



CHAPTER

02

RESEARCH FRAMEWORK



Figure 2.1. Live-build knowledge exchange (Zorn 2021)



2.1

RESILIENCE & VULNERABILITY

The intention of the research is to investigate the existing resilience practices within Plastic View that contribute towards its sustainability. In the interest of the identified issues, the physical indications of these practices will be investigated, primarily through the community's material choices, spatial planning, and micro-infrastructure. According to Usamah, Handmer, Mitchell & Ahmed (2014:178), to understand the resilience of an informal settlement and its degree of social capital and internal networks, the vulnerabilities must also be understood. This is because vulnerability is a measure of the settlement's exposure to hazards (Weichselgartner & Bertens 2000:6), hence a measure of that which threatens its resilience. Investigating the vulnerability of Plastic View, through factors of geography, economy, housing and land tenure (Usamah et al. 2014:181), provides an understanding of the degree to which the community can be affected by disturbances (Weichselgartner & Bertens 2000:6). Understanding resilience practices within such an environment can contribute to building adaptive capacity and reducing vulnerability (Peres & du Plessis 2013:2). Thus, the intended research consists of explorations into the existing resilience of the Plastic View community, the vulnerabilities and potential threats it may face, and the adaptive and transformative capacity it holds in the face of such threats.



2.2

INCREMENTAL SERVICING

While Kihato & Napier (2013:91) characterise informal settlements as poverty-stricken, overcrowded, and lacking in municipal servicing, these characteristics can be considered temporary in the same way the informal dwellings are temporary (Kellett & Napier 1995:22). Plastic View is transient by nature, and the support for its existence comes in the form of incremental upgrading that lends to a transition and reintegration into formal operations of urban life. It is evident that the residents of informal settlements have the capacity to provide themselves with basic forms of shelter; however, the vulnerability of the settlements largely stems from a lack of basic infrastructure and services (Satterthwaite, Huq, Pelling, Reid & Lankao 2007:2). According to Bertaud (2018:260), services such as water provision and sanitation have greater potential to improve a community's livelihood than the quality of their dwellings. Considering that small-scale adaptation of dwellings prevails in informal conditions (Dovey 2015:7), so should the provision of infrastructure through an incremental process.

This comes from a pragmatic stance to settlement upgrading, which, according to Combrinck, Vosloo and Osman (2017:46), sees a context like Plastic View to be in a state of transition and reintegration into formal society. The argument for incrementalism recognises

a necessary balance between provision and enablement that can develop the agency of the community (Combrinck, Vosloo & Osman 2017:34). It can thus be said that upgrading Plastic View, through the development of basic infrastructure, has the potential to improve living conditions, reduce vulnerability against long term disturbances and contribute to the settlement's agency.



2.3 ANTICIPATED REUSE

In response to the architectural issue of static, formal provision, a “safe-to-fail” intervention will be designed to take advantage of the strong social cohesion and internal networks present in Plastic View. It is necessary that the system anticipates a degree of appropriation and adaptation of built forms by the community itself. According to Wakely and Riley (2010:1), this is highly pertinent to facilitating incremental upgrading of informal settlements, as the architecture is positioned to enable the community to elicit their desired socio-spatial evolution (Combrinck et al. 2017:34). Designing to cater for appropriation requires an understanding of socio-spatial organisation within Plastic View. A pattern language of the settlement as a whole, its grid structure, the individual streets, third spaces, and finer details of construction material choice and methods shall inform the design process. This can inform how an intervention may be incrementally adapted and how it may influence a future expansion of the settlement. As a “safe-to-fail” system, the intervention should be designed so that if the proposed use of the building becomes obsolete, a reuse of the structure, or the construction materials, is possible.

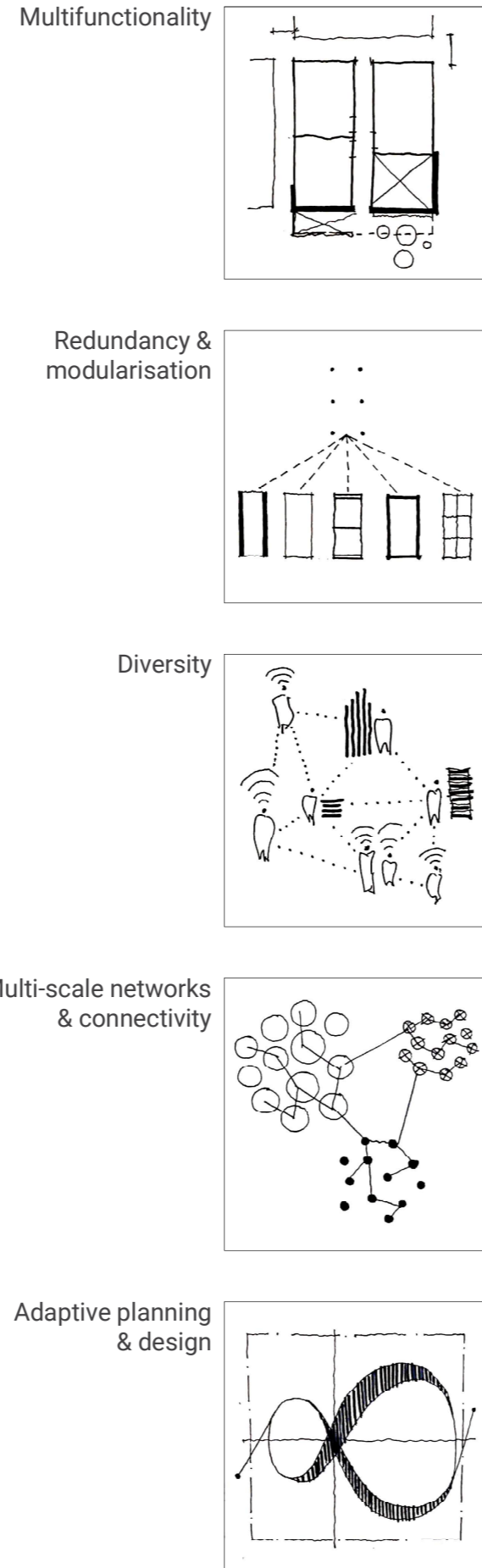


Figure 2.2. Safe-to-fail principles (Author 2021)



2.4 POSTULATION OF PROGRAMME

The resolution of the programme is heavily rooted in the contextual understanding and physical engagement with the Plastic View community. As stated above, the development of infrastructure has the greatest potential to respond to the outlined issues. Understanding the evolving living conditions and transient built forms in the settlement will inform the appropriate programmes to expand on. Basic infrastructure is crucial for the livelihoods of all communities (Bertaud 2018:260); however, a clarification of the specific disturbances and vulnerabilities of Plastic View will delineate the necessary services that will actively build capacity against such threats. The proposal of a programmed intervention is a cautious act for informal settlements due to their inherent changing needs; however, having it rooted in existing functions and conditions on site creates a stronger opportunity for successful unity and appropriation. A responsive, incremental architecture, according to Habraken (1987:4), can be catalytic to subsequent spatial - potentially parasitic - activation. Thus, the incremental development of basic infrastructure, through architecture, will respect the vital role of providing services whilst allowing continuous appropriation by the community in response to their changing needs.



2.5 RESEARCH METHODOLOGY

Reality studio

The research for this dissertation exists in conjunction with Chalmers University of Technology under the 2021 Reality Studio, with the intention of engaging with the complex mode of urbanism that is spontaneous urban settlements. A group of nine architecture masters students, myself included, form the Moreleta Park Integration Project that specifically addresses Plastic View. Our collective goal was to “uncover deeper layers of intricacies of Plastic View and draw legitimate conclusions from these analyses” (Creighton, de Bruin, Herbst, Katranas, Kriek, Lindqvist, Mbedzi, Ramsey & Zachrisson 2021). By dividing into three rapid data collection groups, a broader range of specified data was gathered. I positioned myself within the group focused on the circularity and resilience of Plastic View.

Approach

The methodology is based on qualitative research being conducted for a deeper understanding of Plastic View and the residents. This entails direct contact with the community to investigate and interpret the social and economic occupation of their lived space (Groat & Wang 2002:222). Through an interpretivist approach, explication and reasoning can be made to understand the

resilience practices operating in Plastic View that contribute towards or otherwise mitigate its vulnerabilities. The objective of this investigation is exploratory and interactive due to the transfer and construction of knowledge on the specific topics of interest (Kivunja & Kuyini 2017:33). Whilst broad documentation has been conducted in the past, primarily in 2020, the subject of resilience requires a more detailed investigation. The data gathering process consists of collecting contextual information that, through interpretation, can be used within the chosen context and subsequently related to others (Kivunja & Kuyini 2017:34). The interpretivist approach was identified as it lends to the intention of addressing specific areas of vulnerabilities in the community of Plastic View.

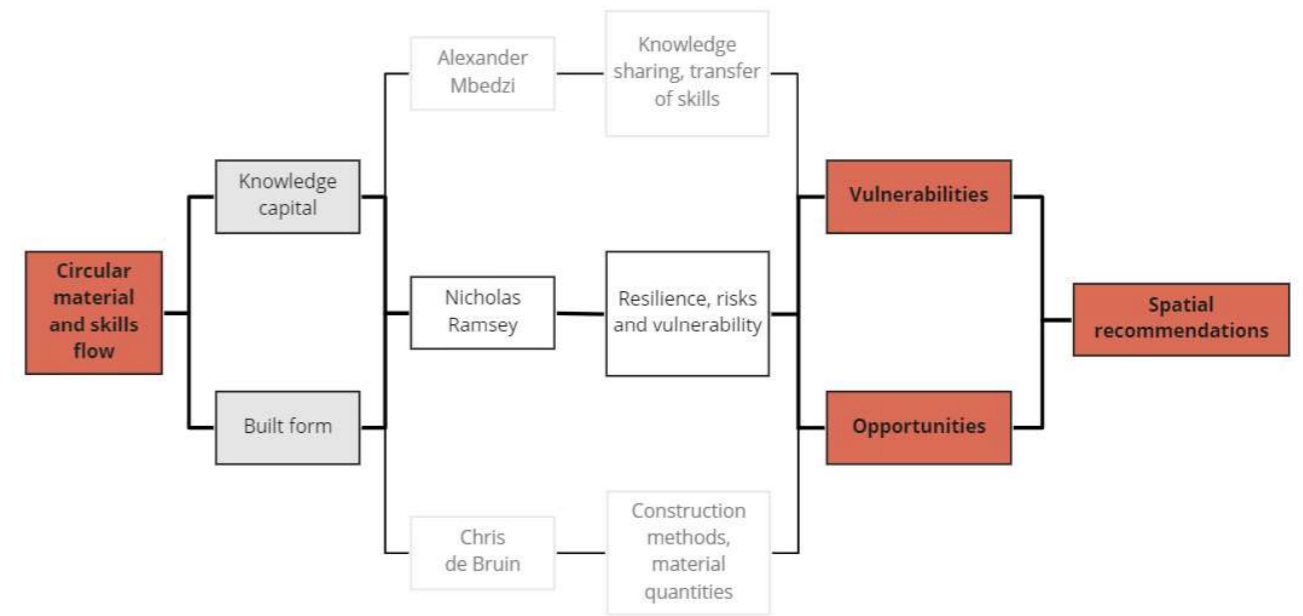


Figure 2.3. Group research framework (Author 2021)

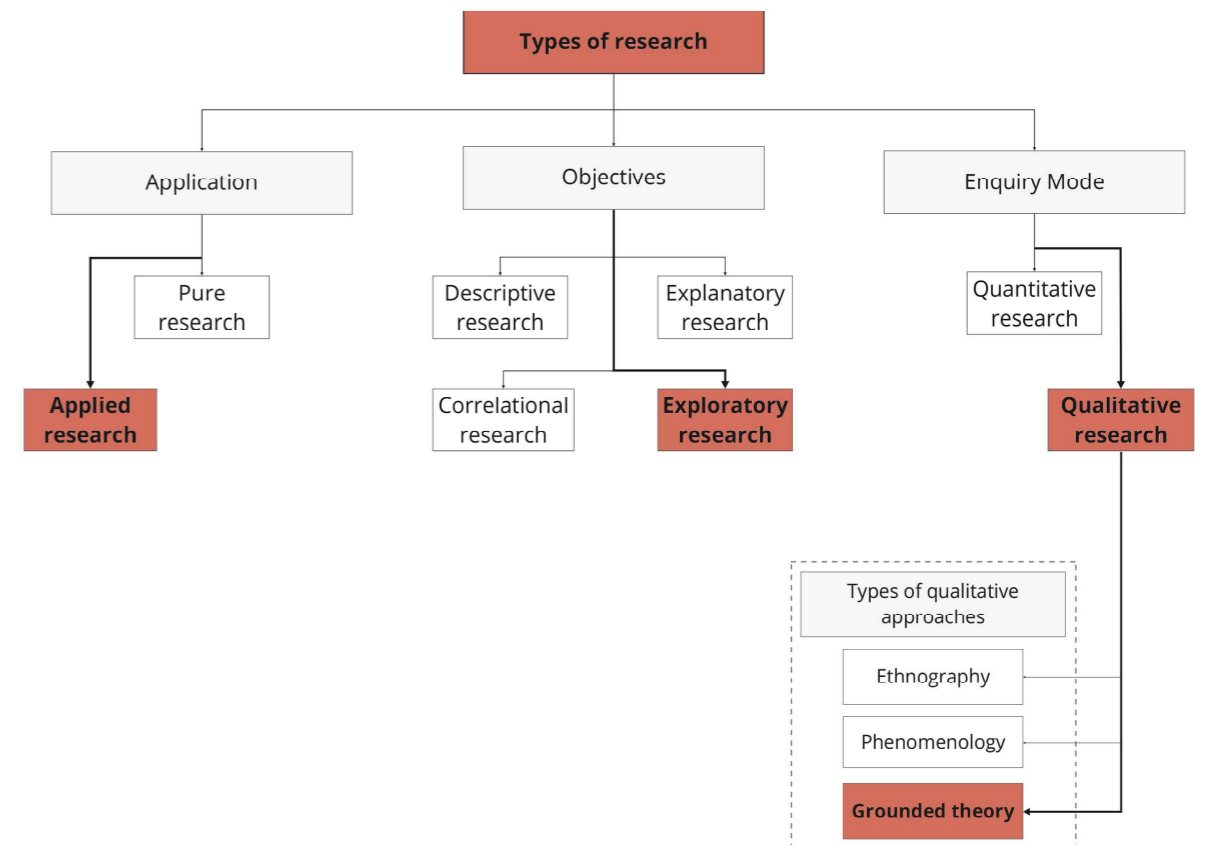


Figure 2.4. Methodology diagram (Author 2021)

Data collection

A reintroduction of the Moreleta Park Integration Project group to the community members was required to make our planned presence and intentions aware. Through photography, the documentation of recent development in the community was accomplished with the recreation of geolocated photos to allow a side-by-side comparison of dwellings. The data gathering process specifically explored the knowledge capital and built forms present in Plastic View. The investigation consisted of structured interviews with residents of Plastic View. Understanding the local construction skills provided a foundation for transformative participation. According to Till (2005:4), the architect offers technical knowledge and is also afforded the opportunity to have their understanding transformed by the participants. Examining the material life cycles and household adaptation and maintenance indicated the expected resource requirements of possible future developments. Elementary floor plans of households were created through brief sketching exercises; in some cases done by the research participants and otherwise after granting verbal permission for researchers to view the inside of their homes. This provided a greater understanding of lived spaces that contributes to the pattern language of Plastic View.

Finally, a prototype live-build was conducted in collaboration with the 2021 University of Pretoria BArch(Honours) students. The objective was to respond to contextual conditions, explore design ideas through open dialogue with the community, and produce a flexible, adaptable structure that promotes future appropriation (Unit for Urban Citizenship 2021:1). During in situ assembly, unstructured interviews and demonstrations were conducted to receive initial feedback regarding construction techniques and speculated use, in the interest of transformative participation.

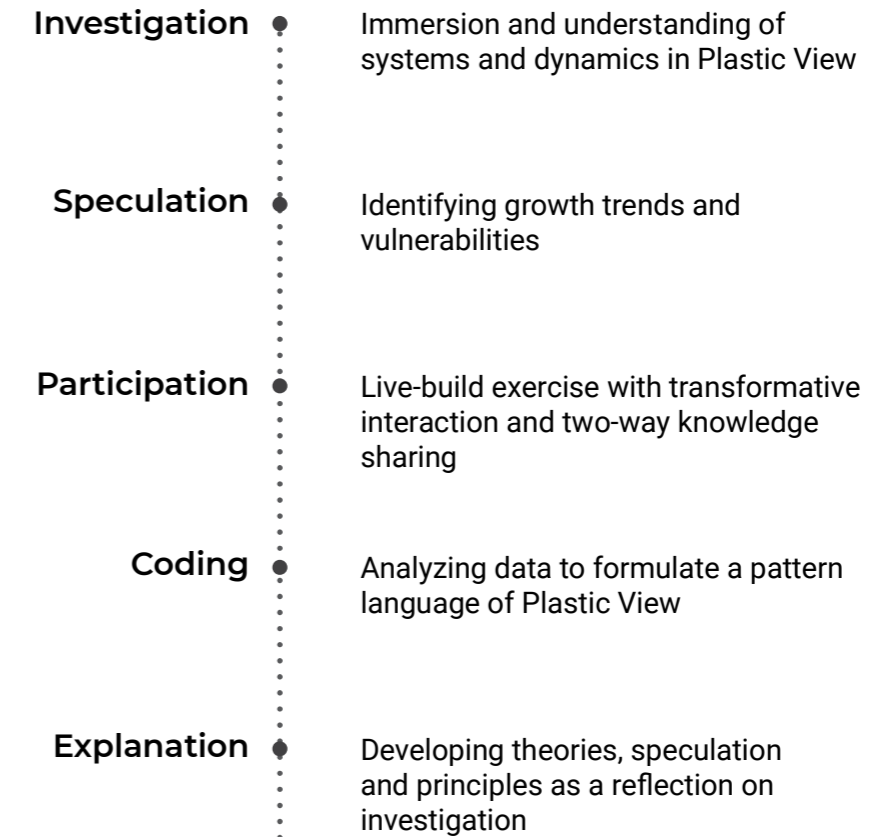


Figure 2.5. Methodology timeline (Author 2021)



2.6 LIMITATIONS & ASSUMPTIONS

As discussed in chapter one, Plastic View constantly undergoes changes to its structures, residents and municipal involvement. Thus, the data presented in the dissertation is accurate to the time of collection. The information is, however, likely to have changed since this time as the settlement has evolved.

“Permanent” construction within Plastic View has historically been met with severe criticism by the surrounding communities. Numerous structures, generally outside of the defined boundary of the settlement, have been removed by the municipality in the past.

Whilst this reaction to new development is changing as the neighbourhood becomes accustomed to the upgrading within Plastic View, it is assumed that the surrounding communities and municipality would approve of the architectural intervention presented in this dissertation.



Figure 2.6. Prototype structure (Author 2021)



2.7 CONCLUSION

The theoretical framework and conducted data gathering provide insight into various principles and informants that can be used for the project’s concept and design development. As it is clear that Plastic View is currently undergoing incremental growth, the construction knowledge, material life cycles, and local socio-spatial organisation that informs this growth will also inform the “safe-to-fail” architecture from this dissertation. In addition to these contextual informants, Ahern (2011:342) proposes five principles for building urban resilience; multifunctionality, redundancy and modularisation, diversity, multi-scale networks and connectivity, and adaptive planning and design. These will be unpacked and assessed in the context of basic infrastructure in Plastic View to identify shortfalls and opportunities for intervention.

Designing to cater for appropriation was earlier

identified as an intention of the dissertation. To respond to the intention, the pattern language of Plastic View will be interpreted to provide an understanding of the settlement’s construction and operations of living. The act of respecting and fostering these conditions will create a greater chance of successful appropriation and longevity of the project and ultimately improve the internal resilience of Plastic View. The site selection and scale of intervention will be informed by an analysis of existing activity and systems in Plastic View. Finally, the speculation of the eventual large-scale growth of the settlement, within a revised urban framework, will further contribute to the design approach for this dissertation.