



CHAPTER

01

INTRODUCTION



Figure 1.1. Entrance to Plastic View (Author 2021)



## 1.1

### RESILIENCE IN THE BUILT ENVIRONMENT

In the 1973 paper “Resilience and stability of ecological systems”, Holling propagated the concept of resilience as a factor of systems thinking (Davoudi 2012:300). He defined resilience according to the magnitude of a disturbance that a system can take in, and the speed at which the system can return to a stable condition after the disturbance (Davoudi 2012:300). The understanding of resilience has since been applied to various fields, including architecture (Peres & du Plessis 2014:3). Unfortunately, because of the extensive range of resilience theory, built environment professionals often confuse it for a solution to urbanization-related problems, when instead it is a characteristic of the problematic system itself (Peres & du Plessis 2014:4). Within the urban development sphere, the term resilience has become a widespread substitution for sustainability; as an overarching goal for city planning (Peres, du Plessis & Landman 2017:691). Resilience and sustainability should instead be considered as having a complementary relationship. Sustainability can be considered the normative position for urban development, as it determines the desired functional characteristics of a system to be restored or upheld (Peres *et al.* 2017:692). Thus, the resilience of a sustainable social-ecological system is its capacity to maintain a quality of life and functional integrity in spite of disturbances, whether that is in a return to original condition or transformation to a new

equilibrium (Peres *et al.* 2017:692; Walker & Salt 2012:215).

Urban resilience practice is based on the understanding that cities are made up of systems that interact on different scales following a hierarchical structure (Allen, Angeler, Garmestani, Gunderson & Holling 2014:578). From this perspective, urban resilience practice is concerned with the enhancing of positive attributes of individual systems that collectively build the general resilience of the city (Peres & du Plessis 2014:1). Within South African cities, rapid urbanisation has led to an influx of migrants establishing informal settlements on municipal and private-owned land (Peres *et al.* 2017:690; Soggot & Amupadhi 1997). Informal settlements are inherently city systems within larger formal urban landscapes, however their marginalisation causes greater disturbance across systems of different scales, consequently challenging their respective cities’ urban resilience (Peres & Du Plessis 2013:7). Understanding and improving the conditions of informal settlements, specifically in their capacity to absorb shocks or transform to more desirable states, can not only create a higher quality of life within settlements but also improve their multi-scale relationships with larger systems in cities (Peres *et al.* 2017:692; Peres & Du Plessis 2013:4).



## 1.2

### INTRODUCING PLASTIC VIEW

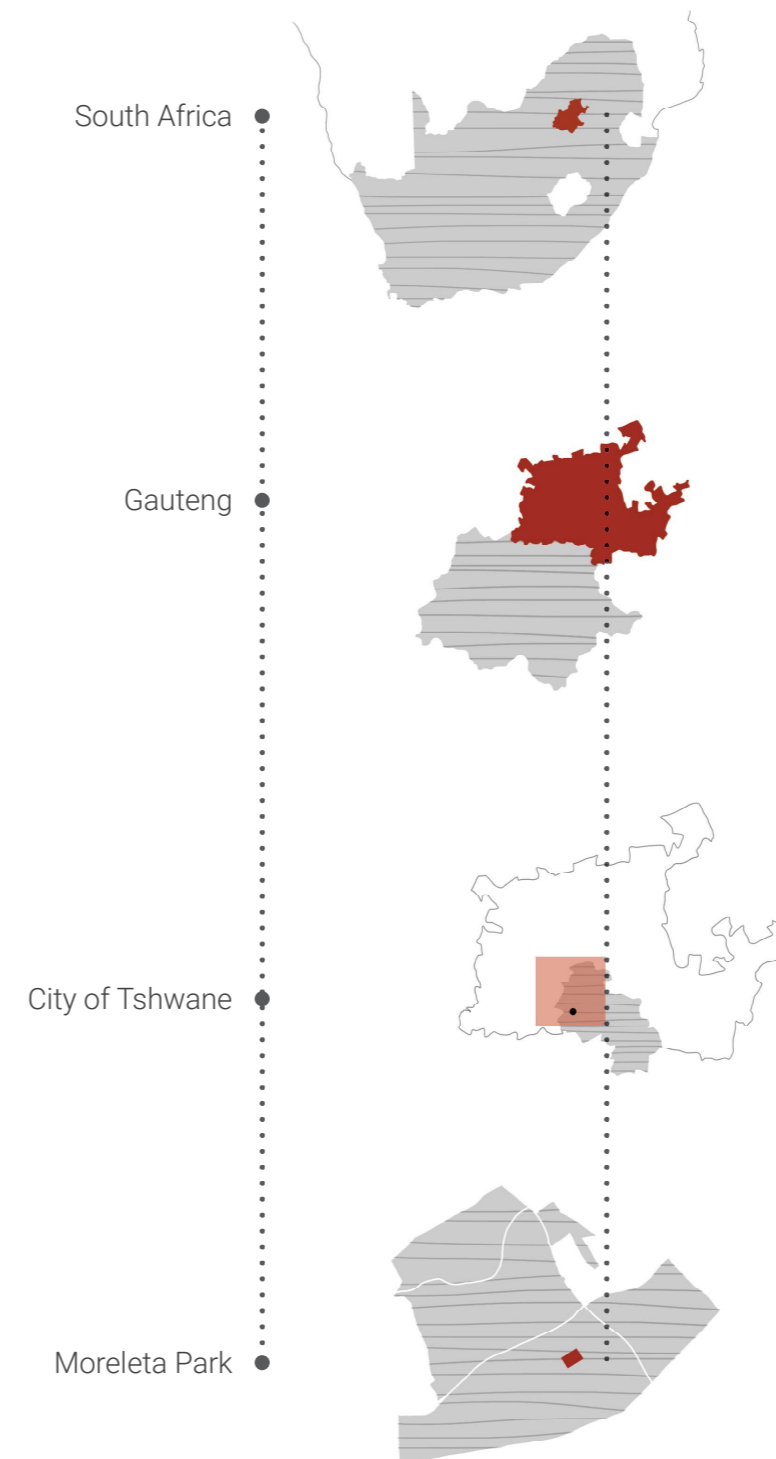


Figure 1.2. Locality diagram (Author 2021)

This dissertation follows a site-specific approach for the improvement of Plastic View informal settlement. The settlement, formally named Woodlane Village, began as small clusters of informal dwellings in an open, municipality-owned portion of land in the Moreleta Park suburb of Pretoria, adjacent to the Moreleta Park Gemeente church. In 2009, it became partially formalised by the City of Tshwane municipality in an effort to control its rapid growth. In an expression of the settlement’s resilience, Plastic View has developed and transformed to its present state, with over 900 dwellings and an estimated 9000 residents. The growth continues unabated despite continuous disturbances, including evictions, fire outbreaks and relocation court cases. The highly dense settlement, of approximately eight hectares, starkly contrasts the surrounding gated communities, with individual plot sizes up to a



hectare each. In addition to density, the disparity is equally evident in household incomes, expenditure and amenities. Within a two-kilometre radius of the temporary dwellings and spaza shops of Plastic View lies the Woodlands Boulevard Mall, Parkview Shopping Centre, Pretoria East (private) Hospital, and several gated communities, whilst within Plastic View, there are spaza shops and temporary dwellings. The formalisation in 2009 resulted in a consolidation of the informal dwellings into organised streets contained within a semi-defined boundary (where there was once fencing, the boundary is currently enforced by the outermost dwellings and the church's boundary fence). Since then, the general layout has remained relatively stable; however, in the past three years, the density has steadily increased in the southern and eastern corners and north-eastern boundary of the settlement. The municipal water and sanitation supply to Plastic View consists of 9 water tanks (maximum 180 000 litres per day) and 87 portable toilets (Ebersohn, Goga, Haese, Hudson, Meij, Mojaphoko, Schmutz & Swart 2021:33). Other municipal infrastructure, such as paved roads, stormwater management, street lighting and waste management, is non-existent in the settlement.

Like all informal settlements, Plastic View is a spontaneous act of self-organisation and

appropriation against the spatially-restrictive city of Pretoria (Lutzoni 2016:2; Peres & du Plessis 2014:8). As informal settlements in the global South continue to grow, so too does a lack of government-issued, resilience-building infrastructure and services for those living in the settlements (Revi & Satterthwaite 2014:546). The issues being investigated in Plastic View are not specific to a single informal settlement but rather part of greater observable urbanisation patterns in South Africa. Plastic View was identified for this dissertation, not only for its exemplification of these patterns but also because of its existing relationship with the University of Pretoria's department of architecture. Research conducted on informal settlements frequently requires on-site data gathering, and the presence of a research team in Plastic View is generally met with comfort by the community as they are familiar with such data gathering processes.

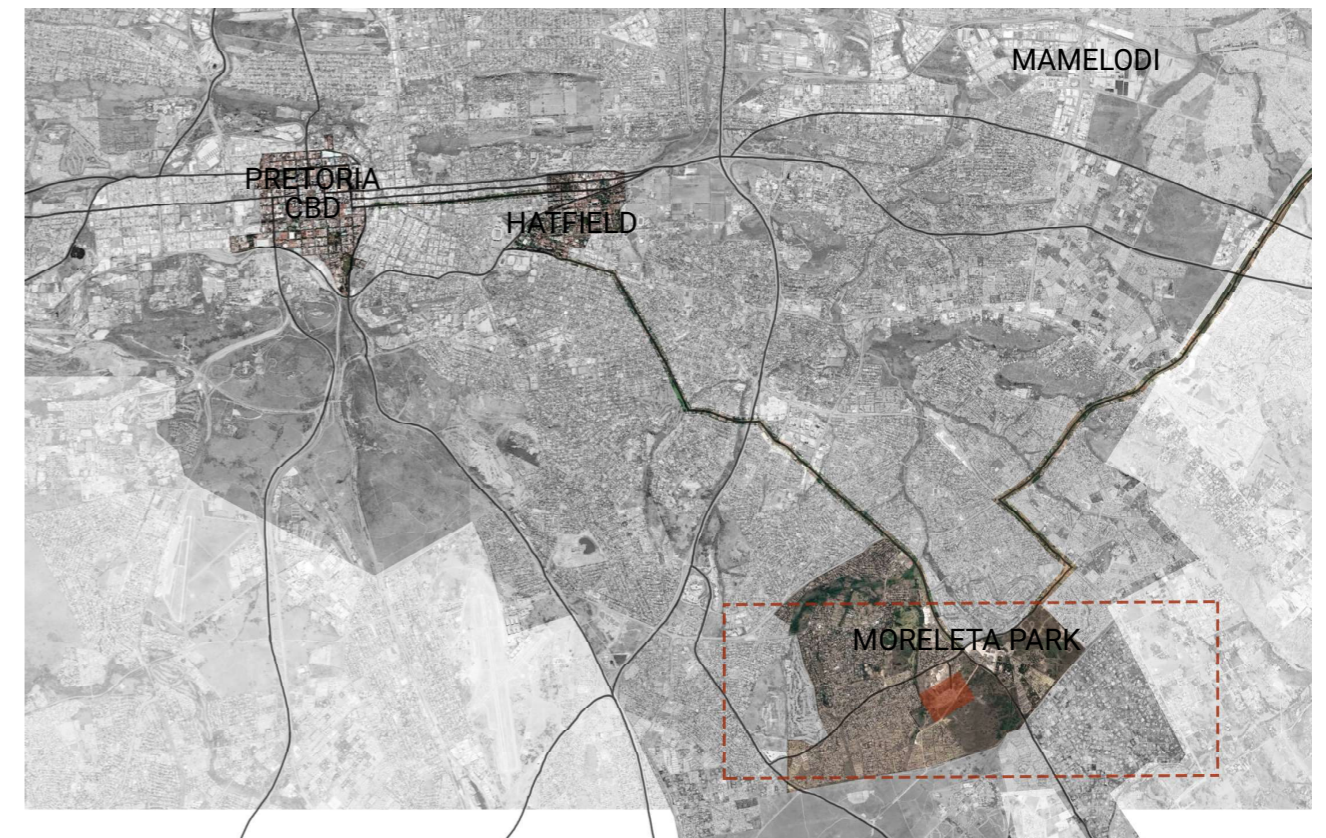


Figure 1.3. Locality map (Author 2021)



Figure 1.4. Suburb map (Author 2021)





## 1.3

### PROBLEM STATEMENT



Figure 1.5. Plastic View aerial view (Author 2021)



#### General issue

The South African apartheid-era urban planning displayed a deliberate approach to spatial separation that provided white, suburban areas with accessible facilities and job opportunities (Landman 2006:3). Close to thirty years after the ending of apartheid, spatial segregation remains evident in the low-density sprawl, socio-economic inequity, and growth of gated communities (Osman 2015; Peres et al. 2017:691; Peres & du Plessis 2013:4). Seeking social and economic opportunities, the urban poor follows the development sprawl of the wealthy. The centralised availability of work opportunities is the primary driver of the growth of informal settlements within high-income, developed areas (Dovey 2015:6; Kellett & Napier 1995:8). Whilst servicing the formal city through cheap, readily available labour, the communities of informal settlements are generally excluded from social capital and municipal service provision (Dovey 2015:6; Peres & du Plessis 2013:3).

Due to assumed criminal activity, informal status and unsightly conditions in settlements (Peres & Du Plessis 2013:5), they are perceived with contempt and distrust by the formal communities surrounding them (Combrinck, Vosloo & Osman 2017:44). Despite providing valuable service to the surrounding

communities, informal settlements continue to be misunderstood and resultantly excluded from formal enablement.

#### Urban issue

The increasing presence of gated communities in 'new business districts' like Moreleta Park has enforced a privatisation of public space that heavily restricts the residents of Plastic View access to socio-economic opportunities and public facilities (Landman 2006:7). The exclusion from formal infrastructure and negative public perception has created a more significant threat of slow and fast disturbances upon the settlement (Peres & du Plessis 2013:8). These disturbances, aided by the lack of land tenure, continues to challenge Plastic View's existence. Plastic View, however, displays an internal resilience as residents create informal methods to mitigate and resolve disturbances (such as fires, job scarcity, and food scarcity). The financial and political limitations faced by the community (particularly in the lack of municipal support) impedes the improvement of such resilience. The social and economic differences between Plastic View and the surrounding neighbourhoods create multi-scale pressures that cause disturbances like evictions and pollution (Peres & du Plessis 2013:7). Ultimately, Plastic View's lack of municipal assistance diminishes the quality



of life in the settlement and creates greater conflict with the surrounding neighbourhoods of Moreleta Park, which in turn hinders the city of Tshwane’s urban resilience.

### Architectural issue

When considering the role architecture can play in improving the existing resilience of Plastic View, its potential contribution towards returning or transforming to a desired condition arises. The non-equilibrium theory recognises that built environments, such as Plastic View, are inherently prone to unexpected change (Wu & Loucks 1995:443). The appropriate response to this theory is to develop architecture that is “safe-to-fail”, whereby it can maintain an adaptive capacity against disturbance or failure (Ahern 2011:342). Informal settlements exist in highly transient states of existence; thus, static, formulaic interventions can be seen as ignorant in the context of a settlement’s unpredictable threats and fluctuating needs (Ahern 2011:342). The informal development in Plastic View, as residents build and adapt their homes with cheap, often found materials, exemplifies the “safe-to-fail” mentality. Formal development, in its adherence to design and planning regulations, often answers to a specific problem or opportunity, failing to recognise that informal settlements rely on incremental adaptation as a mode of

supporting livelihoods (Kamalipour & Dovey 2020:1). The permanent nature of formal construction tends to limit the adaptability and capacity for reuse (Kamalipour & Dovey 2020:1), because it doesn’t often conceive designing to cater for unexpected disturbances as an opportunity to reduce the risk of failure (Ahern 2011:343). In the context of informal settlements, formal intervention must ultimately have the capacity to be continuously appropriated by the community in response to their changing needs.



Figure 1.6. Plastic View dwelling (Author 2021)



Figure 1.7. Woodhill Golf Estate dwelling (Moreleta Park Integration Project 2021)





## 1.4

### RESEARCH QUESTIONS

#### Primary question

How can architecture facilitate the improvement of the internal resilience of Plastic View?

#### Sub-questions

- a. What existing infrastructure and systems actively contribute to the resilience of Plastic View?
- b. How can the interconnection of multi-scale networks, hosted by an architectural intervention, contribute to the settlement's internal resilience?
- c. How can one expand on the existing conditions to build further resilience in Plastic View?

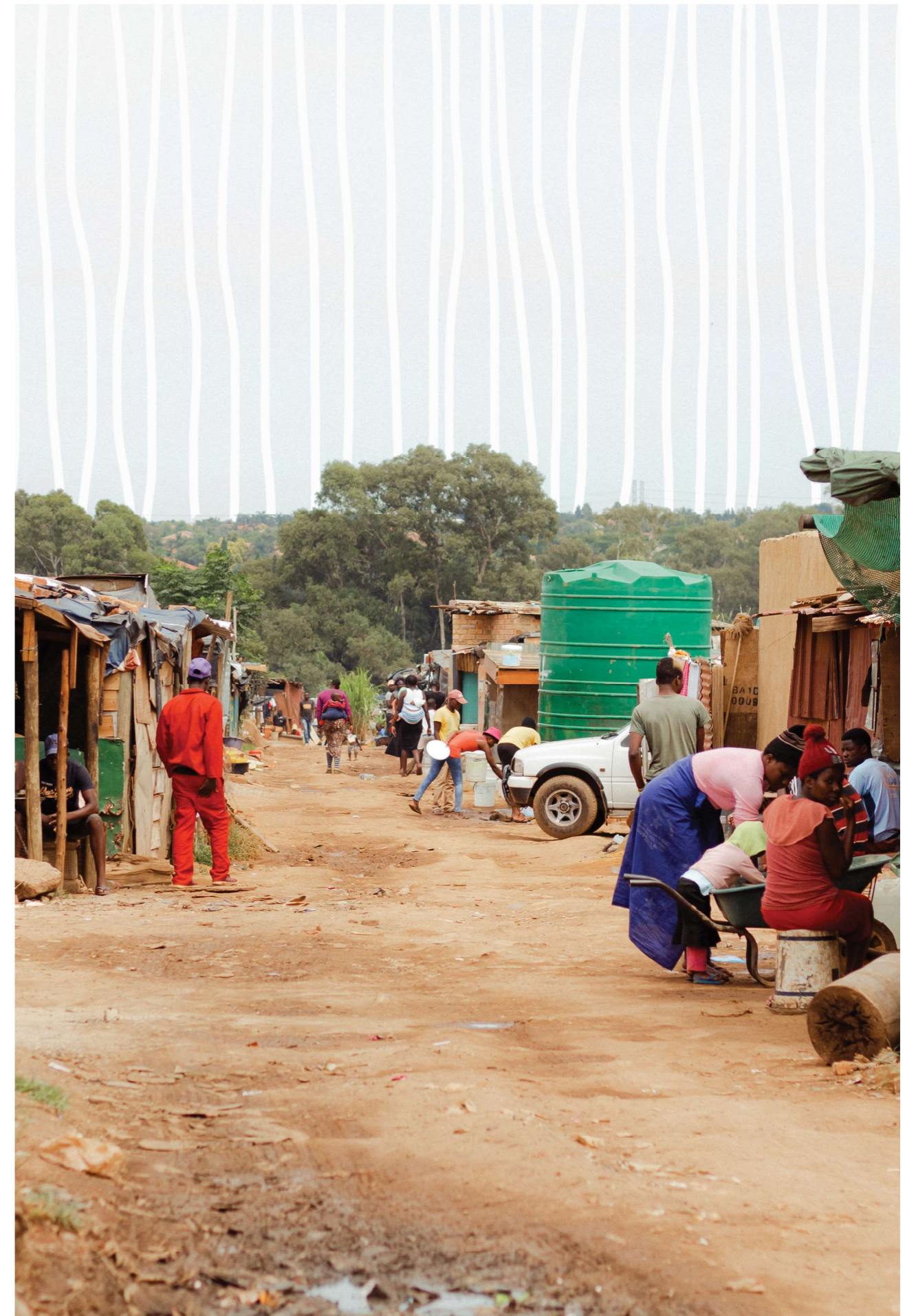


Figure 1.8. Plastic View street (Author 2021)