood what comes to your mind first when you imagine the color green/blue/red/yellow/white?" The second set asked: "When you think of Chuini what comes to your mind first when you consider the word city/house/home/people/water?" And the third set asked: "When you think of your everyday life what comes to your mind first when you look at the picture on the other side of this card?" The corresponding photos are presented in Fig. 8.1. In addition, the participants were asked to tell their age, gender, and occupation. These exercises aimed at identifying the associations that a set of colors, words, and pictures would awaken in the participants' minds, which could then constitute sources of inspiration in the design process.

A local *sheha* (the head of a *shehia*, the smallest administrative unit in Zanzibar) chose 15 households to participate in this probing exercise. After deciding that, to avoid excessive peer influence, it was better to deliver the probe kits individually to each household than to deliver them in a group meeting, we walked from house to house together with the *sheha*'s assistant and our research assistant who translated the discussions. We offered a kit to each participant, gave an overview of its contents, and explained why we wanted them to participate in such an exercise. Despite our intentions, we did not get to meet all the participants personally, because four kits were left with the *sheha* to be delivered to inhabitants living a little further away.

We allowed 5 days for the participants to fill in the cards and return them to the *sheha*, from whom we picked them up after the deadline. Altogether 10 kits were returned from three women and five men aged 40–68, and two participants who did not share their details. The involved *sheha* probably encouraged the participants to respond to the probes but

FIGURE 8.1 Pictures used to invoke associations with everyday life. From left to right: tree crown, a muddy puddle, plastic bottles in an open drainage, baked bricks, and colorful fabrics. *Credit: Miia Suomela (2019).*

also might have put pressure on them to answer in a certain way. It is difficult to estimate the impact of the *sheha*'s involvement, but we worked on the assumption that the participants responded to the questions individually and uninfluenced as we asked them to.

The answers provided valuable insights for us into the thoughts and feelings of the inhabitants of Chuini, regardless of the shortcomings. All except one respondent answered in Swahili. We carefully studied the responses but did not summarize or count them to emphasize their role as inspiration instead of information. A couple of the original responses are portrayed in Fig. 8.2. In those cards, yellow is depicted as a color "that shows a good beginning of the day in the morning" and red sparks the thought: "We condemn with all force the lack of peace inside our Chuini." The word "people" makes one participant think about poverty and unemployment and to conclude: "We need to be empowered." The word "house" inspires a very universal thought: "Every human being wants a place to live." The picture of colorful fabrics makes a participant express their hope: "I wish that there was a factory that would make fabrics for making clothes." The picture of plastic bottles in a drain spurs a call for action: "I think that we should take care of our environment."

In the other responses, the words made the participants express their concern for the unplanned urban sprawl in Chuini and how it has destroyed the natural environment and invaded cultivated land. Regarding colors, green and blue are associated with nature, which the participants value as an essential part of their environment and would like it to be preserved. The photos sparked hope of modern homes and services to be available. Besides, participants addressed the preservation of livelihoods and the creation of employment opportunities. The probe responses inspired the urban design of future Chuini mandating the prioritization of protecting green areas while considering socioeconomic aspects. Thus, our design proposed the preservation and enhancement of most of the green areas, the structuring of and better connections to the residential areas, and versatile social services and economic activities, as suggested by the participants.

FIGURE 8.2 Some of the original probe responses in Swahili. *Credit: Miia Suomela (2019).*

3.2 Probing for socially resilient housing design in Ng'ambo

In the second design-probing exercise, we focused on social sustainability and sought mainly to gather information about the community, even if the results also inspired the design. Together with the DoURP, we chose for our affordable-housing design an inner-city site with 13 houses and approximately 100 inhabitants in Ng'ambo, a predominantly low-rise neighborhood. Many of the inhabitants had lived in the area for generations and some of them had lost their houses due to the construction since the 1970s of the Michenzani apartment blocks: 12 seven-floor high 300-m long buildings in the core of their neighborhood (Folkers, 2014). This major change in Ng'ambo was still fresh in the inhabitants' memories. Thus, they were aware of the risk of eviction they might face, which made the task of establishing trust between the involved stakeholders a challenge. For the design-probing exercise, we chose to engage only 5 of the 13 families because we wanted to make the probe packages rather extensive, with a focus on quality instead of quantity. Moreover, probing was only one of the participatory exercises we wanted to conduct, and we did not want to exhaust all 13 families at the beginning of the design process, considering their possible time constraints.

The probing exercise intended to make the inhabitants reflect on their relationships with their homes and to encourage them to observe their surroundings. The probing package contained artifacts and exercises designed to enable participants to illustrate what daily life is like in Ng'ambo. We strived to make the probing package personal and yet familiar, using locally available material (Fig. 8.3). As we were applying design probing in an architectural project for the first time, we crafted the probe package in a rather neutral way in order not to risk disturbing the results by the material choices, opting for a handcrafted style. The exercises were thoroughly explained in the package and designed to be concrete.

With stickers, a disposable camera, and pens included in the probing package, the participants had to accomplish the following exercises:

FIGURE 8.3 The design-probing package. *Credit: Helena Sandman (2016).*

- mark with different colored stickers items or parts of the house that they either favored or disfavored;
- take pictures of the placed stickers;
- take pictures of the places visited and the people met during the exercise timeframe;
- draw a map of places visited during the exercise timeframe;
- draw a plan of their present and their dream houses; and
- reply to a few questions regarding their life in Ng'ambo.

Through our discussions before and after accomplishing the exercises, the participants also received information about the plans for the area.

Introducing the probing exercise required personal contact to create trust and an appropriate framing of the situation (Fig. 8.4). In each household, according to local customs, we asked the oldest person to choose who would assume the task of the probes, a practice that led to a natural inclusion of different generations, thereby yielding a variety of views. The elder generation was also involved in the meetings at the beginning and at the end of the exercise, whereas the chosen probers (three women and two men) were all young adults, except for one, who was the head of the house and a single mother. During the distribution of the packages, we introduced the project and went through the exercises in detail, and allowed the participants two weeks to complete the probes.

Subsequently, in each household, we had a thorough discussion about the exercises and the replies. According to the feedback received, the participants enjoyed doing the exercises and found it interesting to reflect on their relationship to their home and their neighborhood. In the outcomes, on an informative level, we noticed a desire for new modern spaces and furniture and a dislike of the worn-out parts of the buildings and broken furniture. Similarly, the inhabitants also criticized items that consumed much electricity, due to high costs and frequent power cuts. Additionally, they revealed a wish for better sanitation and functioning infrastructure. Two of the participants wished for more privacy, particularly concerning the toilet and bathroom spaces. The responses also indicated a lack of proper cross-ventilation in

FIGURE 8.4 Our research assistant Saada, on the right, introduces the probing package to Mwanakombo. *Credit: Helena Sandman (2016).*

the houses (Fig. 8.5). The photos taken by the participants showed how they spent their time and what parts of the home drew their attention. The exercises pointed out some spots in the neighborhood that were important (Fig. 8.6) and made it clear that outdoor life, green spaces, and vegetation were appreciated.

The floor plans of the houses drawn by the inhabitants were informative as it was interesting to compare these with the actual plans of their houses, which were previously measured. For instance, when space was perceived as good or important, it was often drawn bigger than its actual size, whereas when disliked it was drawn smaller. In two cases, the room of the participant was bigger than its actual size, whereas in four plans the bathroom was drawn much bigger than it was in reality. In two drawings, the living room and the

FIGURE 8.5 Ali disliked the fact that one of the windows in his room was closed and prevented cross-ventilation due to an extension of his house. *Credit: Helena Sandman (2016).*

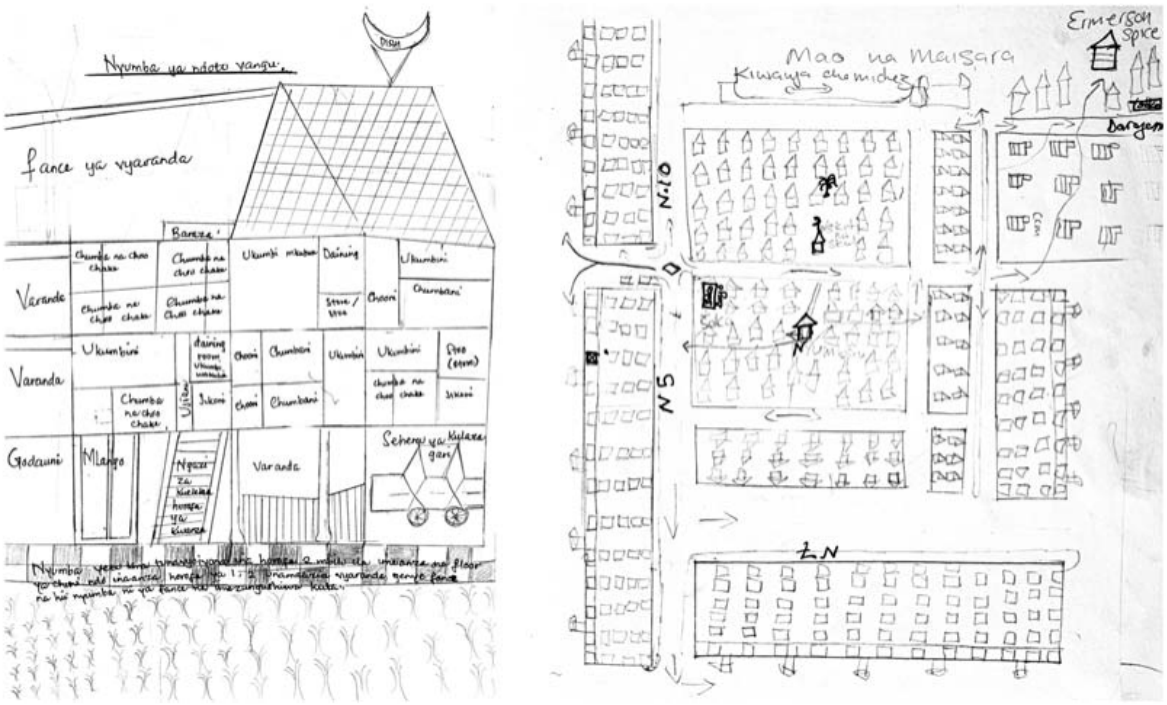

FIGURE 8.6 Two completed exercises showing a dream house and important spots in the neighborhood. *Credit: Helena Sandman (2016).*

veranda (and in a case also the backyard), the common places of the home, were also drawn bigger than in reality. These plans essentially illustrated how the participants perceived their homes, which might be more important than factual measurements for a design project. It was also interesting to compare the drawings of their existing homes with those of their dream homes. Some of the dream homes were close to copies of their existing ones. However, three dream homes demonstrated that living on multiple floors would be preferable to living in one-story houses. This fact is encouraging, for higher buildings are necessary when densifying an existing urban structure.

Through the probes, we also learned that people generally agreed that life in Ng'ambo was peaceful and nice, and its inhabitants took advantage of living in the city center. Three participants praised the social connections and the quality of knowing your neighbors, whereas two preferred more privacy. Additionally, we identified significant information regarding the use of space, social factors, and architectural features of importance. Furthermore, it proved an eye-opening experience to discuss the exercises and reflect on the concept of home with the participants and their families. Thus, the actual housing design was strongly influenced by the probing exercise, which generated solutions that neither we nor the participants would have been able to create in isolation. The rich materials inspired us to design a housing solution that would leave an opportunity for the inhabitants to develop their own homes incrementally in a personal way (Fig. 8.7). We designed a three-floor building around a courtyard, with 24 apartments. Each apartment could consist of a varying number of rooms, depending on the needs of each family (Fig. 8.8).

FIGURE 8.7 The flexible floor plan and façade of the resulting affordable-housing proposal for Ng'ambo. *Credit: Helena Sandman, Mariana Rantanen, & Ivan Segato (2017).*

Through the responses, we understood that the apartments required proper cross-ventilation and a space akin to an open courtyard, where laundry and kitchen activities could take place. Parts of the apartments could be left open, as large outdoor areas. Moreover, the inhabitants could choose themselves how much space would be utilized for indoor rooms and the outdoor terrace. In this respect, we intended to leave the same amount of flexibility for the inhabitants within the walls of the apartment, as they have now in their private houses, where the plot border constitutes the limits. We also understood the value of outdoor social meeting points (*barazas*), which take the form of either a veranda next to the house's main entrance or a group of benches around a tree in a public spot in the neighborhood where men often gather in the evenings. This possibility to sit outdoors for a chat with the neighbors was also a feature added to the design due to the probing exercise. To accommodate this, we suggested *barazas* along the streets, in the courtyard, and the open staircases.

4. Discussion: Engaging through inspiration and information

The probing exercises in Ng'ambo and Chuini demonstrated contentment with the present situation on some levels and a positive attitude toward the urban development to come, yet we also identified suggestive patterns of concerns and wishes. Although in the two cases the

FIGURE 8.8 A view of the proposed courtyard. *Credit: Helena Sandman, Mariana Rantanen, & Ivan Segato (2017).*

probing exercises aimed at either getting inspiration or gathering information, our experiences indicated that probes in architectural design are helpful in both dimensions. Through the conducted experiments, we consider that a combination of information and inspiration is indeed the most fruitful.

After these experiences, we would be much more flexible regarding the design of the probe kit. For instance, we wanted to use a disposable camera in the exercises in Ng'ambo, as this is a typical probing tool and we did not know beforehand how common the use of smartphones was in Zanzibar. However, we learned that disposable cameras are not suitable for a probing exercise. Firstly, they are not sustainable, secondly, the quality of the pictures is poor, and thirdly the item was strange and unfamiliar to the participants. We found out that smartphones are very common among the inhabitants of Ng'ambo and could be easily used in a probing exercise. Nevertheless, our design skills should always prevail when crafting the probes, regardless of the resort to digital possibilities. When the probes are produced with intention and care, the exercise package becomes something nice to receive and, consequently, the replies are likely given equal care, as in the probing results we received.

Furthermore, the visual impression of the probe package might have stirred the participants' imagination by encouraging them to look at ordinary things from a new perspective, as revealed for instance by the poetic comments on the cards in the Chuini case or the creative drawings of dream houses in the Ng'ambo case. In the latter, when we received and studied the probing results, it felt as though we had been visitors in the households for a much longer period than the brief introductory meetings that we had on the porches. It also made us feel

like guests, bringing to our attention aspects of the homes that would have stayed obscured through observations alone. We came to appreciate these homes and their inhabitants. The design probing opened doors to the lives of the participants, which otherwise would have been challenging to access given the available resources.

The responses further implied that the community members are open to various spatial possibilities and willing to participate in the design process. The personal reflections revealed in the probes made us deeply grateful to the participants. We were touched by the openness and trust the participants showed us. In the two cases, we experienced the flexibility and versatility of design probing, which yielded deep insights into the inhabitants' world without demanding excessive efforts on either part. Through these experiences, we could easily agree with the argument of Gaver et al. (2004) that probes foster intimacy between designers and users. This method helped us build bridges between us, the architects, and the inhabitants.

5. Conclusions: Design probing as a method for resilience building

Design probing allowed us to produce exercises that duly considered ecological and social aspects. The exercises aimed at fostering social sustainability through people's engagement and the focus on their ways of living. Moreover, the exercises also raised awareness and interest in ecological issues. By directing the participants' attention to aspects of their everyday life and their environment through the probes, the participants may feel encouraged and empowered to tackle these issues themselves. When the inhabitants find that their participation matters and could translate into development, their feeling of empowerment and ownership is enhanced and might encourage further actions to develop the sustainability of their community.

The examples presented in this chapter illustrate the potential design probing has as a technique to support a community's ability to adapt to change and to keep developing without losing its core characteristics. When design probing is geared toward sustainable development and building resilience, both inspiration and information are needed, as well as empathy at the deepest possible level within the constraints of the project. For architects working in developing countries, utilizing a method that supports these qualities can be an asset. Furthermore, our experiments showed that design probing can be less time-consuming and more adapted to the rapid urbanization pace of cities than traditional participatory-design practices. However, as probing is only one possible technique among others, future research would need to consider probing in relation to other empathic-design methods when targeting resilience building.

We can conclude that design probing as a participatory method for resilience building provides a possibility for the inhabitants to take part in the process of change and for architects to learn about the core characteristics of the community and its inhabitants' aspirations and dreams. At this stage of the process in Zanzibar, we cannot yet find long-term evidence that empathic design and probing exercises lead to augmented resilience and sustainability; however, indications in this direction are possible to detect. Our experiences hint at the probing exercises having an impact on community engagement and empowerment. For instance, in his probing responses, Ali had wished for an apartment where he could have a small shop downstairs. As the affordable-housing project was not implemented fast enough, he ended

FIGURE 8.9 The house of Ali's aunt, Ali's shop, and the *baraza* he created in front of it. *Credit: Helena Sandman (2017).*

up transforming a shed attached to his house into a small shop, in front of which he organized a *baraza* around a tree on public land (Fig. 8.9).

Another example is Mama Barke, who runs a small coffee shop in Ng'ambo and participated in our activities. She told us that after our project she established a discussion group together with some of her clients, inhabitants of the neighborhood. They intended to discuss their views on how they would like their neighborhood to develop in the future, a novel experience of public debates for them, according to Mama Barke. The small positive changes demonstrated in the cases of Ali and Mama Barke support the overall hypothesis that participatory engagement enhances resilience.

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