# Build and design

Ferro (1982) argues that dynamic tools, especially drawing, may act as instruments of alienation by those who actually build the cities due to the artificial separation between those who think about and design spaces and those who build them. In this section, the concept of reapproximating design and construction is intended to illustrate how hierarchies can be challenged and how other forms of dialogue can emerge when designers and builders work together.

This section will explore the potential for experimentation and innovation when hands-on work and design are combined. One of the main tools that will be presented is the dual design strategy, which we have been experimenting with in different contexts since 2018. The dual design strategy is based on a combination of a small-scale intervention – that aims to provide concrete outcomes for the community and build an environment of trust and mutual learning – and the development of future scenarios. In addition, we will explore other tools, such as experimental construction sites and technical guides.

## Dual design strategy

The dual design strategy is based on a methodology I developed in collaboration with a group of researchers and professors during the annual COLLOC Workshop Series[1], which has been held since 2018 in a self-organized occupation in Rio de Janeiro, Brazil. The COLLOC Workshop Series is a Deutscher akademischer Austauschdienst (DAAD)-funded workshop coordinated by Kathrin Wieck. I am part of the project team, which also includes Natacha Quintero, Toni Karge, Fernanda Petrus, Manuel Meyer, Ana Slade, Jorge Fleury,

1 https://collocworkshop.com

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Luciana Andrade, Ana Lucia Britto and Luciana Lago. From 2018 to 2024, we have experimented with and developed a dual design strategy based on the simultaneous development of small-scale interventions and systemic scenarios oriented towards localised problem–solutions and reflections on their implications

> The systemic scenarios and embedded interventions focus on issues that are decided collectively and that can change according to the needs of the community. … The small-scale interventions play the role of catalysts, they are test balloons, and they link short-term solutions with long-term perspectives. They manifest and anchor transformational knowledge in space, meaning that knowledge becomes visible, tangible, and accessible for all. They also create the possibility for reflection on that practice, what practice means for research, and how it can be transferred. (Wieck et al. 2023: 129)

These solutions arise from close interaction with the local community and other relevant actors from the beginning to collectively develop the problem(s) to be addressed and to further develop joint findings for the potential solutions at different scales.

In this context, the small-scale intervention must be relevant to the collaborating community, and the systemic scenario approach works to bridge the dialogue among scholars, citizens and other actors. Therefore, the developed interventions prioritise the inhabitants' urgent needs. The systemic scenarios connect these local and urgent needs to broader contexts and issues in terms of their spatio-temporal scales:

> … these aspects interlink and complement each other – together they do not only alter the physical features of the settlement and its vision of the future, but they impact the system that holds it all together, the urban metabolism so to say, linking different spatial and temporal scales (Wieck et al. 2023: 129).

An example of a systemic scenario is a collective kitchen and community garden operated by a self-organised occupation in Rio de Janeiro, Brazil. These two areas are central to the community; they are the places where most collective actions take place and how potential income is generated through the production and sale of food (Petrus 2021). In recent years, the COLLOC interventions in this community space included restructuring cooking workflows, installing new lighting systems, creating multifunctional furniture

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pieces, building stronger connections between the kitchen and garden and connecting them to ecological sanitation infrastructure.

In another experience I coordinated using the dual design strategy in 2022 at a DAAD funded summer school in Berlin entitled Collaborative Design Methods: transforming communities through spatial intervention, we built a small playground inside a community garden, mostly using existing materials from the site. The systemic scenario connected to this construction involved thinking about green spaces in the neighbourhood and exploring the potential of the community garden as a central place for connecting diverse inhabitants. In particular, we considered collective food production in the neighbourhood as a counter-hegemonic practice towards a sustainable and healthy future.

The goal of the dual design strategy is to promote environments of knowledge exchange where individuals can bring their own expertise, relevant issues are addressed and concrete outcomes are produced.

> [The dual design strategy] goes beyond singular participatory processes. Instead, it fosters mutual learning through continuous collaborations between academic and non-academic actors. We all become 'co-researchers' and we develop what we call 'common ground' knowledge, knowledge as a commons, which emerges from experiencing, negotiating, and experimenting together. Learning, planning, and acting together can lead to more socially and spatially just transformation (Wieck et al. 2023: 129).

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*Figure 22a: COLLOC workshop, Rio de Janeiro, 2022. Source: colloc archive*

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*Figure 22b: COLLOC workshop, Rio de Janeiro, 2022. Source: colloc archive*

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*Figure 23: Winter School Building Resilient Cities, Cairo, 2024. Source: Juliana Canedo*

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*Figure 24: COLLOC Workshop, Rio de Janeiro, 2022. Source: Group open spaces*

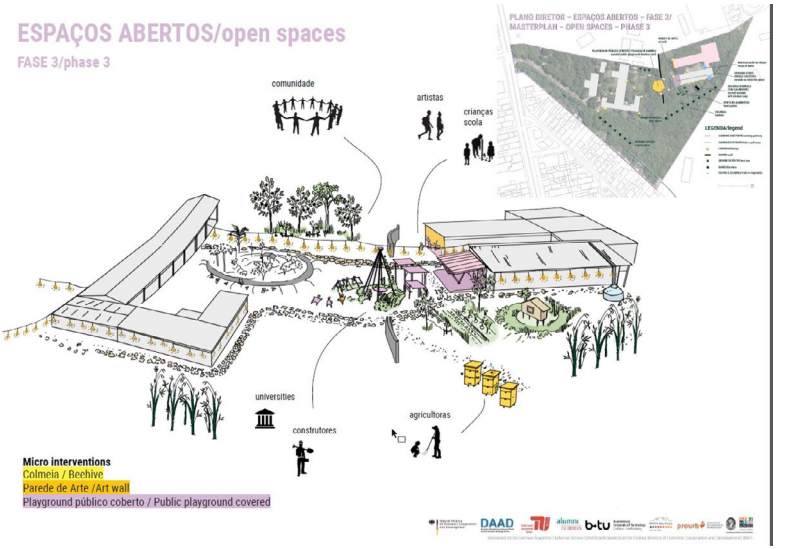


*Figure 25: COLLOC Workshop, Rio de Janeiro, 2023. Source: Juliana Canedo*

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## Experimental construction site

The concept of an experimental construction site can be used in diverse ways that are not necessarily connected to collaborative processes that approximate designing and building sites. In Brazil, for example, experimental construction sites are part of architects' and urbanists' regular training. This activity aims to offer tools for students to experiment with and develop innovative construction techniques or materials.

> The experimental construction site is an innovative part of training in architecture education, which qualifies learning and provides integration of disciplines through the design and construction of models and prototypes. In addition, it enables a systemic approach based on the student's experience and interaction with the diverse events of a construction site environment. Above all, it is a space for students to experience their transformative potential in the act of designing and building (Gonçalves and Martinez 2021: 1312)[2].

Despite the value of these activities, in this book, I aim to focus on the idea of using experimental construction sites as a dynamic tool for local communities to exchange building methods based on technical, popular and empirical knowledge that expand upon traditional building methods. In this way, the experimental construction site can serve as a pedagogical tool for students, researchers and local communities.

I present two examples to better illustrate this concept, which are both connected to a self-organised occupation in Brazil called Solano Trindade, where my colleagues and I have been developing the COLLOC Workshop Series since 2018.

The first example is not connected to the COLLOC Workshop Series but was developed through the cooperation between the Federal University of Rio de Janeiro, Brazil, and Solano Trindade. It also involved various actors, such as Catálise, an architects' collective. In 2018, a series of practical workshops were held at the Solano Trindade occupation with the aim of introducing alternative construction technologies, such as 'rammed earth', 'reinforced masonry' and 'reinforced mortar'. These techniques have opened up a myriad of possibilities for the local production of building elements, which could be used in

2 Free translation from the author from Portuguese to English.

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the construction of new homes, help reduce costs for families and improve the quality of the built environment. Despite the initial resistance by the Solano Trindade inhabitants to experiment with these alternative building materials and techniques, after completing the workshops, the participants became excited by the potential of these techniques in building houses in cost-effective and ecologically responsible ways (Petrus 2021).

One outcome of this experience was the development of compressed earth blocks to construct the internal walls of new-build houses in the occupation. The idea of using this material was in connection with the ecological sanitation system that was being implemented in the occupation, which involved the extraction of a large amount of soil from the site. The decision was to use the removed soil to produce bricks for the new houses. With the supervision of technical advisers, several lab tests and training workshops were conducted until they identified the exact ratio of local soil and cement for the compressed earth blocks as well as the appropriate process for preparing and drying them. A manual press was purchased, and the production of the ecological bricks was led by residents who produced 400 bricks per day. (Petrus et al. 2022)

Although the development and production of these construction materials were not part of the COLLOC projects, the production and use of the ecological bricks became a central part of the community. The production of these materials was included in all of our subsequent workshops in diverse ways. For example, a group of participants in one of our workshop events organised a brick production site, which incorporated the names the women from the community gave to each step of the process, namely the maternity, nursery and kindergarten.

This involvement of women from the community in the production of the compressed earth blocks was key to understanding the potential of the experimental construction site for the awareness and politicisation of the community. Initially, the production of compressed earth blocks was dominated by men from the community as a clear reflection of the patriarchal structures that are hegemonically and globally present. In the occupation, women were responsible for running the collective kitchen and men were usually in charge of the construction site.

Women from the community became the experts and main actors in this field over time. The women developed their expertise as a result of the care and attention needed for drying the compressed earth blocks, which required specific amounts of water poured over them at regular hourly intervals throughout the production process. We observed that this dynamic challenged the sex-

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ist structures of Brazilian society and placed the women in different positions and roles in the community.

Another interesting outcome of this experience was that when the idea of using alternative construction materials was presented to the residents, they were initially very resistant. This resistance is related to the ideals of hegemonic construction techniques and materials that even influence self-built areas, even when residents cannot afford them. The concept of status in construction and architecture was also engrained in these contexts; therefore, proposing techniques that are more closely associated with traditional architecture can be perceived as efforts to reinforce the aesthetics of poor communities. The potential for developing innovative techniques through using local and popular knowledge became clear to the technical and academic experts following their experience of collective testing, exploration of different materials and discussion about the benefits and potential outcomes for the community. This occurred after the community members learned to produce the compressed earth blocks and became fully in charge – and the real experts – of their implementation.

After the first houses built with the compressed earth blocks were ready, the residents were extremely proud of how beautiful their earth walls looked. They realised how the bricks could be used to differentiate their buildings from others.

The second example involved the use of bamboo as a construction material and was developed in one of the COLLOC Workshop Series. The desire to learn how to use bamboo as a construction material first came from the Solano Trindade residents. The Solano Trindade occupation is located in a 50,000 square metre area, with a forest comprising a large portion of this land. The residents saw the potential for planting bamboo on this land to have access to cheap – or free – construction materials.

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*Figure 26: Production of BTC in Solano Trindade, Rio de Janeiro, 2022. Source: colloc archive*

Following this initial concept and a discussion with the Solano Trindade residents, we decided to organise a workshop where our students and the residents would learn different ways of using bamboo as construction material. The students developed different design proposals using bamboo as a structural element. For example, it could be used to build space dividers or as the main material for a roof for a building in the community. At the end of this COLLOC Workshop Series, we organised the Solano Trindade children to plant bamboo seeds.

Both of these experiences show the potential of developing alternative solutions that emerge from local and technical knowledge on site. In vulnerable contexts, such as favelas or other forms of self-built spaces, these experimental construction sites also have the potential to inspire others and influence other building environments.

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*Figure 27: COLLOC Bamboo Workshop, Rio de Janeiro, 2021. Source: colloc archive*

*Figure 28: COLLOC Bamboo planting, Rio de Janeiro, 2021. Source: colloc archive*

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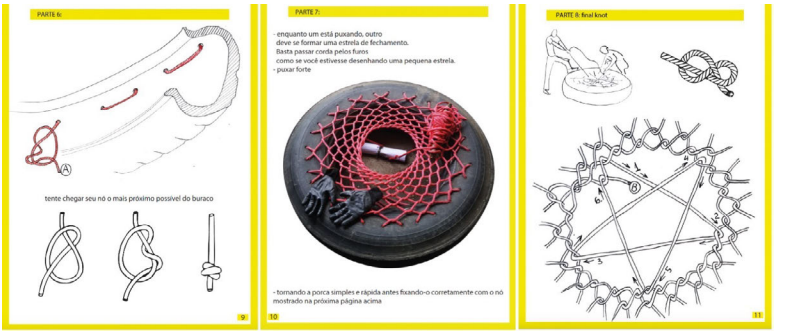
## Technical guides

Manuals or technical guides can be used as tools for documenting and enabling the expansion of solutions that have been developed on-site through hands-on work. Here, the idea is to use the visualisation and systematisation skills from our training to create documents that can continue to be used by the community after our departure.

I describe the development of two manuals in the COLLOC Workshop Series in Rio de Janeiro, Brazil. The first manual details the production of a trampoline using tyres, which was initially suggested during a workshop I attended in Jordan organised by my colleague Hassan Elmouelhi. There were a large number of tyres in the area, which we decided to use to build play structures for a public playground. For example, a tyre trampoline made with colourful ropes was a huge success among the local children. After this experience, I presented this idea to students during the 2022 COLLOC Workshop Series, and we built tyre trampolines for a playground for refugees in Berlin. One of the students was highly skilled in handcraft, and she developed a technique for braiding ropes to make the trampolines sturdy and aesthetically pleasing.

*Figure 29: COLLOC Workshop, Rio de Janeiro, 2022. Source: Group collective spaces*

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The local children loved the tyre trampoline, and the students involved in the project decided to develop a manual to document the construction process and to enable the residents to build more trampolines. The manual was an interesting method for recording empirically produced knowledge and served as a basis for further development.

Another example of manual development and use came from the same COLLOC Workshop Series. For this scenario, participants were focused on water, which was a great challenge in this context due to the heavy rains that caused flooding and leakage problems in the area. In addition, the public water supply system was precarious and often left the area without potable water. Due to these issues, the student group developed the concept for collecting roof water, employing a filtering system for water reuse and directing excess water to a rainwater garden. This idea combined the inhabitants' local knowledge, as they already understood how to channel rainwater from their roofs through a gutter system, with the technical knowledge of water experts who had previous experience in constructing rainwater gardens. In addition, one participant's knowledge of specific local plants with insect-repellent properties was used for the rainwater garden, resulting in a systemic solution that encompassed several community issues.

The group built a prototype of the rainwater garden and produced a technical guide to document the process and enable the community to develop it further. This guide included various details, such as how to build the rainwater garden and the specific uses of various recommended plants.

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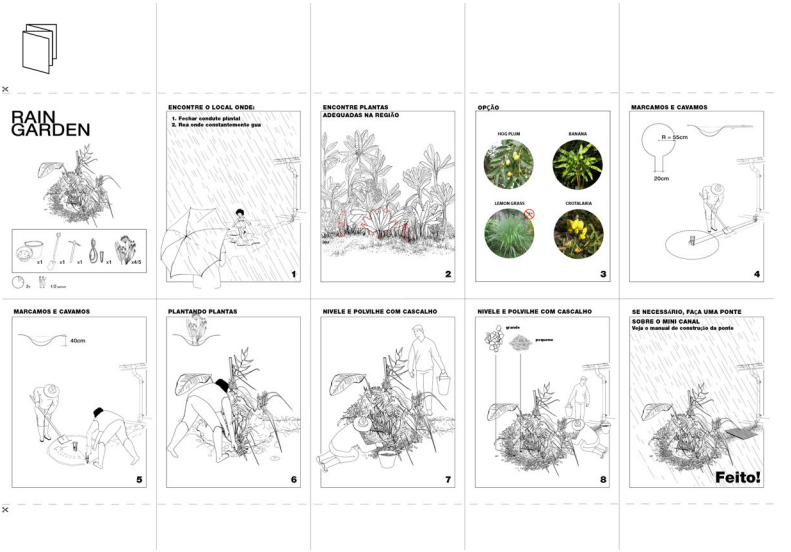
*Figure 30: COLLOC Workshop, Rio de Janeiro, 2022. Source: Group open spaces*




## Artefacts

> An approach gaining traction within education, business, and government is the use of tangible objects as a tool for structuring, sustaining, and evidencing collaborative events. The qualities of tangible objects lend themselves to becoming items of discussion and critique that can address some of the difficulties of traditional approaches to facilitated discussions and events. The tangible object physically embodies and represents a shared understanding and vision. Objects are better the more abstract they are, otherwise, there is a tendency for people to think about the details, rather than the overall picture (Buur & Mitchell, 2011). (Tewdwr-Jones and Wilson 2022: 230)

Transformative artefacts can be a powerful tool to engage a community to focus on one specific topic; they serve as physical representations of ideas that enable the participants to actively engage in the design process. These objects function as conversation starters, making abstract concepts more accessible and allowing for more inclusive discussions. When community members interact with artefacts, they are invited to co-create, question and refine their ideas, ensuring that diverse perspectives are integrated into final outcomes. This hands-

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on approach not only breaks down communication barriers but also empowers participants; their contributions can be made visible, which can be especially valuable in communities where marginalised voices often go unheard.

Moreover, the transformative potential of artefacts lies in their ability to shift focus from traditional, often hierarchical, planning modes to more democratic and collaborative processes. By using abstract, flexible objects that encourage imaginative thinking, communities can move beyond preconceived notions and rigid structures. This allows participants to explore possibilities for density, communal spaces and urban configurations without becoming entangled in specific details. The open-ended nature of these artefacts fosters creativity by enabling participants to envision new forms of urban living aligned with their own needs and aspirations. Thus, artefacts not only facilitate dialogue but also become catalysts for innovative, sustainable and inclusive urban design solutions.

In the experience of a group of students working with refugee children living in Berlin, a *Bollerwagen* (i.e. handcart) was chosen as an artefact was to be transformed by the children to embody their wishes, favourite actions and places and what they missed from their home countries. The idea emerged during the first interaction, when the students learned that the children could not invite their friends over due to the rules of their refugee shelter. The students then proposed that the children could bring their playground to their friends instead of inviting them to visit. This artefact, which the children could manage, was designed to explore the materiality of the object, incorporate their dreams and desires and allow them to explore their neighbourhood.

This workshop comprised three interactive moments that happened on different days, mostly among the same group of refugee children. The students described the different workshop activities as follows:

> Workshop 1: Collaging
> The objective was to further understand the children's preferences and introduce the *Bollerwagen* (a handcart) as a tool for creative expression. Activities included creative collaging to identify favorite activities. Outdoor experimentation with the *Bollerwagen* to see how children interacted with it in a more dynamic setting. Findings were clearer: Picnics, BBQs, and sports were popular activities. The *Bollerwagen* served as a catalyst for outdoor play and creative expression, despite initial difficulties in maintaining focus indoors.

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Workshop 2: Mapping
The objective was to explore how children perceive and interact with their neighborhood using the *Bollerwagen*. Activities were walking tours with children to map their favorite spots in the neighborhood and a series of interactive games involving dice and question cards to guide the children in discovering and documenting their environment. Findings: Children enjoyed nature and wanted to use the *Bollerwagen* for picnics. The *Bollerwagen* became a tool for spatial appropriation, allowing children to claim and personalize their surroundings. Mapping activities revealed insights into the children's views and their attachment to various neighborhood spots.

Workshop 3: Picnic
The objective was mainly to involve parents in the project and establish a sense of ownership and connection with the *Bollerwagen*. Activities included organizing a family picnic to introduce the *Bollerwagen* to parents and children. Facilitating model-building activities where children could directly implement their ideas on the wagon. Collecting materials for creative projects, such as sewing sandbags for games. Findings: the picnic fostered a communal atmosphere and encouraged families to connect with the project. Children expressed interest in various creative pursuits, such as fashion design. The *Bollerwagen* was successfully integrated into the children's activities, reinforcing the concepts of ownership and creative expression.[3]

During these three workshop activities, the students tested different interventions using the artefact, such as painting it, dismantling it, adding new elements to it and filling it with toys or food for the picnic. All these activities were conducted with the refugee children as a way of building their sense of appropriation of the *Bollerwagen* while discussing the children's spatial perceptions, assumptions, practices and desires.

Following their walks in the neighbourhood and the children's drawings and disclosed information, the students created a child-friendly map of the area surrounding the refugee shelter.

3 Extract from the Ebook of the Studio Insurgent Design: unlearning practices through marginalized spaces (Juliana Canedo, Tuanne Monteiro, Qusay Amer, Maureen Abi-Ghanem and Francesca Ceola), TU Berlin 2024. Students: Annika Hopster, Sari Hallak, Valentin Keller, Milon Thomsen, Ida Duge.

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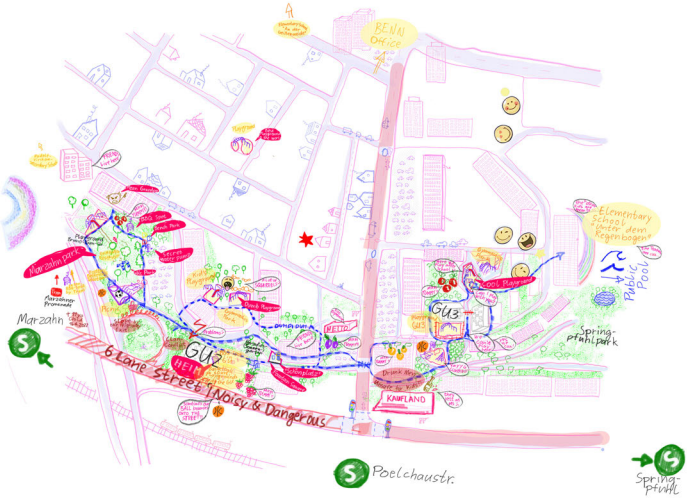
*Figure 31: Studio Insurgent Design, Berlin, 2024. Source: Annika Hopster, Sari Hallak, Valentin Keller, Milon Thomsen, Ida Duge*

*Figure 32: Studio Insurgent Design, Berlin, 2024. Source: Annika Hopster, Sari Hallak, Valentin Keller, Milon Thomsen, Ida Duge*

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All these produced materials and the artefact were then given to the children with the mediation of the social worker responsible for all voluntary activities in the refugee shelter. The students described this process as follows:

> At the end of the process and all the workshops, the neighbourhood map and the *Bollerwagen* are available as a product for the children. They identify with the object and recognize ownership, they proudly call the *Bollerwagen* their own. They can now use it to explore the neighbourhood and use it with their friends outside the GU[4]. The families can also borrow it to go on a picnic, for example, or the social worker can use it during her activities with the children. It's also great to see that the children use the *Bollerwagen* to appropriate their surroundings and re-code existing spaces.
>
> In addition, a festival kit was developed together with the children to help them appropriate their surroundings. It consists of simple materials that can be used in different ways – such as a blanket that can be turned into a volleyball net with the help of the *Bollerwagen* and broomsticks, but is also the playing field for "Twister". All the situations developed together with the children were recorded in a manual, which is now part the *Bollerwagen* such as a picnic table, a stage or different games. Rules were also developed for using the *Bollerwagen* (e.g. "only two children maximum"), so every kid is safer while using it. From now on, the children can borrow the *Bollerwagen* from the security personnel and have fun with it in the neighborhood.

In this example, as well as in the other methods that involved construction elements, the outcomes for the refugee community were clear and tangible. Efforts to target the children's urgent needs or address objects that can potentialise their imagination and materialise solutions or ideas using objects or interventions is an empowering way to give something back to these communities and build their trust.

4 GU, *Gemeinschaft Unterkünft* or collective accommodation in English.

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