



Shi Zeng | 5534739

Global housing graduation studio 2022-2023
Research plan tutor / Rachel Lee
Design tutor / Dr. Nelson Mota & Ir. Harald Mooij

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Background

Currently, about 16% of the urban population in Brazil still lives in the slums (Population Living in Slums (% of Urban Population) - Brazil | Data, n.d.). The disparity between the rich and the poor is a highly complex issue with frequent overlapping economic, political, cultural, and institutional causes (Pimentel Walker & Arquero de Alarcón, 2018). In the 1970s, the price of the economic miracle under the military dictatorship was a serious increase in the division between rich and poor, which was evident in Brazil's major cities - large numbers of the urban population were forced to move into slums (Fig.01). From the 1970s to the 1980s, the population of slums doubled ten-fold. By 1987, 55% of São Paulo's population was living in slums. This increase was accompanied by violent crime. From 1978 to 1994, the murder rate in the São Paulo metropolitan area increased by 356 percent (Ruotti et al., n.d.).



Figure 01: The sprawling favela of Paraisópolis (Gui Christ)

Phenomenon

The area with sustained growth of slums is accompanied by a high frequency of population change due to migration (Fig.02). People's housing affordability varies since urban residents usually have wide income disparities (Guild, 2003). In pursuit of a more beautiful environment and higher levels of medical and educational services, people with higher incomes have more options to relocate their houses away from areas with subpar public infrastructure, under-funded public services, and overcrowded housing. However, those with lower income are far from these advantages and can't afford to pay for better-supported expensive housing, so they have to endure their current situation. Over time, as the "Matthew effect(it is occasionally summed up by the proverb "the rich get richer and the poor get poorer")" intensifies, the poorer a region is, the more impoverished it becomes.



Figure 02: Migrants (Candido Portinari 1944)

Community

It is difficult to define favela precisely because it has changed over the years, and its use as a synonym for slum has become a uniquely Brazilian term. If we look at the history of its formation alone, favela means a community of people of the same status ("Favela," 2022), while the slum is determined by the low income occupants and their poorly built houses. Therefore, It's necessary to create the sense of community (Fig.03) for the residents. So at this point, the design of favela should not only concentrate on the space but also reconstruct the interpersonal relationships. As architects, how should we intervene in public space design, how should we share public resources, what kind of "relationship" should be established between people, and can we only huddle in private space without contacting the public? The problem of life is about coexistence issues. If we narrate the fate of life like the describe the physical movement of things, all the meaning and value of life will be cancelled (Zhao Ting-yang, 2009). And the concept of happiness will disappear because there is no happiness that belongs to the state of existence of individual things, it belongs to coexistence states.



Figure 03: Community (Authors own photograph)

02 | Research question

Obsevation

During the interview with local citizens in Sao Paulo, people all mentioned how they got involved in the design process and then participated in the construction. As the first generation of inhabitants, they are proud of the house they built (Fig.04), and they are willing to beautify their homes and improve the environment of the community. However, when some of the inhabitants sold their houses and moved out, the new residents had the opposite attitude toward the community. They only focus on their own homes and ignore the needs of the neighborhood. Thus, the genius loci are lost, and the meaning of community is gradually fading away.

Motivation

In order to increase the vitality of the site, some local residents dec- orate the community in their own ways, such as by designing their own front yards, refurbishing the facade, and so on. Compared to the buildings completely designed by the architects, the houses with the local people's concept are more vivid. The spontaneous re-design not only increases the variety of repetitive units but also enhances public participation willingness, thus intensifying the sense of community.



Figure 04: Construction of an additional floor (Authors own photograph)

02 | Research question

How to engage less-privileged groups to participate in different stages of design?

The question can be divided into 3 sub-questions:

1 | Less-privileged groups

What are the characteristics of social housing for less-privileged groups?

The socially vulnerable groups are usually voiceless and can hardly fight for their rights due to discrimination and segregation classify. many people think they do not exist or are very far from our lives. But we should not ignore the existence. To better understand the characteristics of the target group and implement the elements in the subsequent design process,

Due to discrimination and segregation, socially vulnerable groups frequently lack a voice and are unable to defend their rights. Many people think the less-privileged groups have already lost their social connection and are disconnected from their daily lives (Pettit, 2004). However, we should not ignore their existence and disregard their feeling about the living environment. To better comprehend the traits of the target group and incorporate the components (Fig.05) in the following design process.

I categorize the housing qualities into two parts: The **input** and **output**. Input means the needs of residents, and output means what the residents can provide for their own houses and the whole community (Fig.06).

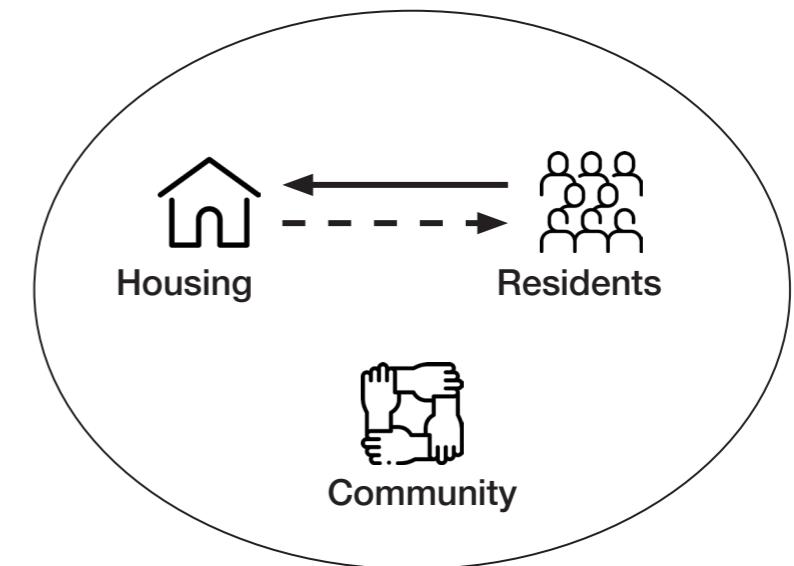


Figure 05: Sense of community (Authors own diagram)



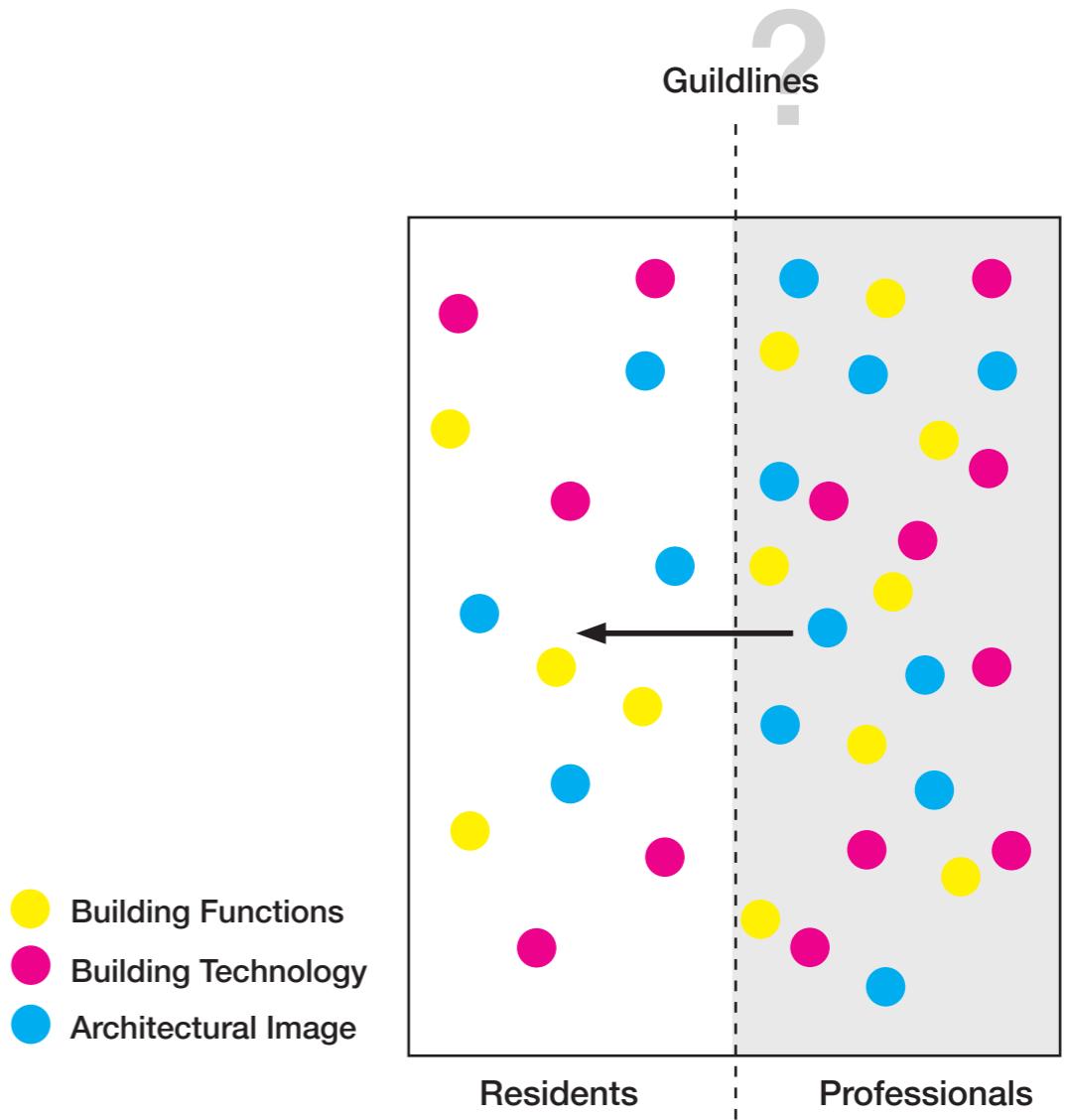
Figure 06: Self-built stool (Authors own photograph)

02 | Research question

2 | Public participation

What is the boundary of design between professionals and local residents?

Through the seminar with local residents, I observed that they are motivated to demonstrate hidden skills and contribute to the community. So I need to engage public participation in the design as much as possible while ensuring that the basic functions of the building units are well-developed and that the buildings function well with the municipal infrastructure network, such as Heating, Ventilation, and Air Conditioning (HVAC) and water supply and drainage. I categorize the building elements into three parts: **a) building functions** (requirements that the building should meet in terms of material and spiritual aspects), **b) building technology** (including building materials and products technology, structural technology, construction technology, equipment technology, etc.) and **c) architectural image** (building's shape, colors, details, materials, etc.) Then based on these three categories, I will sort these elements(Fig.07) according to the degree to which citizens can participate, thus forming the levels of participation.



02 | Research question

3 | Design Stages

What kind of roles can local residents play in different stages of design?

There are 5 design phases to architectural services (Architecture Phases Of Design, Fontan Architecture, n.d.). Based on the participatory design situation, I simplified them into 3 stages: **a) identification, b) development, and c) construction.**

Identification indicates the needs of residents, which are based on the demand of inhabitants and the site analysis from the architects. In this phase, the design comprises assisting locals in resolving issues that affect their area by utilizing their interpersonal relationships and their own suggestions for revitalizing their neighborhood. The most important component is handling “soft” community-related issues, such as obtaining feedback from the locals and hosting workshops, rather than managing the “hard” infrastructure, such as buildings and parks (Giving Design a Local Touch: Yamazaki Ryo and Studio-L | Nippon. Com, n.d.).

In development phase, the architect and owner will collaborate during design development to choose materials, including interior finishes and items like windows, doors, fixtures, appliances, etc. Compared to Schematic Design, the architect will make more detailed revisions to the drawings.

In the construction segment, the main focus can be on two components: building technology and building materials. Building materials are processed using locally available raw materials as much as possible to reduce costs and also to reflect local characteristics. For the building technology part, since most of the residents are not construction workers, they need to build under the guidance of professionals. Local residents can reduce the cost of construction by providing labor, and at the same time, because they are involved in the construction of the building, they can also promote their passion for the community.

1 | Characteristic of less-privileged groups

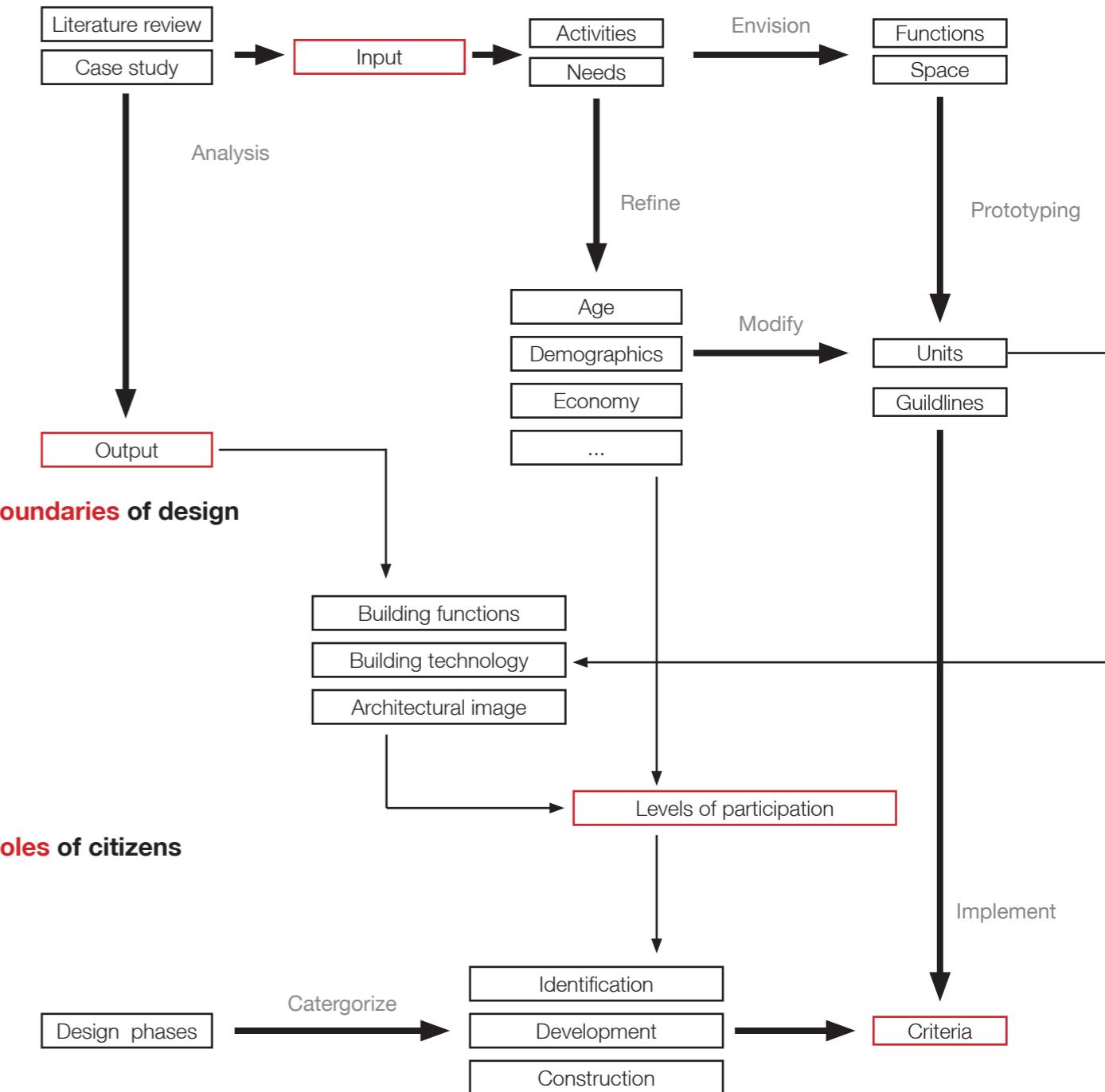


Figure 08: Research question framework (Authors own diagram)

03 | Theoretical framework

Collaborative design

The fact that there is already knowledge and recognition value within the social sciences field is a key benefit to employing the interactive settings produced by participatory action research. Since the Participatory Design Conference (PDC) has served as the primary forum for the dissemination of Participatory Design(PD) work for more than 30 years, I began my search with literature review based on this event (Fig.09). I also established my thesis on grassroots experimental participatory design projects to bridge the gap between theory and practice. My goal is to develop theoretical and applicable significance and assist people to gain a more comprehensive understanding of potential collective futures.

The realization that design-foundational knowledge is infused with a systemic nature gave rise to many collaborative design methodologies, including participatory design (Bp, n.d.) and co-design (Manzini & Rizzo, 2011). It was the use of prototypes to collectively foresee potential futures with stakeholders (Bødker, 1987). As more designers engage in social transformation initiatives, they understand the value of the citizens who are underrepresented in the design process yet can offer invaluable insights to the designers. By incorporating communities in a deliberate process of imagining the future through their work, Robert Jungk and Norbert Müllert (Jungk & Müllert, 1987) created a space for design practices to be involved in the creation of policy.

Guillermo Aguirre-Núñez discusses instances when democratic policymaking was employed to maintain control over the process and win public support for already-in-development policies (Núñez, n.d.). Under such circumstances, empowering underprivileged groups to participate actively in the design and decision-making process is crucial.

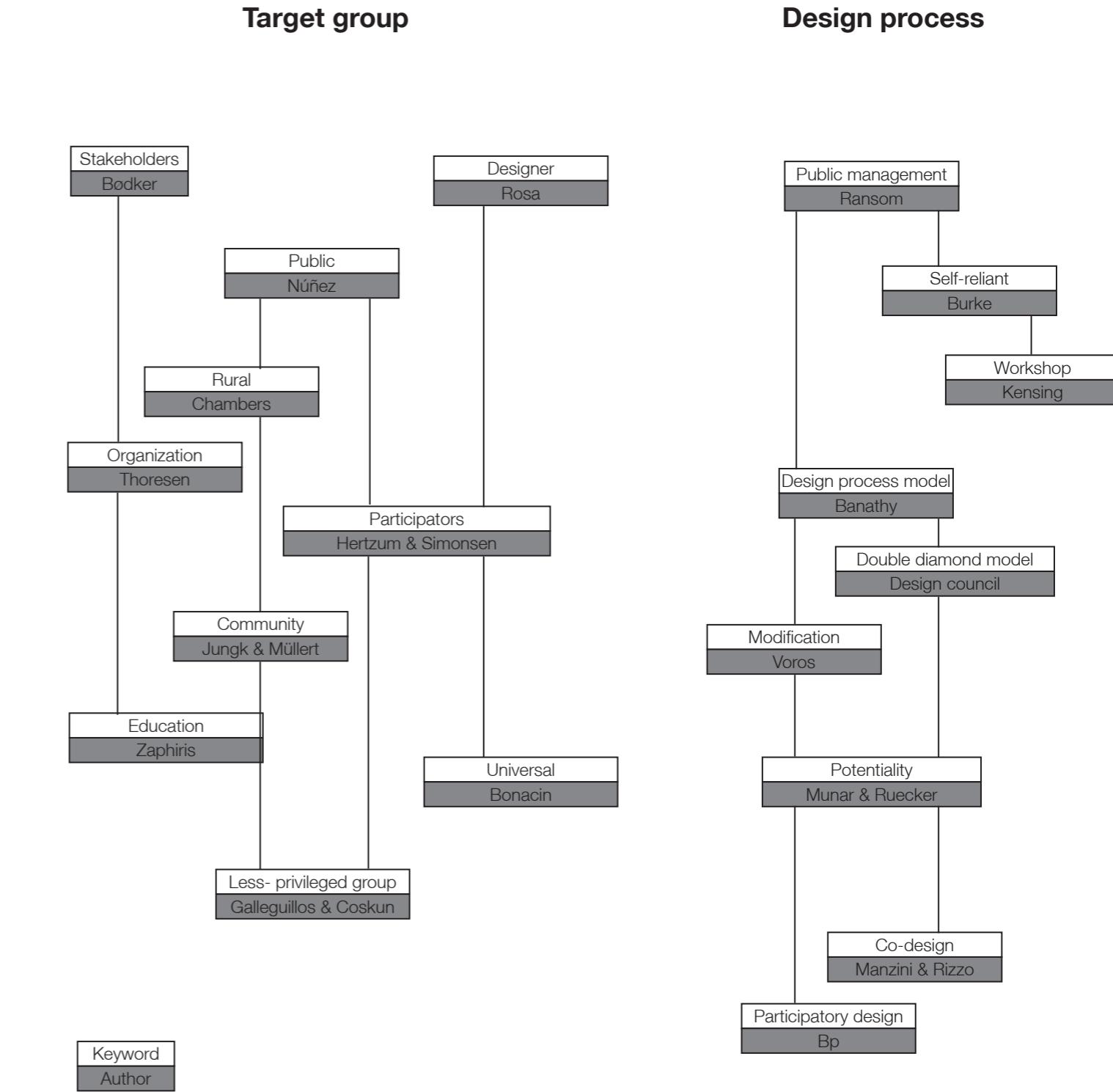


Figure 09: literature review of participatory design (Authors own diagram)

03 | Theoretical framework

Design process model

To modify complicated social systems, Banathy created a design process model (Banathy, 1996). His paradigm has been crucial to our comprehension of how design may engage communities in defining and implementing their futures. The model's limitation, however, is that it depicts time and process as linear, failing to take the adaptation into account. According to Joseph Voros' research, he improved the viability of the design procedure (Voros, 2003). It allows for potential adjustments or modifications during the process. In 2004, Banathy's concept served as the foundation for the Double Diamond model (The Double Diamond: 15 Years on - Design Council, n.d.) of the Design Council and other cutting-edge design thinking frameworks (Fig.10).

In 2020, Juan de la Rosa Munar and Stan Ruecker combined these two models to present a more detailed design portrayal (De la Rosa Munar & Ruecker, 2020). It shows how the intention to find a new direction and identify potential components through practical implementation. Because of this, the design enables subtle corrections that allow the trajectory to be revised in response to the effects of continuously evolving policies and a pervaded long-term objective, which may eventually result in systemic changes (Fig.11). And according to Bødker's research, it is remarkable that in order to define and modify the complicated social system, those who will be influenced by the result must be involved in the process (Bødker, 1987). Therefore, designers need to guide citizens to participate in the design process and correct the final design outcome into the envisioned future based on the locals' experiences and feelings. Rosa et al., mentioned four ways to embody the designer's job (Rosa et al., 2021): a) intention identification, b)empowerment for voiceless groups, c) democracy facilitation, d) critical review of unintended consequences. With the rapid change of society, these articles aim to provide a space to rethink the roles that designers might play in the new era of altering reality, and my research seeks for the same goal based.

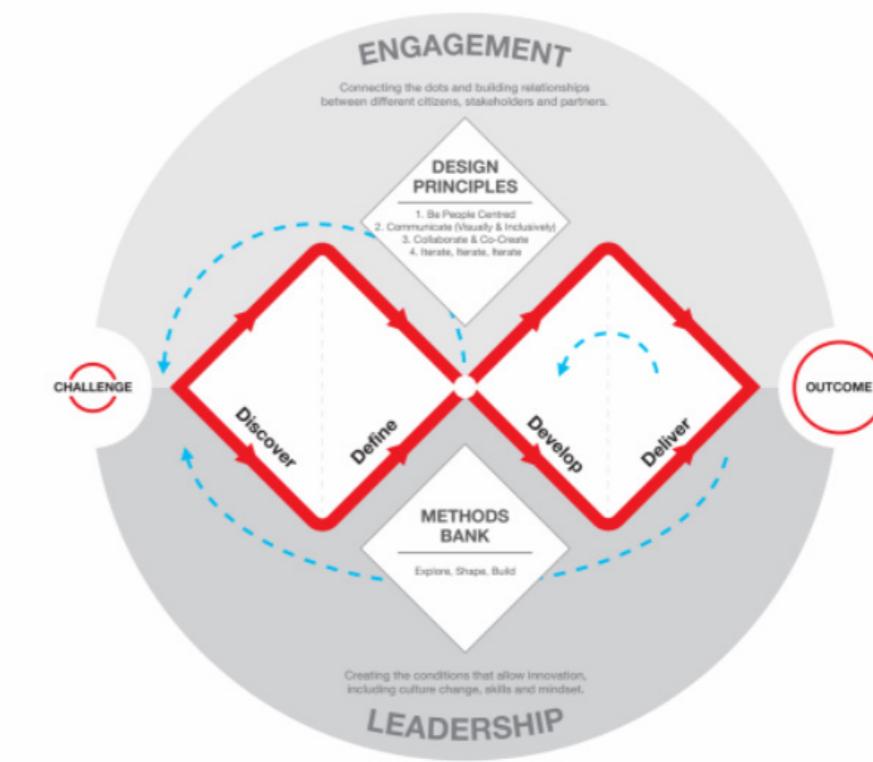


Figure 10: Double diamond model (Design council, 2004)

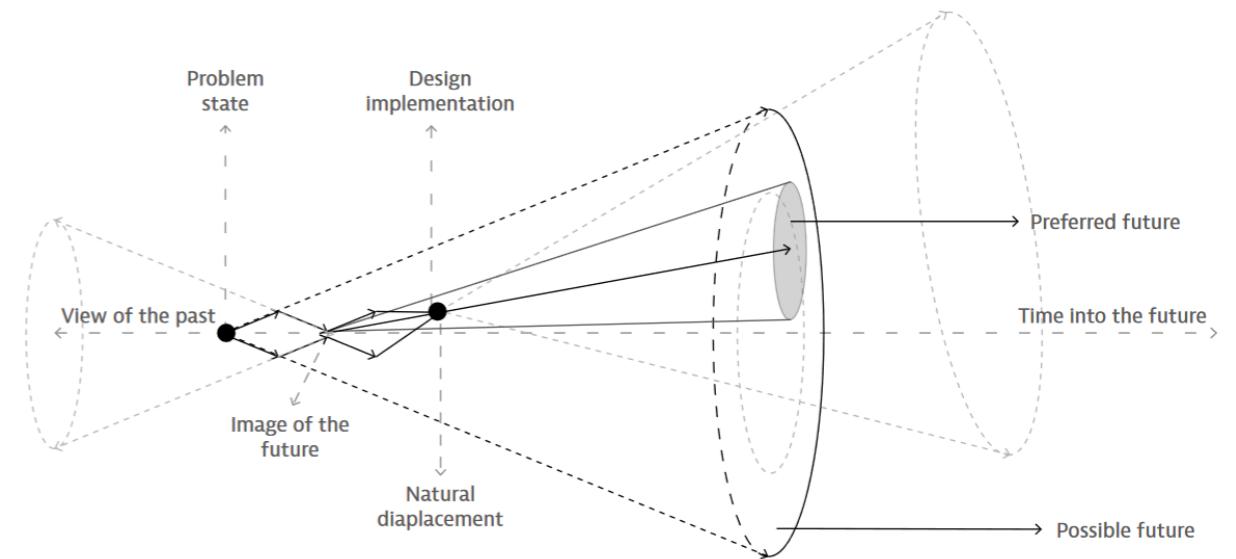


Figure 11: Non-linearity of the design process model (De la Rosa Munar & Ruecker, 2020)

04 | Methodology

Following the research question, I will choose different strategies to figure out the answers. Firstly, I will start with a literature review, because it addresses a particular aspect of the problem in a more specialized, comprehensive, in-depth, and systematic way. By synthesizing, analyzing, and evaluating the content reviewed, I can reflect on the authors' views and insights, which can help me better understand the background of PD and future application scenarios, and lay a good foundation for my subsequent graduation design. However, based on the current PDC research, most of them focus on top-down policies, and their intended audience is the research community. Thoresen (Thoresen, n.d.) and Hertzum and Simonsen (Hertzum & Simonsen, 2010) are the only two exceptions, and they carried out formative assessments to inform project participants. So the bottom-up practice in the design process is still in its infancy, It necessary to use other methods to conduct subsequent research.

In Galleguillos and Coskun's research, they introduced four common methods to conduct PD based on a literature review: **workshops, interviews, naturalistic observations, and toolkits** (Laura Ramírez Galleguillos & Coskun, 2020). During the field trip in October in 2022, we(10 students) participate in the workshop in Sao Paulo, we take a site visits to the case studies analyzed site and the project's site area, and we had a brief seminar with the local citizens in each site (Fig.12, Fig.13). Through the interview, we can better understand their struggles to fight for their right, and their need of their house. Through the close contact, the local citizen's feedback are beneficial to graphically illustrate our study topic. But the limitation of workshops and interviews is the subjectivity of their feedback, sometimes people only answers what the interviewers want to hear (Analysis of the Cognitive Interview in Questionnaire Design | Request PDF, n.d.). And through the on-site exploration, I noticed that there are some gap between the community and the municipality, which means the facts inhabitants mentioned were different from what the government presented, therefore, it is essential to evaluate the materials' accuracy and be aware of their informational sources.



Figure 12: Workshop of the site (Author own photograph)



Figure 13: Interview with local citizens (Author own photograph)

04 | Methodology

Observations are frequently made on field visits, where the researcher watches the participants' behavior (Fig.14). Researchers used cultural immersion to perform a different kind of observation while working in a place with a different culture (Wang et al., 2020). However, due to the culture difference, the misunderstanding may cause some biases. Under such circumstances, the interview and seminars provide a fundamental framework for evaluating and correcting the outcome of observation. As a result, researchers improved their comprehension of what individuals do, how they do it, and the meanings associated with specific activities from the viewpoint of the participants (Baskerville & Myers, 2015). Toolkits are a collection of implements for constructing something or directing one's own observations on a subject. Toolkits are more often associated to ideation and co-design process for prototyping a project or service when utilized in a workshop. But It's less viable to design and implement this method on the local citizens.

However, due to geographical and language barrier, It's hard to conduct these four methods again in subsequent research. So my study will mainly focus on the online resources (literature review and previous practice) and offline resources, including transcript of interviews and seminars, the pictures and videos of the site, etc... For more information, I will go on an interview of the students and professors from School of Architecture and Urbanism of the University of Sao Paulo (FAU-USP), to ask their feelings and suggestions about how to engage less-privileged people in PD. Considering the safety concerns and technical defects, I will not do the interview and the online survey with the locals. I will try to identify relevant themes from previous studies, concentrating on the residents' actual demands for housing and public space. Based on the responses, I can categorize the general data regarding their fundamental and urgent spatial quality requirements, assisting in the graduation design of global dwelling.



Figure 14: On-site exploration (Author own photograph)

05 | Relevance

The idea behind participatory design is to involve those who may be affected by a new design or technology in its development (Participation in Design Things | Design Things | Books Gateway | MIT Press, n.d.). But occasionally, those who have faced difficulties because of prejudice based on their sex, ethnicity, economic and immigrant status (Refworld | Leaving No One Behind – The Imperative of Inclusive Development, n.d.) are less powerless to speak up.

This research aims to identify effective ways to involve underprivileged groups in the design process, because there are greater barriers for them. Additionally, based on Research through Design (RtD) approach, my graduation project will offer some conclusions and suggestions for enhancing both present and upcoming PD practices. At this stage, I come up with the “**Triple-E**” concept (engagement, empowerment and establishment) to facilitate public participation in the design process (Fig.15).

Engagement

The designers' capacity to deal with the practitioners has to be considered, and the designers must be aware of their limitations (Bonacini et al., 2019). And according to Natasha Iskander, modifying design tools for varied innovative contexts plays an significant role in PD process (Design Thinking Is Fundamentally Conservative and Preserves the Status Quo, n.d.). In the research, Galleguillos and Coskun categorize the typical involvement process into three steps: **a) ideation**, in which designers define the issue with participants; **b) building**, in which designers develop ideation activities with participants and use this data to create prototypes; and **c) validation**, in which designers present their work to participants for feedback (Laura Ramírez Galleguillos & Coskun, 2020).



Figure 15: Self-built stool (Authors own photograph)

Empowerment

Self-built homes have lots of convenience for locals, but how to engage the voiceless groups to stand up for their rights? The empowerment can be achieved in two different ways. On the one hand, it can be done through preliminary policy-making, which refers to the government's policy adjustment to encourage residents to be more involved in the design. For instance, in the case of Conjunto Casarão Celso Garcia, citizens can participate in the construction by using their labor to mortgage the initial rent. On the other hand, designers should give citizens certain possibilities in the operation and maintenance and extensions of the building. For example, With the rapid increase in population, the original floor plan was no longer adequate for the daily life of the family, so some residents in Jardim São Francisco added partition walls inside the building to separate the spaces, while others extended the balcony to increase the bedroom space. Comparing to the projects completely design by the architects (Fig.15), And some new residents in Comuna Dom Helder Câmara have repainted the facades with brilliant colors or replaced the brick façade with ceramic tiles (Fig.16), adding to the vibrancy of the neighborhood.



Figure 15: Housing complexity (MVRDV, Den Haag)



Figure 16: Variety of refurbished facade (Authors own diagram, Sao Paulo)

05 | Relevance

Establishment

After residents have taken an active part in the design and construction process, there is a need for prompt feedback and ongoing follow-up on design, maintenance, changes, or extensions. This helps to solidify the relationship between citizens and architects and promotes the long-term sustainability of participatory design in the community (Fig.17). Through reading the research literature, Poderi and Dittrich discovered that a longer-term participatory design intervention that gradually involves all participants can yield more beneficial outcomes (Poderi & Dittrich, 2018). Thus, It's necessary to focus on the practical value and the improvement of PD projects. By participating in the practical projects, inhabitants feel connected to the site, and they develop a sense of commitment, which consolidate their ownership and embody their efforts and success. This facilitates the involvement of local residents in the building construction process, thus shaping their sense of empathy for the site. The development of skills and competence can be aided by the same process. Participants frequently employ their own abilities or experience that are frequently disregarded in daily work by rearranging the duties, activities, and generating new goals. And according to participatory design, each of these elements helps to produce a result that is more long-lasting.

Figure 17: Sense of community
(Authors own diagram)



06 | Timeline

P1 Progress Review

Nov.25th, 2022
 Research Plan
 Compilation of the Contextual Analysis and Design Research
 Design Hypothesis

P2 Formal Assessment

Jan.26th, 2023
 Graduation plan based on template
 Urban draft / master plan 1:1000 / 1:500
 Program / list of requirements
 Draft design (plans, sections, elevations) 1:200

P3 Progress Review

April.6th, 2023
 Interim Presentation
 Plans, facades, cross-sections, 1:200
 Part of the building, plan and cross-cut
 Facade fragment with hor. and vert. cross-section
 Set up details
 Draft reflection

P4 Formal Assessment

June.2nd, 2023
 Formal Presentation
 Site 1:5000 / 1:1000
 Plan ground level 1:500
 Plans elevations, sections 1:200 / 1:100
 Part of the building, plan and drawings 1:50
 Facade fragment with hor. and vert. cross-section
 Details

P5 Final presentation

June.23rd, 2023

Bottom-up design

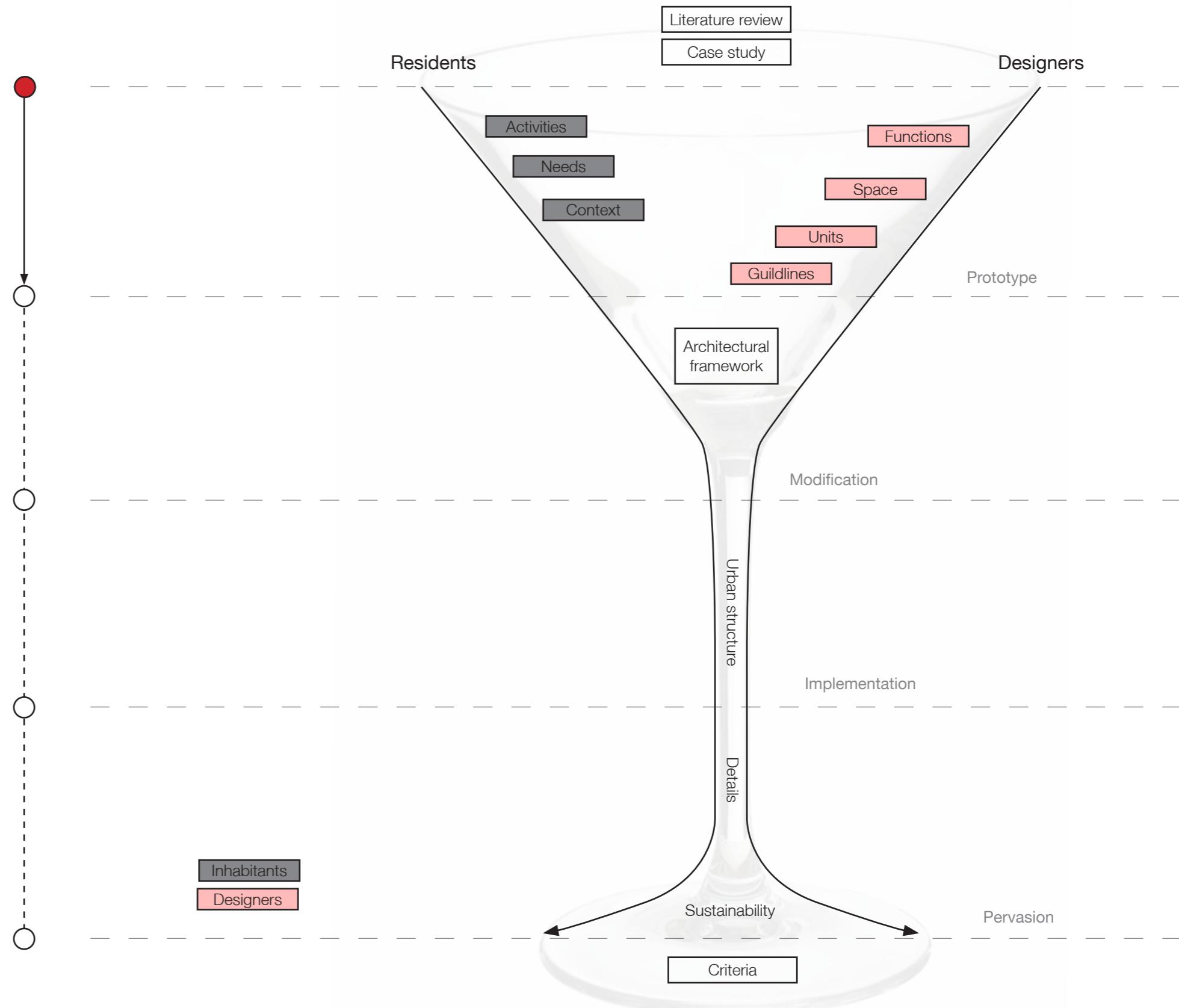


Image captions

Image number	Authors
Figure.01	Gui Christ, 2020, photograph, São Paulo's favelas are running out of food. These women are stepping in, retrieved Nov 12,2022, https://www.nationalgeographic.com/science/article/coronavirus-brazil-sao-paulo-favelas-running-out-of-food-women-stepping-in
Figure.02	Candido Portinari, 1944, painting, Migrants, retrieved Oct 10, 2022, https://arteeartistas.com.br/os-retirantes-candido-portinari/
Figure.03	By author
Figure.04	By author
Figure.05	By author
Figure.06	By author
Figure.07	By author
Figure.08	By author
Figure.09	By author
Figure.10	Double diamond model, 2004, 15 years on—Design Council. (n.d.). Retrieved November 14, 2022, https://www.designcouncil.org.uk/our-work/news-opinion/double-diamond-15-years/
Figure.11	Non-linearity of the design process model , De la Rosa Munar, J. A., & Ruecker, S. (2020). Using prototypes to produce high-resolution systemic future maps. A proposed model for design research and knowledge. <i>Bitácora Urbano Territorial</i> , 30(2), 87–100. https://doi.org/10.15446/bitacora.v30n2.81801
Figure.12	By author
Figure.13	By author
Figure.14	By author
Figure.15	By author
Figure.16	By author
Figure.17	By author

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