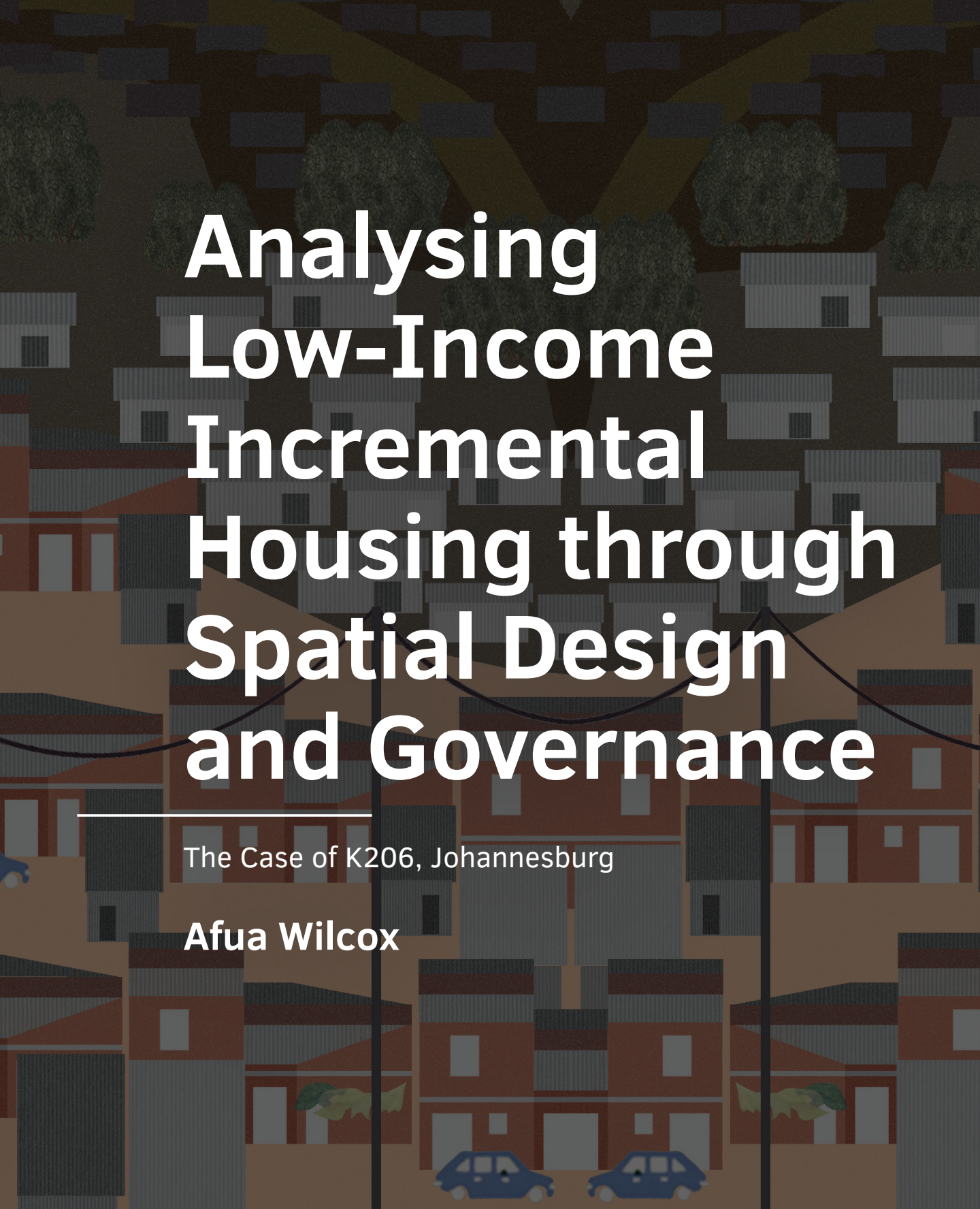

Analysing Low-Income Incremental Housing through Spatial Design and Governance

The Case of K206, Johannesburg

Afua Wilcox

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A+BE | Architecture and the Built Environment | TU Delft BK

25#17

Design | Sirene Ontwerpers, Véro Crickx

Cover photo | Cover designed by Leyla Hepsaydir and edited by author

ISBN 978-94-6518-077-9
ISSN 2212-3202

This dissertation is open access at https://doi.org/10.71690/abe.2025.17

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Analysing Low-Income Incremental Housing through Spatial Design and Governance

The Case of K206, Johannesburg

Dissertation

for the purpose of obtaining the degree of doctor
at Delft University of Technology
by the authority of the Rector Magnificus, prof.dr.ir. T.H.J.J. van der Hagen
chair of the Board for Doctorates
to be defended publicly on
26 June 2025 at 12:30 o'clock

by

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This dissertation has been funded by the NRF Nuffic Scholarship
under Grant Number [120199].

Surrender

Natural order is restored willingly or by force,
As the human order will always be restored willingly or by force,
Life has taught me to listen more and surrender willingly,
It is a more beautiful and loving experience than the outcome of force

A.W.

Acknowledgements

I dedicate this thesis to my God whose ways are higher than my own, myself and all the other aspiring PhDs who are pursuing the PhD knowing or unknowingly as a form of searching self, searching for self on a deep personal level, looking for answers that extend past the PhD. I dedicate this PhD to those PhDs who made necessary and unnecessary sacrifices in pursuit of this journey. I dedicate this PhD to all of the women pursuing or still to pursue their PhDs, the ones who have made personal sacrifices of long term relationships, marriages and being a mother in pursuit of breaking barriers and advancing the voice of women in their industry, I hope you find your peace and find what you are really looking for. I dedicate this PhD to other PhDs who are struggling or who have struggled with depression, imposter syndrome and or other ailments or medical conditions, I dedicate this PhD to those who started but decided not to finish in pursuit of happiness, I dedicate this PhD to all the young women and Africans who are pursuing their academic journey, rise and take your place! You belong here! Amandla!

I extend my heartfelt thanks to my promotor, Marja Elsinga, for her guidance, expertise, and compassionate leadership throughout this PhD process, both on a professional and personal level. I am deeply grateful to my co-promotors, Marietta Haffner and Nelson Mota, for their commitment to this demanding journey and for generously sharing their knowledge, time and insights along the way. The interdisciplinary nature of this research has certainly presented challenges, and I am especially appreciative of the dedication my supervisory team has shown. I firmly believe that their diverse range of skills and perspectives has greatly enriched this thesis, allowing it to transcend the limitations of the singular disciplinary lens I initially brought to the project.

I would also like to acknowledge the National Research Fund (NRF) Nuffic scholarship for providing the resources for my PhD, my experience at TU Delft has afforded me the most incredible opportunities to build my academic career.

I would like to thank the participants and partners that assisted in building the content for this research. I would like to thank Sandile Mavundla, Julian Baskin, Monica Albonico, Anca Szalovitz, Phindi Mabunda, Micheal Hart, Matt Jackson, Lesego Ntsoane and Thulane “Zakes” Magodielo, the Rays of Hope team including Sihle Mooi, Banele Sangcozi, Bafana and the rest of the Rays of Hope team.

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I would like to thank Leyla Hepsaydir for her contribution to the graphics content of the dissertation. I would also like to thank my mentors and colleagues: Michael Hart, Prof. Amira Osman, Dr. Finzi Saidi, Jabu Makhubu and Leago Madumo for inspiring and supporting my journey in academia.

On a personal note, I would like to thank my husband and life coach Thamsanqa Sibandze for being such an incredible pillar of support to me. Your love has been a driving force of inspiration for me on this journey. Thank you Goje. I would like to thank my father Vaughan E. Wilcox for his care and emotional support throughout the PhD. You believing in me has helped me believe in myself thank you. I would like to thank my mother Korkor Cudjoe for being, and for helping me find strength in myself. Your strength, love and authenticity has helped shape the woman I am today, thank you. I would like to thank my father Simon Roberts, thank you for inspiring me to take up this PhD journey, for your professional and personal advice, I thank you. Mum, Akua Debrah Donkoh, thank you for inspiring me to strive for academic excellence from a young age, I appreciate your love and guidance over my life. To my son Kwabena Iminathi Wilcox Sibandze, thank you for being so gentle on me, and enabling me to birth both you and this PhD simultaneously with love and peace.

I would also like to thank my other family members for their love and support during this journey: Robert Wilcox, Kwesi Roberts, Thato Roberts, Maame Sikayena Cudjonu, Dede Cudjonu, Michael Cudjonu, Awusi Cudjonu, Emmanuel Kudjonu, Yaw Ntim Donkoh, Kwena Kudjonu, Auntie Zanele, Uncle Kwasi, Clifford Odoi, Joy Rockley, and Make Thandi ‘Gladys’ Dlamini. I would like to thank my extended family and friends who played a significant role in supporting me through the PhD process: Siphathisiwe Hlongwane, Lando Dlamini, Tebogo Mogadime, Fadzai Dube, Nandipha Nocuze, Cynthia Souaid, Macarena Gaete Cruz, Nana Kwasi, Jackie Dlamini, Lindelwa Dlamini, Ma Bunie, Auntie Beryl and Christopher Shilubane.

It has taken a village to raise this dissertation. To my village, I thank you!

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Abbreviations, Selected Local Terms and General Notes

ABBREVIATIONS	
ARP	Alexandra Renewal Project
RDP	Reconstruction and Development Programme
IRDP	Intergrated Residential Development Programme
ISU	Informal Settlement Upgrading
BNG	Breaking New Ground Policy
CBD	Central Business District
AHYF	Alexandra Homeless Youth and Families
ACA	Alexandra Civic Association
AVCC	Alexandra Vukuzenzele Crisis Committee
CLOs	Community Liaison Officers
UISP	Upgrading of Informal Settlements Programme
ADF	Alexandra Development Fund
CoJ	City of Johannesburg
JOSHCO	Johannesburg Social Housing Company
NHBRC	National Home Builders Registration Council
HBE	Home Based Enterprises

>>>

SELECTED LOCAL TERMS	
bona fides	Representing resident households who have lived in Alexandra since the original settlement in 1912, with freehold tenure (Bonner and Nieftagodien, 2008)
amagoduka	Directly translated to “the people in transit”, represent Alexandra residents who settled after the original “bonafides” residents. (Bonner and Nieftagodien, 2008)
hostels	In the South Africa context hostels are represented as single sex workers’ hostels. These spaces were previously associated with extensive crime and violence during the apartheid regime. In later democratic years, there have been a number of attempts to improve the conditions of these spaces (Xulu, 2014).

GENERAL NOTES
When translating residents’ interviews, specific details that could reveal individuals’ identities are excluded. Instead, respondents are assigned pseudonyms ranging from Respondent 1 to 26, ensuring that sufficient information is retained for the study.
The exchange rate of 1 Euro is about 20 South African Rands.
Research questions in introduction and conclusion may have been slightly updated in comparison to published texts in order to improve the overall flow of the dissertation.

Summary

Despite a wealth of informative explorations of low-income housing in various disciplines (Danlandi et al., 2023), existing studies on low-income housing often remain within disciplinary silos (e.g., economics, planning, political studies). This has led to fragmented understandings of the complex issues faced by low-income populations. In as much as disciplinary related studies are important, they miss out on the comprehensive insights that interdisciplinary approaches could offer. In 2018, the United Nations highlighted the urgency of addressing the global housing crisis, with over 1 billion people living in informal settlements. Addressing this crisis requires a shift toward interdisciplinary research to develop sustainable and inclusive housing solutions.

In South Africa, the housing discourse also suffers from literature being written in disciplinary silos. Despite substantial literature on low-income housing post-apartheid, studies often remain confined to specific disciplines, limiting their ability to offer insights that cross disciplinary boundaries. A more integrated approach that combines different disciplinary perspectives will be able to address the multifaceted challenges of low-income housing, including population growth, immigration, urbanisation, and systemic inefficiencies.

This thesis specifically examines low-income housing through two disciplinary lenses—spatial design and governance. Spatial design in this case taken as the practice concerned with the creation of built form in relation to its context and the process through which it is conceived (Alexander, 1964; Alexander et al., 1977; Lefebvre, 1991). Governance is taken to refer to the interaction between actors (both governmental and non-governmental), the instruments they use and the aims they seek to achieve in the process of decision making and implementation (Gibb, 2018; Meuleman, 2008; OECD, 2020; Rhodes, 2007).

The investigation explores the combined effects of the two lenses through the K206 case study in Alexandra, South Africa. This dissertation reviews three low-income housing aspects of the project through this double-lens. These are namely informal settlement upgrading, state-subsidized housing, and incremental housing. These aspects of low-income housing were informed by the nature of the K206 project itself—an informal settlement upgrading initiative carried out through relocation. The project provided former informal settlement residents with state-subsidized housing in the form of a basic dwelling, which, in most instances, was subsequently adapted and extended through incremental housing practices.

With this double lens of governance and spatial design, the dissertation analyses how the aims of government were translated into built form, and how that built form was received by residents in the context of Alexandra. The empirical evidence of this was collected in interviews with residents in combination with surveys of their homes, next to interviews with the experts involved in the project.

The thesis answers the following question:

— **How can a double-lens approach to spatial design and governance improve our understanding of low-income housing in South Africa?**

The study uses the K206 project to explore these dynamics, assessing how spatial design and governance intersect and impact residents' lives. This research aims to provide a nuanced understanding of low-income housing by integrating perspectives from both spatial design and governance, addressing both academic and societal needs for more holistic housing solutions.

Findings

The dissertation is structured into four chapters, each examining different themes of the governance and spatial design in the K206 housing project in Alexandra, Johannesburg. Chapter 2 offers an in-depth analysis of the context of Alexandra township. Following this, Chapters 3, 4, and 5 each focus on specific aspects of the project: resident-responsive design, security of tenure, and income generation, respectively. Each chapter uses distinct methodologies to explore these dimensions, providing an understanding of the case study from the governance and spatial design perspectives.

Chapter 2 discusses the context of the K206 project by first exploring the upgrading aims of government for the Alexandra Renewal Project (ARP). It focuses on how the upgrading of informal settlements overlooked Alexandra's historical context, leading to issues with tenant allocation and resistance to rent payments. These challenges highlighted the need for transparency and resident involvement in allocation processes. The chapter also explores some of the existing spatial design conditions of Johannesburg and Alexandra with some examples of housing structures built before the K206 project to give context to the built form of the area. The chapter explores the governance structures of the context of Alexandra, as well as the housing spatial design of the area.

Chapter 3 explores the K206 project from a resident responsive spatial design perspective. It explores how the K206 project introduced innovative spatial design solutions (in comparison to RDP design) in order to increase housing density and better meet the needs of low-income residents. These design solutions included flexible design models for incremental expansion and medium-density housing clusters which allowed residents to expand their homes as needed. The design innovations, with allowance for incremental growth, addressed residents' needs for income generation and family growth. The project showed that resident-responsive design could enhance housing solutions, though challenges with governance and funding structures persisted.

Chapter 4 explores security of tenure, which was a key issue in the K206 project, affecting how residents engaged with their housing. The relocation of residents (government aim) resulted in the need for a mixed tenure model to accommodate secure tenure for both qualifying and non-qualifying residents. The project's state-subsidised incremental housing extensions allowed residents to assert their perceived right to tenure and adapt their homes, despite difficulties with tenure allocation. This approach led to an alternative governance structure initiated by residents, highlighting the limitations of block-by-block allocation systems and the need for flexible tenure solutions in informal settlement upgrading.

Chapter 5 examines income generation in the K206 project. Income generation was a central objective of the K206 project, incorporating state-built rental rooms and opportunities for incremental housing expansion. Residents used these opportunities to generate income, though governance issues that resulted in tenant-owner tensions together with plot size limitations affected the extent of income generation. Incremental extensions allowed for diverse income sources to be developed to address high unemployment rates, showing the potential of housing design to support economic development. The project's success in providing income-generating options was overshadowed by tenure-related conflicts, suggesting a need for policy support for small-scale housing developers and facilitating governance measures.

Main Conclusions

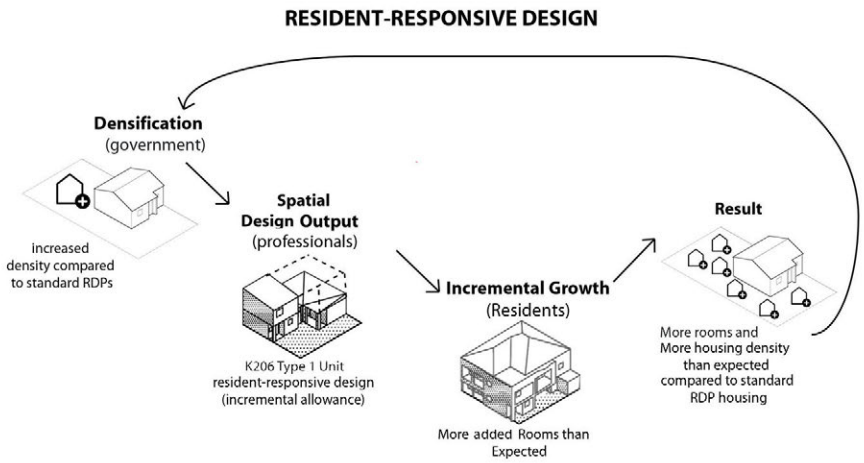
The study contributes to three bodies of literature in low-income housing. These are namely: Informal settlement upgrading, state-subsidized housing and incremental housing. Based on the research findings, the dissertation presents several key conclusions regarding the K206 housing project in Alexandra, Johannesburg. The study underscores the complex interaction between governance and spatial design within the project. In its chapters 2 to 5, the study explores the background and context of the K206 project, focusing on resident-responsive design, tenure security, and income generation.

The successful aspects of the project included the integration of both qualifying and non-qualifying residents, through a block-by-block relocation approach. The project also provided opportunities for incremental expansion and constructed additional rental rooms that residents could use to generate income. Additionally, it explored medium-density typologies, which resulted in increased density in comparison to standard RDP housing while still allowing for incremental growth.

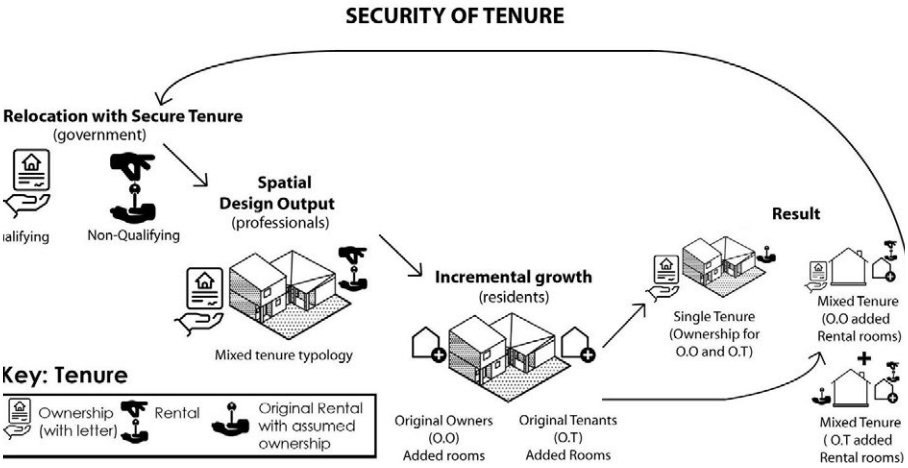
However, the project faced several challenges, primarily related to governance structures. Allocation practices were accused of being unfair, with allegations of corruption. This affected residents' security of tenure and hindered the original aims of income generation through the rental rooms provided. These issues also led to violent clashes between tenants and owners, resulting in power struggles due to problematic allocations and insecure tenure. The block-by-block approach was also criticised for addressing residents based on location rather than need, as the system overlooked existing waiting lists and housing backlogs in the area.

The project's findings can be clearly understood through the governance aims and spatial design outputs of the project and the residents' responses to government interventions in three key areas.

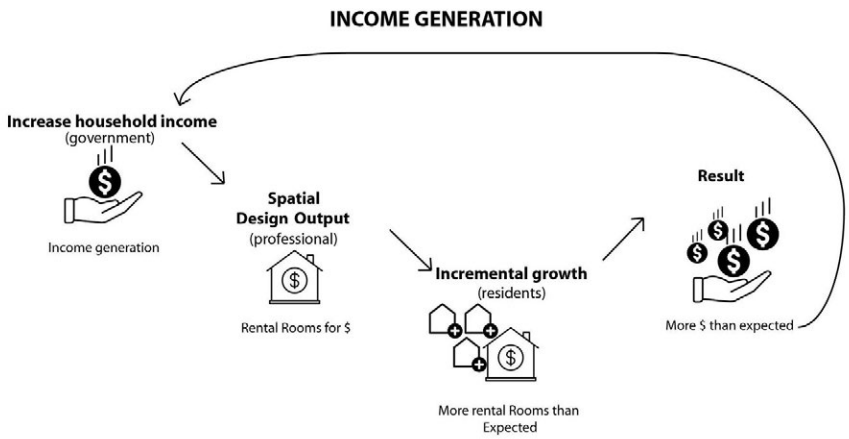
The first government aim set for the K206 project was to develop higher density housing compared to standard state-subsidized (RDP) housing in order to make the most of the well-located land in Alexandra. This was done through allowing additional resident responsive design called incremental allowance here. In practice, however, the built form became a joint effort between government, contracted professionals, and residents. While the state and professionals envisioned controlled densification, residents actively responded and extended their homes beyond these parameters. Over time, this resident responsive spatial design process led to densities that went beyond the original projections. —enhancing opportunities for income generation and housing supply, but also contributing to issues such as overcrowding and poor construction quality that fell short of formal housing standards.



The second government aim of the project was to relocate informal settlement residents with secure tenure for both qualifying and non-qualifying residents. This was done by using a mixed-tenure model (designed by contracted professionals). This model resulted in qualifying residents receiving housing with ownership letters, while non-qualifying residents were granted lease agreements to rent from the qualifying owners, though offering a more secure form of tenure compared to informal settlements. However, an unexpected issue arose when original tenants felt they were treated unfairly and refused to pay rent, effectively taking de facto ownership of their homes. Many of these tenants and owners expanded their homes incrementally to meet family needs or create rental rooms, providing additional income and maintaining tenure security for both qualifying and non-qualifying residents.



The final government aim of the K206 project was to give residents opportunities to increase household income. Contracted professionals designed houses with two additional rental rooms as an output for residents to generate income. These rooms alongside allowance for incremental expansions (first key aim and instrument) gave opportunities for residents to generate income through rental rooms. However, residents exceeded expectations by expanding their homes more than anticipated, building more rental rooms than the government had initially envisioned. As a result, residents earned significantly more household income from rental rooms than the government had originally projected. On the other hand, these incremental extensions also lead to non-regulatory housing extensions and overcrowding.



The aims of the project conceptualized by government were for increased density in comparison to standard RDP housing, relocation with secure tenure and increased income earning options for households. These aims were enacted through spatial design instruments of resident responsive design, mixed tenure housing and the additional rooms that were built in conjunction to state-subsidized house built for dwelling.

Residents were able to expand their homes incrementally and generate income from rental rooms. These rental rooms were expected to provide additional housing options, while at the same time increase density. However, unintended consequences arose, including the extent of incremental extensions, where residents expanded beyond allocated boundary lines and added more rooms than originally envisioned. This resulted in rental income for original owners and original tenants that exceeded state expectations and densities that were much higher than originally planned.

Initially, governance issues such as tenure security and household income challenges were addressed through spatial design. However, residents' responses to these designs led to the emergence of new governance structures, such as self-initiated ownership for original tenants, showing that while governance aims informed spatial design outputs, resident post occupancy spatial design interventions also played a part in resultant governance outcomes.

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The study also contributes to a broader understanding of how governance and spatial design interact in low-income housing contexts. It highlights the importance of considering residents' experiences and emphasises the need for more sensitive governance strategies and resident-responsive design. The research identifies gaps in the relationship between governance and spatial design and suggests that incremental housing solutions could more effectively address emerging needs.

Finally, the dissertation recommends further investigation into comparative analyses of governance and spatial design across various projects, along with an exploration of tacit knowledge systems related to incremental housing. These areas could provide deeper insights into improving governance and design in low-income housing. Overall, the research underscores the complexity of balancing governance and spatial design in housing projects and suggests that integrating resident feedback and incremental design solutions can lead to more effective and equitable outcomes.

Samenvatting

Ondanks een overvloed aan informatieve verkenningen van huisvesting voor lage inkomens binnen verschillende disciplines (Danlandi et al., 2023), blijven bestaande studies over huisvesting voor lage inkomens vaak binnen disciplinaire silo's (zoals economie, planning, politieke studies). Dit heeft geleid tot gefragmenteerde inzichten in de complexe problemen waarmee mensen met lage inkomens worden geconfronteerd. Hoewel disciplinaire studies belangrijk zijn, missen ze de brede inzichten die interdisciplinaire benaderingen kunnen bieden. In 2018 benadrukten de Verenigde Naties de urgentie van het aanpakken van de wereldwijde huisvestingscrisis, waarbij meer dan 1 miljard mensen in informele nederzettingen wonen. Het aanpakken van deze crisis vereist een verschuiving naar interdisciplinair onderzoek om duurzame en inclusieve huisvestingsoplossingen te ontwikkelen.

Ook in Zuid-Afrika lijdt het huisvestingsdebat onder literatuur die geschreven is binnen disciplinaire silo's. Ondanks een aanzienlijke hoeveelheid literatuur over huisvesting voor lage inkomens na de apartheid, blijven studies vaak beperkt tot specifieke disciplines, waardoor ze geen holistische inzichten kunnen bieden. Er is een meer geïntegreerde benadering nodig die verschillende disciplinaire perspectieven combineert om de veelzijdige uitdagingen van huisvesting voor lage inkomens aan te pakken, waaronder bevolkingsgroei, immigratie, verstedelijking en systemische inefficiënties.

Deze scriptie onderzoekt huisvesting voor lage inkomens specifiek door twee disciplinaire lenzen — ruimtelijk ontwerp en governance. Dit wordt onderzocht aan de hand van de K206-casestudy in Alexandra, Zuid-Afrika. Ruimtelijk ontwerp verwijst hier naar de praktijk die zich bezighoudt met het creëren van bebouwde vormen in relatie tot hun context en het proces waarmee ze worden bedacht (Alexander, 1964; Alexander et.al, 1977; Lefebvre, 1991). Governance verwijst hier naar de interactie tussen actoren (zowel overheid als niet-overheid), de instrumenten die zij gebruiken en de doelen die zij nastreven in het besluitvormings- en implementatieproces (Gibb, 2018; Meuleman, 2008; OESO, 2020; Rhodes, 2007). In de K206-casestudy worden drie aspecten van huisvesting voor lage inkomens onderzocht door deze dubbele lens: de upgrading van informele nederzettingen, door de staat gesubsidieerde huisvesting en incrementele woningbouw. Deze aspecten werden bepaald door de aard van het K206-project zelf—een initiatief voor de upgrading van een informele nederzetting dat werd uitgevoerd door

middel van herhuisvesting. Het project voorzag voormalige bewoners van informele nederzettingen van door de staat gesubsidieerde woningen voor basisbewoning, die in de meeste gevallen vervolgens werden aangepast en uitgebreid via incrementele woningbouwpraktijken.

Met deze dubbele lens van governance en ruimtelijk ontwerp analyseren we hoe de doelstellingen van de overheid zijn vertaald in bebouwde vorm, en hoe die bebouwing is ontvangen door bewoners in de context van Alexandra. Het empirische bewijs hiervoor werd verzameld via interviews met bewoners, surveys van hun woningen en gesprekken met experts die bij het project betrokken waren.

De scriptie beantwoordt de volgende vraag:

— **Hoe kan een gecombineerde dubbel-lensbenadering van ruimtelijk ontwerp en bestuur ons begrip van huisvesting voor lage inkomens in Zuid-Afrika verbeteren?**

De studie gebruikt de casestudy van het K206-project om deze dynamiek te verkennen, waarbij wordt onderzocht hoe ruimtelijk ontwerp en governance elkaar kruisen en het leven van bewoners beïnvloeden. Dit onderzoek streeft naar een genuanceerder begrip van huisvesting voor lage inkomens door perspectieven van zowel ruimtelijk ontwerp als governance te integreren en zo in te spelen op zowel academische als maatschappelijke behoeften aan meer holistische huisvestingsoplossingen.

Bevindingen

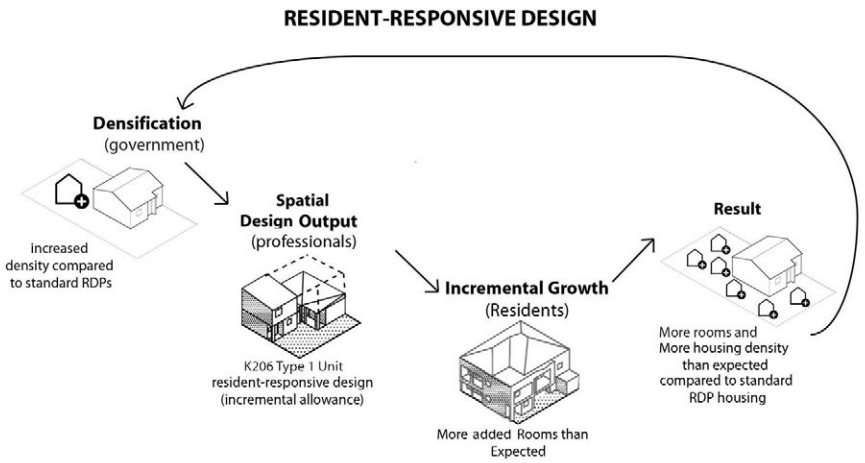
De studie draagt bij aan drie belangrijke literatuurgebieden binnen het domein van huisvesting voor lage inkomens, namelijk: upgrading van informele nederzettingen, door de staat gesubsidieerde huisvesting en incrementele woningbouw. Op basis van de onderzoeksbevindingen presenteert de dissertatie verschillende belangrijke conclusies met betrekking tot het K206-huisvestingsproject in Alexandra, Johannesburg. De studie benadrukt de complexe interactie tussen governance en ruimtelijk ontwerp binnen het project. In hoofdstukken 2 tot 5 onderzoekt de studie de achtergrond en context van het K206-project, met een focus op bewoner-gevoelig ontwerp, zekerheid van eigendom en inkomensgeneratie.

Tot de succesvolle aspecten van het project behoorde de integratie van zowel gerechtigde als niet-gerechtigde bewoners via een relocatiebenadering per bouwblok. Het project bood ook mogelijkheden voor incrementele uitbreiding en de bouw van extra huurkamers die bewoners konden gebruiken om inkomen te genereren. Daarnaast werd er geëxperimenteerd met woningtypologieën met middelhoge dichtheid, waarmee de dichtheid van standaard RDP-woningen werd verhoogd, terwijl er toch ruimte bleef voor incrementele groei.

Het project kende echter ook verschillende uitdagingen, voornamelijk gerelateerd aan governance-structuren. Toewijzingspraktijken werden bekritiseerd als oneerlijk, met beschuldigingen van corruptie. Dit had gevolgen voor de zekerheid van eigendom van bewoners en belemmerde de oorspronkelijke doelstellingen van inkomensgeneratie via de aangeboden huurkamers. Deze problemen leidden ook tot gewelddadige conflicten tussen huurders en eigenaren, resulterend in machtsstrijd door problematische toewijzingen en onzekere eigendomssituaties. De aanpak per bouwblok werd eveneens bekritiseerd omdat deze bewoners benaderde op basis van locatie in plaats van behoefte, aangezien het systeem bestaande wachtlijsten en woningtekorten in de omgeving negeerde.

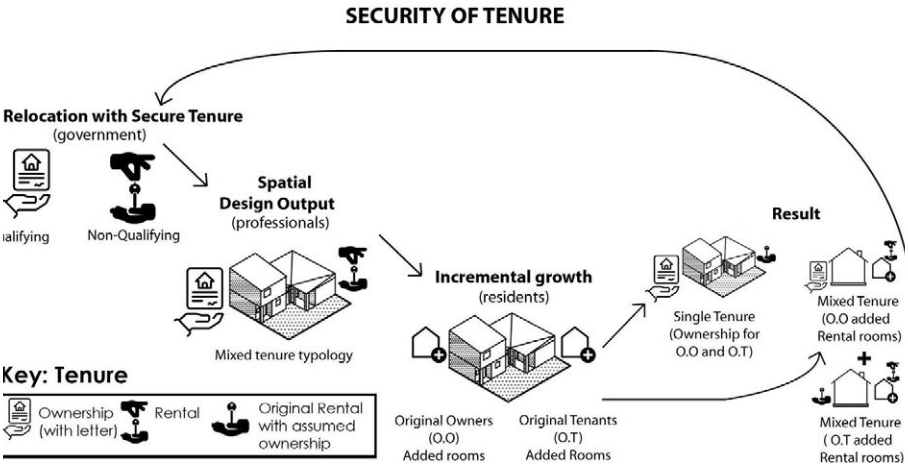
De belangrijkste bevindingen van het project kunnen duidelijk worden begrepen door de overheidsdoelen en de ruimtelijke ontwerpprestaties van het project te koppelen aan de reacties van bewoners op de overheidsinterventies in drie kerngebieden.

Het eerste doel van de overheid in het K206-project was het ontwikkelen van woningen met een hogere dichtheid dan de standaard staatswoningen, om zo optimaal gebruik te maken van de goed gelegen grond in Alexandra. Dit werd nagestreefd via bewoner-gevoelig ontwerp in de vorm van ruimte voor incrementele uitbreiding binnen het ontwerp van door de staat gesubsidieerde woningen. In de praktijk werd de bebouwde vorm echter het resultaat van een gezamenlijke inspanning tussen overheid, ingehuurde professionals en bewoners. Terwijl de staat en professionals streefden naar gecontroleerde verdichting, reageerden bewoners actief en breidden zij hun woningen uit buiten de gestelde grenzen. Op den duur leidde dit bewoner-responsieve ontwerpproces tot dichtheden die de oorspronkelijke projecties overtroffen—waardoor de mogelijkheden voor inkomensgeneratie en woningaanbod werden vergroot, maar ook bijdroegen aan problemen zoals overbevolking en slechte bouwkwaliteit die niet voldeden aan de formele huisvestingsnormen.



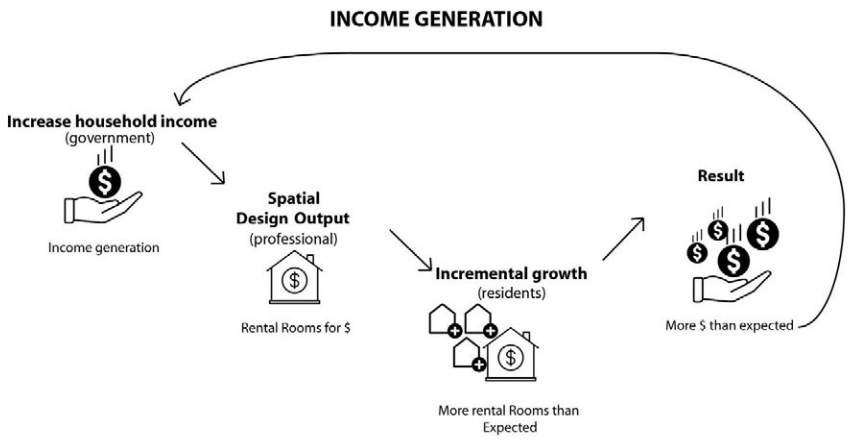
Het tweede doel van de overheid binnen het project was het herhuisvesten van bewoners uit informele nederzettingen met zekere eigendomsrechten, zowel voor gerechtigde als niet-gerechtigde bewoners. Dit werd gerealiseerd via een gemengd eigendomsmodel (ontworpen door ingehuurde professionals), waarbij gerechtigde bewoners een woning ontvingen met een eigendomsverklaring, terwijl niet-gerechtigde bewoners huurovereenkomsten kregen om te huren van de gerechtigde eigenaren—een veiligere vorm van eigendom dan in informele nederzettingen.

Er ontstond echter een onverwacht probleem toen oorspronkelijke huurders zich oneerlijk behandeld voelden en weigerden huur te betalen, waarmee zij in feite het eigendom van hun woningen opeisten. Veel van deze huurders en eigenaren breidden hun woningen incrementeel uit om tegemoet te komen aan gezinsbehoeften of om extra kamers te verhuren. Dit leverde extra inkomen op en zorgde voor behoud van eigendomszekerheid voor zowel gerechtigde als niet-gerechtigde bewoners.



Het laatste doel van de overheid binnen het K206-project was om bewoners de mogelijkheid te bieden hun gezinsinkomen te verhogen. Ingehuurde professionals ontwierpen woningen met twee extra verhuurbare kamers, als middel voor bewoners om inkomen te genereren. Deze kamers, samen met de mogelijkheid tot incrementele uitbreidingen (het eerste hoofddoel en instrument), boden bewoners de kans om huurinkomsten te verwerven.

Bewoners overtroffen echter de verwachtingen door hun woningen uitgebreider uit te breiden dan vooraf was voorzien, waarbij zij meer verhuurbare kamers bouwden dan de overheid oorspronkelijk had gepland. Hierdoor genereerden bewoners aanzienlijk meer gezinsinkomen uit verhuur dan de overheid had ingeschat. Aan de andere kant leidden deze incrementele uitbreidingen ook tot niet-reglementaire woninguitbreidingen en overbevolking.



De doelstellingen van het project, zoals geconceptualiseerd door de overheid, waren het verhogen van de dichtheid in vergelijking met standaard RDP-woningen, herhuisvesting met zekere eigendomsrechten en het verhogen van het gezinsinkomen. Deze doelstellingen werden gerealiseerd via ruimtelijke ontwerpinstrumenten zoals bewonersresponsief ontwerp, gemengde eigendomsmodellen en extra kamers die samen met de door de staat gesubsidieerde woningen voor bewoning werden gebouwd.

Bewoners konden hun woningen incrementeel uitbreiden en inkomsten genereren uit verhuurkamers. Deze kamers waren bedoeld om extra huisvestingsopties te bieden en de dichtheid te verhogen. Er ontstonden echter onbedoelde gevolgen, waaronder de omvang van de incrementele uitbreidingen, waarbij bewoners buiten de toegewezen perceelgrenzen bouwden en meer kamers toevoegden dan oorspronkelijk voorzien. Dit leidde tot huurinkomsten die de verwachtingen van de staat overtroffen en tot dichtheden die veel hoger lagen dan oorspronkelijk gepland.

Aanvankelijk werden bestuurlijke kwesties zoals eigendomszekerheid en uitdagingen rond gezinsinkomen aangepakt via ruimtelijk ontwerp. De reacties van bewoners op deze ontwerpen leidden echter tot het ontstaan van nieuwe bestuursstructuren, zoals door bewoners zelf geïnitieerd eigenaarschap voor oorspronkelijke huurders. Dit toont aan dat hoewel bestuursdoelstellingen het ruimtelijk ontwerp beïnvloedden, ook bewonersinterventies ná bewoning een rol speelden in de uiteindelijke governance-uitkomsten.

TOC

De studie draagt ook bij aan een breder begrip van hoe bestuur en ruimtelijk ontwerp interageren in contexten van huisvesting voor lage inkomens. Ze benadrukt het belang van bewonerservaringen en wijst op de noodzaak van meer sensitieve bestuursstrategieën en bewonersgerichte ontwerpbenaderingen. Het onderzoek identificeert hiaten in de relatie tussen bestuur en ruimtelijk ontwerp en suggereert dat incrementele huisvestingsoplossingen doeltreffender zouden kunnen inspelen op opkomende behoeften.

Tot slot beveelt het proefschrift verder onderzoek aan naar vergelijkende analyses van bestuur en ruimtelijk ontwerp in verschillende projecten, evenals een verkenning van impliciete kennispraktijken rond incrementele huisvesting. Deze gebieden zouden diepere inzichten kunnen verschaffen in het verbeteren van bestuur en ontwerp in de sociale huisvesting. Over het geheel genomen benadrukt het onderzoek de complexiteit van het balanceren tussen bestuur en ontwerp in huisvestingsprojecten, en suggereert het dat het integreren van bewonersfeedback en incrementele ontwerpstrategieën kan leiden tot effectievere en eerlijkere uitkomsten.

1 Introducing Low-Income Housing Through Spatial Design and Governance

The Case of K206, Johannesburg

1.1 Introduction

Academic research on low-income housing largely operates within disciplinary silos (Abdel-Samad et al., 2021; Foo et al., 2022), leading to a fragmented understanding of the complex challenges faced by low-income communities. Soja (2000), in his exploration of cities and regions, underscores the necessity of examining urban processes and spatial structures through more than a singular disciplinary lens. While scholars from diverse fields—such as economics, planning, social sciences, and spatial design—have made significant contributions to the study of low-income housing (Bardhan et al., 2018; Brueckner et al., 2019; Danlandi et al., 2023; Meth, 2017; Robins, 2002), these studies often remain confined within their respective disciplines. As a result, they miss the opportunity to integrate multiple perspectives for a more comprehensive and nuanced understanding of low-income housing. This argument also applies to the topic of addressing the housing crisis for low-income populations whose urgency is underscored by the United Nations' 2018 estimate of over 1 billion people residing in informal settlements worldwide. A transition towards

beyond singular disciplinary explorations will allow to meet this urgency when teams collaboratively analyse, synthesise, and propose innovative strategies for sustainable and inclusive housing solutions, as emphasised by recent studies (Abdel-Samad et al., 2021; Foo et al., 2022; Martin, 2022).

The discourse surrounding low-income housing in South Africa highlights this broader issue of global disciplinary silos.The substantial body of literature exploring the low-income housing situation in the country (Barriére, 2013; Gunter, 2012; Mabuya and Scholes, 2020; Mbandlwa, 2021; Mhlongo et al., 2022; Patel, 2016) tends to focus on single disciplines. While each study contributes to advancing knowledge in the field of low-income housing in South Africa, the insights that cross disciplinary borders remain limited. Cultivating investigations from different disciplinary perspectives would help to ensure more diverse and possibly holistic insights (Beier, 2023; Marutlulle, 2021; UN Habitat, 2020).

The South African low-income housing dialogue is especially layered and requires an exploration that goes beyond a single-disciplinary scholarly approach for several compelling reasons. The delivery of houses to low-income urban dwellers has been a cornerstone of post-apartheid policies, aiming to address historical injustices and provide access to urban land, homeownership, and citizenship (Beier, 2023; Huchzermeyer, 2003; Kepe and Hall, 2018; Marais and Cloete, 2015). However, the persistent unmet need for low-income and affordable housing in South Africa is influenced by complex factors such as unemployment, income inequality, population growth, immigration, increasing urbanisation, and systemic inefficiencies, including corruption (Barriére, 2013; Patel, 2016; Maluleke et al., 2019). These challenges surpass the scope of any single discipline, demanding a broad understanding that extends beyond traditional housing studies and draws on insights from multiple fields (Mabin, 2020).

Therefore, exploring the added value that goes beyond a singular lens would allow for an opportunity to analyse the interconnected challenges associated with low-income housing in South Africa in a different way, an exercise that is worth doing. This dissertation does this exercise by applying a double lens of governance and spatial design.

The term "governance" encompasses a wide array of definitions across various disciplines (Hufty, 2011; Keping, 2018; Kjaer, 2004; Kjaer, 2023; Meuleman, 2008; Meuleman, 2018; Rhodes, 2007). Recognizing that the term "governance" encompasses various interpretations across disciplines (Kjaer, 2004), this thesis focuses specifically on housing governance. Housing governance refers to the act of setting aims and enacting these aims through a series of instruments and number of actors in the process of decision making and implementation of housing. Governance

in low-income housing in South Africa has been extensively studied (Gbadegesin and Marais, 2020; Levenson, 2017; Manomano et al., 2016; Musvoto and Mooya, 2016; Mhlongo et al., 2024; Tissington, 2010).

Similarly spatial design in low-income housing in South Africa has also been explored (Gwebu, 2024; Hendrikz and Osman, 2022; Lizarralde, 2014; Poulsen and Silverman, 2005; Van Tonder, 2022.) Spatial design is the practice concerned with the creation of built form in relation to its context and the process in which the built form was created. (Alexander, 1964; Alexander et al., 1977; Lefebvre, 1991; Poulsen and Silverman, 2005; Van Tonder, 2022).

While approaching low-income housing through a double lens, the study contributes to three key bodies of literature which are informal settlement upgrading, state-subsidized housing and incremental housing. These three bodies of literature are in line with the relevance for the case study. The K206 case study (Alexandra, Johannesburg) is explored through a double lens of governance and spatial design. This double lens explores the four chapter themes of context, resident-responsive design, tenure security and income generation.

Existing literature on governance and spatial design in South African low-income housing provides extensive knowledge within respective disciplines. However, this research largely develops within disciplinary silos, resulting in a disconnect between governance and spatial design. While governance studies focus on housing policy, finance, delivery, land tenure, and participatory governance (Gbadegesin & Marais, 2020; Levenson, 2017; Manomano et al., 2016; Musvoto & Mooya, 2016), they seldom engage with spatial design principles. Conversely, research on spatial design explores issues such as densification, informality, incremental housing, design processes, and contextual influences (Gwebu, 2024; Hendrikz & Osman, 2022; Lizarralde, 2014; Poulsen & Silverman, 2005; Van Tonder, 2022), yet lacks substantial integration with governance frameworks.

Despite shared concerns—such as economic constraints and housing delivery—these disciplines approach the subject from distinct perspectives, resulting in only minor overlaps rather than a comprehensive, interdisciplinary discourse. While governance influences spatial design, and vice versa, their interconnections remain underexplored as a central research focus. This dissertation seeks to bridge this gap by examining the intersections between governance and spatial design, fostering a more integrated understanding of low-income housing in South Africa. In summary, the aim of this study is therefore to explore how research transcending singular disciplinary silos can contribute to a more holistic understanding of the challenges related to low-income housing.

1.2 Research Questions

The overarching research goal of transcending singular disciplinary silos and contributing to a more holistic understanding of the intricate challenges related to low-income housing from a double lens of governance and spatial design is operationalised through the investigation of the following central research question:

— **How can a double-lens approach to spatial design and governance improve our understanding of low-income housing in South Africa?**

Given the case study format (of the K206 low-income housing project) employed for this exploration, the thesis will delve into the following sub-questions, aligning with the broader aim of promoting an approach to gaining insights into issues linked with low-income housing in more than one discipline. The main question is answered through four key questions, as follows:

1. What policies and contextual background are relevant to the Alexandra K206 housing project?
2. How can state-subsidised housing design in the K206 project be responsive to residents' needs and lifestyles?
3. How does security of tenure relate to incremental housing extensions in the K206 project?
4. How did residents engage with the two state-provided income-generating room options of incremental housing in the K206 project?

By answering these research questions, this research aims to contribute to the advancement of knowledge in the field of low-income housing by exploring the potential intersections between spatial design and housing governance. By addressing the central research question and its associated sub-questions within a case study framework, this study endeavours to provide nuanced insights that can inform the development of more holistic solutions to the complex challenges faced by low-income communities.

1.3 Research Approach

The focus of this study is to investigate the double lens of spatial design and governance in the K206 project, Alexandra. Aboelela et al. (2007) describe interdisciplinary research as an academic study or group of studies by scholars from two or more disciplines. The research is based on a conceptual model that links theoretical frameworks from these various disciplines. It uses a study design and methodology that is not limited to one disciplinary field. The thesis adopts an interdisciplinary lens, combining insights from governance and spatial design to examine the dynamics between state actors, contracted professionals, and residents involved in the K206 project as well as the outcomes for residents and built environment.

Positionality

I approach this research as an African, middle-income woman, shaped by my experiences growing up in both rural and urban communities across the African continent. Within my extended family, I have been exposed to a range of income groups and housing types which include low-income housing. I have worked as a professional architect in the field of housing in South Africa for over a decade and have participated in several community engagement projects, which have given me insight into the on-the-ground realities of low-income housing. Through these experiences, I have found that both governance and spatial design are important considerations in the development of low-income housing in South Africa. The research team behind this dissertation includes my supervisors, who come from a mix of disciplinary backgrounds. This has allowed us to approach the thesis in an interdisciplinary manner, using the dual lenses of governance and spatial design to explore the K206 project.

The two lenses of spatial design and governance in low-income housing are defined more in detail in this section.

Spatial Design

Spatial design emerges from the intersection of space as a theoretical construct and design as a methodological process. The term is interpreted differently across disciplines, including architecture and urban design (Alexander, 1964, Alexander et al., 1977; Lefebvre, 1991), geography and sociology (Massey, 2005; Buchanan, 1992), and computer science (Bhatt & Freksa, 2014; Ko et al., 2023). This dissertation specifically examines spatial design within the fields of architecture and urban design.

The definition of space in this study is framed through an adapted version of Henri Lefebvre's (1991) triadic model. This model explores **built form** (perceived, conceived and lived) and the **context** that built form is created in. This includes Perceived Space which is the material and physical environment that includes buildings, roads and fences for example. The second aspect is Conceived Space which pertains to abstract and planned spaces, not necessarily tangible, but articulated through architectural plans, zoning regulations, and boundaries. The third aspect of the triadic model is Lived Space which is representational, it is the personal and experiential dimension of space, influenced by cultural, emotional, and social interactions, as well as individual histories and memories. In addition to the triadic model, within the sub-Saharan and South African context, the concept of transduction (Huchzermeyer, 2021; Lefebvre, 1968/1996) is also relevant to the definition of space. This concept refers to the ongoing negotiation between formal and informal spatial practices that together shape urban environments. Transduction is significant because it illustrates that the three aspects of the triadic model are not mutually exclusive. Rather, complex spaces can simultaneously embody all three dimensions—for example, spaces that are both formal and informal at once.

The definition of design has been taken from Christopher Alexander in his books *Pattern language* (1977) and *Notes on the synthesis of form* (1964). Alexander refers to design being defined as an iterative process and its structured resultant outcome. Alexander refers to design as the process of transformation from existing states to preferred ones through a variety of steps. Wholeness needs to be considered through this process, making sure that all steps of the process work together harmoniously. These steps need to take into account different scales, ensuring that the process is considered at both localized and wider scales. These steps also need to consider perspectives of behaviour, aesthetics, and functionality, taking consideration of context need and lived experience. Design, therefore, engages with this iterative process, while also examining the resulting patterns and spatial configurations (built form in this case) that emerge from it.

Based on the above definitions of space and design separately, the resultant definition of spatial design in this dissertation is the context-sensitive process and outcomes of conceiving housing at both unit and urban scales. In summary, this dissertation defines spatial design as being fundamentally concerned with **built form** and the **context** (surrounding environment and process) in which it is conceived.

Governance

Governance is a multifaceted concept with varying interpretations across disciplines (Hufty, 2011; Keping, 2018; Kjaer, 2004, 2023; Meuleman, 2008; Meuleman, 2018; Rhodes, 2007). To navigate this complexity, Rhodes (2007) recommends specifying the context by using a qualifying adjective. This thesis employs the term "housing governance" to denote the actors, aims, and instruments related to housing. Therefore, every reference to the term “governance” within this thesis refers to “housing governance.”

Applying Rhodes' (2007) definition of governance, housing governance involves a diverse array of actors, both governmental and non-governmental. These actors engage in continuous collaboration to set aims and develop and implement housing policies and initiatives (Gibb, 2018; Meuleman, 2008; OECD, 2020; Rhodes, 2007). Governmental actors include individuals or entities acting on behalf of the government. Non-governmental actors include contractors (contracted workers and professionals), non-governmental organizations, private companies, and residents.

Housing governance also encompasses leadership, control, and decision-making within the public sector, policy, and society (Beer, 2012; Rhodes, 2007; UK National Housing Federation, 2024). It establishes standards for leadership, defines organizational values, and ensures effective management to achieve excellence in governance. Housing governance is crucial for shaping resilient housing systems and ensuring the affordability, safety, and accessibility of decent homes and neighbourhoods (UN Habitat, 2023; Giovannettone et al., 2024). Policymakers, as key actors, are responsible for applying appropriate **instruments** to achieve housing-related **aims**—addressing challenges, meeting sustainability targets, and fulfilling the right to adequate housing by 2030, in alignment with global agendas such as the Sustainable Development Goals and the Paris Agreement (UK National Housing Federation, 2024). However, these governance processes are not limited to policymakers and government actors; housing governance also involves other public bodies, the private sector, and civil society, who contribute as actors to the collaborative instruments used to implement housing aims (Meuleman, 2008).

In South Africa, housing governance specifically addresses the instruments of control and decision-making within governmental and non-governmental actors, with the aim of providing secure tenure for low- to medium-income households (Dibate, 2021). Despite these efforts, challenges persist in the delivery of low-income housing, with governance instruments such as stakeholder participation, accountability, and transparency often overlooked in housing delivery processes. Incorporating these instruments is essential for enabling community involvement and ensuring effective housing interventions in South Africa's low-income housing sector (Pottie, 2004; Mhlongo et al., 2022; Mhlongo et al., 2024).

Based on these definitions from these diverse schools of thought, governance can best be understood through the interaction between **actors** (who governs), **instruments** (how they govern), and **aims** (what they seek to achieve).

Conceptual Framework for Governance and Spatial Design

The relationship between governance and spatial design in low-income housing in South Africa is layered. In the case of K206 (and most state-subsidised housing), the initial relationship between governance and spatial design, based on desktop research, appeared to be one-directional, with governance (aims, instruments and actors) dictating spatial design (built form and context) outcomes as per Figure 1.1. While several sources suggest that governance influences spatial design (Carmona, 2016; van Oosten et al.; 2018; Kumar-Nair and Landman, 2023; Volgger et al.; 2019), there are less overt suggestions that spatial design can have influence on governance (Collier and Gruendel, 2022; Kumar-Nair and Landman, 2023). As such, the relationship between governance and spatial design presents an opportunity for further exploration within this thesis.

Figure 1.1 also shows the contents of the dissertation, which include explorations of the context of the case study, resident responsive design, security of tenure, and income generation.

FIG. 1.1 Chapters of the dissertation and their themes, with a directional arrow between governance and spatial design in the K206 project indicating the anticipated effect based on literature.

Methods

The thesis employed a mixed methods, qualitative approach, using multiple methods to gather and analyse data related to the K206 case study. Each of these enquiries served as the foundation for crafting Chapters 2, 3, 4, and 5. These chapters delved into distinct facets of the governance and spatial design of the K206 project, employing data collection methods tailored to their specific subjects, as outlined in Table 1.1.

TABLE 1.1 Overview of research methods for data collection (Own Work, 2024)

Chapter	Research Question	Methods
Chapter 2	What policies and contextual background are relevant to the Alexandra K206 housing project?	**Desk research** • Academic literature • Policy documents **Field Research** • Site survey/spatial survey • Expert interviews • In-depth interview with residents
Chapter 3	How can state-subsidised housing design in the K206 project be responsive to residents' needs and lifestyles?	**Desk research** • Academic literature • Newspaper articles • Policy documents **Field Research** • Expert interviews • In-depth interviews with residents • Site survey/spatial survey
Chapter 4	How does security of tenure relate to incremental housing extensions in the K206 housing project?	**Desk research** • Academic literature • Newspaper articles • Legal documentation • Google Earth mapping **Field Research** • Expert interviews • In-depth interviews with residents • Site survey/spatial survey
Chapter 5	How did residents engage with the two state-provided income-generating options of incremental housing in the K206 project?	**Desk research** • Academic literature • Legal documentation **Field Research** • Expert interviews • In-depth interviews with residents • Site survey/spatial survey

The methods listed in Table 1.1 were employed to understand the interplay between spatial design and governance aspects of the K206 project. Data on governance included policy and contextual background, security of tenure, and income generation. Data collection on spatial design involved examining the design of the K206 project at both unit and neighbourhood scales, with spatial design decisions largely influenced by governance aspects.

To understand how the governance and contextual background related to the project, the thesis explored academic literature, policy documents, and expert interviews. For exploring the security of tenure within the project, the study reviewed academic literature about the state of the art in tenure security; furthermore, legal documentation, expert interviews, and newspaper articles detailing tenure issues faced

by K206 residents were taken into account for the analysis. The resident interviews were held to gather insights into the on-the-ground realities of tenure security.

To investigate the income generation aspects of the K206 project, the study examined expert interviews, academic literature, and legal documentation to understand the project's initial intentions. Resident interviews and spatial analyses of their homes were used to explore the practical realities of how and why the homes were used to generate income.

For the spatial design aspect, expert interviews and academic literature were used to establish the initial spatial design intentions of the project. Resident interviews were conducted to understand their actual experiences with their homes and their decisions to incrementally extend them. Additionally, spatial surveys were conducted to show how residents adapted their homes spatially.

All interviews with residents and the spatial analyses of their home and living environment were conducted in March 2021 in Alexandra. During fieldwork, twenty-six interviews were conducted with K206 residents, and with each interview, a spatial analysis of the residents homes was conducted. All residents interviewed had incrementally extended their homes. Recruitment was facilitated with a local NGO (Rays of Hope), who helped by distributing advertising flyers, word-of-mouth advertising, and in some cases, the snowball method. Efforts were made to interview a diverse group of residents, ensuring representation across various unit types and an even distribution within the 28-hectare K206 project area. Interview participants were selected based on the criteria that they resided in homes within the K206 project that had undergone incremental extensions since its completion in 2010. All interviews were conducted with residents who had lived in the development since 2010. Household sizes ranged from two to 18 people, including rental room tenants, within each dwelling plot.

All residents gave their consent for the interviews. Interviews were conducted in isiZulu, English, and isiPedi. A translator was used for isiPedi interviews. Interviews were translated and transcribed in English. The spatial analysis of residents' homes included a housing survey that spatially showed how residents had incrementally adapted their homes over time through a series of sketches and photographs. These sketches and photographs were converted to 2D and 3D drawings of the houses to help analyse spatial design.

Interviews with experts and Alexandra Renewal Project (ARP) management were conducted between 2020 and 2023 in English. Seven interviews were conducted and transcribed in English, each lasting 1 to 2 hours, with key management personnel involved in the K206 project. The aim was to gather firsthand insights and

perspectives on the project's brief, planning, and execution. Experts were selected based on their roles within the management or organizing committee of the ARP. The interview questions focused on their involvement with the project, their perspective on its intentions, and the outcomes over time.

Ethics

Ethical considerations were carefully observed throughout the research process. All interviewees provided informed consent, ensuring that their participation was voluntary and based on a clear understanding of the study's aims. Community interviews were conducted with particular sensitivity, and all responses were anonymised to protect participants' identities and ensure confidentiality. The research was conducted in full compliance with TU Delft's ethical guidelines, and ethics clearance was obtained under ethics approval number 1983 from TU Delft Human Research Ethics Committee.

1.4 Added Value of Research

This section explores the scientific and societal relevance of the research.

Scientific Contribution

Soja (2000), in his analysis of cities and regions, emphasizes the importance of adopting an approach to understanding urban processes and spatial structures that transcends a single discipline. This thesis aligns with this perspective, recognizing the need to examine urban issues from an interdisciplinary lens. While several low-income housing case studies have been conducted within research areas of informal settlement upgrading (Alemaheyu, 2008; Bassett, 2005; Danso-Wiredu and Midheme, 2017), state-subsidized housing (Moolla et al., 2011; Zungu, 2016), and incremental housing (Goethert, R., 2010; Wakely and Riley, 2011), most case studies tend to assess their subject matter from a singular perspective, which makes it challenging to connect the broader literature and identify overlapping themes. This thesis, therefore, seeks to explore the intersection of housing governance and spatial design, examining how these disciplines interact and inform one another.

Several studies have investigated low-income housing in Sub-Saharan Africa and South Africa from various disciplinary perspectives, including policy, social science, housing finance, and material workmanship quality (Benken, 2017; Charlton, 2013; Gulyani and Bassett, 2007). Low-income housing design in Sub-Saharan Africa is largely budget-dependent, with mass-produced housing schemes that lack architectural innovation. Spatial design has been explored (Amoah et al., 2022; Moolla et al., 2011; Ndung'u, 2012), but due to limited budgets in low-income housing, post-occupancy evaluations of these low-income housing schemes and even more so, knowledge about experiences of the residents that live in these schemes is limited (Abbott, 2002; Del Mistro and Hensher, 2009; Huchzermeyer, 2003; Moolla et al., 2011). This dissertation aims to contribute to the limited resources on post-occupancy evaluations in low-income housing that include residents' experiences and perspectives.

Low-income housing literature also falls into a number of discipline-related categories. Informal settlement upgrading and state-subsidised housing in Sub-Saharan Africa are both forms of low-income housing but are generally separated in literature, one silo for informal settlement upgrading and one silo for state-subsidised housing. However, in the South African context, informal settlement upgrading happens almost exclusively through state-subsidised housing practices (DoHS, 2015, 2004). There is a gap in South African housing-based literature that brings together conversations about governance with regards to informal settlement upgrading and state-subsidised housing literature.

This dissertation advances the field by integrating spatial design factors of built form and context into governance conversations that explore aims, instruments and actors in decision making processes. The case study also shows how spatial design in low-income housing can be used as a tool to address governance issues, which has been a marginalised consideration within literature. It also analyses how the governance of incremental housing impacts on security of tenure and housing as a form of income generation which has an impact on residents' long-term stability.

The case study seeks to bridge fragmented discussions in the literature by employing a double lens approach that combines spatial design and housing governance. While the project is grounded in a specific case study with unique circumstances, the innovations it introduced—though problematic in some respects—facilitate an explorative dialogue on both spatial design and governance. Situated in South Africa, the case study's context is shaped by the country's exceptional history, which is crucial to understanding the project. However, the interrelationship between spatial design and governance offers broader insights into state-subsidized housing, informal settlement upgrading and incremental housing beyond the South African

context. This research bridges the gap between policy and lived experience, offering a comprehensive approach for understanding low-income housing in South Africa and beyond.

Societal Contribution

The study integrates societal discussions from governance and spatial design of state-subsidised housing, informal settlement upgrading and incremental housing, emphasising the importance of exploring housing solutions through more than one disciplinary lens. The thesis also provides new insights into governance incongruities between the different lenses and the longer-term effects of decision-making processes in housing on residents. Additionally, the thesis also aims to provide insights into the ongoing tenure-based battle at the K206 project and to give residents access to formalised plans of homes with the option to formally approve their incremental extensions once the option has been made available to them through title deeds.

By delving into the understanding of low-income housing in the region, it addresses elements essential for addressing housing challenges in Sub-Saharan Africa. Through an examination of the practical implementation of the K206 project, encompassing both its achievements and limitations, the study carries societal relevance in the context of low-income housing in Sub-Saharan Africa. This presents opportunities to chart a path forward for improving the current state of low-income housing through the thematic considerations of spatial design and housing governance.

1.5 Structure of Thesis

The thesis is structured as follows: after this introduction, the second chapter delves into an in-depth understanding of the intricate backdrop of Alexandra, the Alexandra Renewal Project, and an overview of the K206 project. The third part delves into the examination of the incorporation of resident-responsive low-income housing design. It involves a comparative analysis between the standardised Reconstruction and Development Programme (RDP) design and the K206 project, considering both neighbourhood and domestic spatial dimensions. The fourth chapter explores

residents' responses to tenure insecurity through incremental extensions. The fifth chapter investigates the income-generating attributes of the K206 project, encompassing its initial design concept and resident-initiated incremental extensions of "backyard rooms." Finally, the thesis ends with a number of discussions and conclusions that include the fact that many of the intended outcomes of the K206 project were different from expected/projected spatial design and governance outcomes.6 project were different from expected/projected spatial design and governance

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TOC

2 Context of K206

ABSTRACT This chapter investigates how the K206 housing project in Alexandra, Johannesburg, represents an innovative approach to informal settlement upgrading and state-subsidised housing by integrating spatial design and governance strategies tailored to local needs. The research asks: What policies and contextual background are relevant to the Alexandra K206 housing project? The study employs a case study methodology, drawing on academic literature, policy documents, expert interviews, fieldwork observations, and spatial analysis of 26 dwelling units. It systematically examines the historical and policy context of Alexandra, explores various housing types and tenure classifications, and analyses the K206 project's design and governance features, particularly its support for incremental expansion and income generation. The K206 project is distinctive in its resident-responsive design, incorporating Alexandra's established backyard room culture and enabling incremental housing expansion. Its medium-density cluster typology addresses both spatial and economic needs. The governance innovation of a block-by-block relocation approach, rather than a conventional waiting list, facilitated community continuity but also introduced new challenges regarding eligibility and access. The project's integration of formalised rental rooms with capped rents directly supported resident income generation. Analysing K206 through the lenses of governance and spatial design reveals the potential and complexities of moving beyond generic technical standards to more flexible, resident-responsive housing solutions.

2.1 Introduction

This chapter delves into the contextual background of Alexandra township, commonly referred to as "Alex," and the operations of the K206 project, shedding light on the political, social, and economic circumstances that have shaped its development. This chapter is explored through the double lens of governance and spatial design.

Alexandra township illustrates the enduring impact of apartheid-era socio-spatial policies and the ensuing challenges encountered in the context of post-democracy urban development (Bonner and Nieftagodien, 2008; Harrison et al., 2014; Hooghiemstra and Cloete, 2018; Sinwell, 2010).

Having navigated a history marked by resistance to forced relocation, Alexandra has transformed into a densely populated enclave, accommodating a diverse demographic in a variety of housing structures, including informal settlements, “backyard rooms," privately owned residences, and state-subsidised projects (Bonner and Nieftagodien, 2008; Harrison et al., 2014; Sinwell, 2005). This chapter examines the layers of social, political, economic, and housing dynamics that have shaped Alexandra's housing landscape over the past three decades of democracy.

The selection of the Alexandra Renewal Project and K206 state-subsidised housing project as a case study was based on its distinctive approach to spatial design and governance considerations that explored informal settlement upgrading, state-subsidized housing and incremental housing.

The K206 housing project serves as a noteworthy case study, offering insights into the intricacies of inclusive urban development and the nuanced challenges associated with housing classifications in South African townships. The central research question guiding this chapter is: "What policies and contextual background are relevant to the Alexandra K206 housing project?”

To answer this question, methods employed in this chapter aimed to acquire insights into the K206 project through an examination of legal documents, newspaper articles, policy papers, and academic literature. Additionally, seven interviews were conducted and transcribed in English between 2020 and 2023 within a timeframe of 1 to 2 hours with key management personnel associated with the K206 project to gather first-hand information and perspectives of the brief, planning, and execution of the project. Questions for these interviews were based on the key management personnel’s interaction and positioning with the project and the intention and outcomes of the project over a period of time. In addition to this, a timeline was compiled consolidating these various Alexandra-related sources into one comprehensive graphic timeline. These methods were used due to the fact that detailed information on the intention and execution of the project was limited. Legal documents, policy documents, academic articles, and newspaper articles helped to give insights on the implementation and some design aspects of the project. Remaining gaps were explored through interviews.

This chapter puts the next chapters of the dissertation into context by exploring the underlying circumstances of current policy ambitions, past policies, and the Alexandra context in order to give background to the significance and challenges associated with the K206 project. It starts in the following section (section 2.2.), which explores the definition of concepts for the chapter and the dissertation at large. The section thereafter (section 2.3) explores low-income housing in sub-Saharan Africa. Section 2.4 explores the historic contexts, starting with the spatial design complexities of Alexandra on a historically urban scale, as well as social considerations for the area. This topic links in with the low-income housing policy that needs to be considered for the project (section 2.5). Section 2.6 explores the main types of housing within Alexandra, with section 2.7 exploring additional housing types of interest in the area. Lastly, the K206 case study is explored through the lens of spatial design and governance (section 2.8).

2.2 Definition of Concepts

This section explores the various definitions of the key concepts in this dissertation. The section explores the terminologies of informal settlements, informal settlement upgrading, state-subsidised housing, incremental housing, "backyard rooms," and tenure security. Each term is listed below and accompanied by its respective definition.

Informal Settlements

In his article titled "The Return of the Slum: Does Language Matter?" Alan Gilbert highlights the use of the term "slum" by the UN and other organisations as a fundraising tool to raise awareness about poverty and inequality in informal settlements. Despite good intentions, Gilbert argues that the term'slum' is derogatory and carries a negative bias towards the people residing in such areas (Gilbert, 2007). Other synonymous terms for informal settlements that have been used include squatter settlements (Srinivas, 2005) and shanty towns (Ni et al., 2014). Consequently, this chapter deliberately employs the term "informal settlements" instead of "slums."

It is important to acknowledge that some scholars use "informal settlement" and "slums" interchangeably (Danso-Wiredu and Midheme, 2017: 98; Del Mistro and Hensher, 2009: 333). There are a number of definitions around formality and informality; in this thesis, "informal" refers to the fact that these structures are

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typically user-initiated and not formally planned or registered according to state records, thus making them "informal." The choice of terminology between using "informal settlement" or "slum" is influenced by language and geography, resulting in various synonyms for informal settlements across different regions.

For instance, Latin American countries use terms such as f*avelas, tugurio, pueblos jovenes*, or *barriadas* and *pobladores* in Brazil, El Salvador, Peru, and Chile, respectively (Bamberger et al., 1982; Gilbert, 2007; Imparato and Ruster, 2003; Magalhães et al., 2016). In Asian countries like Indonesia, India, and Arab-speaking nations, informal settlements may be referred to as *Kampung, Jhuggi,* and *Mudun Safi*, respectively (Ali, 2004; Boonyabancha, 2005; Krstić, 2016). Africa also presents diverse terminologies, with *intra-muros* (Ray, 2016), *imijondolo* (Xulu, 2014), and *chereka biet* (Alemaheyu, 2008) translating to informal settlements in Morocco, South Africa, and Ethiopia, respectively.

The UN Habitat classifies informal settlements based on themes like origin and age, location and boundaries, size and scale, legality and vulnerability, and development stages (Alemaheyu, 2008; UN-Habitat, 2014a). These factors aid in determining the type of informal settlement, proving valuable in preparatory assessments for informal settlement upgrading.

The terminologies such as slum, shantytown, and informal settlement also have historical associations. A literature search by the author using the citation database "World of Science" reveals that the term "slum" first appeared in 1903, "shanty town" in 1964, and "squatter settlements" in 1966, while "informal settlements" gained prominence in citations starting in 1986. The evolving use of these terms over time suggests a progression in understanding and framing the concept of these types of living environments.

In conclusion, informal settlements encompass various forms, and their terminology reflects regional, linguistic, and temporal variations. This dissertation opts for "informal settlements" to eliminate associative biases, recognising that interchangeability with the term "slums" is common in literature related to informal settlement upgrading.

The K206 project involves upgrading an informal settlement, with most residents having relocated from informal settlements to the K206 area. This definition outlines the residents' background and living conditions prior to their move, while highlighting the role of language in classifying these environments, providing context for the subsequent section on informal settlement upgrading. It is also important to note that post-occupation, a number of informal housing extensions in the form of "backyard rooms" in the K206 project were built by users.

Informal Settlement Upgrading (ISU)

Numerous definitions exist for informal settlement/slum upgrading, this dissertation identifies informal settlement upgrading (ISU) as the most socially appropriate and economically viable approach to improve informal settlements (UN-Habitat, 2014; Werlin, 1999; Churchill, 1980). ISU involves enhancing rights, security of tenure, physical infrastructure, social cohesion, amenities, economic stability, and addressing organisational and environmental challenges for informal settlement residents (Ray, 2016), with the involvement of various stakeholders (Mureithi, 2016; Satterthwaite and Mitlin, 2013).

The term "upgrade" specifically denotes the process of improvement within informal settlements. The narrower definition, as per UN Habitat, focuses on "improvements in housing and/or basic infrastructure in informal settlement areas." Gulyani and Bassett characterise upgrading as one of the most effective and "widely applicable strategies" for improving informal settlements in Africa (Gulyani and Bassett, 2007). In a broader context, upgrading encompasses advancements in economic and social processes that contribute to both physical improvements and an enhanced quality of life for residents (UN-Habitat, 2004: 3; Abbott, 2002; Hwang and Feng, 2019; Perten, 2011; UN-Habitat, 2014a). Upgrading serves as an umbrella term encompassing various forms of enhancement of informal settlements. These forms include in-situ upgrading and greenfields development (Abbott and Douglas, 2001; Danso-Wiredu and Midheme, 2017)

While informal settlement upgrading has improved the lives of residents, the process has faced various critiques. Satterthwaite (2012) highlights that many of these projects fail to achieve the necessary scale and are often driven by business interests or political agendas aimed at securing re-election. Additionally, Satterthwaite (2012) raises concerns about tenure security and relocation challenges associated with such upgrades. A number of these similar issues have been revealed within the ISU K206 case study.

The K206 project aimed to offer formally planned, state-facilitated housing for residents of Alexandra's informal settlements through relocation as part of an informal settlement upgrading effort. This resulted in the provision of state-subsidised housing as an alternative to the nearby informal settlements where the residents had previously lived. Moreover, the distinctive nature of the K206 project, which is further detailed in Section 2.6, makes it a case study that is relevant for both greenfields development (with relocation) and in situ upgrading (upgrading without relocation) literature. The case study offers a wealth of information to learn from, but not every aspect of the case study was successful. Based on the layering of both forms of upgrading, the K206 project also faced a number of challenges related to relocation and tenure security.

State Subsidized Housing

In South Africa, formal housing provided through ISU is state-subsidised. As a result, the K206 project serves as both an informal settlement upgrade and a form of state-subsidised housing. In this dissertation, state-subsidised housing pertains to formalised state-funded housing. In the South African context, state-subsidised housing commonly includes Reconstruction and Development Programme (RDP) housing, fully subsidised for low-income households. Additionally, other forms of state-subsidised housing encompass social housing (a subsidised rental option), as well as other housing alternatives designed to provide housing finance assistance to individuals who do not qualify as low-income households for RDP housing but face financial constraints in accessing housing through conventional financial institutions. The RDP programme (DoHS, 1994) has progressively developed into the Breaking New Ground Policy (DoHS, 2004), and most recently into the Integrated Residential Development Programme (DoHS, 2020). This evolution has encompassed improvements from the RDP programme with increased density, higher quality housing, additional amenities and economic opportunities as well as integration of various income groups and flexibility of tenure (DoHS, 2020). Given that the case study's urban design, planning and development took place between 2001 and 2010, the terminology of RDP housing remains relevant to the study. Similar international comparisons and terminologies to state-subsidised housing with regards to spatial typology and provision of housing for low-income earners are the council housing from the United Kingdom (Beier, 2023; Charlton, 2013; Ravetz, 2003; Rhizome Management Services, 2009), Brazil's Minha Casa Minha Vida Program (Da Motta, 2019), Chilean Programa de Vivienda Social (Charlton, 2013; Gilbert, 2004; Galiani et al., 2005), social housing of the Netherlands (Elsinga and Wassenberg, 2014), and the Low-Cost Housing Programme in Botswana (Kampamba et al., 2018).

Incremental Housing

Incremental housing refers to a housing development approach in which a dwelling evolves and is extended gradually over time. It is often described as an "informal" user-initiated housing process where residents progressively expand their existing dwellings. This housing model has garnered acclaim, notably from organisations such as the Cities Alliance (Wakely and Riley, 2011), for its capacity to facilitate scalable housing development. Unlike formal housing initiatives implemented by governments, incremental housing involves individual households adding rooms, proving to be a more efficient and sustainable financial strategy. Residents contribute to the development based on their financial capacity, as and when funds

are available to them. This financial sustainability is coupled with a heightened sense of ownership and management, as residents are more likely to care for and oversee the maintenance of their living spaces after they have invested in them themselves (Wakely and Riley, 2011; Goethert, 2010; Mota, 2021).

Incremental housing is closely associated with low-income households, and its relevance stems from its ability to accommodate large-scale housing developments. This approach is intricately linked to other housing strategies, including state-subsidised housing, slum upgrading, and sites and services (Wakely and Riley, 2011; Goethert, 2010; Mota, 2021).

In the K206 project, specific design considerations were incorporated into one of the types of housing modules (Type 1, see Figure 2.11) to accommodate incremental expansion. Over time, residents also implemented their own informal incremental extensions in the other types of housing.

"Backyard Rooms"

Backyard rooms refer to a type of informal dwelling that is incrementally added to a formal house for either expanding the living space of a family or for generating rental income. While these rooms can provide housing for extended family members or networks, they are also adaptable for income-generating activities such as rentals or home-based businesses (Development Action Group (DAG), 2020; Lemanski, 2009; Poulsen, 2010).

Backyard rooms in apartheid South Africa emerged as a direct consequence of oppressive urban policies that sought to control black urbanization. This informal housing phenomenon intertwined with apartheid mechanisms of influx control and orderly urbanisation. The apartheid regime enforced strict influx control laws to regulate black migration to urban areas, rooted in the 1923 Native Urban Areas Act and later reinforced by pass laws (Marutlulle, 2022). By the 1980s, the relaxation of influx controls under international pressure led to accelerated urbanization, but without corresponding housing investments (Brueckner et al., 2018; Hindson, 1985). Municipalities tacitly allowed backyard rooms as a safety measure to absorb population growth without challenging apartheid's spatial segregation (Marutlulle, 2022). The 1980s also brought a shift to orderly urbanisation, as it abandoned territorial apartheid but retained spatial segregation. This shift lead to backyard rooms as a survival strategy to generate income in townships as well as accommodate the growing population of townships through post-apartheid urbanization (Brueckner et al., 2018).

From a spatial perspective, "Backyard rooms," as the name implies, historically referred to “illegal” rooms constructed for rental purposes or to expand housing, often built discreetly to evade detection by authorities during apartheid. Post-apartheid, these incremental extensions have become commonplace, and although these dwellings still have contended legality, “backyard rooms” are very seldom legally disputed from government in South Africa, more especially in township areas where they are particularly prevalent. It is now also common practice for “back yard rooms” to be positioned anywhere in a yard or housing plot and not only in the back of a plot (Ginsburg, 2001; Ginsburg, 2011; Poulson; Development Action Group (DAG), 2020).

In the K206 project post-occupation, a number of residents opted to expand their houses with backyard rooms.

Tenure Security

Forms of tenure or (in)secure tenure also fall into a wide spectrum based on varying contexts. In the context of this dissertation, tenure security denotes the assurance of secure land or property ownership for an individual or household (Simbizi et al., 2014; Van Gelder, 2010). It entails residents experiencing a genuine sense of ownership, being safeguarded against forced eviction, and having the freedom to make enduring investments in and enhancements to their property. In the South African context, marked by a history of forced removals for mostly vulnerable non-white and low-income groups, the Reconstruction and Development Programme (RDP) and informal settlement upgrading have sought to rectify insecure tenure among low-income residents by providing fully subsidised housing, along with either title deeds (Bassett, 2005; Gulyani and Connors, 2002; Payne and Durand-Lasserve, 2012).

In the K206 project, tenure security became a contested issue due to the distinctive mixed tenure system, as detailed in Chapter 4.

Insurgent Urbanism

Insurgent urbanism refers to a bottom-up approach, typically involving informal urban development. These insurgent practices are initiated by residents to challenge formal state policies, processes, governance, or regulations in order to create outcomes that meet their needs. This often occurs when residents feel their voices have not been heard by the state. This form of urbanism is frequently associated

with marginalised, low-income communities. The term has evolved from the earlier concept coined by urbanist James Holston, who introduced the term “insurgent citizenship” to describe how marginalised communities, feeling excluded from formal city systems, assert their rights to the city (Canedo and Andrade, 2024; Davis, 2013; Holston, 2007; Hou, 2010; Mukwaya, 2016).

2.3 Low-Income Housing Sub-Saharan Africa

Low-income housing in Sub-Saharan Africa, particularly in South Africa, is a complex and multifaceted issue that has been explored across a wide range of disciplines. The concept of low-income housing encompasses various interconnected elements, including the economic conditions of low-income households, the physical housing structures they occupy, and the policies that facilitate the connection between people and housing. These layers reflect a dynamic interplay between social, economic, and spatial factors that are crucial to understanding housing issues in the region.

A bibliometric study by Danlandi et al. (2023) reveals that "low-income housing" is among the top 12 most frequently used keywords in housing studies in Sub-Saharan Africa, with South Africa standing out as a significant contributor to the body of literature on this topic. This indicates a substantial volume of academic output in South Africa, where low-income housing remains a critical and relevant subject within housing studies across the continent.

Low-income housing, as a theme, spans multiple disciplines and perspectives. From an economic standpoint, it focuses on the financial challenges faced by vulnerable households in accessing housing that can improve their economic prospects. The intersection between individuals and their housing is also deeply tied to policy, which determines how people are connected to housing options, ensuring that their basic needs are met through effective governance and support structures.

Gbadegesin and Marais (2020) conducted a bibliometric exploration of housing policy, finding that the terminology surrounding housing policy draws from over 22 distinct disciplinary backgrounds. This highlights the breadth and depth of

the subject matter, showing that the policies shaping housing development are influenced by various academic perspectives, from economics and sociology to political science and urban studies.

In addition to policy, the spatial design of low-income housing is another critical area of focus. Alemaheyu (2008), Gwebu (2024), Haileselassie (2025), Hendrikz and Osman (2022), Lizarralde (2014), Poulsen and Silverman (2005), Rukwaro and Kieti (2019), and Van Tonder (2022) provide valuable insights into how spatial design decisions impact the lives of low-income residents in Sub-Saharan Africa.

With regards to governance low-income housing is also explored in depth by researchers such as Turok and Borel-Saladin (2015), Akinmoladun and Adewumi (2020), Gwon and Groenewald (2013), Lall and Deichmann (2012), and Rust (2016), who examine housing finance models and their implications for affordable housing delivery. These studies demonstrate the challenges in financing housing for the low-income sector, where access to credit, affordable mortgages, and government subsidies play crucial roles in shaping housing availability. Finally, the lived experiences of residents explored by Lall and Deichmann (2012), Mancheno (2006), Beier (2023), and Watson et al. (1997) highlight how individuals and communities navigate the challenges of inadequate housing, underscoring the social and cultural dimensions of housing.

In conclusion, the study of low-income housing in Sub-Saharan Africa is inherently multidisciplinary, drawing on economics, spatial design, policy analysis, and social sciences. The diverse body of research in this area reflects the complexity of the issue and the need for comprehensive, multifaceted solutions to address the housing needs of the region's low-income populations.

2.4 Alexandra's History: Spatial, Political, Economic and Social Explorations

This section describes Alexandra's unique history within the context of spatial design and governance in South Africa. Originating as a farm in 1912, Alexandra defied apartheid city planning. As a consequence of Johannesburg's changing infrastructure, the township is 3 km away from Sandton CBD. This is unprecedentedly close for a township in South Africa based on historical apartheid planning. This unique history, marked by layers of colonialism, apartheid, political unrest, and post-democratic transformations, underscores the township's resilience and contributions to culture.

Spatial Design

Figure 2.2 situates Alexandra within the apartheid city model, illustrating its unique position as a township unusually close to the central business district, contrasting with the spatial segregation principles of apartheid city planning (Bonner and Nieftagodien, 2008; Harrison et al., 2014). Initially established in the early 1900s as one of the few opportunities for Africans to own land near Johannesburg, Alexandra's proximity to economic hubs like Sandton contributed to its high population density and diverse housing types, ranging from single-storey homes to multi-storey subsidised walk-ups to informal settlements. The establishment of the industrial buffer zone of Marlboro, aligned with apartheid spatial planning, aimed to physically segregate Alexandra from affluent white populations while maintaining its proximity to economic centres. Despite efforts to disassemble, Alexandra remained within 3 kilometres of Sandton, deviating from typical apartheid planning and township locations driven by urban sprawl. Figure 2.1 depicts the original spatial model for the apartheid city, and showcases where Alexandra highlighted in yellow clearly disrupts the original allocation system by locating African low-income populations into areas that were originally earmarked by the apartheid government to be white middle-income areas.

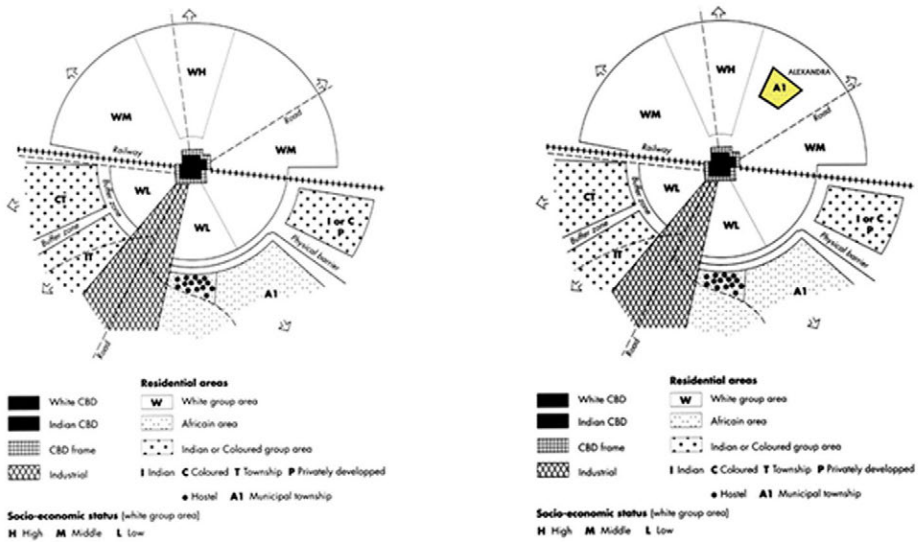

FIG. 2.1 (left) Depicts the original spatial model for the apartheid city. (Source: Davies, (1981)). (right) The amended model of the apartheid city according to Davies situating Alexandra highlighted in yellow. (Source: Davies, (1981), adapted).

Using Davies model to situate Alexandra township an exception to apartheid spatial planning, in yellow located centrally in a previously white middle class area. The presence of this yellow block and Alexandra's location as a disruption to apartheid spatial planning were not intentional on the part of the apartheid government. However, as Johannesburg expanded, particularly northward, the already established township of Alexandra became a challenge and gradually emerged as an exception to the apartheid spatial plan.

The timeline of Alexandra's spatial development, as depicted in Figure 2.2, traces the evolution of its physical landscape, reflecting the impacts of colonialism, apartheid, urbanisation, and upgrading efforts.

The government's attention to reform and upgrade Alexandra resulted in numerous projects post-apartheid (after 1994). Spatial challenges have included the intertwined nature of frustrated development plans, the absence of concrete references, policy-related issues like hostel upgrades, and political challenges as highlighted in 2.3.2. The interconnectedness of these various factors has heavily influenced development decisions, and Alexandra's complexity lies in balancing development without compromising already tight spaces and addressing the challenges of de-densification (Albonico, M., Personal communication, November 2, 2020; Baskin, J., Personal communication, December 1, 2021).

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Political and Economic History

The political history of Alexandra, as delineated in the same timeline and corroborated by expert insights, elucidates its resilience against apartheid policies and post-apartheid transformation efforts. Initially proclaimed as a non-white settlement in 1912, Alexandra resisted apartheid relocation attempts, maintaining its status as a black township despite pressures for relocation. With the advent of South African democracy in 1994, initiatives like the Greater Alexandra Development Forum and the Alexandra Renewal Project aimed to address historical challenges and improve the living conditions of residents. However, the political landscape of Alexandra is also marked by the complexities of a lack of legal approvals, private sector involvement, land disputes, contended land allocations, ownership disputes, and relocaThe political history of Alexandra, as delineated in the same timeline and corroborated by expert insights, elucidates its resilience against apartheid policies and post-apartheid transformation efforts. Initially proclaimed as a non-white settlement in 1912, Alexandra resisted apartheid relocation attempts, maintaining its status as a black township despite pressures for relocation. With the advent of South African democracy in 1994, initiatives like the Greater Alexandra Development Forum and the Alexandra Renewal Project aimed to address historical challenges and improve the living conditions of residents. However, the political landscape of Alexandra is also marked by the complexities of a lack of legal approvals, private sector involvement, land disputes, contended land allocations, ownership disputes, and relocations (Albonico, M., Personal communication, November 2, 2020; Baskin, J., Personal communication, December 1, 2021). Despite these challenges, Alexandra remains a vibrant community with a rich cultural heritage and a history of political activism and resilience.

The K206 project in Alexandra, South Africa, unfolds within the intricate context of South African economic inequalities and the historical legacy of apartheid policies. These policies, implemented over decades, sought to segregate classes and races, a legacy that continues to influence spatial planning in the country today (Christopher, 2000; Davies, 1981; Lemanski, 2009). Townships emerged as a key element of this segregation strategy, with low-income African populations situated in areas far from higher-income white residential zones, despite the need for labour in the CBDs of major cities. This spatial arrangement led to high commuter costs for the African workforce (Kerr, 2015).

However, as indicated in Section 2.3.1, Alexandra stands as a remarkable exception to this apartheid spatial model. This close proximity to economic opportunities and affordable housing turned Alexandra into a unique and sought-after location. The area experienced rapid growth, reaching a population of around 500,000

people in less than two acres. Alexandra's offering of close proximity to economic opportunities can rarely be found in other townships.

The township of Alexandra, despite prolonged social challenges, has a vibrant history, contributing to music, sports, and entrepreneurship. Its proximity to Sandton CBD makes it a valuable area for low-income African residents seeking job opportunities. Despite the challenges and a densely populated environment, a significant proportion of Alexandra's residents expressed satisfaction with their living conditions in a 2007 survey (Richards et al., 2007).

In conclusion, the close proximity of Alexandra to the Sandton CBD allowed for a number of economic opportunities for Alexandra residents. This is a key factor in what makes Alexandra a desirable location to live in, as it offers affordable housing opportunities in a well-located area for job opportunities. This has also resulted in dense housing distributions and opportunities for housing rentals in the area.

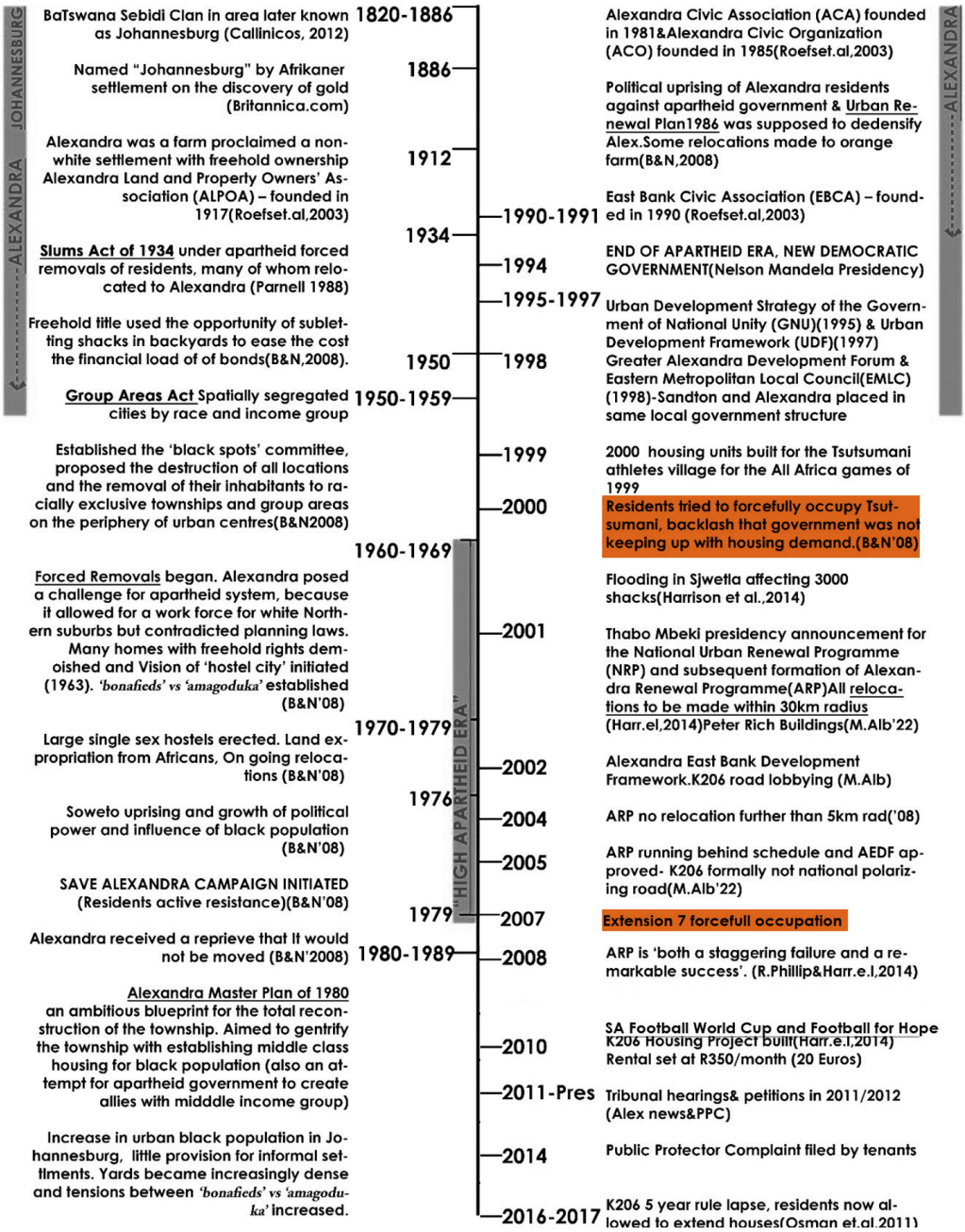

FIG. 2.2 A timeline depicting the history of Alexandra that pertains to socio political, economic and housing experiences of Alexandra residents. (Source: Author based on information from Bonner and Nieftagodien (2008); Callinicos (2012); Harrison et al. (2014))

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Social Issues of Residents

This section explores the social experiences of Alexandra residents, political tensions, and residents' resistance over time, based on the social issues of the wider South African context that include socio-economic segregations. This is visually explored in Figure 2.2, which highlights the turbulent political history of force removals during the high apartheid era, as well as resident forceful occupation of houses at Extension 7 as well as the Tsutsumani housing project.

This section delves into the historical development of resident classifications in Alexandra, examining how they emerged over time. The bona fides representing residents since the original settlement in 1912 stood in contrast to the amagoduka, who arrived later. Amid apartheid pressures and the government's attempts to disassemble Alexandra, residents, facing tensions, turned on each other, creating classifications that suggested preferential treatment for the bona fides over the amagoduka. Other classifications emerged as more residents settled in informal settlements at a later stage, creating even more internal distinctions (Bonner and Nieftagodien, 2008).

Concerns escalated as Alexandra residents, considering themselves the original property class, sought the return of their land. The complex scenario unfolded when the ruling ANC party, supporting all residents, struggled to take sides or resolve the issue. In response, the Alexandra Property Owners Association obtained a court interdict, halting any development in the original part of Alexandra. This redirected the development of Alexandra housing to the East Bank areas. Not all residents on waiting lists received housing, and this problematic land allocation has also affected the process of securing title deeds for residents with properties in the area.

In addition to these complexities, Baskin's insights, confirmed by Bonner and Nieftagodien (2008), highlight the intricate ownership complexities arising from residents who were moved out of Alexandra via housing relocation and later returned. Houses allocated to those relocated to Orange Farm and Diepsloot led to discontent, with some opting to return to Alexandra. This influx into Alexandra also included non-South African citizens seeking settlement in the city. Housing had to adapt to the resulting complexity, responding to the needs and preferences of this diverse group (Baskin, J., Personal communication, December 1, 2021).

In essence, these classifications and housing preferences reveal the layered history of Alexandra, reflecting the struggles, complexities, and resilience of its residents in navigating the challenging socio-political landscape. It is also clear here that typology does play a political role, and the type of authorised/unauthorised

structure one lives in in Alexandra is connected to the stigma of these residents being newcomers to the area and the community's perception of their right to access state-funded housing. Throughout Alexandra's history, resident resistance against town planning actions and housing allocations has been a persistent and contentious issue. Internally, resident classifications have fuelled social clashes, particularly evident in the allocation of Reconstruction and Development Programme (RDP) houses. Post-democracy in 1994 witnessed two resident uprisings driven by dissatisfaction with housing allocation, emphasising residents' assertion of their housing rights. One notable incident was the occupation of Tsutsumani housing.

In 1999, 1800 homes were constructed for the All Africa Games, intending to later house Alexandra residents. The allocation process, marred by poor organisation and slowness, led residents, led by the Alexandra Homeless Youth and Families (AHYF) and the Alexandra Civic Association (ACA), to attempt house occupations. Police intervention resulted in violent clashes, highlighting the unresolved question of who would gain access to the housing. Eventually, a portion of Tsutsumani was occupied via RDP systems, but 300 homes were auctioned against the desires of Alexandra residents, reportedly of subpar quality (Bonner and Nieftagodien, 2008).

In 2007, the lack of adequate housing prompted members of the Alexandra Vukuzenzele Crisis Committee (AVCC) to illegally occupy newly finished RDP housing in extension seven, leading to violent clashes. The AVCC, unable to engage government officials effectively, bypassed channels and occupied houses earmarked by the Alexandra Renewal Project (ARP). These actions created internal clashes within Alexandra residents and conflicts with law enforcement. Despite being aware of the illegality, the AVCC believed ARP's allocation processes were unsatisfactory (Sinwell, 2010).

Both the forced occupation of Tsutsumani in 1999-2000 and the later occupation of extension seven housing in 2007 underscore Alexandra residents' power and insights in exercising their right to housing. Unfortunately, these acts of resistance triggered violent clashes, disrupting housing allocations and delaying rightful occupations. This underscores the prevalent division among Alexandra residents. These acts symbolise both a struggle for freedom and resistance based on historical efforts to remain in Alexandra, highlighting the persistent right of residents to exercise their housing rights.

Alexandra's unique location as a township, exceptional among South African townships, underscores its ability to provide affordable housing close to economic opportunities. Despite the residents' acute awareness of their rights and the importance of retaining their living spaces, persistent resident classifications,

remnants of apartheid mindsets, contribute to tensions and social unrest. Alexandra's timeline exemplifies its resilience in fighting against injustice, creating a simultaneously volatile and stable environment for its residents.

The workforce dynamics for Sandton, resident classifications, and housing preferences reveal the intricate socio-political landscape. Despite internal distinctions and ongoing challenges, residents' acts of resistance underscore their enduring struggle for housing rights. Alexandra's history exemplifies a volatile yet stable environment, offering valuable insights into the complexities shaping the K206 project. This section serves as a crucial foundation for understanding the historical, social, and political dimensions of this distinctive South African township within the broader context of spatial planning challenges.

2.5 Low-Income Housing Policy in Alexandra

A significant proportion of Alexandra's residents belong to the lowest income bracket. Available housing options for this income bracket were fully state-subsidised RDP housing, “backyard rooms," or informal settlements. The constitutional foundation for the right to housing in South Africa is articulated in Section 26. This right was incorporated into the democratic government in response to the historical injustices of forced removals during colonisation and the apartheid era. The calamity of forcibly displacing people of colour from their rightful historical homes prompted the establishment of this constitutional right, aiming to rectify past wrongs and ensure secure housing for all citizens.

Section 26’s right to housing underpins the rationale behind fully subsidised RDP houses and underscores the significance of non-authorised developments like “backyard rooms” and informal settlements. The government is particularly sensitive to this policy, holding it accountable and aiming to protect residents in unauthorised developments from forced removals. The constitutional provisions emphasise that everyone has the right to access adequate housing, and the state is obligated to take reasonable legislative and other measures, within its available resources, to progressively realise this right. Additionally, no one may be evicted or have their home demolished without being given alternative housing and a court order that considers all relevant circumstances. Arbitrary evictions are not permitted by law (MoJ, 1996).

In response to this constitutional mandate, the government has implemented strategies such as urban renewal, state-subsidised housing, and informal settlement upgrading. These practical measures align with the constitutional ideals of ensuring access to adequate housing for all. The following section will delve into the specific housing nuances relevant to Alexandra and the resulting typologies.

RDP Housing Policy

Alexandra township, characterised by a high percentage of low-income households, grapples with the challenge of housing scarcity. While many residents qualified for fully subsidised or Reconstruction and Development Programme (RDP) housing due to their income bracket, the overwhelming demand had resulted in lengthy waiting lists, exacerbating the housing deficit.

The Reconstruction and Development Programme (RDP), instituted in 1994, aimed to kick-start the new democratic Republic of South Africa. Founded on six principles, these being: integration and sustainability, people-driven, peace and security, nation-building, democratisation, basic infrastructure, and assessment and accountability, the programme formed the basis of RDP housing. This initiative targeted the housing backlog outlined in the new democratic constitution, specifically Section 26, which enshrines the right to adequate housing for all South African citizens. RDP housing, fully subsidised, was designated for those in the lowest income bracket, focusing on addressing the housing backlog and meeting basic needs (DoH, 1994; DoHS, 2004).

Breaking New Ground (BNG) is regarded as a policy improvement of RDP housing introduced in 2004, as it represented a more holistic approach to RDP housing. While RDP housing centred on basic provision and addressing the backlog, BNG extended its focus to strategically address environments, socio-economic challenges, and amenities surrounding housing. The policy covered housing finance, private-public partnerships, urban development, and design, emphasising densification, integration, urban renewal, and informal settlement upgrading. BNG aimed to create permanent residential structures with secure tenure, ensuring privacy and protection against the elements, along with access to potable water, adequate sanitary facilities, waste disposal, and domestic electricity supply (DoHS, 2004). BNG policy was further developed into the Integrated Residential Development Programme (IRDP), which furthermore aimed to develop RDP and BNG housing by means of income integration within spatial planning as well as further develop economic opportunities for residents and more timely title deed allocations within these housing developments (DoHS, 2020).

Post-apartheid, the RDP programme allowed for fully subsidised housing for low-income South African residents, aligning with the newly draughted constitution. Eligibility criteria included South African citizenship, contractual capability, marital or cohabitation status, and a monthly household income of R3500 or less. The criteria also meant that not all low-income families could qualify for housing.

Considering the economic aspect was a crucial factor in RDP housing, as it catered to residents in low-income brackets who typically lack sufficient income. When low-income residents were given RDP housing, their financial positioning heightened by pressure of utility costs often lead to residents typically leveraging their housing to remedy their economic situation. In South Africa, this scenario has often lead to two common outcomes: the construction of incrementally added “backyard rooms” on the premises to generate income for low-income families or the decision to sell their homes for economic gain (Charlton, 2013; Development Action Group (DAG), 2020; Lemanski, 2011, 2009; Mahlakanya and Willemse, 2017; Manomano et al., 2016).

As RDP housing presented an opportunity for economic advancement, a shortage of affordable housing and RDP backlogs have ensued. Not all South African residents qualified for RDP housing, leading to numerous allegations regarding housing allocation practices. Typically, the RDP allocation system relied on a waiting list, where residents underwent vetting and were placed on a waiting list. Allegations suggest that illegal practices occurred, involving the bribery of South African government officials by residents seeking housing (Patel, 2013). This is not to imply that all RDP housing in South Africa was allocated through bribery, but it underscores the significant issue that not all qualified citizens gained access to RDP housing. Some individuals allegedly "skipped the queue" by bribing officials, fostering discontent among residents and a perception of inequality in the housing allocation system (Patel, 2016; Rubin, 2011; Mkhonto, S., Personal communication, August 5, 2022).

Another source of frustration was the backlog of title deeds for RDP housing, particularly evident in places like Alexandra township with a history of disputed land ownership. This backlog compounded the challenges of affordable housing shortages, long waiting lists, and corruption in allocation systems. Many residents, despite overcoming these obstacles, found themselves living in RDP houses without title deeds (Bonner and Nieftagodien, 2008). This lack of legal documentation prevented residents from leveraging their properties for capital or home loan improvements with banks. Additionally, any additions or extensions made to their properties could not be legally processed with the municipality due to the absence of title deeds. This situation led to housing extensions that did not meet national standards and posed hazards to the residents residing in them.

With the evolution of Breaking New Ground in 2004, there was an advanced attempt to design more sustainable housing solutions. Variations of the RDP layouts were introduced, including a minimum specification of a 40 m2, two-bedroom house (DoHS, 2009). The K206 project is classified as an RDP housing development and was built in 2010 under BNG policy, contributing to its more holistic approach to RDP housing. These related policies have contributed to the outcomes of spatial design and governance of the K206 project that are further detailed in Chapter 3.

In addition to formal typologies, low-income housing in South Africa also occurs through informal settlements, addressing the needs of residents in periphery areas, or through informal rental room extensions adjoining more formal housing.

The Alexandra Renewal Project (ARP)

The Alexandra Renewal Project (ARP) was a special presidential project that aimed to address the multifaceted challenges faced by the Alexandra township through a comprehensive strategy that included housing, infrastructure, environmental management, and community development. The Upgrading of Informal Settlements Programme (UISP) was a crucial component of the ARP, aligning with the Breaking New Ground (BNG) principles to improve tenure, health, and security for informal settlement residents (ARP, 2010, 2009; Cirota, 2017; Roefs et al., 2003).

The ARP's approach was deeply rooted in the "All of Government" strategy, where various ministries, departments, and levels of government collaborated to create a holistic impact. However, the project faced both success and challenges, as highlighted by diverse perspectives within the community and experts (Bonner and The Alexandra Renewal Project (ARP) was a special presidential project that aimed to address the multifaceted challenges faced by the Alexandra township through a comprehensive strategy that included housing, infrastructure, environmental management, and community development. The Upgrading of Informal Settlements Programme (UISP) was a crucial component of the ARP, aligning with the Breaking New Ground (BNG) principles to improve tenure, health, and security for informal settlement residents (ARP, 2010, 2009; Cirota, 2017; Roefs et al., 2003).

The ARP's approach was deeply rooted in the "All of Government" strategy, where various ministries, departments, and levels of government collaborated to create a holistic impact. However, the project faced both success and challenges, as highlighted by diverse perspectives within the community and experts (Bonner and Nieftagodien, 2008; Harrison et al., 2014). The housing aspect of the ARP involved a range of initiatives, including the relocation of 7000 people from polluted riverbanks,

upgrading existing housing, building new housing units, and addressing “backyard” real estate. The project also introduced diverse housing typologies, showing a commitment to meeting the varied needs of the community (ARP, 2010).

Despite these efforts, there were mixed feelings about the ARP's success. Some considered it a remarkable achievement, while others labelled it a failure. The success was evident in the improvement of infrastructure, including the widening of roads, upgrading of bridges, electricity supply enhancements, and extensive environmental conservation projects. Economic development initiatives, such as the establishment of business hubs and clusters, aimed to create employment opportunities and enhance local economic development. However, challenges arose in the social development aspect. Relocation efforts faced criticism for not providing adequate alternative housing, leading to social conflicts. The influx of new residents due to ARP's investments further exacerbated social challenges, making Alexandra a "moving target.”.

The "All of Government" approach faced setbacks with political transitions, as changes in government leadership affected the project's continuity and focus. Community Liaison Officers (CLOs) played a crucial role in bridging the gap between the community and the project, but tensions with politically affiliated area councillors hindered effective collaboration. Julian Baskin and Sandile Mavundla emphasised the importance of active citizenship, community representation, and technical expertise in successful urban development initiatives. The ARP's deep investment in Alexandra, rather than a city-wide approach, contributed to unintended consequences like increased population density and a strain on resources (Baskin, J., Personal communication, December 1, 2021; Mavundla, S., Personal communication, October 23, 2020).

The ARP's organisational structure in Roefs et al. (2003) showcased a commendable effort to integrate physical, economic, and social development aspects at national, provincial, and local government levels. However, the absence of a direct focus on addressing historical social issues and traumas within the community limited the project's long-term success.

In conclusion, the ARP, with its ambitious objectives and "All of Government" approach, achieved notable progress in infrastructure development but struggled to address long-standing social issues. The project's success or failure depends on the viewpoint. From a government infrastructural standpoint, investments were made to improve roads, amenities, services, and housing in Alexandra. However, from the residents' social perspective, several harmful decisions, such as problematic relocations, ongoing influxes into informal settlements, and persistent inadequate housing, disrupted the social fabric of the community.

2.6 Alexandra Housing Types and Tenure

This section explores both the spatial design and governance complexities of housing in Alexandra. In as much as the history of Alexandra showcases how mixed housing types and tenure were used historically as a political tool against relocation (strength in numbers with “backyard rooms” in addition to freehold tenure houses), housing type and tenure over time also became a form of classification and exclusion internally. This section explores housing types and tenure within Alexandra as well as how these types and forms of tenure created classifications that created internal conflict within the township.

Housing Design, Typology and Tenure in Alexandra

Housing in Alexandra was made up of a number of tenures. Harrison et al. (2014) classified these types into informal settlements, “backyard rooms," multi-unit buildings, standalone houses, or other specified buildings such as semi-detached housing, flats, or multi-storey hostels. Hostels were typically multi-unit buildings catering rooms for workers that were rented out at a subsidised rate. In addition to these types, informal settlement housing is typically made of materials that allow for later relocation. These settlements have either been bought by residents (materials bought) with informal occupation on a piece of land or built and rented out by a landlord that erects the structure on a piece of land informally. Informal settlements are less likely to have access to services than “backyard” housing. Rental in informal settlements is typically more affordable than “backyard rooms” or more formalised housing (Bonner and Nieftagodien, 2008; Harrison et al., 2014; Huchzermeyer, 2003, 1999; Poulsen, 2010). All housing in Alexandra is either private freehold tenure, rental housing, or subsidised rental, as shown in Table 2.1.

TABLE 2.1 Alexandra housing types. This table explores the design, tenure, formalization and services of the various types of housing in Alexandra. Source: (Bonner and Nieftagodien, 2008; Harrison et al.2014)

House Type Design	Standalone House- Subsidized	Stand Alone House- Non-Subsidized	Multi Unit Social Housing	Multi Unit Affordable Rental	"Backyard Rooms"	Informal Settlements
House tenure	Freehold tenure- fully state subsidized (RDP)	Freehold tenure- bought by occupant (not subsidized)	Subsidized rental to government- partially state subsidized (includes hostels)	Rental not subsidized	Affordable rental (afford-ability based on nature of structure, varies from shacks to concrete block structures)	Freehold tenure (own structure) or renting structure from another party
Formal/ informal housing	Formal	Formal	Formal	Formal	Informal	Informal
Security of tenure	Yes	Yes	Yes	Yes- for residents with legal residence status	Apart from the South African Prevention of Illegal Eviction (PIE) act (no forced removals without alternative accommoda-tion), No	Apart from the South African PIE act (no forced removals without alternative accommoda-tion), No
Basic services- water, electricity, sewage	Yes	Yes	Yes	Yes	Yes	Not guaranteed

Freehold Ownership Tenure

Alexandra was a free-hold township with plots of a farm sold off to various families of colour that invested in their private housing from 1912. From about 1950, political threats meant residents needed to build protection over their assets as an attempt to not be relocated. This freehold tenure has either been built by private owners who have previously had ownership over parcels of land or is fully subsidised by the government.

RDP housing is freehold tenure housing fully subsidised by government since the advent of democracy in 1994. Typically, these housing units consist of single detached dwellings situated on larger plots, covering approximately 250 m2. Renowned architects such as Peter Rich have contributed to designing various housing typologies in the area. Given the pressing need for housing and the sluggish rate of housing provision, RDP housing in Alexandra has a history of being forcibly occupied as a means of activism against the slow pace of housing delivery.

Rental: “Backyard Rooms”

“Backyard” rooming was introduced to bolster numbers and counteract the threats of forced removals. Owners of freehold tenure accommodated these “backyard rooms” not only for economic gain but also to increase the population density on a plot, making it more challenging to evict residents from Alexandra, especially during the era of apartheid forced removals. This led to the characteristic housing typology in Alexandra, consisting of single-storey freehold ownership housing with “backyard” infill, as depicted in Figure 2.3. Affordable housing options in Alexandra often included one-room “backyard” structures for tenants with communal external toilets. While these rooms are cost-effective, unlike informal settlements, they have better access to services as they are connected to the main house grid. “Backyard rooms” are typically situated within the plots of larger freehold tenure houses.

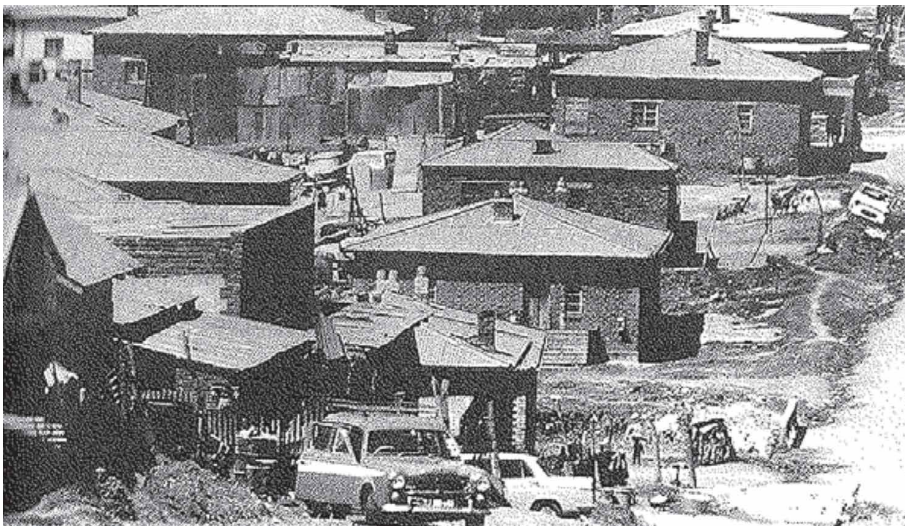

FIG. 2.3 Image of freehold tenure single storey housing and adjoining “backyard rooms” in the 1960s sourced from UWC/RIM/Mayibuye archives (Bonner and Nieftagodien, 2008)

Subsidised Rental: Hostels

In addition to this, from the 1960s, large-scale single-sex hostels were built to keep up with the demand for workers in the area; these included places like Madala hostel, as seen in Figure 2.4(Bonner and Nieftagodien, 2008). The number of hostels was estimated to be 25 hostels housing as many as 200 “single people” each (Rauch, 2002).

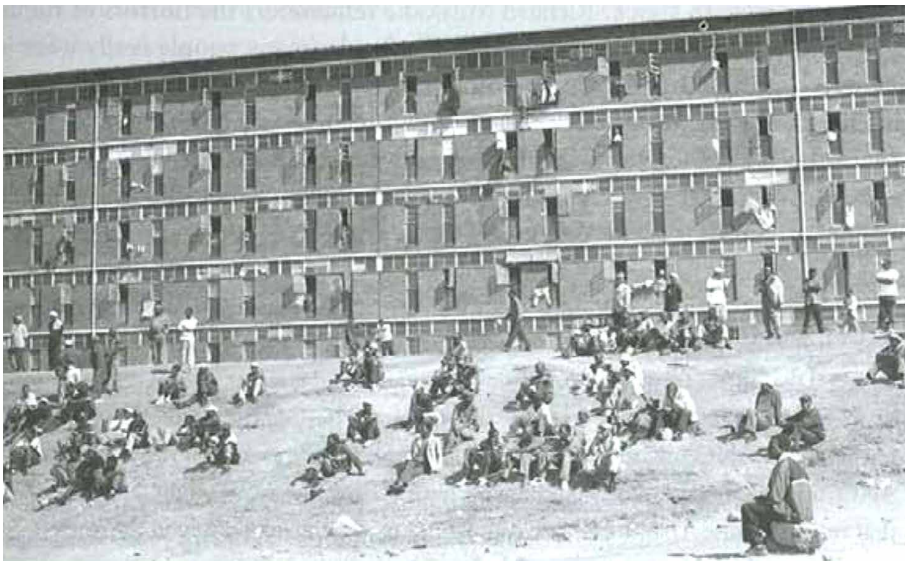

FIG. 2.4 Image of Madala hostel in the 1990s (Source: Sally Guale (Bonner and Nieftagodien, 2008))

Informal Settlements

Informal settlements in Alexandra depicted in Figure 2.5 5 were estimated at upwards of 28,000 informal settlement dwellings (Mbanjwa, 2018; Rauch, 2002). The informal settlements typically form on plots of vacant land, such as Sjwetla, Alexandra's largest informal settlement that is located on the river banks of the Juskei river (Sinwell, 2010). In 2007, a survey by Richards et al. (2007) documented that Alexandra informal settlement residents had little access to basic services.

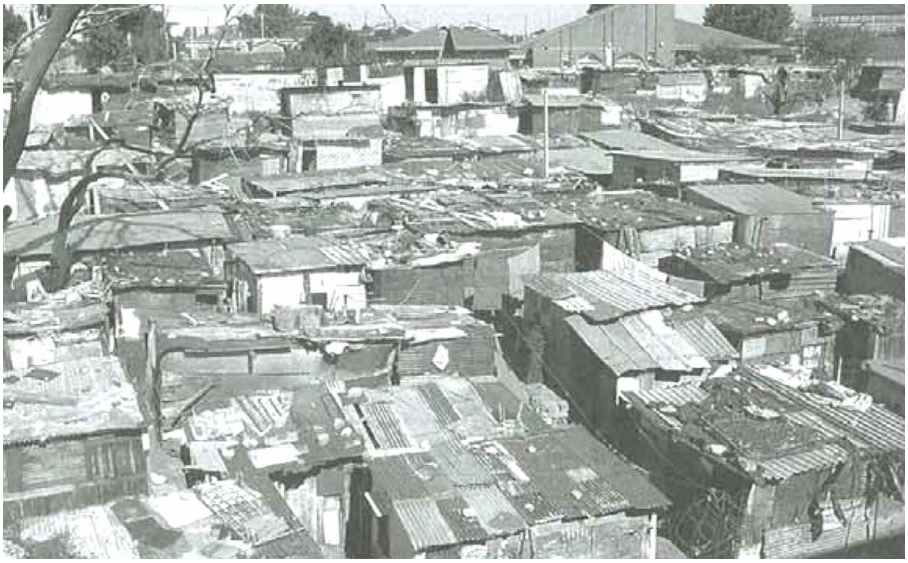

FIG. 2.5 Image of informal settlement typology in Alexandra before 2008. (Sourced: Sally Guale (Bonner and Nieftagodien, 2008))

2.7 Additional Housing Types in Alexandra

Housing types in Alexandra are made up of freehold tenure, rental, or subsidised rental. Housing is either formally authorised or unauthorised, which allows for a myriad of affordable housing options for residents in Alexandra that also have varied access to services. The following housing types provide additional insight into the spatial design of housing in Alexandra, along with context on some existing housing projects in the area.

RDP Tsutsumani 1999 housing for the All-Africa games

Tsutsumani was an RDP social development initiative aimed to empower the youth of Alexandra. It included the development of a stadium and housing for soccer players. The housing included 1700 freestanding, semi-detached, and simplex housing units. This housing was intended for players of the games, and thereafter, the housing was to be given to Alexandra residents (Kotze and Mathola, 2012). Due to frustration over allocation, Alexandra residents forcefully occupied 300 units as a form of activism for housing (Bonner and Nieftagodien, 2008). A mapping of Tsutsumani was superimposed with Google Maps; the indication of Tsutsumani typologies is as depicted in Figure 2.6.

FIG. 2.6 Image of stand alone Tsutsumani housing (extension 7) built in 1999 (Source: Author (2025))

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RDP Peter Rich Housing in Alexandra

According to Albonico (2020), Peter Rich was also instrumental in the Far East Bank for his innovative housing models. These were built before 2001 and the ARP with an emphasis on density. Rich was working on a 200sqm site instead of a 360sqm site that was the initial size, designing innovative RDP housing schemes such as Figure 2.7, with a dual colours RDP house with circular windows (Albonico, 2020).

FIG. 2.7 Image of RDP housing by Peter Rich original building in Riverpark taken in 2025. (Source: Author(2025))

1980s Middle Income Housing-East Bank

In the 1980's, the Alexandra Development Fund (ADF) under the Apartheid government invested in housing for the black middle-income population on the East Bank of Alexandra (Moloto, 1993). This was being used as a buffer zone to separate the low-income black population from more affluent white areas. This is further elaborated by Albonico (2020):

They [the apartheid government] saw them [the black middle-income population] as being their allies; in the 1980's, they knew perfectly well that this thing [Apartheid] was not going to last. And they needed to find ways of creating more support within the black population. To create a black elite, like they did with all the fragmentation of the country and the separation with Baputatswana [homelands] and all that, they created a kind of a political elite that is reflected until today (Baskin, Interview with Julian Baskin Management of ARP K206, 2021).

Noero Architects (2023) documented their Alexandra Housing Design that was built by the ADF in 1985. The scheme included a range of housing typologies and housing sizes that were medium density, stand-alone, and semi-detached dwellings, as seen in Figures 2.8, 2.9, and 2.10.

While this housing does not fall under the low-income category, it represented a significant and strategic manoeuvre by the apartheid government to cultivate support from the middle-class black population. However, this approach created challenges by reinforcing the division within Alex, categorising residents into low- and middle-income classes once again.

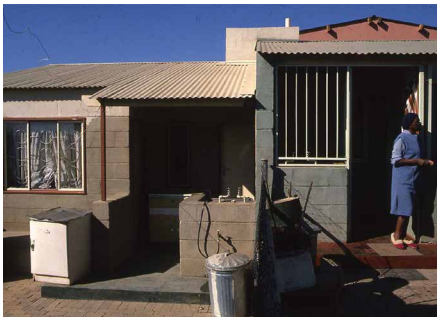

FIG. 2.8 Alexandra housing built in 1985 designed by Noero Architects (Source: Noero Architects, (1985))

FIG. 2.9 Alexandra housing built in 1985 designed by Noero Architects (Source: Noero Architects, (1985))

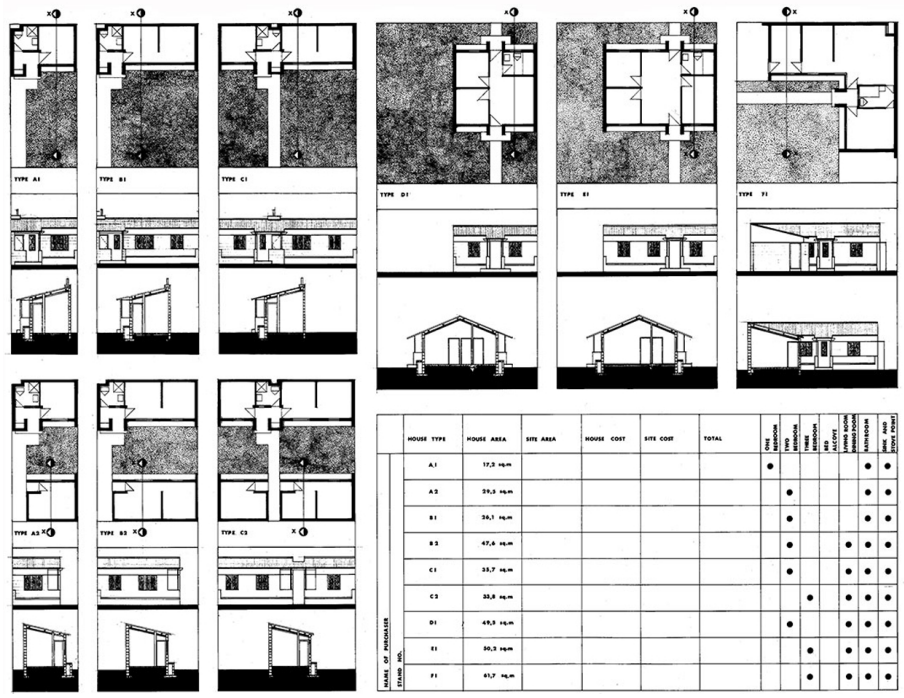

FIG. 2.10 Alexandra housing built in 1985 designed by Noero Architects. (Source: Noero Architects, (1985))

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2.8 The K206 Project

The K206 Housing project, conceived as part of the Alexandra Renewal Programme, was a special presidential project aimed at upgrading informal settlements and enhancing the living conditions of residents in Alexandra. This innovative approach is both a state-subsidised housing project due to the RDP units that were built as well as an informal settlement upgrading project as defined in Section 2.2.., due to the fact that residents were relocated from informal settlements into the K206 project.

Part of what made the project innovative was its aspiration to include residents within the building of the project. This meant a number of actors were involved at a number of levels of governance, both governmental and non-governmental actors. Governmental actors included ARP management and administration that reported back to ministerial and nationwide governing bodies. Contracted professionals to the ARP included professionals such as architects, urban designers, town planners and engineers. Community liaisons were hired to engage residents and community based organizations with ARP decisions, which meant to a certain extent residents did have a say in the planning process of the ARP interventions. With time interventions were experienced by residents and where dissatisfied, residents formulated community based organizations to voice their views on the development. For example the K206 tenants association was founded based on the need to express concerns of the tenants of the K206 project (Nemakonde, M. and Martha, M. Personal communication, March 21, 2021).

Envisioned as a paradigm shift in the realm of housing development, the project focused on implementing RDP housing while introducing innovative design approaches, typologies, and informal settlement upgrading. Despite its distinctiveness and aspirations for community benefit, the project encountered challenges and oversights, reflecting the intricate interplay of spatial, social, political, and economic factors in the unique context of Alexandra. Most aspects of the K206 inherently intertwine issues of spatial design and governance, and this is reflected in the structure of the remaining section that showcases how these two aspects interact.

FIG. 2.11 Image looking at phase 4 of the K206 Development. Houses on the left are Type 1 houses, and houses to the right of the road are Type 2 and Type 3 houses as indicated in Figure 2.12 below. Brown brick finish is reminiscent of original housing, and in most case plastered walls or non plastered stock brick communicates incremental expansions (Source: Author(2021))

FIG. 2.12 Image of K206 cluster in Phase 4 depicting incremental extensions over time, double storey extensions more popular as a form of incremental extension in these depictions. (Source: Author(2021))

FIG. 2.13 Image of Cluster in Phase 2 K206 depicting incremental extensions over time, palacade fencing, multiple materials and extension types cleary depicted within the photograph (Source: Author(2021))

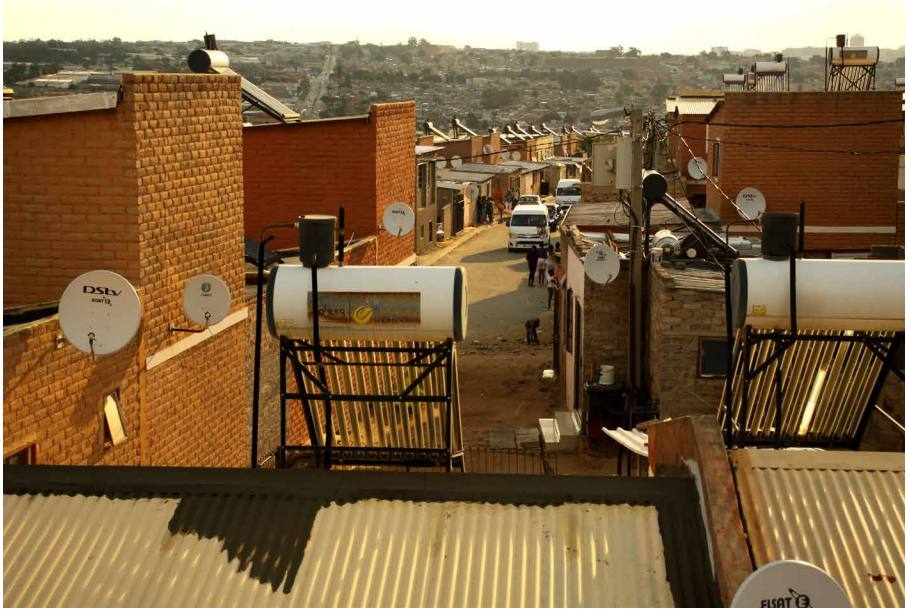

FIG. 2.14 Image of Phase 1and 2 of K206 depicting scale of development (Source: Author(2021))

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Land Reclamation and Decommissioning of K206 Road

In 2002, the K206 Road in Alexandra underwent a significant transformation as part of the Far East Bank Development Framework. The decision to decommission the road was driven by the desire to spatially and socially reconnect portions of Alexandra that had been separated during the apartheid era. Monica Albonico, the urban designer for projects within the Alexandra Renewal Project (ARP), reflects on the decommissioning process, emphasising the need for a fresh and radical approach. Albonico and the ARP team advocated against building the provincial road, foreseeing its potential to fragment communities, particularly those who had been relocated from Old Alexandra to the Far East bank. The road project was deemed a long-term political endeavour abandoned by initial road agencies, prompting the ARP team to envision it as an opportunity for new development. This paved the way for what would later become the K206 housing project (Albonico, M., Personal communication, November 2, 2020).

The road reclamation decision involved government communication and spatial integration and presented a challenge in terms of its elongated shape, requiring a ribbon-like design for the entire housing project. Julian Baskin emphasises the significance of this transformation, viewing the decommissioning as a form of political activism. The ARP's technical and management team, inspired by the need for housing in Alexandra, approached the situation with a holistic government strategy. The result was the detangling, decommissioning, and rezoning of the K206 Road into the K206 housing project, marking a crucial step in desegregating and revitalising Alexandra (Baskin, J., Personal communication, December 1, 2021).

K206 Block-By-Block Informal Settlement Upgrading

The block-by-block upgrading approach of the K206 Housing project aimed to address the challenges of informal settlement de-densification both at a spatial design and governance level. Residents from entire blocks, irrespective of qualification status, were relocated to new housing developments, contributing to the spatial restructuring of Old Alexandra. This innovative strategy was endorsed during the 2004 ARP Review Summit, acknowledging the limitations of traditional housing waiting lists in achieving effective de-densification. The conventional relocation method often resulted in the swift occupation of vacant spaces, making continuous monitoring and policing difficult. The block-by-block concept sought to enhance visibility and impact by clearing entire blocks, allowing for better use of reclaimed land in alignment with the Spatial Development Framework of Alexandra (PPSA, 2014; Sinwell, 2005).

However, this approach posed challenges, particularly in dealing with governance-related issues of non-qualifying residents. A significant downside was identified: households failing to meet national criteria for subsidised housing created complications. Shadrack Mkhonto expresses how these classifications made it especially difficult to socially integrate both qualifying and non-qualifying residents with various tenure allocations into one housing scheme (Mkhonto, S., Personal communication, August 5, 2022). The social outcomes of the project and results of social political tensions are explored in more depth in Chapter 4.

In summary, the block-by-block upgrading approach of the K206 Housing project presented an innovative solution to the challenges of de-densification in Old Alexandra on a spatial design and governance level. Despite facing challenges, such as managing non-qualifying residents, the project contributed to the spatial transformation of the area, showcasing a clear shift from informal settlements to housing upgrades. The multifaceted nature of this block-by-block upgrading approach makes it a valuable case study for both in situ upgrading—where residents were relocated nearby, maintaining their social and economic networks—and greenfield development, which required governance structures to address relocation challenges.

K206 Special Presidential Funding

Resolving the funding obstacle for upgrading informal settlements required the development of a financing mechanism to specifically fund the additional spatial rental component. Drawing from a dedicated presidential fund, the primary unit received funding through housing subsidies allocated for the project. This arrangement enabled the primary RDP structure to be funded through regular state channels, while additional rental rooms were financed through a special presidential budget to economically empower residents with additional rental rooms aligned to housing policies at the time. In essence, this almost doubled the size of the RDP unit, creating opportunities for rental units and economic activities.

This development was then complemented by the entire ARP project, which combined with the supplementary funding contributed to the ARP budget and the City of Johannesburg's financial support for infrastructure elements like roads, stormwater construction, electrical reticulation, and street lighting. This enabled housing upgrading in the context of an entire area improvement.

K206 Design Concepts, Typologies and Processes

The infusion of additional funding from the presidency played a pivotal role in diversifying housing typologies through additional formalised rental rooms for residents' income generation. Guided by the directives of the ARP, ASA Architects introduced an experimental approach, featuring configurations of 80 sqm (40 sqm larger than the average RDP) and 40 sqm (Osman et al., 2011; Osman and Davey, 2011). This innovative typology mirrored the enduring housing patterns observed in Alexandra, characterised by main dwellings accompanied by additional "backyard rooms." In addition to this, the management of the scheme also introduced an additional design asset; the K206 scheme was designed to also accommodate for incremental expansion of houses as well. The design purpose of the scheme was there for threefold: addressing challenges posed by both qualifying and non-qualifying residents, introducing rental housing alternatives overseen by presumed "owners" of the K206 housing (Nemakonde, M. and Martha, M. Personal communication, March 21, 2021), and lastly accommodating for spatial household expansion over time.

The professional team embarked on the intricate task of crafting a housing development that seamlessly integrated both ownership and rental units. Ownership units were meticulously designed to align with subsidised (RDP) housing criteria, while rental units were conceived to be financially accessible for non-qualifiers relocated from informal settlements. The overarching concept aimed to formalise housing arrangements in Alexandra, drawing inspiration from the prevalent practice where "backyard" tenants paid rent to yard owners. Key typologies included semi-detached RDP housing (single-storey standardised) and the distinctive K206 model were developed as per Figure 2.12.

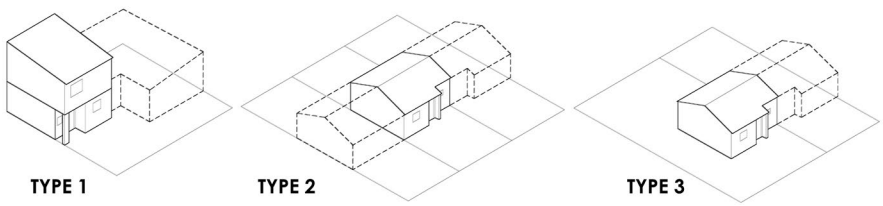

FIG. 2.15 Type 1 K206 typical unit with semidetached generic RDP housing Type 2 and Type 3

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Ext. 9, along with 523 primary units and 527 rental units in Ext. 10. Most primary units featured two attached rental rooms and a shared bathroom. Upholding the safety by design' principle, the core design philosophy mandated that a majority of primary units should be double-storey and placed within a cluster design, as seen in Figures 2.16 and 2.17 (Szalovitz, A., Personal communication, March 31, 2022; PPSA 2014; Baskin, J., Personal communication, December 1, 2021). In addition to its social opportunity, the cluster design also allowed for an increased density, a mandate of the ARP to improve and balance out Alexandra densities (Szalovitz, A., Personal communication, March 31, 2022; Albonico, M., Personal communication, November 2, 2020).

Draft design proposals underwent rigorous workshops with stakeholders, ultimately gaining approval from the Gauteng Department of Housing and the City of Johannesburg (CoJ) (PPSA, 2014).

FIG. 2.16 Architectural Plans of K206 showing ownership. (Sourced from Architect Anca Szalovitz during interview (2022) and ASA Architects)

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FIG. 2.17 3D perspective of proposed houses for K206 Housing Project. (Sourced by Anca Szalovitz during interview (2022) and ASA Architects)

Julian Baskin sheds light on the housing preferences of Alexandra residents. Initially, the construction of high-rise buildings aimed to provide middle-class housing. However, these structures lacked flexibility for expanding families and fell short of residents' expectations (Baskin, J., Personal communication, December 1, 2021). The K206 project also offered a unique opportunity from a spatial design perspective for flexible incremental housing that was medium-rise but also allowed for residents' incremental expansion. Julian Baskin and Anca Szalovitz offered valuable insights into the design and allocation concept, highlighting the goals of flexibility, density, and fostering a unique owner-tenant relationship. The envisioned scenario included the allocation of more diverse and flexible RDP houses to South Africans, promoting a connection between formalised and more informalised forms of housing. Additionally, the design permitted the expansion of the core house across attached rooms; these attached rooms could be used for income generation (Szalovitz, A., Personal communication, March 31, 2022; Baskin, J., Personal communication, December 1, 2021). In summary, K206 did offer a state-facilitated housing typology that made allowances for resident-initiated incremental extensions. Figure 2.18 depicts the initial concept of the incremental design for the K206 project, aiming to facilitate residents' vertical expansion.

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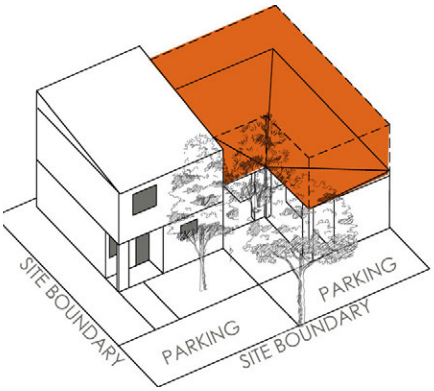


FIG. 2.18 Design that considers long term incremental expansion (Source: Author (2023))

Harrison et al. (2014) commended the K206 project as one of the most innovative housing projects, replicating the 'yards' of Old Alexandra and significantly increasing housing densities.

Despite the spatial design resolution that included incremental housing principles, the K206 project still faced governance-related challenges, with residents not fully engaging in formal development applications. Allocation was perceived as unfair; criteria for allocation and communication around allocations left much to be desired. This resulted in disputes and violence over allocations, underscoring the importance of clear communication and transparent processes. The unintended consequence was an incremental housing project where residents incrementally developed their homes, but with time people built over originally envisioned boundary lines, expanding both vertically and horizontally.

K206 Allocation and Mixed Tenure (Governance)

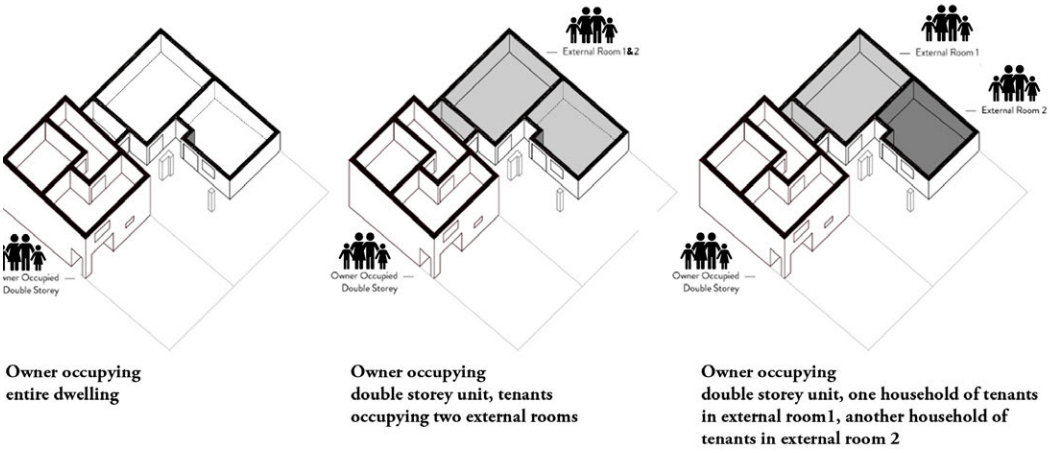
Sandile Mavundla sheds light on the allocation strategy of the K206 project, rooted in the historical context of Alexandra. Rental housing was introduced to accommodate those who did not qualify, especially in areas like Sjwetla, ensuring that no one was left behind. Special cases, such as severely overcrowded living conditions in Old Alexandra, were considered for housing applications, guided by recommendations from social workers and local councillors (Mavundla, S., Personal communication, October 23, 2020; PPSA 2014). The typology was designed for either an owner to take a whole house or for them to take the double-storey section and rent out rooms to one or two families for rental opportunities. Room prices were to be fixed at R350.00 per month for tenants to ensure affordability for non-qualifying residents and income generation opportunities for landlords.

The majority of beneficiaries, earning less than R3500/month, faced difficulties sustaining their subsidised houses, often resorting to informal property transactions, such as renting out “backyard rooms” or establishing home-based businesses. These economic opportunities are further explored in Chapter 5. This informal property market emerged as a financial empowerment tool for beneficiaries, deviating from the formal regulations (PPSA, 2014; Sinwell, 2009, 2005).

Tenants were instructed to pay rent directly to the property owner. The monthly rental was set at R350, consistent with Bothabelo Village, and managed by the City of Johannesburg’s social housing institute, JOSHCO. The rental arrangement formalised the relationship between the landowner and the tenant. Occupancy of K206 commenced in October 2009, with the last units allocated by March 2011. Beneficiaries hail from various informal settlements in Alexandra, including Seswetla/Sjwetla, Iphuteng School Cluster, Minerva School Cluster, Alexandra Transit Village, Silvertown, and Zozo Occupants, as documented in the Public Protector Complaint of 2014 (PPSA, 2014).

The dual nature of the K206 Housing project, addressing both ownership and rental aspects within the same cluster, is evident in Figure 2.19. This design not only accommodated qualifying occupants with core ownership but also introduced affordable rental tenure for non-qualifying residents. The configuration featured double-storey RDP houses alongside adjoining rental housing, providing a unique typology that reflected the diverse needs of relocated residents.

A number of allegations were made as to the legitimacy of allocations of these units, that corruption in the allocation system resulted in some residents who did not qualify attaining ownership of houses (PPSA, 2014; Siso, 2016; Mkhonto, S., Personal communication, August 5, 2022). The allocation is shown in Figure 2.19, representing owner occupation and tenant occupation options.



Owner occupying entire dwelling

Owner occupying double storey unit, tenants occupying two external rooms

Owner occupying double storey unit, one household of tenants in external room1, another household of tenants in external room 2

FIG. 2.19 Overview of allocation options, distinguishing original owners and original tenants. (Author, 2024)

The K206 Housing project, with its transformative initiatives and ambitious goals, stands as a captivating case study in housing development. As this review unfolds, the multifaceted nature of the project becomes apparent, showcasing both its successes and challenges in the spheres of spatial design and governance.

2.9 Conclusion

In summary, this chapter examines the K206 housing project within the setting of Alexandra Township and South Africa as a whole, through the double lens of spatial design and governance. It addresses the research question, "What policies and contextual background are relevant to the Alexandra K206 housing project?"

Firstly, Alexandra Township has historically resisted governance and spatial design structures at a macro level due to its close proximity to surrounding white neighbourhoods and economic opportunities. The community's collective resistance has been crucial in maintaining Alexandra as a non-white neighbourhood in the northern suburbs since 1912, despite numerous efforts by the apartheid government to dismantle it. This resistance also influenced the governance structures related to housing. Residents in the same way resisted and challenged government-initiated housing allocations when they disagreed with the strategies.

Secondly, the exploration of South African state-subsidised housing policy highlights the post-apartheid government's efforts to uplift low-income communities through governance and spatial design initiatives. The K206 project is part of this effort by uplifting low-income communities through incremental housing that provides roofs over the heads as well as possibilities for income generation.

Thirdly, the Alexandra Renewal Project (ARP) and the K206 project exemplify an "all of government approach" that significantly impacted both governance and spatial design aspects of the affiliated informal settlement upgrades and state-subsidised housing. This approach facilitated land reclamation for low-income housing, implemented block-by-block strategies for informal settlement upgrading to achieve more visible infrastructural improvements, and unlocked additional funding for context-responsive housing design solutions.

The project's multifaceted nature, as shown through its successes and challenges, makes it a valuable case study that transcends a single disciplinary perspective. This chapter provides an overview of Alexandra Township and sets the stage for discussing the post-occupancy realities of the K206 project in the following chapters. The following chapters will explore the dynamics of governance and how residents respond to them. They will also provide a deeper analysis of the spatial design elements of the K206 project, including the incremental "backyard room" extensions.

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TOC

3 Compact Housing for Incremental Growth

The K206 RDP Project in Alexandra, Johannesburg

ABSTRACT The South African Reconstruction and Development Programme (RDP) was initiated to provide subsidised housing for low-income families. However, the programme faced challenges in establishing adequate technical guidelines and standards, resulting in subpar housing quality. This article discusses the multifaceted nature of subsidised housing design, emphasising the importance of incorporating technical housing standards as well as the spatial needs of residents based on their context (at both domestic and neighbourhood scales). The article focuses on the K206 housing RDP project in Alexandra, Johannesburg, as a case study that transitioned from generic technical standards to a resident-responsive design scheme that was inspired by the backyard room incremental expansions that were already prevalent in the Alexandra context. A critical review of South Africa's RDP housing design technical standards and policy is explored. The article also examines the density standards and allowances for incremental expansions introduced by the K206 project, analysing data derived from fieldwork observations, interviews, and the spatial analysis of 26 dwelling units. The study's findings underscore the significance of maintaining an equilibrium between technical standards and resident-responsive design decisions. The results show that tailoring the RDP housing design solutions to unique contextual needs can significantly elevate the quality of life of residents concerning income generation and flexibility for incremental expansion. However, this balance is delicate, and disparities between the RDP technical standards and user-initiated development over time also have the potential to ultimately impair residents' living spaces.

KEYWORDS incremental housing; Reconstruction and Development Programme; South Africa; subsidised housing; technical norms; technical standards

3.1 Introduction

South Africa's Reconstruction and Development Programme (RDP), launched in 1994, aimed to provide fully subsidised state housing for low-income households following the country's independence. However, the programme encountered significant challenges in establishing adequate technical guidelines and standards, resulting in subpar housing quality, encompassing materials, design, and workmanship (Arrey and Chikulo, 2016; Lokko, 2013; Manomano et al., 2016; Mbatha, 2019). Tasked with the formidable responsibility of swiftly delivering housing to millions of low-income households within tight timeframes, the state hurriedly erected thousands of housing structures with insufficient attention to design and material quality.

The concept of subsidised housing design is multifaceted and varies across regions, with each country crafting its housing classifications based on constitutional practices, policies, and tenure preferences (Ozer and Jacoby, 2022; Susanto et al., 2020). Subsidised housing design is cost-sensitive, but international technical housing standards have been established to create a baseline for design standards (Gallent et al., 2010; Ishak et al., 2016; Ozer and Jacoby, 2022; Susanto et al., 2020). Ozer and Jacoby (2022) argue that these standards often revolve around minimum space requirements based on factors such as the number of bedrooms, the number of occupants per dwelling, or the functionality of the space.

In addition to technical housing standards, it is equally important for housing to reflect its sociocultural context and the spatial needs of its residents. Housing should consider the everyday life patterns unique to its inhabitants to complement, rather than hinder, their lifestyles (Canizaro, 2007; Frampton, 1983; Rapoport, 2000; Simone, 2004). Therefore, a critical approach to subsidised housing should incorporate technical housing standards, sociocultural context, and the spatial needs of the residents.

In South Africa, the most prominent form of subsidised housing is RDP housing, which is a programme fully subsidised by the state. This programme was a response to apartheid inequalities and an overhaul of previous state-funded and public housing norms and technical standards (Arrey and Chikulo, 2016; Greyling, 2009; Hickel, 2014; Hlatshwayo, 2016; Linstra, 2016). Although the South African government has undertaken initiatives to improve technical housing standards for subsidised housing during the democratic era, these enhancements have not effectively catered to the spatial requirements of residents (both the individual household and neighbourhood levels) in RDP housing designs, including the backyard rooms incrementally added by

the residents to the original houses provided by the state. This inadequacy becomes apparent in the insufficient emphasis placed on the importance of state-subsidised housing being responsive to the sociocultural context and needs of residents across key technical standards in South Africa (CSIR, 2000; Department of Housing, 1994a; Department of Human Settlements [DoHS], 2004, 2009, 2014; National Upgrading Support Programme, 2015; National Planning Commission, 2012; Republic of South Africa, 1995). Despite policy improvements over time, a significant number of housing developments have suffered the consequences of inadequately built RDP houses, and because of this, the primary emphasis of RDP housing has been to meet technical housing standards, overlooking more contextually responsive solutions to the residential preferences of its users. This results in mass housing that fails to meet the contextual requirements of its residents (Arrey and Chikulo, 2016; "Hundreds of RDP houses in Ekurhuleni to be revamped," 2008; Lokko, 2013; Manomano et al., 2016; Ntombela and Jili, 2020). Moreover, there is a lack of constructed instances and literature documenting RDP housing projects that have incorporated design strategies responsive to the local residents' aspirations.

In examining the complexities associated with subsidised housing in South Africa, particularly the lack of contextually responsive RDP housing projects, this article focuses on shedding light on the K206 housing project in Alexandra, Johannesburg. This initiative represents a departure from the conventional approach to state-subsidised housing, which often neglects design responsiveness to residents' needs and aspirations.

The K206 project addressed the spatial needs of its residents by incorporating Alexandra's backyard room culture, which supported incremental housing expansions initiated by the residents themselves. Backyard rooms in Alexandra play a crucial role in meeting the additional space requirements for RDP housing, which is typically too small for many families. Additionally, these rooms serve as rental spaces, providing a source of income for homeowners (Bank, 2007; Bonner and Nieftagodien, 2008; Harrison et al., 2014; Howe, 2020; Poulsen, 2010; Shapurjee and Charlton, 2013).

The K206 project, designed as a medium-density housing scheme, used cluster formations, innovative layouts, and units incorporating both single-storey and double-storey sections to address residents' aspirations. The most prevalent housing type of the scheme was specifically designed with additional backyard rooms, increased density, and provision for incremental housing expansions that aligned with residents' aspirations. The central research question guiding the exploration for this article is: How can a housing design approach be responsive to residents' aspirations and enhance subsidised housing design beyond mere technical standards?

The article will proceed to delve into the methods section, followed by an examination of the technical housing standards governing RDP housing. Subsequently, the exploration will shift to evolving densities and incremental housing in Alexandra township before delving into the resident-responsive design innovations of the K206 RDP project before its conclusion.

3.2 Methods

This research employed a mixed-methods approach, integrating both a comprehensive literature review and an examination of housing technical standards. Furthermore, interviews were carried out with K206 management and industry experts to establish the historical context of the case study and RDP housing protocols. A spatial analysis of the incremental growth of standardised RDP units in Alexandra was performed as a benchmark for comparative analysis. Additionally, interviews were conducted with K206 residents, and spatial analyses were undertaken to understand the incremental expansion of their homes.

A comprehensive review of technical housing standards in South Africa was carried out (see Table 3.1). The study also included an analysis of standard RDP housing types and incremental expansions (Figure 3.2). Furthermore, a comparison of design strategies between standardised RDP units and the K206 unit was explored (Figure 3.3). An analysis of the incremental expansion of the K206 unit was conducted (Figure 3.4), highlighting the unique context-responsive design of the K206 project that accommodated incremental expansion and density.

The mixed-methods approach encompassed data collection from diverse sources on technical housing standards and policies, including policy documents, the national building code, human settlement guidelines, academic literature, and input from K206 project management and construction industry experts (a total of seven interviews). To understand the RDP housing landscape and its transformation, policy documents were studied alongside industry expert interviews.

For an in-depth understanding of the case study, 26 resident interviews, spatial surveys, and analyses of 26 K206 dwelling units were conducted, and comprehensive data collection aimed to analyse the potential for the incremental development of the K206 units.

Given the focus of this study on contrasting two sets of RDP design approaches—one without contextual considerations (standard RDP typology) and the other complemented by resident-responsive adjustments accommodating density and incremental expansion (K206 model)—an analysis of standardised RDP house plans and a survey of the K206 unit were conducted in Figure 3.5, inspired by expansion illustrations included in Susanto et al. (2020). The formulation of Figure 3.5 aimed to identify differences in incremental expansion potential and density in spatial planning when contrasting standard RDP typologies with those of the case study.

3.3 RDP Housing Technical Norms and Standards

RDP housing emerged from the 1994 RDP policy framework, designed to provide fully subsidised housing for low-income households (Department of Housing, 1994b). Initially characterised by minimal technical norms and standards, the policy landscape underwent a significant transformation with the introduction of the National Home Builders Registration Council in 1997 and, in 2004, the introduction of the Breaking New Ground (BNG) strategy (a strategy to improve RDP housing) that moved from a focus on housing only to a focus on sustainable human settlements (DoHS, 2004).

The RDP policy, established in 1994 within the framework of South Africa's new democratic constitution, was rooted in the six fundamental principles of integration and sustainability, people-driven processes, peace and security, nation-building, meeting basic needs and infrastructure, democratisation, and assessment and accountability (Department of Housing, 1994b). RDP housing materialised as a government initiative to provide fully subsidised housing and services to South African citizens facing housing needs. Despite the noble intent, RDP housing has encountered extensive criticism and scrutiny. Concerns have been raised regarding corruption, mismanagement in allocation, inadequate house sizes, subpar housing materials, design deficiencies that include repetitive mass housing design with little attention to the diversity of typology, challenges in service provision and maintenance, suboptimal project locations, limited stakeholder and beneficiary involvement, tenure insecurity, unemployment, and instances of housing beneficiary misuse (Arrey and Chikulo, 2016; Dugard, 2020; Greyling, 2009; Makgobi et al., 2019; Manomano et al., 2016; Moolla et al., 2011; Sekoboto and Landman, 2019).

Following the implementation of the BNG strategy in 2004, several changes were implemented, such as more central locations for housing. Furthermore, the criteria for RDP housing eligibility were refined to include South African citizenship, marital status or cohabitation with a partner, financial dependents, a monthly household income not exceeding R3,500 (approximately €200), and qualification as a first-time government subsidy recipient, first-time homeowner, or single military veteran without financial dependents (DoHS, 2022). Applicants were required to apply through a housing waiting list system. The BNG policy aimed to foster sustainable human settlements over providing only housing provision in isolation of the human settlement they were located in. In parallel, technical norms and standards for RDP housing were raised.

After the BNG policy, substantial improvements were made to technical housing standards concerning housing design, as detailed in the Housing Code (DoHS, 2009) and updates of the Red Book (CSIR, 2000; DoHS, 2019). These standards became more explicit and comprehensive. Table 3.1 shows the technical standards of RDP housing.

TABLE 3.1 Summarised architectural technical housing standards and guidelines of subsidised RDP housing

Design-based technical standard theme	Elaborated architectural technical housing standards and guidelines
House sizing	The *2009 National Housing Code—Part 3* document from the DoHS establishes the minimum size of a house at 40 m^2 (DoHS, 2009, p. 25). According to the same document, the minimum room design standards encompass two bedrooms, a separate bathroom with a toilet, shower, and hand basin, and a combined living area and kitchen with a sink (DoHS, 2009, p. 25). For walls, the requirement is a minimum of 140 mm cement masonry units, as detailed in Section F.1(a) (DoHS, 2009, p. 29). Additionally, wall lengths and heights must conform to the specifications outlined as indicated in the 2022 document from the South African Bureau of Standards (2022, pp. 75, 79). The DoHS mandates a minimum ceiling height of 2.4 m, as specified in Section J (DoHS, 2009, p. 31). This requirement is supported by the South African Bureau of Standards (2022, p. 52) in Section CC3.2. Moreover, the minimum slope level is governed by *SANS 10400* (South African Bureau of Standards, 2022, p. 90).
Lighting and ventilation	The *2009 National Housing Code—Part 3* document from the DoHS outlines requirements for lighting and ventilation in habitable rooms, bathrooms, shower rooms, and rooms containing a WC (DoHS, 2009, p. 32). According to this document, these rooms must be equipped with means of lighting and ventilation that allow for their intended use without compromising health and safety or causing nuisance. The minimum window area (light area) for each habitable room, including kitchens, is specified to be between 5% and 10% of the total floor area. Additionally, the document establishes that 5% of the floor area, with one opening having an area of at least 0.1 m^2, should constitute the minimum area of openable windows or controllable ventilation openings for each habitable room, including kitchens. Further details on window and ventilation positioning for optimal ventilation and light are also provided (DoHS, 2009, p. 32; South African Bureau of Standards, 2022, p. 102). Window positioning requirements are additionally governed by *SANS 10400* (South African Bureau of Standards, 2022, p. 98).

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TABLE 3.1 Summarised architectural technical housing standards and guidelines of subsidised RDP housing

Design-based technical standard theme	Elaborated architectural technical housing standards and guidelines
Thermal efficiency	The *2009 National Housing Code—Part 3* document from the DoHS emphasises guidelines for dwelling orientation (DoHS, 2009, p. 35). According to this document, the longer axis of the dwelling should be orientated as close to east/west as possible. The plan of the dwelling should be compact, with the rooms that are most frequently used and the major areas of glazing strategically positioned on the northern side of the building. This arrangement is designed to facilitate the penetration of solar heat through the glazing during the winter months. Furthermore, the document stipulates that the roof overhang on the northern wall should be sufficient to shade the windows from midday summer sunshine. Additionally, windows facing east and west should be limited in number and confined in area to the minimum necessary for daylight and ventilation. These guidelines for dwelling orientation and window placement are in accordance with the standards outlined by the South African Bureau of Standards (2022) document, specifically in Chapter XA.
Sustainable design considerations	The *2009 National Housing Code—Part 3* document from the DoHS discusses energy-efficient housing considerations (DoHS, 2009, p. 37). According to this document, energy efficiency in housing is predominantly influenced by natural elements such as the sun, wind, and rain. Consequently, to optimise the impact of these natural forces on buildings, careful attention must be given to the planning, location, and orientation of the housing. On a micro-level, the layout of the house also plays a crucial role in maximising the influence of climatic forces, as outlined in Section 2.3.1 of the DoHS (2009) document.
House plan and layout	The *2009 National Housing Code—Part 3* document emphasises specific design considerations for housing (DoHS, 2009, p. 38). The plan of the house should be crafted to maximise interior space while minimising exterior wall area, which is prone to heat loss in winter. To enhance energy efficiency, living spaces should be strategically arranged, with rooms where people spend the majority of their time situated on the northern side of the unit. Uninhabited rooms, such as bathrooms and storerooms, can serve as screens for unwanted western sun or act as barriers to prevent heat loss on south-facing facades. Ideally, living rooms and kitchens should be positioned on the northern side. In accordance with the general considerations outlined in Section 2.4.3 of the DoHS (2009, p. 45) document, all housing units should incorporate robust insulation measures to further ensure energy efficiency.
General considerations	The *2009 National Housing Code—Part 3* document underscores a general consideration for housing units (DoHS, 2009, p. 45). It mandates that all housing units must incorporate effective insulation measures to guarantee optimal energy efficiency.
Average size of typical RDP stand size	The sizing typically aligns with town planning standards for standalone RDP housing, as indicated by Harrison et al. (2014, p. 356) and corroborated by the City of Johannesburg (2018) and information provided by M. Jackson in a personal communication (2023, October 3).
Enhancing the housing product	The BNG strategy by the DoHS (2004, p. 23) elaborates on enhancing the housing product: • Enhancing settlement design: Enhancing measures and incentives to include design professionals at planning and project design stages and develop design guidelines for designers and regulators to achieve sustainable and environmentally efficient settlements. This is aimed at promoting the development of a dignified size of housing that supports the morality of family and society. • Enhancing housing design: Enhance the traditional technologies and indigenous knowledge, which are being used to construct housing in rural areas. There is a need to focus on changing the face of the stereotypical RDP houses and settlements through the promotion of alternative technology and design. • Addressing housing quality: Audit and develop a programme to address the poor quality of houses built before the introduction of national norms and standards (DoHS, 2004, Section 3.7).

Table 3.1 shows, except for a handful of established standards, South Africa's technical housing standards, particularly those related to subsidised RDP housing, which are largely centred on minimum space standards and passive heating and cooling systems. These standards lack specificity and fail to adequately address the context-related, diverse design needs of the residents in these developments. While certain standards, such as minimum size requirements and housing ventilation, are useful, the emphasis on passive heating and orientation, often reinforced by a grid-based road system, has resulted in a dearth of neighbourhood character within stereotypical grid RDP layouts.

In addition to the *National Housing Code* and BNG policy, the *Red Book* series was introduced to address various neighbourhood-scale issues, encompassing considerations for road and block design options, public walkways, environmental factors, parking areas, public squares, pedestrian streets, and spatial dimensions. However, these guidelines also remained relatively broad and did not offer practical insights. For example, one guideline suggested the need to "ensure an appropriate sense of enclosure that is on a human scale and fits into the context within which the space is situated" (CSIR, 2000, p. 7).

The predominance of stereotypical grid-based RDP housing, coupled with a lack of diversity, lack of attention to building scale, and lack of public-private building transitions and public amenity design, reveals that the *Red Book* series, despite its intentions, lacked accessibility in translating its guidelines into actualised developments. These standards and guidelines also failed to provide tools, insights, or a necessity for the integration of spatial design in low-income areas. They did not offer insights on specifically creating RDP developments that are responsive to the everyday needs of residents and the characteristics of their surroundings. Context-responsive design, as described by Canizaro (2007) and Frampton (1983), is a fundamental architectural design principle that is not substantially addressed in South African technical standards and is something that is greatly missing in our low-income housing design guidelines.

Furthermore, a significant body of urban design literature underscores the pivotal role of spatial and social community development as well as safety. Advocates have called for more resilient and sustainable neighbourhood designs that prioritise safety through enhanced visibility, smaller building clusters, diversity, and multifunctional housing typologies (Alexander, 1977; Bibri and Krogstie, 2017; Jacobs, 1961; Meerow et al., 2016). While the *Red Book* national guidelines on human settlement and neighbourhood planning and design have started exploring these principles, these guidelines have yet to be grounded in the South African context. A national policy that addresses the specific challenges faced by low-income and RDP

neighbourhoods on a neighbourhood scale or that caters to residents' experiences through design is (still) missing (DoHS, 2014, 2019). Even though the BNG mandate aimed to transform RDP housing (DoHS, 2004), there has been no comprehensive national-level intervention or guidelines to address critical issues related to informality, backyard rooms, township formations, and unemployment from a neighbourhood-scale spatial perspective (City of Johannesburg, 2016; CSIR, 2000; DoHS, 2019). It is worth noting that while the City of Cape Town passed an urban design policy in 2013 addressing informality at a neighbourhood scale, it has not been implemented in any other South African city (City of Cape Town, 2013).

After examining current guidelines and technical standards related to RDP housing, we have identified a deficiency in addressing design considerations that account for residents' needs and aspirations within their context. Section 4 will investigate contextually relevant design considerations in Alexandra, focusing on density and incremental housing.

3.4 Evolving Density and Incremental Housing Norms in Alexandra

Alexandra Township, which is located within 3 km of Sandton, Africa's richest square mile with many employment and economic opportunities, boasts one of the highest population densities, as high as 25,978 people per square kilometre. With an average of five persons per dwelling, this translates to up to a density of 160 dwelling units per hectare, and in 2009, the township had already accumulated more than 90,000 housing structures (Alexandra Renewal Project [ARP], 2009; Harrison et al., 2014; Howe, 2020; Mbanjwa, 2018; Sondzaba, 2019; Wazimap, 2011). This high density is largely related to informal housing infill and caused the layering of diverse housing typologies, which include incrementally extended backyard rooms. The township comprises freehold tenure single-storey houses, which were established as early as 1912, as well as a mix of RDP fully subsidised houses, flats, and workers' hostels. Notably, both freehold tenure and RDP housing often include multiple rental backyard units, incremental extensions to the initial house provided by the government, which were initiated by the residents themselves. This practice was historically rooted in the need to supplement income for freehold tenure houses due to high property prices driven up by the apartheid government. According to Bonner

and Nieftagodien (2008), it also served as a political defence against forced removals during apartheid, as the greater the number of residents settled within a plot, the more challenging it became for the apartheid authorities to carry out forced relocations. Informal settlements, like the Sjwetla settlement, can also be found between established settlements and along riverbanks (Bonner and Nieftagodien, 2008; Harrison et al., 2014). In addition to these typologies are also hostels, flats, and accommodation in factory subdivisions. However, the most prominent form of housing in Alexandra, accounting for more than half of the total number of dwelling units, is the incrementally developed backyard rooms, as shown in Figure 3.1.

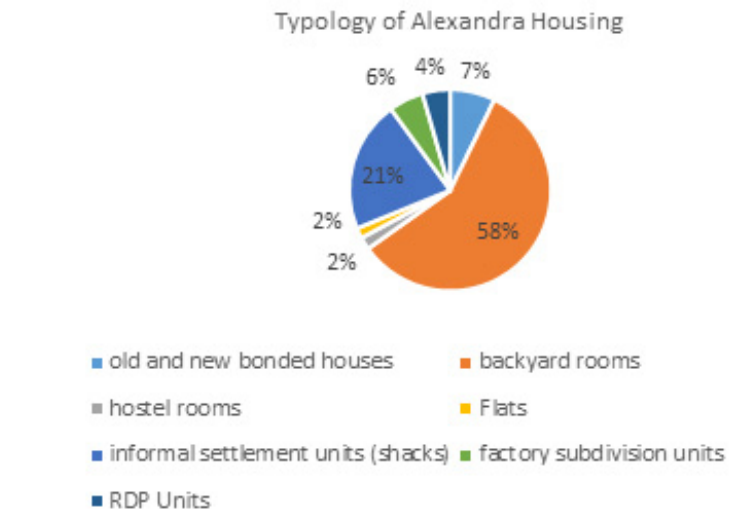

FIG. 3.1 Typologies of Alexandra housing. (Source: Author's work based on ARP (2009)).

In summary, the history of Alexandra is characterised by resilience against forced removals, with the culture of backyard rooms serving as both a response to the need for affordable accommodation and as a form of resistance against displacement. These backyard rooms have incrementally expanded over time, providing space for family and economic opportunities to respond to the community's cultural history and residents' spatial needs over time (Bonner and Nieftagodien, 2008; Harrison et al., 2014; Mahlakanya and Willemse, 2022; Shapurjee and Charlton, 2013).

3.5 Resident Responsive Design Innovations in the K206 Housing Project

This section delves into the innovative resident-responsive design approaches of the K206 housing project, which employed contextually relevant solutions to tackle governance issues linked to informal settlement upgrading via state-subsidised housing. It will first examine the common housing practices involving incrementally constructed backyard rooms in Alexandra. Subsequently, it will explore the governance-related challenges tied to the K206 development, followed by an investigation into how resident-responsive design was employed to devise solutions addressing governance issues within the K206 development.

Alexandra has a high prevalence of incrementally built backyard room formations, as depicted in Figure 3.2. These spaces were not only intended for income-generating activities but also for expanding homes to accommodate extended family members when household sizes exceeded the limits set by technical norms (Table 3.1 outlines the minimum standards for a two-bedroom house, which in practice is significantly expanded upon with the addition of backyard rooms).

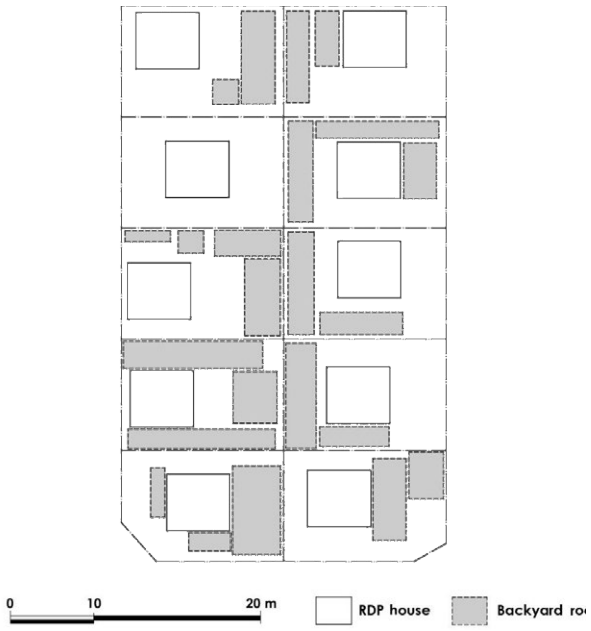

FIG. 3.2 Mapping of RDP houses and backyard rooms between 1st Street and 2nd Street, Far East Bank, Alexandra.

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During the design and planning stages of the K206 development, it became evident that discerning significant developmental differences in informal settlement upgrading, especially within the densely populated housing environment of Alexandra, was a challenging goal to reach. Consequently, a departure from the conventional waiting list approach, commonly used for informal settlement upgrading in South Africa, was proposed and implemented (Harrison et al., 2014; Sondzaba, 2019). The block-by-block approach was introduced, which entailed the relocation of all residents from an informal settlement block to the K206 block (ARP, 2009; Harrison et al., 2014; Sondzaba, 2019). This informal settlement upgrading approach allowed for the complete redevelopment of the informal settlement area into new housing units and social facilities on the K206 site, thereby showing a visible transformation in infrastructure development to the community (ARP, 2009; Harrison et al., 2014; Sondzaba, 2019).

While this concept appeared commendable in theory, as it allowed networks of residents to move, challenges surfaced when residents on waiting lists were informed of the change in systems. Now, not all residents in the earmarked informal settlement qualified for housing (for example, those not having South African nationality), exacerbating the situation by granting access to housing for non-qualifying individuals (Public Protector South Africa, 2014). Despite these challenges, the strategy persisted in pursuit of the overarching goal of achieving tangible and visible improvements and development in the area for the residents.

To address this issue of accommodating both qualifying and non-qualifying residents, ARP management, together with Anca Szalovitz architects, developed an innovative house type that was split in two components and devised to accommodate two forms of tenure. One owner-occupied double-storey, two-bedroom house, and an adjacent single-storey volume with two additional rooms to be rented out by the owners to non-qualifying households. This two-volume typology was distinctive in its capacity to respond to the need for housing densification through cluster formations. The K206 house type also acknowledged the prevalence of backyard rooms in Alexandra, incorporating opportunities for incremental expansion in response to the growing demand for housing and income generation in the area.

The K206 project allowed for vertical incremental extensions above the single-storey volume dedicated to the rental rooms. The layout of this unit followed a medium-density cluster formation, drawing inspiration from the existing densities and incremental backyard room formations in Alexandra (J. Baskin, personal communication, December 1, 2022; S. Mkhonto, personal communication, August 5, 2022; A. Szalovitz, personal communication, March 29, 2022). These design innovations of the K206 unit were created in conjunction with RDP technical housing standards.

Sections 5.1 and 5.2 explore in detail these context-related design innovations (increased density and incremental growth) for the K206 project over and above the project's compliance with technical standards.

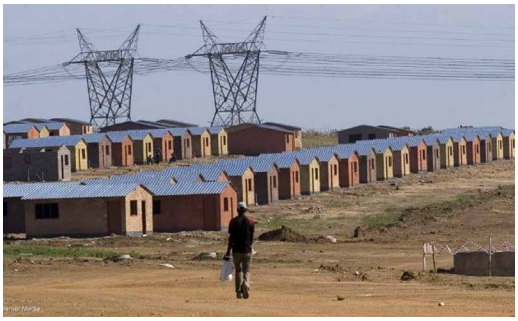
3.6 Density

The K206 housing project was inspired by the existing urban fabric of Alexandra, which exhibited significantly higher density compared to technical norms of RDP housing as shown in Figure 3.3. Elevated density proves especially advantageous in well-located areas, optimising the value of prime locations, typically superior to outlying ones (DoHS, 2004). Standard RDP housing plots adhere to a minimum size of 250 m^2 (Greyling, 2009; Harrison et al., 2014), corresponding to a maximum density of 40 dwelling units per hectare. Conversely, the K206 project, with its cluster layout and the unit incorporating both a single-storey and a double-storey section, was designed to accommodate six core units and six backyard room units (12 units) on a 750 m^2 plot when accounting for both core and rental units within a cluster, translating to a density of up to 160 dwelling units per hectare, four times higher than the standard densities of RDP housing as shown in Figure 3.3.

The neighbourhood scale design quality of the K206 project was also considerably more thought out based on the evolved historical norms in Alexandra township (Harrison et al., 2014) than standardised RDP repetitive standalone neighbourhoods on a standardised grid system. It creatively adhered to several guidelines suggested in the *Red Book* that not only enabled increased density but also fostered smaller social groupings, enhancing social interactions among neighbours and providing additional safety and security opportunities. With more residents overlooking common areas where people enter and exit, the sense of community and surveillance was augmented. The arrangement of clustered buildings also enhanced the ability for individuals to orient themselves, despite the massive scale of the project.

It is important to note that despite managing to acquire considerably more density than most standardised norms of RDP housing as highlighted in Table 3.1, the K206 design also accommodated incremental extensions that responded to the existing incremental extensions in Alexandra based on its design form and site layout.

a)



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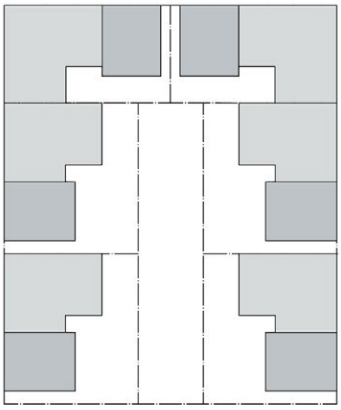

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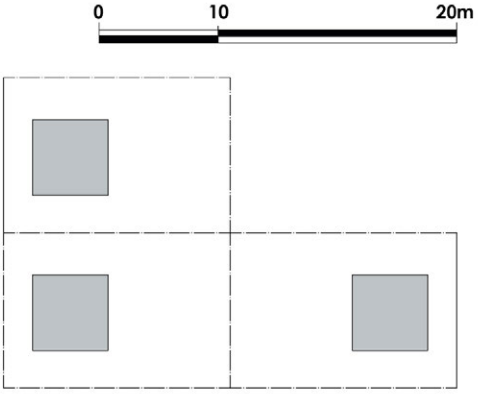

d)

FIG. 3.3 Density of K206 Houses vs RDP houses: (a) K206 houses (Google Earth Street view of K206 in 2013, accessed December 12, 2020); (b) the typical 40 m2 standard single-storey RDP houses, design based on technical housing standards only (photo of Mogale City, Gauteng, by Daws, 2022); (c) K206 housing cluster plan that answers both technical standards and residents' contextual needs (layout inspired by drawings from ASA Architects); (d) typical 40 m2 RDP houses plan (layout inspired by Mogale City RDP development).

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3.7 Incremental Housing

Another K206 design innovation involved the design of a housing type incorporating both a single-storey and a double-storey volume, as seen in Figure 3.4. This deliberate choice was made to facilitate the option of economic gain for residents via two rental rooms, as well as allowing the vertical expansion of the single-storey volume, anticipating incremental growth. The government subsidised the K206 project, granted ownership to the beneficiary households for the double-storey core unit, and enabled income generation through the two additional rental rooms built in the single-storey volume (Public Protector South Africa, 2014).

The owners of these units were also given the option to vertically extend the single-storey volume, offering maximum flexibility with a flat timber roof. The internal housing layout was designed to allow a smooth transition between the entire house being occupied by the owner or the double-storey section being used by the owners while renting out the backyard rooms (Osman and Davey, 2011).

Although not initially foreseen by the designer and management (J. Baskin, personal communication, December 1, 2022; S. Mkhonto, personal communication, August 5, 2022; A. Szalovitz, personal communication, March 29, 2022), the remaining space allocated for gardens and parking could also be absorbed into the incremental expansion of the building and rental rooms as seen in Figure 3.4.

Overall, the layout's design flexibility proved particularly advantageous for various scenarios of incremental expansion. It allowed for internal merging to create larger units and provided owners with the option to use rental rooms for income generation. This income generation in many cases allowed residents to either improve the finishes of their homes or build even more rental rooms. Furthermore, the design anticipated the seamless development of a second storey above the single-storey rooms. Additionally, although not part of the original design intent, the plot size accommodated the addition of a garden and parking space next to the cluster driveway, which unintentionally served as placeholders for residents to further extend into these open spaces (J. Baskin, personal communication, December 1, 2022; A. Szalovitz, personal communication, March 29, 2022).

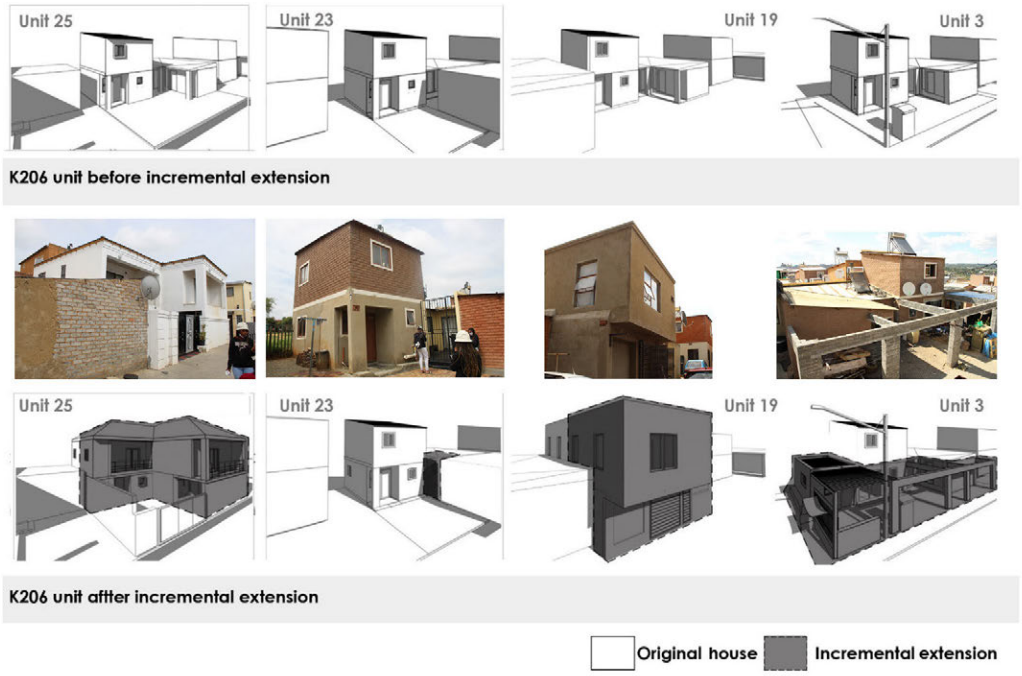

FIG. 3.4 Representative examples of K206 units with incremental expansion.

The cluster layout of the K206 project facilitated a diverse range of opportunities for incremental expansion. As the spatial mapping indicated, the potential for such adaptation seemed to be influenced by the unit's position within the cluster (Wilcox et al., 2024). For instance, in cases where the unit's façade faced main roads, commercial opportunities like restaurants, chicken sales, or preschools became viable options. Moreover, the shape of the clusters often opened onto municipal land parcels that were not initially incorporated into the housing scheme. Many of these parcels were substantial in size and allowed residents to informally extend their homes. For example, one such land parcel accommodated an additional five backyard rooms, contributing to 50% of the owner's household income. In as much as the cluster composition allowed for opportunities to expand, periphery units had more opportunities to expand than internal units that did not border municipal land or street edges.

When comparing the K206 unit to the standard RDP unit in Figure 3.5, it is evident that the K206 unit generated a residential density much bigger than the standard RDP unit. The K206 project leveraged the minimum 40 m^2 requirement, providing two bedrooms, a bathroom, a living area, and a kitchen following the specified technical standards, all within the prescribed budget for an RDP house.

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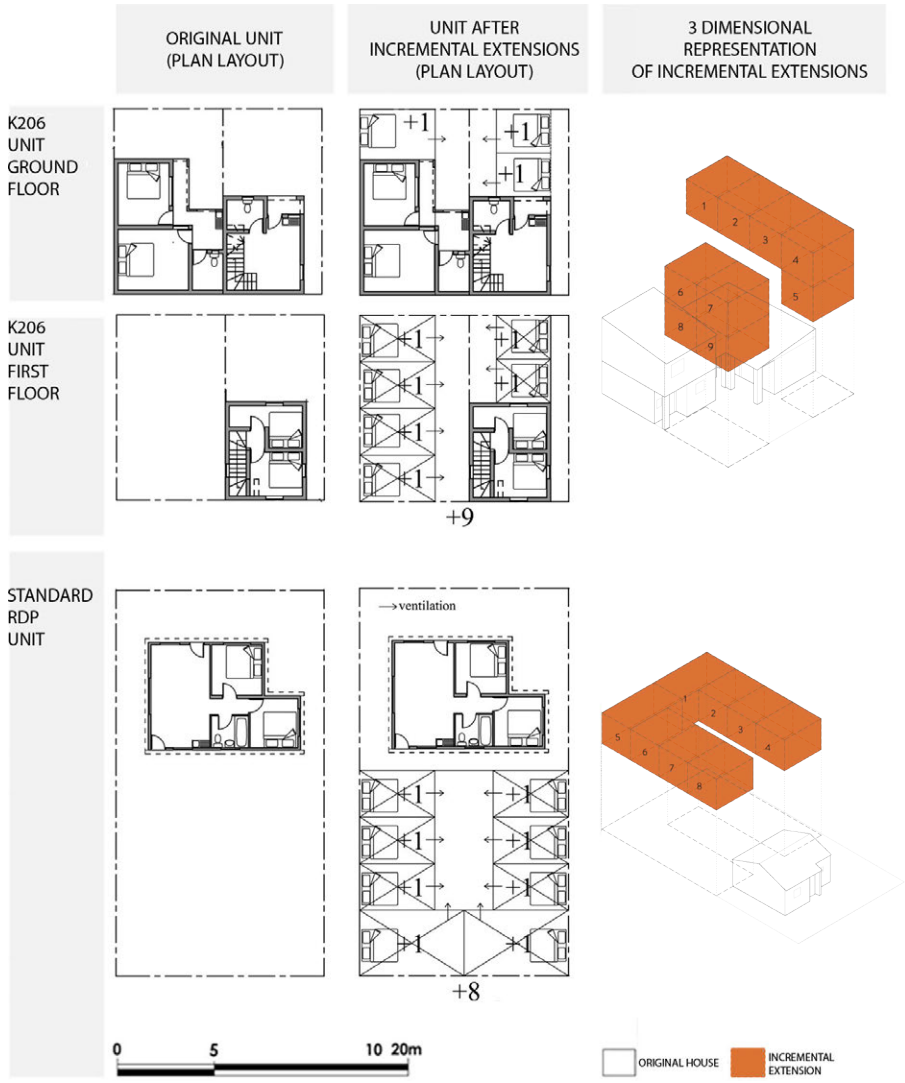

FIG. 3.5 Density comparison of incremental potential between standard RDP unit and K206 unit.

Additionally, a special presidential budget al.ocation subsidised the RDP unit for the two extra backyard rooms (S. Mavundla, personal communication, September 30, 2020). These additional rooms were either occupied by two families at one room per family, or both rooms became a unit for a single family. The flat timber roof design encouraged vertical expansion, whereas standard RDP houses typically feature timber-pitched roofs, which are more challenging to modify for additional floors.

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The potential for incremental expansion in the K206 unit exceeded initial expectations when compared to the standard RDP housing model. While standard RDP houses come with larger plot sizes, allowing for more space for backyard room expansion, our analysis of 26 K206 houses, in conjunction with national housing code regulations, reveals that single-storey standalone houses on larger plots were less likely to expand vertically. Residents of single-storey stand-alone houses typically opt for horizontal incremental expansion due to the lower cost associated with single-storey expansion. In contrast, K206 houses, which inherently offer opportunities for incremental vertical expansion, were more inclined to expand vertically. When site composition exercises were conducted comparing the potential for maximising incremental rooms in a K206 unit and plot with that in a standard RDP unit, plot, and incremental expansion, it was found that the outcomes were comparable in terms of the number of possible well-ventilated backyard rooms, as illustrated in the architectural analysis of incremental extensions in Figure 3.5. In terms of density, Table 3.2 shows that with backyard extensions and assuming each backyard room to be a dwelling unit, the K206 units allow for significantly more density potential than typical RDP units.

TABLE 3.2 Comparative potential density of standard RDP unit to K206 unit with incrementally added backyard rooms based on Figure 5 layouts. (Author, 2024)

	Standard RDP unit	K206 unit
Density without backyard rooms	40 du/ha	160 du/ha
Density with one additional backyard room	80 du/ha	240 du/ha
Density with two additional backyard rooms	120 du/ha	320 du/ha
Density with 10 additional backyard rooms	440 du/ha	960 du/ha
Density with 11 additional backyard rooms	480 du/ha	1040 du/ha

Note: du/ha = dwelling units per hectare.

Observing Table 3.2, it is crucial to highlight that the K206 unit shows greater efficiency in both density and backyard room outputs compared to standard RDP units.

Despite the considerable potential of the K206 project, particularly in its cluster-based design, many residents chose to gradually expand their homes by adding rooms with diverse housing quality and spatial configurations (typical of most backyard rooms) (Poulsen, 2010). Some of these extensions used high-quality materials, providing adequate light and ventilation, while others were constructed with substandard materials and lacked proper lighting and ventilation. The decisive factors influencing material choices and spatial layouts were primarily driven by cost, with residents having additional income streams being more inclined to invest

in higher-quality finishes. Residents and their builders played a pivotal role in determining most spatial layouts. Backyard room configurations typically included self-contained units where residents conducted various activities such as living, washing, sleeping, and cooking. A common toilet or toilets were shared among backyard room residents, and living areas were typically situated amid circulation areas around the rooms. The variation in housing and spatial design quality of incremental extensions highlights the challenge of achieving consistency in both the material quality and spatial quality of these extensions, despite the project's encouragement of incremental growth.

It is also worth noting that residents of the project still lack title deeds, rendering it even more difficult for the municipal authorities to regulate the quality of these extensions. Even willing residents cannot make housing extension applications because title deeds are required (S. Mkhonto, personal communication, August 5, 2022).

The K206 project's clustering approach was well-conceived in comparison to more standardised grid-like RDP configurations, both in terms of the unit's scale and its responsiveness to the local context, offering opportunities for incremental expansion. It also exhibited innovative neighbourhood design by implementing a cluster association of individual dwelling units to enhance social integration among residents and safety within smaller clusters, as opposed to the conventional standalone houses on a grid system. Notably, despite the success of this design approach, which was completed in 2010, it has not gained widespread adoption or replication elsewhere. In the realm of RDP developments, standalone houses on a grid road network continue to dominate, despite policy recommendations advocating for housing typology diversity and intensification to mitigate urban sprawl.

The primary deterrent for broader adoption appears to be cost-related. The K206 project received additional special presidential funding for the creation of rental rooms, which would be challenging to replicate without subsidies. However, certain key principles inherent to this design, such as the clustering system, the balance of density with incremental expansion allowance, and the choice of roof design for vertical expansion, could still be adopted within the cost brackets of RDP housing. These principles facilitate the intensification and densification of urban areas, especially in regions with limited or expensive land availability.

While this model may not match the densities achieved by larger multi-storey buildings, it responds to the everyday needs of residents, and it provides residents with opportunities to incrementally expand their properties and accommodate the gradual changes that occur over time, including family growth and income

generation through additional rooms. This distinguishes it from current multi-storey RDP developments and their limitations in accommodating such incremental changes.

3.8 Conclusion

In conclusion, this study delves into the impact of resident-responsive design on improving state-subsidised housing beyond technical housing standards. The central research question guiding our exploration is: How can a design approach that is responsive to residents' aspirations enhance subsidised housing design beyond mere technical standards?

Using the K206 housing project as a case study, this article highlights the urgency of enhancing technical housing standards and adjusting provisions to better align with the social, economic, and spatial needs of residents. This underscores the importance of implementing more detailed policies to ensure RDP housing design is contextually responsive. The K206 project, providing fully subsidised state housing for low-income families, extended beyond minimal technical design standards (traditional RDP housing design typically adheres only to basic technical design standards due to budget constraints). The project expanded on these standards to accommodate residents' aspirations and spatial needs rooted in the century-long tradition of Alexandra's backyard room culture and incremental housing expansions. The K206 unit typology and its cluster-based configuration, influenced by these spatial tendencies in Alexandra, showed higher spatial efficiency, measured in terms of residential density, when compared to standard RDP housing.

Furthermore, interviews with residents and policymakers underscored the success of these design interventions, incorporating grassroots initiatives such as increased housing density and income-generating opportunities through incremental backyard room additions. The K206 project significantly elevated residents' quality of life by enhancing income prospects and providing flexibility for gradual expansion.

However, while the design interventions of the K206 project accommodated incremental growth, this study also sheds light on the conflicts and disparities arising when user-initiated developments deviate from established RDP technical standards. Although incremental spatial expansion brings positive economic benefits

through income generation, it comes with trade-offs. The trade-offs include potential compromises in the quality of space and materials of the extensions that do not meet technical housing standards. Achieving the right balance between being responsive to local building practices and adhering to technical standards is a nuanced task, demanding careful consideration throughout the design and policy-making process.

The K206 project efficiently facilitated incremental expansion, surpassing the efficiency of standard RDP layouts. The K206 unit typology featured a core double-storey home for the owner along with two additional rental rooms that exhibited good material and spatial design quality compared to resident-initiated backyard rooms typically associated with standardised RDP housing. Despite the positive aspect of the government-sponsored rental rooms, K206 residents continued to incrementally add more rooms of varying quality to their homes.

In summary, this research emphasises the importance of acknowledging and embracing the dynamic interplay between technical housing standards and addressing the social and economic needs of residents who live in subsidised housing. Achieving this equilibrium is crucial for addressing housing needs, enhancing the well-being of South Africa's low-income households, and remaining compliant with technical standards. Policymakers and practitioners, by embracing both the technical and social dimensions of housing design, can contribute to more effective and responsive housing solutions for vulnerable populations. The K206 housing project provides valuable lessons, highlighting the potential benefits of a holistic approach to subsidised housing design that combines the rigour of technical standards with the socio-cultural practices of its context.

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4 Incremental Housing Extensions as a Proxy to Tenure Security in Informal Settlement Upgrading

The Case of the K206, Alexandra, Johannesburg

ABSTRACT In informal settlement upgrading the effects of the governance of tenure security, housing allocation and resident-initiated incremental housing have been understudied. This study sheds light on the challenges associated with informal settlement upgrading, kick-started by the block-by-block relocation of residents in the K206 project in Alexandra, Johannesburg, South Africa. Housing allocation rules differed for those eligible for the new housing and those not eligible. The mixed tenure system that was introduced to cope with these differences in eligibility offered new hierarchies of housing tenure in an existing community, and resulted in social unrest. The study's findings show how residents' perceived security of tenure, reinforced by national housing laws, and exercised through incrementally extending their housing, mitigating social tensions extending their dwellings and thereby reducing social conflicts among residents. The study contributes caused by the project's allocation system of dwellings. These findings are based on a

spatial mapping of the incremental extensions within the project and supplemented by interviews with management and residents. This project demonstrated the interaction between residents and the governance principles of the project. Housing allocation and tenure policies were shown to be counteracted by residents (and to a larger extent by tenants) enacting their perceived security of tenure through incrementally to the literature on the interactions between governance and resident-initiated design extensions.

KEYWORDS Housing Allocation, Perceived Tenure Security, Incremental Housing, Insurgent Urbanism, Informal Settlement Upgrading

4.1 Introduction

Many low-income households in South Africa live in informal settlements with little or no access to adequate services (Pinfold, 2015). Informal settlement upgrading (ISU) with secure tenure has been used as a key strategy to fulfil the constitutional right to adequate housing for numerous vulnerable households in South Africa (MoJ, 1996). However, housing provision in South Africa for low-income residents has reached a critical point whereby its supply cannot keep up with the demand of millions of qualifying households that persist on housing waiting lists (Levenson, 2021). This backlog of housing provision is further exacerbated by housing allocation processes resulting in numerous households being left without suitable housing. Housing allocation systems set by the state, frequently disregard the needs of residents, leading to problematic allocations and social unrest, particularly in contexts susceptible to corruption (Mosha, 2013; Shutina, 2010; Tomlinson, 2011). Incremental housing through the addition of backyard rooms has been regarded as an insurgent resident initiated response to problematic housing processes (Poulsen, 2010; Lategan & Cilliers, 2016).

The existing literature on ISU has largely overlooked the complexities surrounding disputes over tenure security and housing allocation, particularly in cases where resident-initiated incremental housing is employed as a government-initiated solution (Marais & Ntema, 2013; Abbott, 2002; Cirolia et al., 2017). While many studies focus on traditional approaches to housing allocation, there is a significant gap in understanding how mixed tenure systems, especially those involving incremental housing extensions, influence social dynamics and conflicts within communities. This research aims to address this gap by examining the K206 project, which as

type of greenfield ISU adopted a novel block-by-block resident relocation strategy that aimed to keep together the communities, but move them to a new location (see note 1). This empirical exploration specifically investigated how incremental housing extensions (as spatial design initiatives) have been used as a way to reduce social conflicts among residents caused by disputed housing allocation and tenure security (governance structures), providing new insights into the challenges of ISU.

The case study therefore explores the interaction between spatial design initiatives and government structures, guided by the following research question:

— **How does security of tenure relate to incremental housing extensions in the K206 project?**

The paper explores this question in the next section by analysing from the literature notions of security of tenure and incremental housing in South African ISU. Next, the paper observes how these concepts translate into the on the ground realities of the K206 project by first outlining the methods employed in this study, including interviews with experts and spatial mappings of the incremental extensions. Moving forward, the paper proceeds to present the findings derived from the case study that include a review of governance and spatial design outcomes of the project as well as an analysis of incremental housing extensions that residents undertook, in order to develop reflections on the impacts resulting from governance and design interactions.

4.2 Security Of Tenure And The Role Of Incremental Housing

To position the K206 housing project within the existing literature, this literature review examines the notion of security of tenure in ISU and how incremental housing can be interpreted as a physical manifestation of perceived security of tenure.

Tenure security plays a crucial role in ISU, by granting residents' long-term ownership of their improved living spaces, which in turn aims to promote the maintenance and enhancement of the surrounding environments. Such ownership therefore aims to foster a sense of responsibility among residents, motivating them to invest in the overall well-being of their properties, services, and the broader development (De Souza, 2001; Kiddle, 2010; UN-Habitat, 2014).

The success of providing tenure security depends thereby on the specific circumstances of the ISU and the associated property rights (Bassett, 2007, 2005; Gilbert, 2008; Gulyani & Connors, 2002; Payne et al., 2009). Traditionally, tenure security has been associated with titling. In the context of ISU, security of tenure is also provided in communal land trusts and by rentalcontracts. However, recent research has highlighted that security of tenure can also be effectively established through various non-titling agreements (Gulyani & Connors, 2002; Payne et al., 2009). Residents with security of tenure are then residents that are protected from involuntary removal from their land or residence based on an agreement regulated by legal and administrative frameworks (either statutory or customary) between individuals or groups to occupy land or property (Payne & Durand-Lasserve, 2012). This suggests that residents do not necessarily always need formal title deeds or rental agreements to feel secure in their tenure.

Security of tenure becomes a perceived security of tenure when there is not necessarily an absolute guarantee, but rather a degree of confidence by residents that they will not be arbitrarily deprived of their rights to encounter and/or profit from the land or property they reside in (Payne & Durand-Lasserve, 2012). Perceived security of tenure has therefore been argued to be a valid form of tenure security in situations where obtaining legal documentation as proof of ownership is challenging or inaccessible (de Souza, 2001; Kiddle, 2010). Residents hereby make judgements on their security of tenure based on their experiences and history of their occupied residence. This perception can make residents act like they own the properties they reside in even without legal proof of ownership (De Souza, 2001).

It is important to note that the levels of security of tenure for land and property rights are closely centred on the historical, institutional, economic, cultural and political context of the area and/or nation at large. Forms of tenure or (in)secure tenure also fall into a wide spectrum based on these varying contexts (Bassett, 2005; Gulyani & Connors, 2002; Payne et al., 2009; Payne & Durand-Lasserve, 2012). In the specific context of South Africa, secure tenure through titling is of paramount importance due to historical experiences of forced removals during the apartheid era, which have left a majority of citizens desiring formalized forms of tenure based on past experiences (DoHS, 2004; Fabricius & Wet, 2022; Parnell, 1988). Post-apartheid policy interventions have also led to forms of perceived security of tenure for South African citizens greatly influenced by national housing policy and protection of vulnerable residents. Section 26(1) of the constitution gives every South African the right to have access to adequate housing (MoJ, 1996). This, alongside the Prevention of Illegal Eviction from an Unlawful Occupation of Land Act (PIE Act) of 1998 (OotP, 1998), practically means that residents cannot be evicted from a house or parcel of land (even if they are occupying it unlawfully), without

being relocated to adequate alternative accommodation or land. Despite these laws, there are a number of grey area cases where residents have experienced eviction (Nyoka, 2020; Seleka, 2020).

As a result of this, even though South African citizens who live in spaces without legal documentation are not completely exempt from eviction or relocation, they experience high degrees of perceived tenure security based on their constitutional rights, which sets them apart from individuals residing in countries without similar protective legal frameworks . These legal provisions can also elicit insurgent responses from citizens wherein residents feel that their experiences have contradicted the principles enshrined in these laws, and take action to correct the course based on their perception of what tenure should look like (Frenzel, 2014; Alter, 2012; Holston, 2021, 2009, 1995; Wilcox, 2018; Wilhelm-Solomon, 2016). Insurgent citizenship encompasses the "working against" authoritarian urban structures, enabling marginalized residents to exercise agency and contribute to more inclusive cities. Insurgent urbanism hereby represents the spatial mode of insurgent citizenship (Caldeira, 2017; Cruz, 2015; Davis, 2013; Holston, 2021, 2009, 1995; Hou, 2010). In the same way insurgent urbanism is a spatial manifestation to insurgent citizenship, incremental extensions can be considered a spatial manifestation of perceived security of tenure. De Souza's 2001 article highlights the significance of perceived security of tenure among residents: this perception has the power to lead residents to consider a particular piece of land or housing as their own despite the absence of legal status. De Souza (2001) empirically establishes a correlation between residents who possess this perceived security of tenure and their inclination to take ownership of their spaces through incremental extensions and development of their properties.

Incremental housing is the incremental extending of housing over time, occurring with the evolution of a households needs over time. This form of housing has been argued to create more resilient housing that is better suited to the needs of its residents (Goethert, 2010; Wakely & Riley, 2011). The flexibility of incremental housing allows for spatial shifts over time as well as a more progressive model of financing for housing extensions when and where housing finance is available or saved up by the resident. With respect to ISU in South Africa, incremental housing occurs after state-funded housing is built in order to better cater to the needs of residents. Incremental housing is therefore a user-initiated way of making ISUs more suitable for household needs (Goethert, 2010; Martins & Rocha, 2019; Wakely & Riley, 2011).

Although South Africa has explored incremental principles through sites-and-services schemes (Huchzermeyer, 2003) and self-help housing projects such as the Peoples Housing Process (PHP) (Lizarralde, 2011), literature around incremental

housing in South Africa is far outweighed by conversations around incremental backyard rooms (Bank, 2007; DAG, 2020a; Lemanski, 2009; Mahlakanya & Willemse, 2017). Backyard rooms are incremental additions to Reconstruction and Development Programme (RDP) housing that are built to either accommodate residents extended family or to generate income through rental units (Poulsen, 2010). RDP housing is a form of government fully subsidized housing that is typically associated with the backyard room phenomenon in urban areas. Backyard rooms have been the centre of a narrative that speaks to the opportunity of incremental housing as a form of income generation for low- income households, and also as potential to solve the housing backlog, generating efficient ways of housing provision with adequate services (DAG, 2020a, 2020b; Brown-Luthango et al., 2017; Poulsen, 2010).

The occupation and implementation of these extensions are not always legally documented, and therefore residents who implement incremental extensions can often be seen to identify with a sense of perceived tenure security, as De Souza (2001) argues. De Souza (2001) underscores that the act of incrementally extending these houses can be seen as evidence of residents' sense of ownership over these properties. This observation allows to draw connections to the concept of insurgent urbanism. Despite lacking legal proof of ownership, perceived tenure security exercised through residents' insurgent urbanism manifests through physical extensions of their homes, possibly as a form of activism. It represents residents' exercising of agency to assert their ownership over these spaces, particularly in contexts like South Africa, where protective laws for vulnerable households exist (Caldeira, 2017; de Souza, 2001; Alter, 2012; Holston, 2021, 2009, 1995).

In conclusion, perceived security of tenure could be argued to be crucial in ISU, fostering long-term ownership and investment in improved living spaces. In South Africa, historical experiences and protective laws contributed to residents' perceived tenure security. Residents with perceived security of tenure have spatially asserted this form of tenure through incremental housing extensions. Perceived security of tenure could therefore be a vital aspect of ISU in adapting housing to needs.

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Incremental housing is therefore a user-initiated way of making informal settlement upgrades more suitable for household needs (Goethert, 2010; Martins and Rocha, 2019; Wakely and Riley, 2011).

Although South Africa has explored incremental principles through sites-and-services schemes (Huchzermeyer, 2003) and self-help housing projects such as the Peoples Housing Process (PHP) (Lizarralde, 2011), Literature around incremental housing in South Africa is far outweighed by conversations around incremental backyard rooms (Bank, 2007; Development Action Group (DAG), 2020a; Lemanski, 2009; Mahlakanya and Willemse, 2017). Backyard rooms are incremental additions to RDP housing that are built to either accommodate residents extended family or to generate income through rental units (Poulsen, 2010). RDP housing stands for Reconstruction and Development housing, a form of government fully subsidised housing. This backyard room phenomenon is typical of South African urbanism based on the prevalence of RDP housing in the country. Backyard rooms have been the centre of a narrative that speaks to the opportunity of incremental housing as a form of income generation for low-income households and also how incrementally built housing has the potential to solve the housing backlog, generating efficient ways of housing provision with adequate services (Development Action Group (DAG), 2020a, 2020b; Poulsen, 2010). The occupation and implementation of these extensions are not always legally documented, and therefore residents who implement incremental extensions can often be seen to identify with a sense of perceived tenure security (de Souza, 2001). In conclusion, perceived security of tenure could be argued to be crucial in ISU, fostering long-term ownership and investment in improved living spaces. In South Africa, historical experiences and protective laws contributed to residents' perceived tenure security. Residents with perceived security of tenure have spatially asserted this form of tenure through incremental housing extensions. Perceived security of tenure could therefore be a vital aspect of ISU in adapting housing to needs.

4.3 Methods

The K206 case study was chosen for its unique block-by-block allocation that resulted in mixed tenure systems (see next section). The exploration of the case shows how governance initiatives resulted in problematic outcomes with regards to security of tenure. Although the case study is unique to South Africa, it discusses common issues associated with South African state-subsidized housing such as poor housing allocation practices, insecurity of tenure and incremental housing (Bredenoord & van Lindert, 2010; Patel, 2016; Payne & Durand-Lasserve, 2012; Wakely & Riley, 2011).

The research applied several methods in order to be able to grasp the complexities. To understand housing and tenure allocation at both the stages of initial implementation and ten years after implementation, five interviews with key professionals involved in the Alexandra Renewal Project (ARP) including the K206 project were conducted alongside 26 interviews with residents between March 2020 and December 2023. The opinion of two representatives from the K206 tenants association were collected in one interview in order to understand the governance structures for the project. Informed consent was obtained from all individuals who participated in the interviews.

Residents were selected to represent the entire range of housing allocation and tenure types within the project. Interviews included spatial mappings that were taken by the researchers that showcased the incremental developments of their homes. The interviews conducted were synthesized to create visual representations illustrating typical patterns of housing allocation and tenure systems within the project. Finally, a mapping exercise that connects perceived tenure security with incremental housing was conducted within Phase 1 of the K206 project to practically demonstrate the on the ground realities of housing allocation and perceived securities of tenure. This mapping was based on google earth images that demonstrated incremental changes that were made by residents. This demonstrates this by mapping ownership tenure, perceived ownership tenure and incremental expansions that suggest a perceived ownership over properties. It is important to note that this mapping used architectural research and spatial design methods through identifying incremental expansions spatially. These spatial incremental expansions overlaid by original ownership structures have helped identify perceived security of tenure (governance findings).

In addition to the interviews, secondary academic sources and project documents were used to understand the developments in the past ten years. Last, but not least, information sourced from newspaper articles and legal documentation of the project revealed the background behind violent clashes that occurred as a result of the founding governance principles of the project (eligibility and allocation).

4.4 K206 Informal Settlement Housing Upgrade

The K206 case study is located in Alexandra, Johannesburg. Alexandra Township has a history of several layered socio-political housing and land claim complexities. This history includes being an area inhabited by residents with long term freehold tenure. But residents in the area have also experienced a number of tenure insecurity occurrences such as forced removals, relocations, demolitions, and numerous threats of eviction that occurred pre and post-apartheid (Bonner & Nieftagodien, 2008; Makgobi et al., 2020).

Over time informal settlements continued to grow on the periphery of the Township, which in turn made Alexandra an area with mixed forms of allocation, both legally documented and self-allocated. Alexandra was also made up of primarily three types of housing tenure, primarily being ownership with legal documentation, rental backyard rooms or occupation without legal documentation.

Alexandra has encountered a number of upgrading interventions including the Alexandra Renewal Project (ARP), established in 2001 . The project was aimed at upgrading the living conditions, infrastructure, services, socio-economic and environmental conditions as well as creating adequate housing for Alexandra residents in need (ARP, 2010, 2009; Bonner & Nieftagodien, 2008; Harrison et al., 2014). The K206 Housing project was an ISU project via relocation initiated by the ARP that aimed to rehouse residents in need from nearby Alexandra areas (interview with Mavundla; PPSA, 2014).

Between its inception in 2010 and 2014, the K206 project, part of a special presidential project, had been documented in a few academic scripts describing the original housing concept and its innovations that included its inclusive strategy to accommodate all

residents through block-by block relocation and provide income generation for residents (ARP, 2009; Charlton, 2010; Harrison et al., 2014; Osman et al., 2011). However, these innovative governance principles did not fully take into consideration the latent political, governance and socio-spatial complexities that would evolve over time.

4.5 Housing Allocation of K206

According to the allocation regulation, South African housing is allocated to households that apply to be on the waiting list, are on the waiting list and meet qualifying criteria. Qualifying criteria for low-income households are as follows: Households must be South African citizens, they must be contractually capable, married or habitually cohabiting with a partner, single with financial dependants, they must earn R3500 / (€ 200) or less household income per month, they must be first-time government subsidy recipients, first-time homeowners and or single military veterans without financial dependants (DoHS, 2022).

In the context of South Africa's ISU, the traditional method of housing allocation has been to employ a waiting list system for housing allocation, with a predominant emphasis on freehold tenure. The fundamental idea behind this approach is to ensure an equitable distribution of housing to deserving residents, who are subsequently recorded in the housing registry under the prescribed form of tenure stated in the housing agreement. However, it should be noted that in South Africa, these systems do not always function efficiently, and numerous instances have arisen where ISU projects have faced allegations of corrupt allocation processes (Abdullahi & Aziz, 2011; Ochieng, 2018; Patel, 2016; Rubin, 2011; Tomlinson, 2011). State housing allocations with legalized documentation follow a specific process of allocation and meeting necessary qualifying criteria. State allocated housing tenure types in South Africa are generally limited to either RDP (Reconstruction and Development Programme) housing which is fully subsidized housing with ownership tenure for residents who earn below R3500 a month, or social housing for residents who earn between R3500 and R7000 .

Tenure systems without legal documentation are typically resident initiated in South Africa. These systems deviate from the traditional practice of legal documentation with regards to allocating houses and often entail residents engaging in self-allocation, particularly in unconventional, unoccupied or ambiguous areas of land or housing.

During the ARP, several ISU housing interventions were implemented through the waiting list approach. The waiting list approach for housing is South Africa's standard method of housing allocation, a first come first served approach, where qualifying residents write their names on a list to wait for housing. The waiting list approach gathered residents from scattered inadequate homes in Alexandra and rehoused them into new consolidated housing developments. This made it difficult to see evident physical infrastructural improvement within the existing parts of Alexandra they were rehoused from. Due to this less evident result, the block-by-block approach was adopted and residents were allocated housing according to earmarked areas of Alexandra instead of the waiting list system (Sinwell, 2009, p. 201). The idea here was for Alexandra residents to see the physical difference the ARP was making and the block-by-block approach was more effective than the waiting list in demonstrating infrastructural improvement. Once the area was cleared with the block-by-block system, the entire area where people were moved from could be redeveloped.

This alternative form of housing allocation raised two disputed issues: conflicting waiting timeframes and conflicting qualifying criteria. Firstly, there were conflicting timeframes as residents in these "blocks" were given preference over residents who had been on waiting lists for much longer. This caused conflict as it was argued to be unfair that new residents in blocks could receive a house at K206 over people who had been on the waiting list for decades. Secondly, conflicting qualifying criteria arose as the waiting list system worked with qualifying requirements for state-subsidized housing, but the block-by-block approach (aimed at spatial transformation) did not. All the residents in selected blocks were moved to new housing regardless of whether they qualified for state-subsidized housing (thus creating another issue of having to rehouse people of varied qualifying classifications). The ARP allocated housing to all residents of the upgraded blocks. Fully subsidized housing was given to residents that qualified for it and affordable rental housing was allocated to residents that did not qualify resulting in two different tenure systems: that of ownership tenure and that of rental tenure (Baskin, Interview with Julian Baskin Management of ARP K206, 2021; PPSA, 2014). These were the only two tenure options based on the rigidity of the housing qualifying criteria.

Despite the noteworthy and pioneering concept, the allocation process of housing of the K206 project was allegedly riddled with corrupt practices as many of the former tenants of the project claimed that some residents from the blocks were allocated give-away housing unlawfully when they did not qualify for it. This allocation was seen as unfair by residents, leading to violent clashes between tenants and owners as a result of this inequitable system. All residents were brought from the same

informal settlements, all having same tenure status into a different upgraded development with variations of tenure. When residents were moved into K206, they were allocated into one of two tenure statuses. Residents that did not qualify for ownership were deemed original tenants even though their homes had been demolished and they had nowhere else to go. The tenants believed their rights should be no different from those who did qualify to be original owners. Tenants believed that they were prejudiced by arbitrary actions of government through unfair allocation practices (PPSA 2014, Siso, 2012, 2016; K206 Tenants Association interview).

4.6 Perceived Security of Tenure of K206

Mixed tenure housing typologies have often been commended for creating more diverse housing environments (Talen, 2008). K206 notably catered to more than one housing typology it offered a range of unit types and unit densities), which catered to residents with mixed qualifying criteria and subsequently mixed tenure. The current housing qualifying criteria systems in South Africa also make it difficult to create interconnected tenure typologies. The K206 project did include single story single tenure units, however to overcome the challenges encountered by the block-by-block relocation, the K206 project pioneered a singular unit type 1 which was made up of two adjoining unit types, each having different tenure systems. This unit in theory was created to proverbially “kill two birds with one stone”, it consisted of a two-bedroom house with an appending two rooms with ownership given to one qualifying household from earmarked blocks that would then lease their two rooms as affordable rental units to non-qualifying residents from the earmarked blocks. This offered the implicit contract that the owner would maintain the property and the tenant would contribute to the overall costs of the property (Baskin, Interview with Julian Baskin Management of ARP K206, 2021; PPSA, 2014). This tenure solution was the only viable option based on the rigidity of the housing tenure options in South Africa at the time. Because tenants did not qualify for state-subsidized housing, this model created a dual tenure unit that included a fully subsidized unit with affordable rental units for qualifying residents. These affordable rental units could be leased out to non-qualifying residents to pay rent directly to unit owners.

As Figure 4.1, shows, the type 1 unit was owned by one family with three tenure allocation options. The type 1 unit was either owned by one family with no rental units (i), the second option was for type 1 owner to rent out two rooms to one family (ii) or the third option was for the type 1 owner to rent each of the two rooms out to different households (iii).

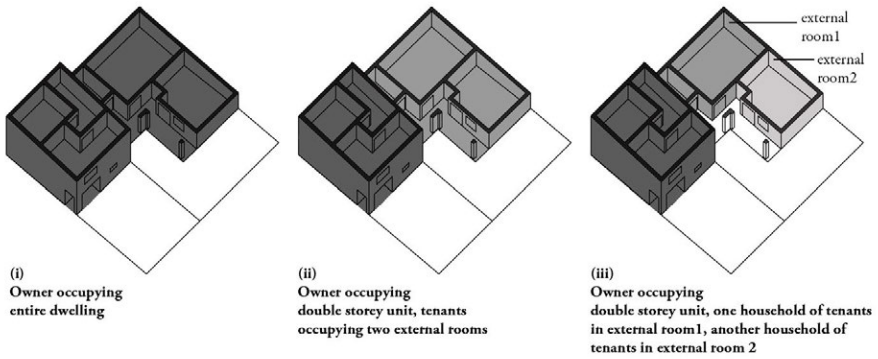

FIG. 4.1 There are a number of unit types in K206, the three Type 1 unit allocation options for K206 with owners and tenants are shown above.

Up until 2021, “owners” had not received title deeds, but they were given allocation letters to prove ownership over their properties. ARP drafted a 5-year lease agreement that was signed by both owner and tenants agreeing that tenants would pay owners R350 per month (20 Euros per month) to stay in the rental unit for up to 5 years with the opportunity to extend the lease (PPSA, 2014). The owner-tenant contract was later queried as part of a public prosecutor complaint against malpractice of the ARP in the K206 project, as former tenants' homes in their previous informal settlement had been demolished and they were desperate for accommodation. Meshak Nemakonde from the K206 Tenants association mentioned (personal communication, March 21, 2021) stated:

"It’s a disaster…They have one thousand five hundred owners and another one thousand five hundred rentals (the number is not sufficient). So now they are stuck because they are a lot of people that need to allocate. Giving everybody ownership and rental it doesn’t work."

They felt that they did not understand the initial terms and conditions that were set in the contract and were not given the voice to query the contract. Former tenants also queried the prevalence of some corrupt landlords breaching contacts and charging more than the stipulated R350 per month for rental which was another factor in tenant-owner tensions (PPSA, 2014; Mkhonto, 2022).

With the overlap between the accusations of malpractice in housing allocation, problematic tenure systems and subsequent power dynamics of allocation systems, there erupted a number of violent clashes between K206 residents (Siso, 2016; Siso, 2012; Mkhonto, 2022). “Owners” were putting pressure on tenants, allegedly harassing them to pay rent. Many of the tenants felt the whole process had been unlawful and that they deserved the same tenure rights as owners, thus refusing to pay rent (Siso, 2016; Mkhonto, 2022). They mentioned that they would have preferred to pay rent directly to the state (Mkhonto, 2022), but because the state-subsidized housing system only recognized qualifying residents, and a need for funds to manage these processes, this option was not implemented. The public protector complaint was lodged thereafter from tenants stating their claim to the same tenure rights as their landlords/ owners. The recommendation for the complaint was that a political intervention should be sought to prevent further clashes between owners and tenants (PPSA, 2014).

This left a vacuum for political intervention, but no coherent political intervention was effected, and thereafter tenants sought justice for themselves. Tenants began to act like owners through a perceived security of tenure, they refused to pay rent and developed incremental interventions, as a form of insurgent citizenship. The grey area left in the vacuum of legal recommendations compounded with the legal rights of tenants (Section 26(1) and PIE Act) meant tenants felt they had the right to own these homes (perceived tenure security) and thereafter developed their properties spatially resulting in a form of insurgent urbanism (Mavundla, 2020; K206 Tenants Association, 2021; Mkhonto, 2022).

Residents perceived security of tenure was spatially manifested through the building of incremental extensions (De Souza, 2001). These incremental extensions occurred in a number of spatial configurations, not always adhering to demarcated boundary lines as demonstrated in Figure 4.2, , an example of incremental expansions made which occupy almost triple the size of state anticipated incremental expansions. These incremental extensions allowed for residents to better cater to their household’s spatial needs via spatial expansion, and in many cases provide rental accommodation to generate household income (Authors). Despite the residents' ability to adapt to the challenges they face, the issue of formalized tenure persists in the project. Land ownership is still disputed, with questions about who owns

what and what can be formalized under ownership tenure. This makes resolution difficult. Even if the government is willing to formalize these subdivisions of space, the process remains contested and must be resolved for residents to receive formal tenure ownership in K206 (Mkhonto, 2022).

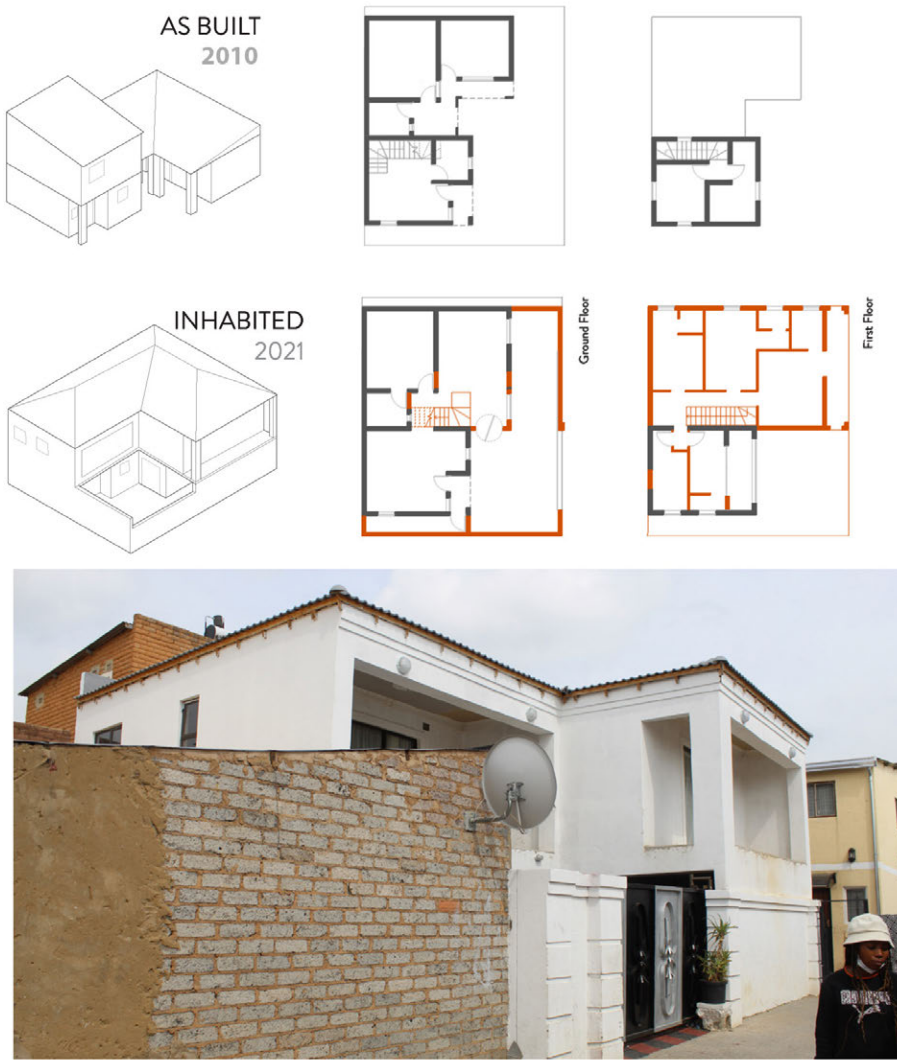

FIG. 4.2 Spatial Analysis looking at incremental extensions that surpass initial intended boundaries

In order to assess the levels of perceived security of tenure in the project the next section of the paper explores the magnitude of perceived security of tenure by spatially assessing the extent of incremental extensions by residents within the project.

4.7 Mapping of Phase 1 K206 Housing

It has been established that perceived security of tenure can be spatially embodied through incremental housing (Section 2; De Souza, 2020). It could therefore be argued that any incremental extensions within a housing project with disputed tenure security can be associated with residents' perceived security of tenure over those properties. This section will review the levels of perceived security of tenure in Phase 1 of the K206 project (the K206 has 6 phases) through analysing the extents of incremental extensions. Phase 1 of the project consisted of 175 houses (140 of which are cluster units and 35 of which are standalone housing units). The phase mapped incremental housing as a proxy indicator for perceived tenure security as demonstrated in Figure 4.3. It maps original owners and original tenants and whether they extended incrementally their housing. Owners (residents that qualified for housing) did not have title deeds, but the allocation letters gave them a more solid tenure status in comparison to tenants (residents that did not qualify for housing) who had no formal paperwork for occupation other than expired lease agreements and legal proceedings related court cases. This meant both tenures had perceived security of tenure, but owners had a higher perceived tenure than tenants because of allocation letters.

TABLE 4.1 Perceived tenure in Phase 1 K206 residents (Author, Site mapping 2023)

	Original "Owner"	Original "Tenant"
Total number of units	111	64
Percentage of units without incremental extensions (did not exercise perceived tenure security)	20%	9%
Percentage of units with incremental extensions (did exercise perceived tenure security)	80%	91%

FIG. 4.3 Mapping perceived security of tenure through incremental housing extensions for Phase 1, K206

On reflection of the results, there was a resonating number of residents with a perceived security of tenure based on the high levels of incremental extensions in the phase. 80% of owners incrementally extended their homes and 91% of tenants extended their homes. Both were very likely to extend their homes but surprisingly, tenants were more likely to extend their homes than owners, as the percentage of owners' units without extensions were twice the percentage amount of tenants units without extensions.

This verifies that despite not having sufficient legal documentation to stake claim of ownership, the majority of residents perceived tenure security of their spaces exercised through incremental extensions. However, it is unusual that "tenants" were more likely to incrementally extend than "owners".

This could be related to one of two things: Tenants were alleged "non-qualifiers", the reason for not qualifying was either based on the fact that they were not South African citizens, single households with no dependents or made household income that exceeded R3500 per month (DoHS, 2004). According to the latter, this could mean that many of the tenants that did not qualify were earning above R3500 per month, and therefore had more income to create incremental interventions. Single households would be less likely to extend houses, and non-South Africans would not directly need to incrementally extend more than South African residents, so this would not directly affect number of incremental extensions.

The second possibility is that the very insecurity of tenure of tenants, was the inspiration behind incremental extensions. Tenants' history with expired lease agreements and violent clashes with original owners could have fuelled their desire to physically assert their perceived security of tenure through incrementally extending homes. This suggests a form of insurgent urbanism, a form of protest to their right to own their property and a form of self-housing allocation. The results here being that legal tenure and allocation status when field work was taken, proved to be more difficult to spatially resolve after tenants had incrementally developed their properties.

Alexandra municipality and K206 residents are apparently also finding the situation spatially difficult to resolve. Based on an interview with former ward councillor Shadrack Mkhonto in 2022, K206 residents and Alexandra municipality were still in negotiations to try and detangle allocation and tenure challenges of the project in order to establish formal titling for residents within the project. This formalization of title or tenure has been made particularly difficult based on the incremental extensions and investments of tenants within the scheme. According to Mkhonto, relocation of tenants to alternative accommodation is not an option based on the legal claims of tenants backed up by the spatial implications of their incremental investments (Mkonto, 2022).

The K206 housing project took a radical approach to ISU through its innovation of housing allocations and tenure in ISU. This radical approach responded to accommodate the diverse range of informal settlement residents through the block-by-block approach and in doing so also innovated for a mixed tenure system in ISU (both affordable rental and ownership) in order to respond to the on the ground issues. At the time, this made a valuable contribution towards resident's needs. However, this radical response did not take into account the history of tenure insecurity in Alexandra and South Africa at large, and with it the hierarchies of tenure that were created through the tenure allocation and which became socially problematic. Residents attributed a perceived security of tenure, seemed to exercise their right to own their homes by spatially enacting these perceived rights through incremental extensions. In the

end, this made a positive impact on stabilizing the social environment. Contrary to expectation, tenants who had a less secure tenure than owners, were more likely than owners to incrementally extend their houses.

4.8 Discussion

The paper examines empirically how perceived security of tenure exercised through incremental housing extensions mitigated the social conflict in the K206 project caused by Informal Settlement Upgrading (ISU) block by block relocation structured by housing eligibility requirements and the associated tenure allocation policies.

The findings indicate that housing allocation processes significantly affect residents' perception of tenure. More importantly, when housing allocation processes are mistrusted by residents, they may develop a perceived security of tenure and assert their agency by self-allocating and taking ownership of property without legal documentation. Despite the project's aim to address residents' needs through radical allocation and tenure systems, such as block-by-block allocation and mixed tenure approaches to cope with different eligibility requirements by residents, the actual process turned out much more complex than expected and delivered quite some social tensions between original owners and original tenants.

In practice, the proposed mixed tenure and applying this in the dwelling allocation system were rejected by the original tenants. The mixed tenure systems of combining affordable rental and ownership were based on the limitations of South African housing qualifying criteria and limited state-subsidized housing tenure options. The perceived tenure of residents, spatially exercised through incremental housing as if tenants were homeowners, emerged as a strategy for insurgent urbanism employed by residents to address perceived housing and tenure allocation injustices. Surprisingly, the tenants with the least secure tenure in the scheme exercised a higher level of perceived tenure than that of owners, if the spatial demonstration through incremental extensions is taken as proxy for the level of perceived tenure security. This could be based on tenants having more household income than owners, or this could be an insurgent response to assert their perceived ownership over their inhabited properties. Given that these empirical findings of a relationship between perceived tenure security and housing extensions as well as the causes are based on one case study, further research will be needed to delve deeper in motivations and causes of agency.

The study not only exposes the limitations of South African housing qualifying criteria and tenure options in state-subsidized housing, but also therefore demonstrates how perceived security of tenure can serve as a remedy for problematic allocation and tenure systems where countries have a strong right to housing. The study underscores the necessity for improved housing allocation and tenure systems in ISU, showcasing the negative consequences that arise from perceived unfair housing allocation by residents on the informal settlement communities that the state aims to uplift. It is also important to consider context, as perceived security of tenure seems to be closely tied to national housing laws. This study specifically focuses on South Africa, a country with strong rights advocacy for individuals with insecure tenure. Therefore, certain actions and decisions of residents may be more applicable to countries in the Global South with similar legal structures.

4.9 Conclusion

Within the conversations on housing processes at ISU, the paper explores the following research question:

— **"How does security of tenure relate to incremental housing extensions in the K206 project?"**

This study reveals that residents' perceived security of tenure in the K206 project. Surprisingly, according to the spatial mapping exercise in which the extent of incremental extensions applied were used as proxy for resident tenure security, interview results and drawing from South Africa's legal right to housing, K206 tenants appeared to have based their incremental extensions on their strong perception of tenure security. This mode of operating had the potential to mitigate social conflict caused by disputed housing allocation and tenure allocation policies. The observed tenant behaviour improved the governance outcomes in the ISU process when housing allocation and tenure systems had failed to cater for equitable housing outcomes for all relocated residents. This new and promising upgrading approach did not work in practice as relocation via block-by-block meant qualifying and non-qualifying residents were collectively allocated housing. Non-qualifying households were given no choice but to become tenants. Tenants felt they had been treated unfairly by the allocation system. Allocation as a governance structure had a negative impact on the neighbourhood resulting in social unrest.

Despite their lack of secure tenure and contrary to expectation, when the policy was designed, tenants refused to pay rent and exercised their perceived security of tenure through incremental extensions possibly as a form of insurgent urbanism to assert their perceived right to own their inhabited residences. Tenants were more likely to incrementally adapt their homes than owners based on either higher incomes or as an insurgent response to (consciously) resolve the housing situation caused by the block-by-block housing allocation system and rigid state housing tenure options (either owning or renting). This spatial response of incremental extensions by tenants has made formalization of tenure within the development more difficult to resolve and may have increased the chances of tenants receiving a more secure tenure within their inhabited areas in the longer run.

These findings contribute to international discussions on housing allocation and tenure security, highlighting how incremental housing can serve as a user-initiated tool for achieving fairer outcomes in situations where housing allocation and tenure security are disputed. It contributes in two ways to the insights on the relationship between governance and spatial design. First, the case study shows that a promising resolution for block-by-block housing allocation in ISU may not be successful by itself, when state tenure and housing qualification regulations make it difficult to resolve without enforcing hierarchies of tenure. Second, the study employs an architectural method of mapping to identify spatial manifestations of incremental extensions as proxy for tenure security. This mapping overlayed with tenure allocations assisted in understanding perceived security of tenure dynamics (governance and social science outcomes). The paper argues that these spatial observations of the built environment (through incremental housing) can be a clue to understand the levels of security of tenure (social science aspects) of a particular area.

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5 State Subsidized Housing Designed for Income Generation

The case of K206 Housing in Johannesburg

ABSTRACT State-subsidised housing in the Global South often receives criticism for failing to meet the economic needs of low-income citizens. The K206 housing project, situated in Alexandra, Johannesburg, stands out as a unique case by not only addressing housing requirements but also addressing the economic concerns of its low-income homeowners. This response included the incorporation of state-initiated formal built-in rental rooms and provisions for incremental extensions to support income generation. This paper aims to explore both of these options that allowed residents to use housing as a means of income generation and examine household strategies and the motivations behind using these options for extra income. Twenty-one resident interviews and spatial analyses provided insights on how the K206 housing facilitated income-generating opportunities for its residents and analysed whether households capitalised on these opportunities and the factors influencing their decisions to do so. The findings were that state-built in backyard rooms did not generally work for income generation due to poor allocation strategies that caused conflict. Incremental extensions, even in unintended locations, proved more effective for generating income. Incrementally added backyard rooms served multiple purposes and had the potential to generate income to address cash shortfalls, contribute to pension plans, and facilitate investments.

KEYWORDS State Subsidized Housing, South Africa, Income Generation, Incremental Housing, Mixed Housing Tenure

5.1 Introduction

In addressing poverty among low-income residents in the Global South, state-subsidised housing has been recognised as a pivotal strategy (Charlton and Kihato, 2018; Gilbert, 2004; Magalhães et al., 2016; Salcedo, 2010; UN-Habitat, 2014b). While such housing has been associated with improvements in residents' lives (Gilbert, 2004; Moser et al., 1998), it has not necessarily directly elevated residents' income (Greyling, 2009; Riley et al., 2001). Income generation becomes particularly critical in the South African context, where a staggering 33% of the labour force is unemployed (STATSSA, 2023). In South Africa, the fully- subsidised Reconstruction and Development Programme (RDP) provides better-quality housing with essential services for low-income families. However, this housing does not guarantee access to resident income-earning opportunities (Charlton, 2018; Greyling, 2009; Lemanski, 2011; Napier, 2005; Robins, 2002). Allowing for income-generating opportunities has become a challenge, as some South African RDP beneficiaries have been known to even go as far as to prematurely sell their homes below market price in order to get access to cash flow (before the stipulated eight-year mark). Alternatively, they moved back into informal shelters while renting out their state-subsidised housing in response to not having alternative income-generating opportunities (Charlton, 2013; Lemanski, 2011; Manomano et al., 2016).

State-subsidised housing for low-income residents is well documented, particularly in the Global South (Charlton, 2013; DoHS, 2004; Moretti et al., 2015; Salcedo, 2010; van Gameren and Tola, 2017). Research also delves into incremental housing, defined here as the gradual extension of existing housing over time (Aduwo et al., 2013; Shiferaw, 1998; Mota, 2021; Wakely and Riley, 2011), and the economic benefits it presents for residents (Bredenoord and van Lindert, 2010; Cities Alliance, 2011; Gough and Kellett, 2001). Furthermore, a body of knowledge discusses how housing has the potential to generate additional income through home-based businesses. This underscores that proactive residents can use their housing to augment household income (DAG, 2020B; Gough et al., 2003; Moser et al., 1998; Sinai, 1998). Importantly, the existing studies on housing and income generation do not specifically address state-subsidised housing projects.

In the context of South Africa, conversations regarding the income-generating potential of housing primarily revolve around user-initiated incrementally added backyard rooms as a consequence of RDP housing layouts. This underscores the emphasis on the ability of backyard rooms to improve design flexibility to allow for income-generating activities (DAG, 2020a, 2020b; Lemanski, 2009; Robins, 2002). Though previous literature has acknowledged that residents independently create economic opportunities within

state-subsidised housing occupancy (DAG, 2020A; Lemanski, 2009; Mahlakanya and Willemse, 2017; Shapurjee and Charlton, 2013), limited focus has been placed on comprehending how the state can actively foster residents' income generation through housing design that facilitates income generation.

This study examines the effects of the K206 project on the income generation of its residents through answering the following research question:

— **How did residents engage with the two state-provided income-generating options of state-built rental rooms and incremental housing opportunities in the K206 project?**

The K206 project was a component of the Alexandra Renewal Project (ARP), a government initiative involving multiple ministries that sought to enhance infrastructure, services, amenities, and housing in Alexandra. As part of the ARP, various housing developments were implemented, including upgrades to informal settlements. Specifically, the K206 project aimed to improve the housing conditions and livelihoods of its residents, who were relocated from nearby informal settlements in Alexandra to the state-subsidised housing units of K206.

The research team was interested in understanding how residents engaged with the two income-generating opportunities of state-built rental rooms and incremental housing opportunities. The unique aspect of this article lies in its exploration of how residents in the K206 project had the opportunity to leverage on two types of opportunities to generate income from their homes. First, the extra rental rooms that were provided by this government initiative, next to the house for the owner, offered the innovative option with the intention for residents to generate rental income. The residents' built-in design possibilities in state-subsidised housing that incorporated opportunities for future incremental growth of the house were a second formal opportunity to be used for income-generating activities. This was unique for state-initiated housing interventions, as incrementally added backyard rooms have typically been user-initiated (Lategan and Cilliers, 2016; Mahlakanya and Willemse, 2017; Poulsen, 2010). This novel project therefore provides insights into the extent to which the intended outcomes regarding the economic status of residents were achieved through the combination of the two design options.

To produce these insights, the paper draws on an in-depth qualitative study of the K206 project, which includes seven interviews with Alexandra Renewal Project (ARP) management and leadership personnel that were involved during the policy-making and implementation phase and twenty-one interviews with the residents about the income-generating activities (in-depth interviews) that they undertook based on the incremental extensions that they realised (spatial analysis).

The following section analyses the literature on how incremental housing and state-subsidised housing in South Africa have been used as methods for income generation for their residents. The subsequent section discusses methods of data collection and analysis of the study in more detail. The section thereafter contains the spatial analysis, which explores the K206 post-occupancy unit and extracts results of the spatial expansions of the 21 units. The paper next reviews the impact of the incremental outcomes of units on residents' income. Finally, before the conclusion, the paper examines residents' motivations and barriers to using incremental extensions, as well as their income-related outcomes.

5.2 Turning Low-Income Housing into Money Generating Possibilities

5.2.1 Incremental housing and income generation strategies for low-income residents in the Global South

Incremental housing amplifies opportunities for income generation. It does so through providing the option to extend housing over time, which can be particularly useful in low-income areas in the Global South (Mota, 2021; Park et al., 2019; Van Noorloos et al., 2020; Wakely and Riley, 2011). Incremental housing offers opportunities for flexible housing finance and design. Additional rooms built over time can also be used for income generation for residents.

Incremental housing operates as a dynamic approach, enabling individuals to actively engage in constructing their homes at specific development stages, potentially leading to superior quality and more scalable housing processes (King et al., 2017; Van Noorloos et al., 2020) for low-income housing development. Incremental housing also offers opportunities for flexibility, diverse housing finance options, effective management, development governance strategies, and socio-economic improvement (Hwang and Feng, 2019; Wainer et al., 2016; Wakely and Riley, 2011).

While the financial flexibility for low-income populations may pose challenges, the long-term incremental approach proves to be a healthier and more cost-effective development model. Serving as a catalyst for socio-economic development and household income improvement, incremental housing creates job opportunities and avenues for savings (Wakely and Riley, 2011). The flexibility of incremental housing allows residents to adapt their spaces for physical, commercial, and home-based businesses, including constructing additional rooms for rental earnings (Bredenoord and van Lindert, 2010).

Importantly, incremental housing provides financial empowerment, eliminating the need for substantial loans with high interest rates, relieving financial pressure, and allowing residents to develop spaces at their own pace (Bredenoord and van Lindert, 2010). Incremental projects can serve as a family's financial asset, offering opportunities for investment, a return on investment in the long run, and a potential escape from poverty cycles, contingent upon secure tenure and durable housing quality (Bredenoord and van Lindert, 2010; Jimenez, 1983).

In South Africa, the most common form of incremental housing is so-called backyard rooms. These are a form of low-income incrementally built informal housing built in plots adjoining formal housing for the socio-economic gains of formal house owners. The nature of low-income state-subsidised houses with backyard rooms is inherently incremental, serving as later additions to existing formal houses. The South African incremental backyard model has the potential to keep up with the much-needed housing provision and decrease the immense housing deficit (DAG, 2020a, 2020b; Robins, 2002; Shapurjee and Charlton, 2013), as well as provide much-needed income generation options in a country with high unemployment rates (DAG, 2020a; Scheba and Turok, 2020; Shapurjee and Charlton, 2013; STATSSA, 2023). Similar developments in other regions, such as examples in Colombia explored by Gough and Kellet (2001) and compound houses in Ghana (Asante et al., 2015), exhibit opportunities to facilitate income generation for low-income landlords. This underscores the widespread prevalence and benefits of incremental development in informal, low-income rentals across the Global South.

5.2.2 State subsidiSed housing and income generation for low-income residents in South Africa

State-subsidised housing initiatives have played a pivotal role in poverty alleviation strategies in the Global South. Typically concentrating on housing provision, finance, or economically driven interventions, these programmes aim to uplift low-income communities. However, little attention has been given internationally to assessing the income-generating potential of the housing itself (DoHS, 2004; Haregewoin, 2007; Roitman, 2016). In South Africa, housing has been viewed as a means of economic upliftment, contributing to economic growth, job creation (construction of houses provides short-term jobs for communities), and sustainable human settlements (Huchzermeyer, 2001; Lombard, 1996; Rust, 2018). However, the provision of housing does not directly improve the household income of the residents who receive this housing. While RDP housing has provided accommodation for low-income citizens, mere possession of a house does not guarantee an improvement in economic status. Some RDP beneficiaries resort to selling (before the stipulated 8-year mark) or informally renting out their homes due to the dearth of alternative income-generating opportunities in the vicinity of government-subsidised housing (Charlton, 2013; Lemanski, 2011; Manomano et al., 2016). This raises critical questions regarding the efficacy of housing policies in directly addressing the economic challenges faced by low-income populations (Charlton and Kihato, 2018; Gilbert, 2004; Lemanski, 2011; Manomano et al., 2016).

Despite the challenges they face, residents have taken the initiative to create income-generating opportunities by adding backyard rooms and gradually expanding their fully subsidised homes with self-contained units. The term “backyard rooms” encompasses additional rooms added to formalised houses either for rental income or to accommodate the needs of the core family. Originating from pre-apartheid times when such rooms were discreetly built in the backyards of formalised houses, the concept has evolved post-apartheid to be more widely accepted, encompassing housing extensions for family needs or income generation located anywhere on a user’s site. Although these backyard rooms exemplify user-driven innovation, they remain insufficiently acknowledged and supported by the government, as noted in various studies (Lategan and Cilliers, 2016; Mahlakanya and Willemse, 2017; Poulsen, 2010; DAG, 2020A; Scheba and Turok, 2020; Shapurjee and Charlton, 2013).

In conclusion, this section highlights the nuanced relationship between state-subsidised housing and income generation for low-income residents in South Africa. It emphasises the need for a more comprehensive understanding of the economic dynamics within subsidised housing programmes to ensure sustained improvement in the economic status of beneficiaries.

5.3 Methods

The investigation embraced a case study methodology, with a focal point on the K206 project. A variety of research methods were used, including an examination of the project's background and first-hand accounts from residents regarding income-generating opportunities stemming from their homes. The main goal was to reveal how the introduction of two additional formalised backyard rooms and incremental housing allowances could function as a mechanism for fostering economic empowerment among the residents.

The research investigation involved comprehensive data gathering from academic sources, newspaper articles, legal proceedings, and interviews with seven key management and leadership personnel. Between September 2020 and August 2022, seven interviews were conducted with personnel from the Alexandra Renewal Project (ARP) and K206 leadership. These interviews aimed to provide insights into the governance frameworks and on-the-ground implementation realities of the project. These interviews, audio recorded, approved, and transcribed, included respondents who agreed to be listed by name. Academic sources and legal documents were consulted to extract background knowledge about the project, providing context on governance structures and design insights for the units. This information guided an understanding of post-occupancy unit design outcomes.

To delve specifically into household income aspects, in March 2021, interviews were carried out with 26 residents, and their 26 housing units were drawn up and analysed to assess the extent of incremental development. 21 of these houses were type 1 units. A total of five units were excluded from the study due to their typology lacking two rental rooms and designed incremental allowances. The selection criteria for interview respondents required them to reside in homes within the K206 project that had undergone incremental extensions since the project was completed in 2010. All interviews were conducted with residents that had lived in the development since 2010. Resident households ranged from two to 18 people (including rental room tenants) within a dwelling plot.

Spatial analysis techniques were employed, entailing thorough surveys of the buildings, illustrating the gradual expansions of residents' homes over the years. Drawings of 21 type 1 unit houses were created to highlight the spatial changes that occurred over time. Additionally, the motivations behind these alterations were documented, including whether residents were driven by income-generating reasons for the extensions.

Efforts were made to interview a diverse group, representing various unit types and ensuring an even distribution across the 28-hectare footprint of the K206 project. Recruitment was facilitated in collaboration with a local NGO, using methods such as advertising flyers, word of mouth, and, in some cases, the snowball method. All interviews were audio recorded and transcribed for analysis. Informed consent was obtained after residents were briefed on the project's background. The interviews, lasting between one and a half hours, were conducted in languages comfortable for the residents, predominantly isiZulu, isiPedi, and English. A translator was used for isiPedi interviews. Respondents shared insights into their incremental extensions motivations, timelines, and their correlation with household income. Interviews were transcribed in English and manually coded to systematically analyse data, focusing on themes of income generation and incremental expansion. Additionally, each unit was digitally drawn and spatially analysed using various architectural methods to understand its expansion over time and how the home expansion was put to use.

5.4 Case study: The K206 Housing Project in Alexandra Township, Johannesburg

The K206 housing project in Alexandra Township, Johannesburg, is an example of a housing project where the state actively encouraged residents' income generation to counter poverty. Despite Alexandra Township being located only three kilometres away from the Sandton CBD, Africa's richest square mile (Bohn, 2017), 52% of the population is not considered to be employed. K206 was part of the Alexandra Renewal Project (ARP), as a special (still unique) presidential project that aimed to implement solutions for economic empowerment among other objectives (Albonico, personal communication, June 28, 2022; ARP, 2009). The K206 project consisted of 2924 units in total. Ninety percent of the development comprised of type 1 units, which by design enabled rental income generation from the outset as the units included two built-in rental rooms. Units of types 2 and 3 constituted a minority within the project, characterised by an alternative design approach that did not include deliberately integrated built-in backyard rooms or planned incremental features. The rental rooms of the type 1 units came with 5-year formal rental agreements. The monthly rent was subsidised and formally capped at R350/€20 per room (PPSA, 2014).

In addition to the two built-in rental rooms, K206 type 1 units were designed to accommodate incremental expansions by owners to extend homes for future income generation, as elaborated in the case study section. Over an 11-year period, over 80% of all the units were incrementally extended.

The K206 project was tailored to address the income generation needs of Alexandra residents, distinguishing it from other housing initiatives. Its design, which included provisions for incremental expansions and two built-in rental rooms specifically integrated into the project, rendered it particularly distinctive. These distinctive attributes will be examined further in the following section.

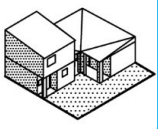
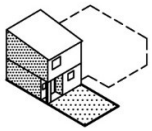
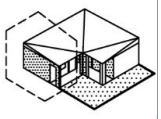
5.5 Housing Unit with Built-In Rental Rooms and Incremental Extension Opportunities

The K206 unit (as seen in Table 5.1) was originally designed to offer a double-storey 43-m^2 house along with two additional rental rooms for qualifying residents. This state-subsidised housing model aimed to cater to both qualifying and non-qualifying residents (residents that did not meet housing criteria). Alongside the provision of two rental rooms, the type 1 unit was also facilitated for incremental growth.

In contrast to the initial plan of relocating non-qualifying residents to the affordable type 1B rental units, as seen in Table 5.1, the actual outcome deviated from expectations (Baskin, personal communication, December 1, 2021; A. Szalovitz, personal communication, March 29, 2022). Instead of serving as long-term, low-rent accommodations for non-qualifying residents and generating rental income for the property owner, the majority of tenants, in most cases, declined to pay rent and assumed a de facto ownership role of the rental rooms. (K206 Tenants Association Representatives, personal communication, March 21, 2020; S. Mkhonto, personal communication, August 5, 2022; Siso, 2012; PPSA, 2014). Key reasons for this included perceptions about the legitimacy of the allocation process, and the allocation process was viewed as unfair (S. Mkhonto, personal communication, August 5, 2022; Siso, 2012).

Eventually, the pressure against unfair allocation resulted in tenants informally taking ownership of their units, resulting in unit type 1 being divided into types 1A and 1B in the cases where type 1 owners chose to have tenants, as illustrated in Table 5.2. Among the 21 cases examined, only one (Respondent 23's unit) adhered to the original plan of using the type 1B unit, built by the state, to generate income for the household residing in a type 1A unit. In contrast, all other households either maintained their entire type 1 unit without using it for rental income generation or, similar to Respondent 3, employed room extensions for home-based enterprises. Initially, the remaining type 1 units did use their type 1 units for renting out the type B units, resulting in the type B units being taken over by tenants in terms of ownership. This also resulted in rental prices of the development being uncapped from R350 and landlords' asking price being left to their own discretion.

TABLE 5.1 K206 post occupancy unit types and incremental housing potential (post-occupancy) (Author, 2024)

House Type	Size of plot	Size of Subsidized House built by state	Built in Design features to encourage incremental growth	Opportunity to Incrementally Expand
K206 Unit type 1 	Approximately 86 m^2	40 m^2 two bedroom, double storey house with appending single storey 2 bedrooms and bathroom	Yes	Yes, due to design of unit that allows for incremental expansion (even vertically)
type 1A 	Approximately 43 m^2	40 m^2 two bedroom, double storey house	No	Yes in remaining plot space in front of house
type 1B 	Approximately 43 m^2	(Appropriated by original tenants) single storey 2 bedrooms and bathroom	Yes	Yes in remaining plot space in front of house and vertically

5.6 Income Generating Implications of Original Tenant Responses on Original Owners' Income Generation

The implications of original tenant responses were that type 1 owners who originally decided to rent out their adjoining rooms forfeited the opportunity to generate income from these rooms. Type 1 units are roughly made up of a 50/50 split in size between double-storey and single-storey portions, and therefore, a large majority of type 1 owners (with the exception of Respondent 23's unit) essentially lost ownership of 50% of their plot and thus halved their opportunity for incremental expansion and income generation. The outcome was the complete opposite of what had been intended. Despite how this worked out for original owners, the 50/50 split provided original tenants with housing and the opportunity to incrementally expand and create income through these expansions, which was the end result in many of these cases.

Owners were located in double-storey dwellings, and incremental extensions had been designed for above the rental rooms. The opportunity to expand vertically became much more difficult for type 1A owners. The original tenants, now de facto owners (type 1B residents), had more opportunity to vertically expand.

If the motivations to rent out adjoining rooms were based on the need for income, this shift also meant residents who were most in need of income lost their opportunity to generate it, while those who did not need it as much (type 1 owners that did not rent out the outside rooms) retained their assets and potential to generate income.

5.6.1 Implications of incremental housing on property rights

Incremental housing extensions made the property rights of the K206 project even more difficult. The more incremental expansions made by original tenants, the less likely original owners/landlords were to regain ownership over their entire property.

The property rights tensions substantially affected the outcomes of the K206 project; this also affected the original intention of the type 1 design. The initial design and allocation plans aimed for type 1 owners to either retain the entire house or convert it for income generation, resulting in type 1A and 1B units. However, residents faced significant pressure to rent out type 1B units due to high demand and a backlog

of available accommodation. This resulted in residents either retaining a whole type 1 unit, or with owner-tenant ownership split, they could be shifted into type 1A and type 1B units. The intention of type 1 units was to provide the option of rental housing units and structure that could allow for vertical incremental expansion as shown in Figure 5.1 (top left image). In reality, the majority of these incremental extensions were user-initiated, outside of anticipated state demarcations as shown in Figure 5.1 (right most images).

Incremental housing can also connect to income generation, as the more incrementally added rooms that are built, the more rooms that can be rented out. The case study also revealed that many of the K206 residents extended past formal plot boundaries and, in doing so, maximised the sizes of their plots, which in turn maximised on their opportunity to create income. In the case of the type 1 unit, a maximum of two sizable rooms could be built; the majority of added rooms exceeded 2 rooms (only Respondents 6, 16, 22, and 23 extended within 2 rooms). Extensions occurred in all forms of type 1 units, including type 1A units that were never anticipated by the state for expansion. The majority of these extensions took place in spaces that were not anticipated by the state as seen in Figure 5.1.

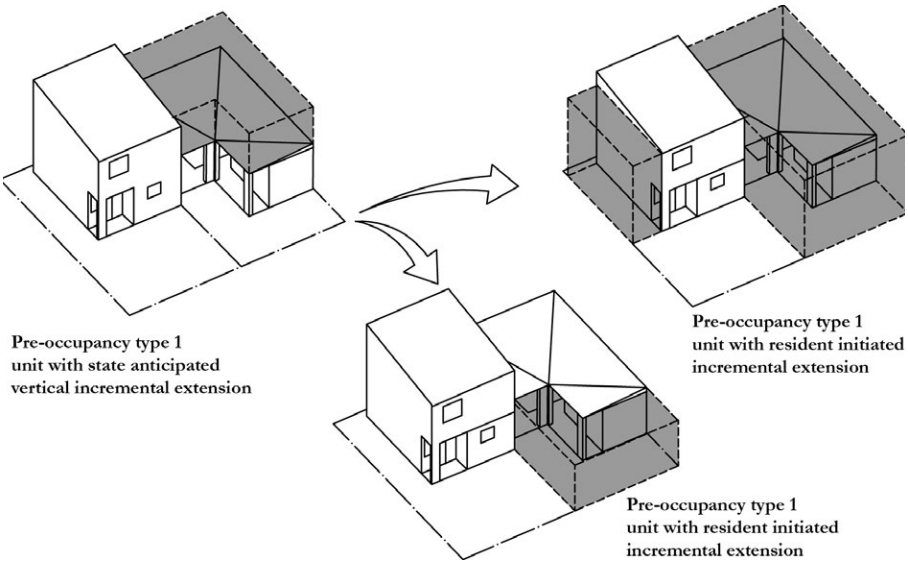


FIG. 5.1 Type 1 Original design concept with anticipated incremental extensions. Further Right: Lived reality examples of resident initiated incremental extensions

TOC

5.7 Income Generation and Motivating Factors

This section reflects on the incremental extensions of the project that were initiated by both owners and original tenants and the extent to which they resulted in income generation per unit type. It also observes the outcomes of extensions within the K206 project, be they state-facilitated extensions or user-initiated extensions. Incremental extensions in this case are built extensions that extend past the original built unit and 2 built-in rental rooms. As the previous section shows, type 1 units were originally designed to facilitate income generation and vertical incremental expansion, but due to resident-initiated extensions, these properties were also incrementally changed over time. Resident-initiated incremental expansions also took place in type 1 units. The section also examines the extent to which type 1 residents (both owners and original tenants) used state anticipative design interventions, and whether this was a practical tool for income generation. This section reviews the incremental outcomes of unit type 1 as well as how they correlate to residents' income generation.

Residents in type 1 units ranged in their household income. Residents with type 1 units and type 1B units were eligible to use state-facilitated incremental design interventions. State-facilitated incremental design interventions did not extend into unit type 1A. The area for anticipated expansion was limited, and therefore many type 1 residents resorted to expanding horizontally, as well as the fact that horizontal expansion was a more cost-effective option. Residents in the 1A units were less likely to generate income from their property due to the limited space to incrementally adapt with the exception of Respondent 19 (45 years) (personal communication, March 22, 2020) that extended the original built unit until cluster driveway. All residents extended their homes incrementally, some extended for income-generating purposes as seen in Table 5.2, and others extended their homes but not for income generation as seen in Table 5.3. The forms of income generation for residents were rental rooms, home-based businesses, or external salaries. In some cases, residents had a form of employment and subsidised income with rental rooms.

TABLE 5.2 Type 1 resident assessment of incremental extensions and how they were used for income generation. (Author, 2024)

Type 1 Units that used Incremental Extensions for Income Generation					
Type	Total Number of Respondents	Number of Units that used State Anticipated Incremental Extensions for Income Generation	Number of units that used Resident Initiated Extensions for Income Generation	Number of Units that Used a Combination of State Anticipated Incremental Extensions And Resident Initiated	Forms of Income Generation of Respondents (R)
1	2	0	2	0	R03 Home-based enterprise (HBE) R23 External salary and rental rooms
1A	4	0	3	0	R04 Rental rooms only R11 Rental rooms only R19 Rental rooms only R20 Rental rooms only
1B	7	0	4	3	R05 Rental rooms only R10 External salary and rental rooms R13 External salary and rental rooms R16 Rental rooms only R17 External salary and rental rooms R18 Rental rooms only R21 HBE
Total	**13**	**0**	**9**	**3**	

Forms of income in all units included: home-based enterprises, external salaries, pensions, rental rooms, or salary supplemented with rental rooms. State-facilitated vertical incremental expansion interventions were used by some type 1B residents; however, they were always supplemented with horizontal expansions outside of formal guidelines.

TABLE 5.3 Type 1 resident assessment of incremental extensions that were not used for income generation. (Author, 2024)

Type 1 Units that did not use Incremental Extensions For Income Generation					
Type	Total Number of Respondents	Number of Units that Used State Anticipated Incremental Extensions	Number of Units that Used Resident Initiated Extensions	Number of Units that Used a Combination of State Anticipated Incremental Extensions and Resident Initiated	Forms Of Income Generation of Respondents (R)
1	3	0	1	2	R14 External salary only R22 External salary only R25 External salary only
1A	3	0	2	0	R02 External salary only R06 External salary only R24 External salary only
1B	2	0	2	0	R07 External salary only R12 External salary only
Total	**8**	**0**	**5**	**2**	

5.7.1 Residents' motivations to use their incrementally adapted units for household income improvement

This section takes a more in-depth look at the motivations for residents to use housing incremental extensions for income generation. The main motivations for this were to make up for income shortfalls, pension income, or to eventually sell the property.

Unemployment, cash shortfall in household income and income to provide for children

Unemployment is an all too familiar circumstance for many people in Alexandra (Harrison et al., 2014). The three residents below used incremental extensions as a basis for household income generation or to supplement income because they are either unemployed or do not generate sufficient income to support their household. According to Respondent 20 (43 years) (personal communication, March 22, 2020):

People are not working so they need to add rental rooms

Respondent 4 (41 years) (personal communication, March 18, 2020) suggested other motivations:

On a personal level, me? I would like to stay inside a farm, a big space, not a congested space. I need … birds, nature. This is not my type of environment, it's for commercial reasons or economic reasons that's why I am in this type of setup… Renting is done so you can sustain yourself, this is not someone who is making a property, buying here then you go like Sandton [suggesting this is not an affluent property developer setup but rather living hand to mouth], that's not the type of place this is, this is done just to sustain a living.

When discussing the reason for building rooms and the household income in a house of five adults and one child, Respondent 17 (52 years) (personal communication, March 22, 2020) stated:

The one child went to study marketing and then when they finished they got a job at African Bank. They started for 2 months in 2018 and then from that job they helped me to build the rooms. Now my other child is studying HR. The University for my other child has been stressing me [financially]. But at least my other child had a job, but then Covid, now I'm the only one working.

Respondents 20 and 4 earn their total income from incrementally built rental rooms. As Respondent 17 is employed (only one out of six family members), between 23% and 39% of family income is from incrementally built rooms.

These narratives show that housing has offered a form of income generation for residents who have not been fortunate enough to find employment and pay for their basic needs. Respondent 17 (52 years) (personal communication, March 3, 2020) speaks of the turbulence in employment in her family that she built rental rooms because of the availability of funds that her child's income presented to the family. This income was quickly absorbed into a rental room investment that could secure a monthly stipend and contribute to household income. Covid-19 was unfortunately the reason for the eventual termination of her child's employment contract, but fortunately, during the time of employment, the available funds were used as a safety net for longer-term remuneration.

Respondent 20 (43 years) (personal communication, March 22, 2020) reinforces the scarcity of jobs and suggests that the reason why many K206 residents build incremental extensions for income generation is because it is the only resource they have to generate income. The potential to earn rental income made Respondent 4, a migrant worker (even if work is being a landlord), move to Johannesburg, even though he still identified his true home in his home town of Tzaneen. He was accruing income in Johannesburg, but his ultimate plan was to return to Tzaneen with the wealth he had amassed. This situation aligns with the findings of Marais et al. (2021), where individuals employed in urban environments accumulate wealth with the intention of later investing in and developing their homes in rural areas, eventually relocating back to those rural areas instead of opting for a complete move to urban centres.

With relation to income, some residents used incremental extensions to increase household income for the future of their children to make up for cash shortfalls in the household. As is seen in the following excerpt where Respondent 4 (41 years) (personal communication, March 18, 2020) explains the reason why he has invested in his house and why he will not sell his house in the future:

Yes, for our kids, for instance … now I am not working, so, those rooms are going to allow my kids to go to school, and do what they need as kids … I won't sell it [the house], this [house] is my kid's career.

None of the five household members in Respondent 4's household are working. Therefore, other than any possible welfare assistance, 100% of Respondent 4's household income comes from the incrementally built rental rooms.

Respondent 4's narrative illuminates the long-term aspirations that many of the residents have for their families. This particular extract and the use of the terminology of "career" suggest a twofold meaning. It speaks to the fact that the rental units offer opportunities for income generation that can be used to financially support their children and their needs as dependents, but also to how, in the long run, the rental units offer potential careers for their children to inherit these homes and become landlords themselves. The intention and long-term motivations behind investing in their incremental home rentals are for an increase in household income to better the lives of their children.

Pension

While some residents were building for their children and families, other residents wanted to enjoy their money during their retirement. In these cases, incremental extensions are used to increase income to save for their retirement. Respondent 10 (43 years) (personal communication, March 20, 2020) explains the reason why she does not want her daughter to have a child until she can financially look after it herself. For example, respondent 10 explains how she will move back to the rural areas and live on rental income during her retirement.

When will I rest? [When explaining the reason she is investing in the building] One day I am going to get old and I will go for a pension. One day I can rent it all and go home! [Her hometown village]. I will stay at home, and collect the rentals … you see, people will pay rent and I will stay at the village, you see, for pension.

Between 38 and 56% of Respondent 10's household income (two employed household members) comes from the incrementally built rental rooms. Respondent 10 has invested in rental rooms that will generate monthly income when she retires. Another interesting observation is the investment in the quality finishes of the property. Respondent 10 has over 10 years before she reaches retirement age; this could be the reason why she has created such a quality product for her tenants. Many other residents have invested in the bare minimum for their rental rooms, but Respondent 10 has invested in quality materials, including high-end tiling and aluminium windows, for her tenants for long-term benefits.

For Sale-Investment

Not all the residents in K206 aspire to take root in the development for the long term. Some are incrementally developing their property for its resale value. When asked about the reasons for investing in her house, Respondent 13 (39 years) (personal communication, March 20, 2020) mentioned her aspiration to eventually sell her property:

Obviously maybe after some years I'm selling so I'll be able to buy another big house that has a yard.

Apart from the erratic income that comes from her events business, 100% of Respondent 13's household income comes from the incrementally built rental rooms. Units C, C1, and C2 have smaller yards than type a and b units; this could be a reason why Respondent 13 in a type 3 unit would like to move on from the property in pursuit of a 'bigger yard'; however, with supplementary municipal land, Respondent 13 occupies a larger stand than most at 217 m^2. She also spoke of the inconvenience of the small driveway and lack of privacy, so perhaps the access to the site is what is most influencing this statement. In all, Respondent 13 sees her property as a nest egg and stepping stone to being financially equipped to move to greener pastures.

It is also important to note that there is a grey area around the selling of RDP houses and how much one can earn by selling RDP houses. RDP housing can be sold back to a willing party, but it is not clear if residents incrementally adapt these homes or whether incremental developments will significantly increase the value of their properties. The sale of these houses will most likely be quite complex due to the lack of title deeds in the project (S. Mkhonto, personal communication, August 5, 2022).

5.7.2 Barriers to using incrementally adapted units for household income improvement

In the previous section, we have discussed three reasons the residents invoked to use their units to generate income. This section elaborates on the deterrents of using incremental extensions of homes for income generation. These residents adapted their homes incrementally as an investment for their family or because they did not have alternative accommodation and needed to adapt the home to their needs.

Tenure insecurity and owner-tenant tensions

As outlined in the preceding sections, particularly concerning post-occupancy unit design and property rights conflicts, the confusion arising has resulted in tensions among neighbours. These tensions hinder the ease of incremental expansions, thereby discouraging residents from incrementally extending their homes for income generation. When asked about whether residents are happy with their housing, Respondent 22 (49 years) (personal communication, March 23, 2020) explained:

I doubt, it is because there was a miscommunication between housing and the people because the rentals they were told that, after 5 years they need to start paying rent [as explained in K206 Project overview], which to them wasn't fair, they said they must wait 5 years to change the houses … even now, it's not resolved, people are not happy. [When asked why they don't have tenants] They [government] didn't give you options [to have tenants] to prove your case, so with us it was because of the family [the reason they received the housing grant]

Respondent 22's perception of the K206 project has clearly been jaded by the tenant-owner tensions. She feels that people are not happy with the housing situation, similarly to Respondent 2 (41 years) (personal communication, March 18, 2020), who had an overall negative perception of the community based on the history of the development. Respondent 12 (41 years) (personal communication, March 20, 2020) also commented on the compact nature of the cluster and the fact that neighbours could look into each other's spaces and comment on incremental developments. When asked if there was a way to improve privacy, the respondents answered "It's difficult." There appeared to be a lot of tension that had developed over the years between the 'former tenant' respondent and her neighbour; she shares the same yard as her neighbour.

The insecurity stemming from tensions between owners and tenants has posed challenges for some individuals looking to develop rental properties in the area. There is a fear that tenants might assert ownership claims over their rental properties, as has been historically experienced in the project.

Not enough space to cater to the size of family

The issue of a lack of space is also apparent as Respondent 6 (45 years) (personal communication, March 19, 2020) explains that she has not invested in rental rooms but would do so if there were more space:

Ja, because I don't have space ... My daughter plays on the pavement. At the washing line, we have to take chances hanging our clothes. [When asked about whether they want to build rental rooms] Not to say I don't want, but for me, if it were a bigger space I'd have rooms.

The statement shows the willingness of some residents to use their homes for household income generation; however, due to a lack of space, they feel they cannot.

Respondent 12 (41 years) (personal communication, March 20, 2020) saw her staying in the space as an act of survival as there was no other alternative for her and her family, and therefore was adapting her home to meet the spatial needs of her family.

In all, the lack of space to cater for size of family based on unit type and owner-tenant tensions became the main barrier of incremental expansion for income generation.

5.8 Assessing the Impact of the K206 Project on Residents' Wallets

This section delves into the broader context of resident decisions regarding incremental extensions (as discussed in the previous section) and housing types (covered in the section on design options and incremental extensions). The aim is to unpack the spatial outcomes of incremental expansions and analyse their impact on household income generation.

All residents, except those in type 1B, qualified for housing, placing them within the 0-R3500 (€200) household income bracket at the project's inception in 2010. Figure 5.2, summarised here, reveals that numerous households managed to surpass their initial income bracket during the 11-year span. Residents who did not engage in incremental home adaptations for income generation experienced an increase in household income through external employment (see the section on incremental extensions and income generation). In contrast, residents who used their homes for income generation, either supplementing household income or transcending the initial bracket, invested significantly in incremental extensions.

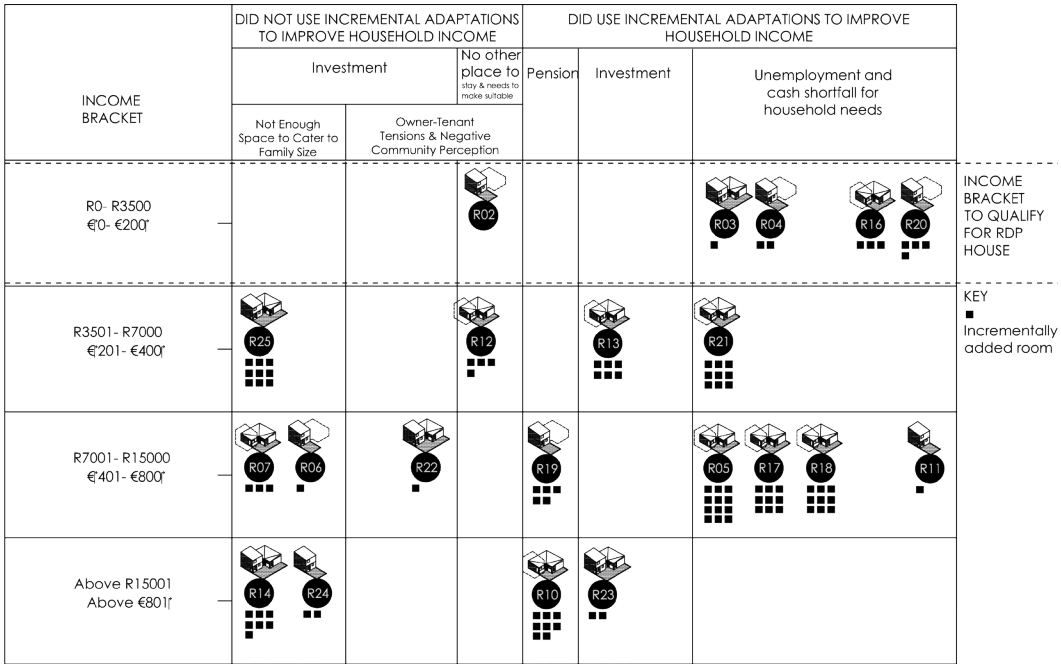


FIG. 5.2 Classification of residents' motivations to improve household income through incremental interventions. The graph depicts household income, unit type and number of rooms added incrementally (drawn as squares below each respondent)

Those who invested in incremental extensions but remained within the initial income bracket often faced constraints such as limited plot size or engaged in unprofitable home-based businesses rather than rental rooms. Notably, respondents like Respondents 10 and 18, for example, who generated income through a salary, were able to construct more incremental rooms than those solely reliant on room rentals. Higher income allowed these residents to invest more in constructing higher-quality rooms, thus commanding higher rental fees from tenants.

The size of the plot emerged as a critical factor influencing potential rental rooms and income generation for all unit types. For residents not using their homes for income generation, a larger plot facilitated more incremental extensions catering to family needs. Respondents 18 and 5, situated in higher income brackets, generated their entire income from the surplus of rooms facilitated by their large plot size. Larger plot sizes allowed residents to construct more rental rooms, thereby increasing their income.

The project's outcome significantly deviated from the envisioned incremental development. However, residents surpassing initial plot extents presented an unforeseen opportunity for greater economic development. Resident-initiated

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incremental development provided increased prospects for income generation, even beyond the initially anticipated incremental development.

From the residents' perspective, state subsidised housing seemed to offer a viable avenue for income generation and income bracket elevation. However, substantial resident-initiated incremental interventions, often exceeding formal state demarcations, proved crucial for generating significant household income.

5.9 Conclusion

The K206 housing project was intentionally crafted to promote income generation for residents' right from its inception. It represented a significant and unique state-led effort to tackle the prevalent unemployment issue in Alexandra, a factor often overlooked in state-subsidised housing initiatives in South Africa. The case study integrated features enabling immediate rental income and potential future expansion through incremental additions by homeowners. This case study provides insight into the dynamic relationship between low-income housing project design, incremental extensions, and income generation, aiming to answer the question: How did residents engage with the two income-generating options presented to them by the state (analysed spatially), and what were the income-generating outcomes for residents based on how they engaged with the income-generating options presented to them? (explored through in-depth interviews) in the K206 project?.

The study delves into how residents used formally built backyard rooms and incremental provisions as strategies for income generation, as shown in Figure 5.3. It highlights that while the state's provision of quality-built rental rooms alongside residences aimed to facilitate income generation for low-income earners, the majority of units were taken over by tenants not paying rent, hindering the original owners' income opportunities. This indicates that the strategy for state-subsidised built-in units did not effectively generate income due to poor allocation strategies. Moreover, residents used both state-initiated and user-initiated expansions to generate income, with plot size significantly influencing expansion potential. Original tenants who acquired experienced increased opportunities for incremental expansion and income generation compared to original owners, emphasising the complexities of state interventions and resident-driven initiatives in income generation strategies.

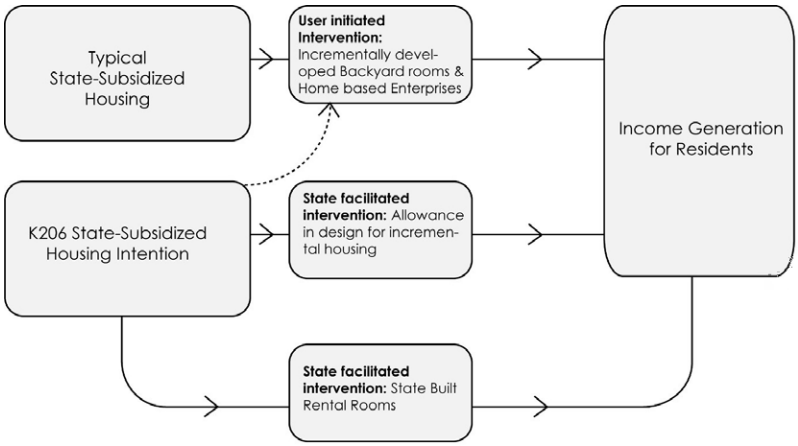

FIG. 5.3 Summary Mindmap illustrating the interplay of state funded rental rooms, Incremental housing in Income generation for residents in the K206 project

Income generation for these residents came from a number of diverse income sources, including external salary, home-based business, rental rooms, or combinations thereof. Income levels also influenced rental room quality, with higher-quality rooms commanding higher fees. Motivations for using incremental housing for income generation stemmed from high unemployment rates and limited income opportunities. Residents adapted homes incrementally to meet various household needs, such as improving children's lives, securing future pensions, and investing for potential property sales. Deterrents to using incremental extensions for income generation were rooted in broader policy structures, including owner-tenant tensions and plot size considerations.

In summary, both state-sponsored initiatives for constructing backyard rooms and considerations for incremental design yielded mixed results in generating income for residents. While dissatisfaction of tenants prevented many original owners from benefiting from the rental income of formally built rental rooms, incremental provisions proved to be more successful in the project. The majority of residents extended their homes incrementally, often beyond the originally anticipated scope as shown in Figure 5.3. These extensions, though not initially planned by designers, provided opportunities for original owners to earn income from their incrementally built units. Additionally, they offered chances for original tenants to expand their homes and generate income from the incrementally added units.

This paper contributes to the literature on income generation for low-income households in the Global South and the practical feasibility of achieving this through state-subsidised housing with government-facilitated options for income generation for residents. While formalising income-generating opportunities through state-subsidised housing holds promise, careful consideration of the implementation process, especially regarding property rights implications and tenant reactions, turned out to be crucial. The case study illustrates how incremental housing can offer emancipatory opportunities for self-initiated transformations and income generation, representing a positive step beyond merely meeting housing needs. However, it also underscores the importance of the institutional environment and prompts further research on the intricate workings of income generation mechanisms, along with advocating for a government assessment of policy effectiveness.

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6 Conclusion

6.1 Introduction

Academic studies on low-income housing often remain confined within singular disciplinary lenses, resulting in fragmented understandings that miss the benefits of interdisciplinary approaches. This limitation hinders comprehensive insights needed to address the global housing crisis. Despite the evident research on low-income housing in South Africa, similar disciplinary silos prevail, restricting holistic insights into low-income housing challenges. Addressing these issues requires an interdisciplinary approach that integrates perspectives from a number of disciplines.

This dissertation has embarked on a journey to transcend disciplinary confines by examining the interplay between spatial design and governance in the context of low-income housing. The case study has explored the chapter themes of the context of Alexandra, resident- responsive design, tenure security and income generation. The projects aims, spatial design instruments and resident responses necessitated an investigation that goes beyond a singular disciplinary approach. This exploration has happened through the double lens of governance and spatial design for a more interdisciplinary understanding of the project and low-income housing at large. The areas of low-income housing literature that have been explored are specifically informal settlement upgrading, state-subsidized housing and incremental housing. The methods employed for the study include interviews and spatial analyses.

The study asks the following research question:

— **How can a double-lens approach to spatial design and governance improve our understanding of low-income housing in South Africa?**

By addressing the central research question and its associated sub-questions, this study aims to provide nuanced insights that can inform the development of more effective and holistic solutions to the complex challenges faced by low-income communities.

6.2 Research Approach, Design and Methods

This section provides an overview of the primary findings from each of the four main chapters of the dissertation, with each chapter dedicated to one of the research questions and themes outlined in Chapter 1.

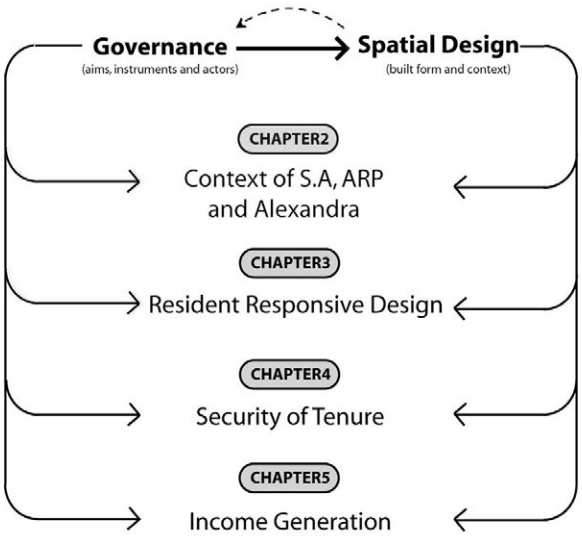

FIG. 6.1 Exploration between governance and spatial design in the K206 housing project within this thesis

Figure 6.1 provides an overview of the dissertation's structure, illustrating how each chapter fits into the relationship between governance and spatial design. Initial desk research indicated that governance structures, as seen in the K206 case, precede and shape spatial design outcomes. Other less overt explorations suggest spatial design can also influence governance (Collier and Gruendel, 2022; Kumar-Nair and Landman, 2023). The rest of this section will offer a brief overview of the research approach, design and methods employed in the dissertation. It will also conclude on the discussion of the relationship between governance and spatial design. Real life outcomes show that the relationship is more complex. The rest of this section will offer a brief overview of the research approach, design, and methods employed in the dissertation.

Chapter 2 explores both governance and spatial design structures in the case study area; it presents an overview of the policies and contextual background that are relevant to the Alexandra K206 project. By desk research and interviews

with experts, the chapter explores Alexandra's socio-political, economic, housing dynamics, and incremental design. It also underscores the challenges in translating governance into practical outcomes, which would eventually become problematic for the K206 project.

The research methods employed in this study primarily revolve around desktop research and understanding the project concept by gathering resident responses to the K206 through interviews and spatial analyses, forming the basis for Chapter 3.

Chapter 3 investigates the interaction between governance and spatial design associated with resident responsive design. It explores how state-subsidised housing design could better meet the needs and lifestyles of low-income residents. It delves into the impact of technical housing standards and neighbourhood design norms on residents' daily lives. The shift from generic standards to context-specific design in the K206 project significantly enhanced residents' quality of life, emphasising the importance of equilibrium between technical standards and context-specific norms. The use of interviews and spatial analyses as research methods, embraces both dimensions of governance and spatial design. This section makes contributions towards designers and policy makers that would like to explore alternative housing solutions that incorporate resident-responsive design.

Chapter 4 explores the ways in which security of tenure exercised through incremental housing extensions (spatial design) mitigated the social conflict in the K206 project caused by housing and tenure allocation policies (governance). The research methods included an analysis of policy documents, interviews with experts and residents, as well as spatial analyses. This exploration includes the potential of incremental housing (spatial design) extensions in mitigating social conflict (governance) related to tenure security. However, challenges arose when rigid state tenure options conflicted with block-by-block housing allocation. The study contributes to international conversations on housing allocation and tenure security, urging further investigation into income generation mechanisms and policy effectiveness. The study also showcases how spatial design in the form of incremental housing can contribute to governance outcomes in the form of tenure security.

Chapter 5 explores how the interaction between low-income housing project design and incremental extensions impact on household income generation in the K206 project. The research methods included a series of spatial analyses as well as resident interviews. The findings show that residents used the anticipative incremental opportunities provided by the project, but surprisingly, state-facilitated rental rooms did not contribute to income generation as anticipated. In most cases tenants appropriated

state- facilitated rental rooms, but a resounding number of owners (original and defacto) incrementally expanded their houses for income generation. Research found that the type of unit and plot size significantly affected the opportunity to incrementally expand, with original owners facing challenges due to tenant-owner tensions and subsequent reduced plot size. Incremental extensions allowed for a diverse range of income types, and the quality of rental rooms impacted the asking price of rental fees. The motivations behind using incremental housing for income generation were driven by the high unemployment rate and the lack of income-generating opportunities. The paper contributes to the literature on improving the possibilities for income generation for low-income households through incremental extensions.

In conclusion the research approach explored the context of K206 as well as the themes of resident-responsive design, tenure security and income generation from the double lens of governance and spatial design. Through these explorations, all cases demonstrated how government aims (governance) informed spatial design outcomes. These outcomes resulted in anticipated resident responses (albiet at a scale that was unanticipated). However in the case of tenure security, government aims informed spatial design outcomes, and resident responses ultimately changed the resultant tenure system (governance). This confirms theory from Collier and Gruendel (2022), Kumar-Nair and Landman (2023), the perspective that spatial design can also influence governance outcomes.

6.3 Answering the Research Questions

6.3.1 The Context of Alexandra Township

— **What policies and contextual background are relevant to the Alexandra K206 project?** (sub-question 1)

The context of Alexandra township is crucial for understanding the governance and spatial design of the K206 project. Governance systems in relation to low-income housing have significantly influenced the spatial design outcomes in Alexandra. The history of governance in the area has shaped how residents respond to low-income housing projects, establishing their substantial, albeit de facto, role in these governance processes.

This study highlights the importance of a housing development's location, particularly its social and political context. The planning of the K206 project overlooked the historical context of Alexandra and its residents. Previous forced occupations, such as those in backyard rooms during apartheid, the Tsutsumani occupations in 1999, and Extension Seven occupations in 2007, show a pattern of residents forcefully occupying houses. After the K206 project was built, many tenants refused to pay rent and forcefully occupied their rooms. These actions reflected residents' dissatisfaction with allocation processes and their initiatives to self-allocate, opposing what they perceived as unfair government allocations. This is a critical consideration for policymakers and professionals working on similar projects in areas with histories of forced removals and land allocation challenges.

Several governance and contextual factors are relevant to the K206 project. It is a state-subsidised housing initiative within the Alexandra Renewal Project (ARP), aimed at upgrading informal settlements. The ARP adopted a comprehensive "all of government" approach, focusing on social, economic, and infrastructural development, including housing upgrades. This holistic approach influenced the K206 project, emphasising integrated decision-making processes.

Established in 2010 under the ARP, the K206 project adhered to the principles of the Upgrading of Informal Settlements Programme (UISP) and Breaking New Ground (BNG). These principles aimed to create sustainable human settlements alongside housing interventions. The project followed the two-bedroom state-subsidised RDP housing model, with qualifying requirements for RDP housing playing a pivotal role in decision-making. The location of Alexandra, offering affordable housing close to economic opportunities, was also a significant factor. One popular form of affordable housing in Alexandra have been backyard rooms. These rooms are a form of incremental housing that have been added to state-subsidized housing in order to offer income generation for low-income families. Alexandra's context, particularly regarding resident classifications and resistance, played a crucial role in the area's housing history. This history highlights the volatility of the RDP and state-subsidised housing market in Alexandra, marked by internal discriminations based on income status and housing typology, as well as resistance to disputed government housing allocations. Before the K206 project, notable cases of forceful occupations by residents due to perceived unfair allocations showcased their stance on housing injustices. The K206 project aimed to create a unique mixed-tenure project but faced accusations of corruption in allocation, leading to a lack of trust in the government as a fair distributor of housing. This distrust prompted residents to self-allocate and resist rental agreements. The project underscores the need for policies that address the historical and social contexts of housing developments, ensuring transparency and resident involvement in allocation processes.

6.3.2 Spatial Design of State Subsidized Housing

— **How can state subsidized housing design in the K206 project be responsive to residents' needs and lifestyles?** (sub-question 2)

The evolution and development of spatial design in low-income housing has been a limited focus in South Africa (Lokko, 2013; Marutlulle, 2021). This has meant a lack of design innovation for this form of housing, particularly RDP housing and housing from the lowest income bracket with rigid and limited governance and funding structures. These limited and rigid governance and funding structures have meant a lack of evolution of spatial design within this form of housing, making it difficult to consider innovations and context-responsive design solutions.

The K206 project is a unique RDP housing development that implemented context-specific design responses to better cater to the needs and lifestyles of its low-income residents. Two key contextual design innovations included a flexible design model with allowance for incremental expansion and medium-density housing clusters. This approach not only accommodated increased density but also provided flexibility for residents to extend housing based on family structures or economic needs for income generation.

Unlike standardised RDP housing, which adheres strictly to technical norms and standards, the K206 project embraced innovative solutions tailored to residents' context-specific norms. The main innovations here are the inclusion of state-subsidised rental rooms for residents' income generation and the incorporation of adjoining single- and double-storey structures, facilitating opportunities for residents to expand within a cluster structure that exceeded the density achievable with standardised RDP housing.

These design interventions of the K206 housing project effectively addressed the unique needs and lifestyles of low-income residents by providing avenues for income generation and accommodating family expansion, all while meeting the required density standards for the high-demand township of Alexandra.

Despite some of the problematic occurrences that happened within the K206 project with regard to allocation and tenure, the design of the K206 project innovated medium density clusters that encouraged incremental expansion, which was considered a successful innovation by the interviewees. The medium density nature of the project allowed for a good balance between higher density layouts than standardised RDP housing, while still allowing for incremental expansion that would not otherwise be possible with a block or flat layout. This model allowed for

both urban densities to improve and residents to have the flexibility for their homes to adapt and change with regards to the dynamic nature of their families and also allowed for the income-generating option of the rental rooms. The drawback with this design was that the additional rooms that allowed for this innovation were subsidised, and in most cases, RDP housing budgets are set; however, we can learn here that medium density layouts that cater for increased density but also incremental expansion can be a very successful option for low-income housing design. This case is an example that innovation in housing design in low-income housing can occur and that it has the potential to be successful. Residents responses suggest that spatial design initiatives undertaken by residents can improve overall design efficiencies in their housing. Mass housing projects that do not take into account the shifting of family structures and opportunities for income generation should be rethought.

6.3.3 Security of tenure in ISU

— **How does security of tenure relate to incremental housing extensions in the K206 project?** (sub-question 3)

Security of tenure is an important consideration of governance in low-income housing in South Africa. In the case of the K206 project, governance factors relating to security of tenure (more especially how to allocate tenure to both qualifying and non-qualifying residents) informed spatial design decisions in the form of housing typology and tenure models led by the state. Residents' responses to these government initiatives also had an effect on the outcome of the project.

The security of tenure in the K206 project, achieved through incremental housing extensions, played a pivotal role in addressing issues arising from tenure allocation. Despite challenges in governance and housing allocation policies, residents exercised their perceived tenure security by incrementally extending their homes. This approach, influenced by residents' interpretation of their right to housing, contributed in their eyes to improved governance in the informal settlement upgrading process.

In contrast to the block-by-block housing allocation system that led to social conflict and unrest, residents shared their experiences in how they adapted to their circumstances by incrementally extending their homes. This response, considered a form of insurgent urbanism, allowed original tenants to assert their perceived right to own their residences. This perceived right was based on spatial allocation

and resulted in an alternative governance structure initiated by residents. Notably, tenants, facing difficulties due to the rigid state housing tenure options, refrained from paying rent and instead opted for incremental extensions as a means of addressing the housing situation caused by the allocation system.

While this insurgent spatial response complicated the formalisation of tenure within the development, it increased the likelihood of tenants securing a more stable tenure in the long run. The findings contribute to international discussions on housing allocation and perceived tenure security, highlighting the limitations of block-by-block housing allocation in the presence of challenging state tenure and housing qualification regulations. Using an architectural method, employing spatial mapping of incremental extensions, the thesis assessed the levels of perceived security of tenure in informal settlement upgrading.

Findings reflected on post-apartheid areas like Alexandra and how they still carry the scars of apartheid segregation. In as much as Alexandra and townships alike are spaces of communal living and rich cultural melting pots, it is still apparent that within areas like Alexandra, there lie a number of nuances and segregations between residents. The bona fides and amagoduka residents' history showcases this: that in as much as historically, Alexandra residents have worked together to remain in the area, there still exist fractions between residents based on housing classifications. These classifications have created conflict in the past, particularly with regards to accessing housing. The K206 project introduced additional fractions with "tenant and owner" classifications with a populace that originally all came from the same informal settlement with the same tenure status. Once people were moved and classified into tenant and owner status, it became particularly problematic, and many original tenants felt discriminated against. This perpetuated form of "who belongs here more," a very similar challenge to the tensions between *bonafides* and *amagoduka*.

The innovative mixed tenure model with block-by-block relocation was implemented in order to address variations in residents qualifying statuses for housing. The mixed tenure model did accommodate the various qualifying statuses, however, not as expected. Housing extensions were further used as an alternative to secure tenure.

6.3.4 Incremental Extensions and Income Generation

— **How did residents engage with the two state-provided income-generating room options of incremental housing in the K206 project?** (sub-question 4)

Income generation for residents is an important albeit overlooked aspect of governance in low-income housing in South Africa. Based on models of “backyard rooms," income generation through housing appeared a viable option of low-income housing for residents. In the case of the K206 project, income generation was a part of the state-facilitated objectives for the project, translated into the spatial design of the K206 built-in rental rooms and incremental allowances. Resident-initiated responses to these government initiatives also had an effect on the outcome of the project.

Insurgent incremental extensions in the K206 housing project in Alexandra have had a substantial impact on residents' income but not necessarily in the ways anticipated. The design of the K206 project facilitated rental income generation and allowed owners to incrementally expand, leading to future income from both rentals and home-based enterprise activities. Residents used incremental extensions to enhance their living situations. This in turn also improved governance challenges around low-income and unemployment.

The main factors, motivations, and barriers associated with income generation through incremental extensions are outlined as follows:

— **Type of Unit and Plot Size:** Interviews Interviews and spatial mappings showed that the type of unit and plot size were directly linked to opportunities for incremental expansion. Original owners of type 1 units had the option of rental rooms for income generation and vertical expansion. However, tensions between the original tenant and the original owner resulted in type 1 owners losing half the size of their plot, limiting their opportunity for incremental expansion and income generation. In contrast, original tenants who gained a plot had the chance to incrementally expand and generate income.

— **Diverse Range of Income Types:** Incremental expansion allowed for a diverse range of income types, including external salary, pension, home-based business, solely rental rooms, or a combination of external employment and rental rooms. The levels of income played a role in determining the quality of incrementally added rental rooms, impacting the asking price of rental fees.

- **Motivations for Incremental Housing:** Motivations for using incremental housing for income generation stemmed from a high unemployment rate, making income-generating opportunities scarce. Residents used their incrementally adapted homes to generate income for immediate household needs, improving their children's lives, and planning for future pensions and property investments.

- **Deterrents for Income Generation:** Larger governance structures, such as owner-tenant tensions and plot size, served as deterrents for income generation through incremental extensions. The challenges associated with these governance structures impacted residents' ability to maximise income opportunities.

The findings contribute to literature on improving income generation for low-income households in the Global South, emphasising the practicality of achieving this through state-subsidised housing. The unique opportunities of the K206 project were heavily weighted on state-facilitated opportunities for incremental expansion and income generation. In addition to this, initiated incremental extensions for income generation. While the formalising income generation opportunities from government can be a successful way of generating income for residents, the implementation process must carefully consider property rights implications and tenure security. Incremental housing in the case study offers emancipatory opportunities for self-initiated transformations and income generation that takes a step beyond merely providing housing. However, the research underscores the importance of the governance structures and raises questions for further exploration of the precise workings of income generation mechanisms, prompting a government assessment of policy effectiveness.

This insight advocates for backyard room movements (DAG, 2020a, 2020b; Mahlakanya and Willemse, 2017; Poulsen, 2010). The backyard room movement is the incremental extension of housing that allows for self-help additions that offer a substantial form of accommodation that far surpasses the rate of building that the government is able to implement in RDP housing for low-income residents in need. The market exists, and it provides serviced housing to people in need, and in doing so also allows for income generation for its landowners. However, there is a need to lobby for support from the government in order to empower small-scale developers to create adequate, well-built, and safe housing for their tenants (safe, well-built housing is not always the reality with this form of housing). The research explores how a number of residents in the K206 development managed to even triple their monthly income from rental rooms over an 11-year period, a testament to how this can become a tool for economic development in South African townships.

The K206 model with adjoining rental rooms was a relatively successful initiative that would allow for economic gain for landlords; however, governance issues that caused tenure-related social unrest overshadowed the original intent of the project.

6.3.5 Summary of Governance and Spatial Design in the K206 Project

This section uses the above findings to reflect on the main research question:

— How can a double-lens approach to spatial design and governance improve our understanding of low-income housing in South Africa?

The dissertation has examined the relationship between governance and spatial design. Initial desktop research indicated a dominant discourse based on how governance informs spatial design. However, in the K206 project, residents' responses, initiated through spatial design, led to alternative arrangements that subsequently influenced and created new governance structures. This is consistent with the narrative in less explored literature that demonstrates that spatial design can also influence governance structures.

When analysing chapter 3 to 5, their research questions and subsequent themes through the double lens, three feedback loops emerged. These feedback loops demonstrate the cycle between Government aims, Professional Design, and Resident Adaptation as seen in Figures 6.2, 6.3, and 6.4. These feedback loops explored the initial government aim, how this was translated to a spatial design output, how residents adapted these designs, and how the resulted governance compared to original government aims.

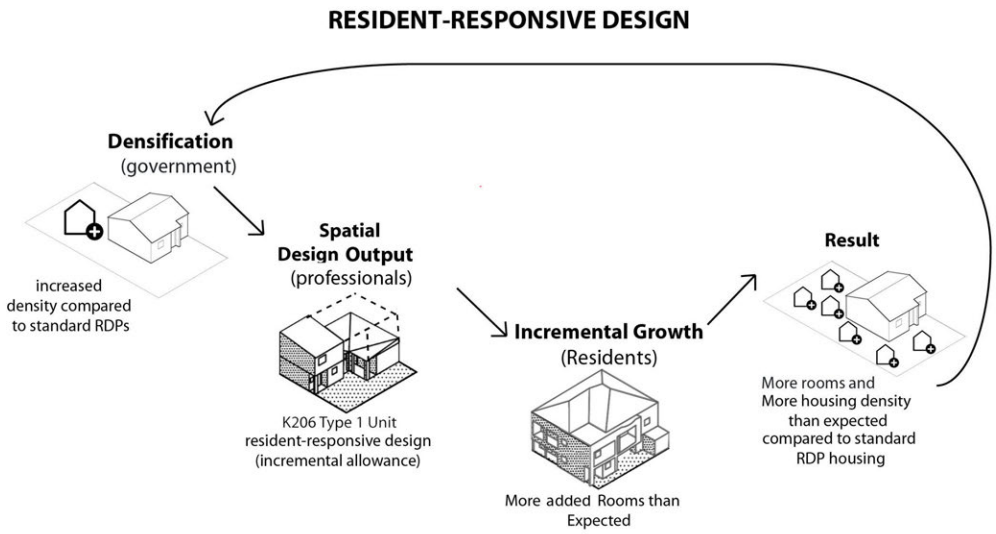

FIG. 6.2 Exploration of K206 housing density and incremental extensions within this thesis

Figure 6.2 illustrates the relationship between standardised RDP housing and the K206 housing project. It emphasises how aligning appropriate RDP housing standards with resident-responsive design solutions can lead to more adaptable and effective outcomes. The K206 project is an example of a more responsive housing solution, offering increased density and allowing for incremental extensions that align with residents' needs.

The government aimed to create a higher-density housing typology that made allowance for incremental growth due to the desirable location. This Type 1 unit was designed by a contracted professional as an instrument to provide increased density and incremental housing allowance. While residents did adapt their homes incrementally, the number of extensions exceeded the state's initial expectations. This resulted in Type 1 units with more additional rooms than originally anticipated, leading to higher housing densities than originally planned.

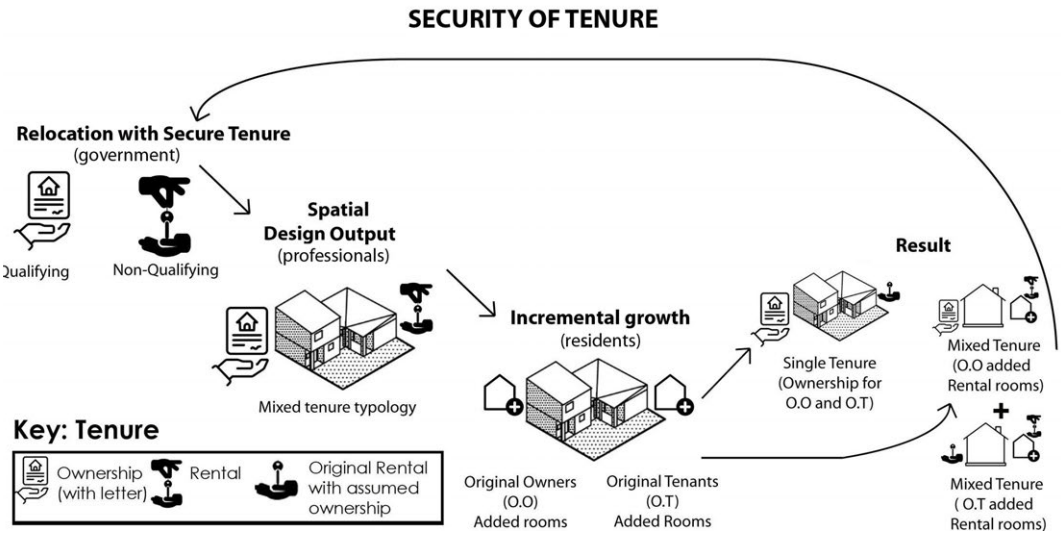

FIG. 6.3 Exploration of tenure security in the K206 housing project within this thesis

Figure 6.3 depicts another governance aim of the project, which was to relocate residents (qualifying and non-qualifying) from informal settlements to the K206 project with secure tenure. ASA Architects created a mixed tenure model that could accommodate for all informal settlement residents of varying qualifying status. Residents' responses were not as expected, and insurgent urbanism interventions based on residents' perceptions of unfair allocation resulted in original tenants staking ownership over their homes. Although this was unexpected for the state, residents' insurgent urbanism was consistent with historical forced occupations of Extension 7 and Tsutsumani housing. Both original owners and original tenants incrementally developed rental rooms. The result was a typology that provided mixed tenure for all resident classifications; however, original tenants who did not originally qualify for ownership tenure claimed de facto ownership over properties that were originally owned by original owners. This forced de facto ownership of original tenants resulted in problematic tensions between original owners and original tenants. This further resulted in self-allocated tenure for original tenants that deviated from initial aim of government.

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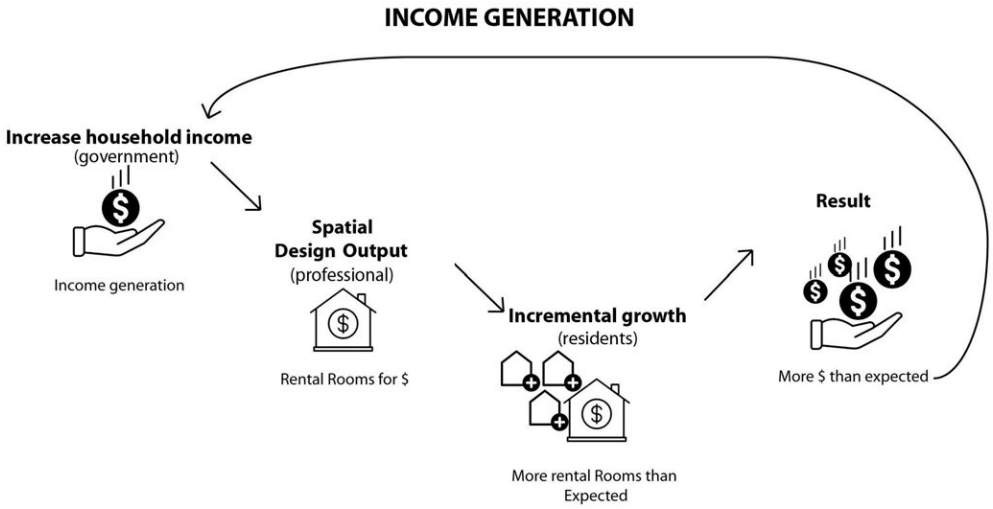

FIG. 6.4 Exploration of income generation through low-income housing in the K206 Housing Project within this thesis

Figure 6.4 depicts how the third government aim of the K206 project, which was to increase income for low-income residents. The spatial design instrument, designed by contracted professional were the additional rental rooms that were incorporated into the state-subsidized house design for residents' income generation purposes. Residents' responses to this spatial intervention were different from expected, as residents acted with insurgent urbanism and built more rooms than initially anticipated. This resulted in more income generation for residents, which was different from what was expected but still led to initial aims of income generation for residents.

The double lens approach facilitated the opportunity to explore the three chapter themes of resident-responsive design, tenure security and income generation through three feedback loops that explored the cycle between Government aims, Professional Design, and Resident Adaptation helping clarify the aims, actors and instruments of the project and how they connected with spatial design.

The outcomes of the K206 project were different from what was expected. Extensions were used as alternative security of tenure, and the number of incrementally added rooms surpassed the expected amount, resulting in residents having more income generation than originally anticipated and higher density housing than originally anticipated. These higher densities and income opportunities in some cases resulted in overcrowding and substandard quality of housing extensions.

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Despite the deviations as a result of resident responses, all three government interventions even with resident insurgent responses, had the potential to still achieve original governance intentions. Although the forced appropriation of tenants' homes for ownership did not fairly solve the issues related to qualifying and non-qualifying residents, this still resulted in a mixed tenure system where incrementally added rooms were added for rental purposes.

This dissertation has explored the dynamic relationship between governance and spatial design within the context of low-income housing. Through the K206 case study, it revealed how residents' responses to spatial design influenced governance structures in unexpected ways. The state's aim of higher-density housing with incremental growth, as seen in the K206 housing project, was met with residents' adaptations that exceeded expectations, creating denser housing and more income-generating opportunities. The mixed tenure model, intended to accommodate both qualifying and non-qualifying residents was reshaped by insurgent urbanism, as residents, particularly original tenants, staked ownership over properties, causing tensions. Despite these deviations, the outcomes still aligned with the original governance intentions, particularly in terms of mixed tenure and income generation. However, these responses also led to overcrowding and substandard housing extensions, highlighting the complex interplay between governance strategies and spatial design, where residents' autonomy significantly impacted the project's evolution.

6.4 Relevance of Study

6.4.1 Scientific Relevance

This thesis builds on this existing knowledge of low-income housing in the research fields of informal settlement upgrading, state-subsidized housing and incremental housing. The investigation connects the three concepts in low-income housing and offers insights within the double lens of governance and spatial design that go beyond a singular discipline investigation. These insights include that governance is not only steering spatial design outcomes, but that residents' responses, initiated through spatial design, also can lead to alternative arrangements that subsequently influence and create new governance structures. The possibility of incrementally adding rental

rooms (spatial design) to facilitate governance challenges of tenure security can be considered a main contribution to the literature. The case also demonstrated how incremental housing extensions (spatial design), also facilitated for income generation (governance). This demonstrates how the double-lens approach of both spatial design and governance can allow for a more holistic insight into low-income housing projects than a single lens is elaborated on in the remainder of the section.

— **What is governance and what is spatial design and how do they come together through these learnings of K206?**

Governance

Based on the exploration of the K206 housing project, housing governance refers to the setting of aims, instruments and actors involved in decision making and implementation of a housing project. These actors can be both governmental and non-governmental entities (Beer, 2012; Rhodes, 2007; Meuleman, 2008; Meuleman, 2018). This thesis examines governance decisions within the Alexandra Renewal Project and K206 project, revealing that while historical aspects of Alexandra residents were considered, meaningful and long-term collaboration and consultation with residents were lacking. This omission led to social conflicts between original owners and tenants. Governance within the K206 project also involved ensuring security of tenure for all informal settlement residents relocated through the block-by-block process. This project was a formally state-subsidized project which demanded formal allocation systems within block-by-block relocations. The project's income-generating aspects were closely tied to the security of tenure for both qualifying and non-qualifying residents.

Although these decisions and processes had merit and relied on regular community meetings chaired by community liaison officers, the outcome was extreme social conflict. Despite intentions to serve the best interests of residents, the results were problematic due to a lack of transparency and trust of government by residents. The state-subsidized, informal settlement upgrading project, had the potential to address significant issues in upgrading and allocation, but ultimately faltered due to perceived corruption and lack of transparency in allocation processes. This lack of trust led residents to create their own rules and systems.

An interesting aspect of governance revealed in this case study is how residents responded to the houses they were given. These resident driven enactments driven by dissatisfaction of failed systems prompted residents to address governance themselves through insurgent interventions.

Spatial Design

While spatial design studies in low-income housing provide valuable insights on the built form and the context they are created in, they often analyse spatial characteristics in isolation. This dissertation advances the field by synthesizing density studies, housing unit layouts, plan analyses, and photographic documentation. It utilizes these spatial studies to deepen an understanding of governance outcomes of security of tenure and income generation.

Spatial design within the K206 project operated on multiple scales (Alexander, 1977; Green, 2018; Massey University, 2024). In the context of low-income housing in South Africa, spatial design was used to physically manifest government aims of densification, relocation with secure tenure and increased household income. However, this approach was linear, responding primarily to the original ARP's vision in the case of K206. While theoretically sound and more responsive to residents' needs than most low-income housing projects in South Africa, this approach was limited by its short-term focus. Long-term spatial design outcomes and residents' needs were not adequately addressed.

Resident-initiated incremental extensions offered longer-term spatial design solutions, highlighting the importance of involving residents in the spatial design process, even within rigid low-income housing systems. Given these outcomes and the significant influence of user-initiated incremental extensions, the research suggests that further investigation is needed into the community participation aspects of the K206 project. Additionally, it recommends exploring the role of incremental housing as a tool for user participation in the design of low-income housing.

The K206 Project was a complex initiative requiring medium-density housing solutions for tenure security and income generation. While spatial practitioners were necessary, some project aspects could have benefitted from allowing residents to develop their homes themselves. Incremental housing appears to be a practical and effective approach for low-income housing in South Africa. Designing governance and spatial design systems that incorporate this approach could lead to better-planned housing solutions that address governance and spatial design concerns, considering residents' long-term needs. In the case of K206, this approach helped resolve governance issues through resident initiated spatial extensions.

Summary

The K206 case study serves empirical research that offers an interdisciplinary exploration into low-income housing research fields of informal settlement upgrading, subsidized housing, and incremental housing. The housing of informal settlement residents was upgraded through the K206 state-subsidized housing project. Over time residents incrementally expanded their homes to suit their needs.

The study examines incremental housing as a converging point between spatial design and governance, analysing how residents' decisions regarding home expansion, adaptation, and investment interact with government aims. This dissertation uncovers unexpected causal relationships that might remain hidden when viewed through a single lens. For instance in the case study, it revealed how resident-responsive design (spatial design) could facilitate for densification (governance), how a mixed tenure model (spatial design) could facilitate for relocation with tenure security (governance) and how additional rental rooms (spatial design) could facilitate for increased income for residents (governance).

The study also highlights how governance influences spatial design and vice versa. For instance, the governance structure of the K206 project aimed to provide income for its residents through the creation of additional rental rooms. While these rooms were intended to generate income for residents, weak governance structures related to allocation often hindered their intended function. Nevertheless, the concept of income generation through housing persisted, leading residents to pursue alternative governance mechanisms to implement these ideas. This interconnectedness shows that while governance can shape spatial design, the outcomes of spatial design in similar contexts with weak adjoining governance structures (in this case, poor allocation strategies) can lead to unexpected governance results.

Unlike previous research that examines spatial design and governance aspects separately, this study synthesizes both dimensions within a single case, allowing for an in-depth understanding of the interplay between policy, design, and lived experience.

While the dissertation focuses on a single case study, the complexity of K206—both in terms of spatial design and governance mechanisms—warrants a deep, context-specific analysis.

The scientific contribution of this study lies in its ability to connect macro-level housing policies with micro-level resident realities, providing a more integrated analysis of low-income housing. By bridging spatial design and governance, the

dissertation offers new perspectives on incremental housing, tenure security, and income generation, ultimately enriching a broader discourse on low-income housing solutions.

6.4.2 Societal Contribution

This study uncovers several factors related to governance and spatial design in low-income housing. It investigates residents' strategies and experiences, yielding findings that can provide valuable insights to enhance the lives of residents in such housing projects, as well as inform the work of designers and policymakers involved in similar initiatives.

The thesis is primarily rooted in its focus on the experiences of residents in low-income housing. It aims to enrich the existing literature on post-occupancy evaluations of informal settlement upgrades and state-subsidised housing. Typically, state-subsidised housing is constrained by budget limitations, resulting in minimal resources allocated for post-occupancy evaluations from the residents' perspective. This gap raises concerns about whether we are effectively improving state-subsidised housing for its residents and enhancing informal settlement upgrading solutions.

This thesis emphasises the user experience of these low-income housing forms, with the goal of contributing knowledge on how to improve these experiences for residents. Additionally, there is an ongoing issue regarding the ownership and tenure challenges in the K206 project. Residents have yet to receive title deeds for their houses due to government backlogs and complications surrounding housing and land rights. A dialogue between residents and the Alexandra municipality is ongoing to address this issue. This study hopes to provide valuable insights from a spatial and governance perspective on the state of these houses, the residents, and the developments since 2010. These insights aim to aid in finding solutions to spatially organise and formally grant ownership of plots and houses to users.

In as much as Alexandra is a unique space, locating low-income housing opportunities near economic hubs and job opportunities is a common practice for the majority of townships and ISUs in sub-Saharan Africa without apartheid planning (Fox, 2014). This section will explore contributions to governance in the South African and Sub-Saharan African contexts.

South Africa

The K206 project has shown the South African government's ability to innovate in both governance and spatial design systems, showing how these systems can work together to address South Africa's contextual issues. However, a crucial consideration for these systems is building trust between government and residents, long-term impact of their initiatives and how to address resident responses that deviate from the anticipated outcomes.

While the K206 project did innovate in spatial design and governance, it remains one of the few RDP informal settlement upgrades to do so. To advance housing initiatives, the South African government took a number of risks with the K206 housing spatial design and governance, which has allowed for new important insights into housing governance and design. For instance, incremental housing is a relatively recent approach aimed at improving both housing conditions and income generation. This approach could be valuable and aligns with current IRDP housing initiatives that seek to enhance economic opportunities for the residents it serves. Yes, the K206 project had problematic outcomes, but it also provided lessons that should be applied to future projects.

On a pragmatic level, the issue of formalising ownership tenure for K206 residents remains unresolved due to the project's complexity, allegations of corruption, and unfair allocation. Incremental expansions by both original owners and tenants have added layers of difficulty, making it challenging for the government to issue final titles to K206 residents. The delay in title deeds is closely tied to this complexity. This thesis aims to create clarity by providing a structured and detailed overview of the situation from all actors' perspectives. This research has also aimed to enable more informed and fair insights into the project, potentially leading to more efficient and equitable outcomes.

There is also a lack of focus on township development within South Africa's spatial development frameworks. Despite efforts in the Western Cape, there are no comprehensive manuals that stitch together spatial design principles with current governance policies in order to envision a better future for South African townships, even though a large percentage of the South African population resides in these areas. This study suggests that comprehensive strategies to enhance township spaces that were initially shaped by apartheid planning are lacking and that there is a need to increase outputs that create new, healthier visions for the future of these spaces.

Sub-Saharan Africa

Sub-Saharan Africa is experiencing some of the fastest growth in slum and informal settlement developments. Our cities are expanding rapidly, and the economic conditions for many South Africans drive a high demand for low-income housing. Although South Africa is one of the few countries in the region that has offered free housing for low-income families, there is still a pressing need to explore options for contextually and resident-responsive low-income housing across the continent. Prioritising income generation, alternative tenure options, and incremental housing provisions should be a crucial consideration for the planning and governance of low-income housing throughout the region. The research from the thesis also indicates that residents had a significant impact on the project's outcomes. This suggests that further research is needed on community participation in the project and how it could have been enhanced to achieve better results.

Overall, the dissertation contributes knowledge to societal development through its social and policy-based findings.

6.4.3 Reflection

A limitation of my dissertation is the challenge of combining different strands of theory, which prevents achieving the depth possible with a single disciplinary approach. While this exploration highlights the complexity of understanding a context or low-income housing project better than a singular disciplinary approach, it also reveals that focusing on just two lenses is insufficient. For example, the absence of legal and anthropological perspectives has also limited the comprehensiveness of the research.

The dissertation involved 26 resident interviews, which represents a relatively limited sample size, but this sample size was limited due to the intricacy of each interview that also included a housing spatial survey. The sample homes were also selected to create a mix of housing typologies and not necessarily a balance between tenure options, i.e., "original owner" and "original tenant," which limited the opportunity for the research to explore this comparatively. While the depth of information gained from these interviews is valuable, the number constrains the extent to which findings can be generalised to a broader population.

6.4.4 Further research

This dissertation examines low-income housing literatures of informal settlement upgrading, state-subsidized housing and incremental housing. Through the exploration of the K206 project, tenure security, backyard rooms, incremental housing, and insurgent urbanism were revealed as crucial considerations from the perspective of governance and spatial design within the K206 case study. By analysing governance and spatial design as mutually interconnected dimensions, the study builds upon existing theories in these fields while providing a double-lens on the complexities of low-income housing transitions.

However, certain limitations of this study present opportunities for further research. First, the research is based on a single case study—a form of informal settlement upgrading with relocation. While the findings offer valuable insights into governance structures and spatial adaptations within relocation-based upgrading, they are less directly applicable to in-situ upgrading without relocation. Future research should explore comparative case studies of both in-situ and relocation-based upgrading projects to assess how tenure security, income generation through rental rooms and incremental housing differ across these approaches.

Additionally, this dissertation emphasizes income generation through incrementally added backyard rooms, yet further research is required to analyse policy interventions that could support and regulate backyard rental economies without disincentivising low-income housing investment. Comparative studies across different South African cities—or even other global south contexts—would help identify best practices for integrating formal and informal housing economies.

A comparative analysis of governance and design across various programmes and projects, including social divisions in townships, housing typologies within townships, and different categories of income generation in incremental housing would be useful in understanding a broader context of the project.

Incremental housing additions as a form of securing tenure appeared to be part of tacit knowledge systems for residents within the K206 project. An exploration into how this correlation came about would be a useful insight into user-initiated township development governance structures, explores what facilitates that knowledge system for residents in townships that are not necessarily “legal” but allowed by the state nevertheless.

Finally, while this research has examined tenure security in the context of subsidized housing, further exploration of tenure diversification with more successful housing allocation systems—such as hybrid models of ownership, rental, and cooperative housing—could inform more inclusive and flexible housing policies. Investigating the effects of tenure security (with successful housing allocation) on long-term housing investments and social mobility would contribute significantly to both academic discourse and policy development.

By addressing these research gaps, future studies can expand on the relationship between macro-level housing policies and micro-level spatial practices, ensuring that governance and design strategies are more responsive to the lived realities of low-income housing residents.

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TOC

Appendices

TYPE 2

R1

AS BUILT
2010

INHABITED
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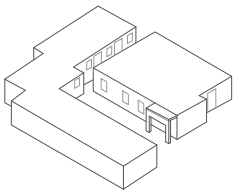

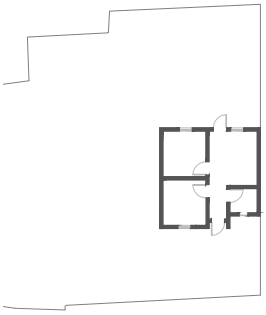

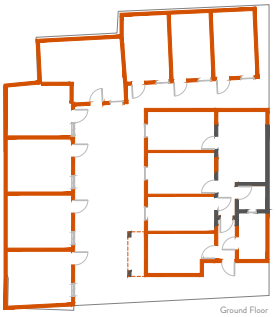

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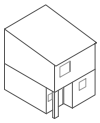
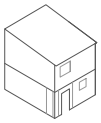
TYPE 1A

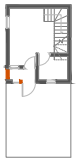
R2

AS BUILT
2010

INHABITED
2021

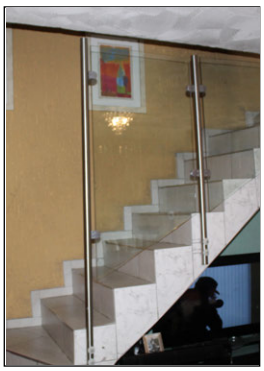






Ground Floor

First Floor



TOC

TYPE 1

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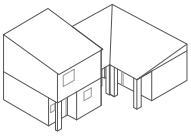
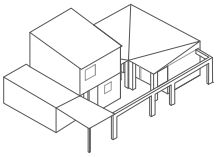
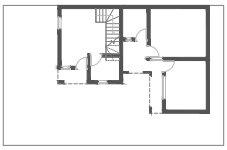
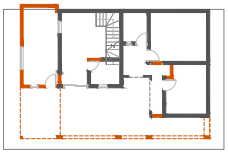
AS BUILT
2010

INHABITED
2021

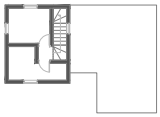


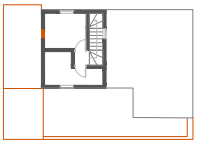






Ground Floor





First Floor

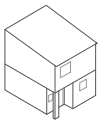
TOC

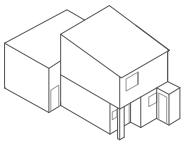
TYPE 1A

R4

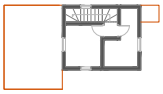
AS BUILT
2010

INHABITED
2021





Ground Floor



First Floor

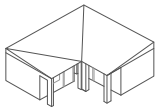
TOC

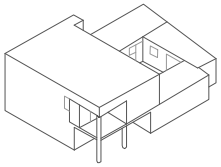
TYPE 1B

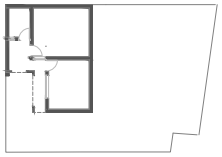
R5

AS BUILT
2010

INHABITED
2021







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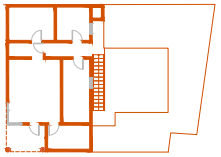


First Floor

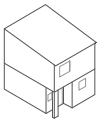
TOC

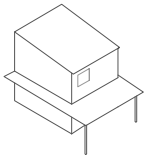
TYPE 1A

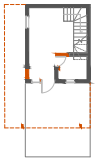
R6

AS BUILT
2010

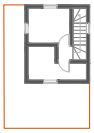
INHABITED
2021



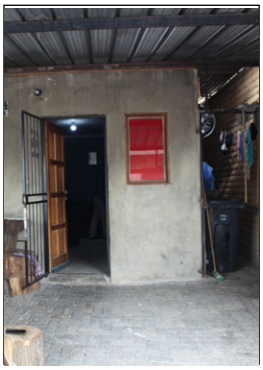




Ground Floor



First Floor



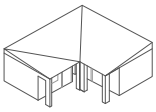
TOC

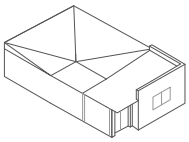
TYPE 1B

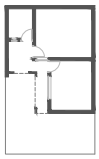
R7

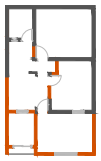
AS BUILT
2010

INHABITED
2021









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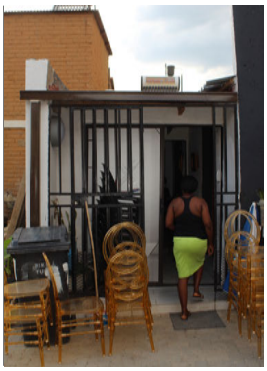


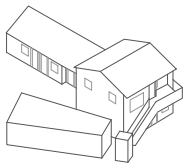
TOC

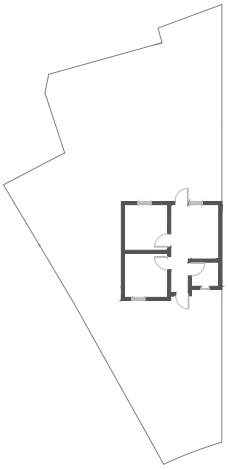
TYPE 3

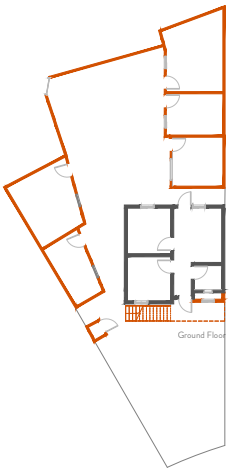
R8

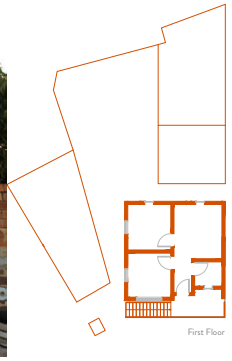
AS BUILT
2010

INHABITED
2021









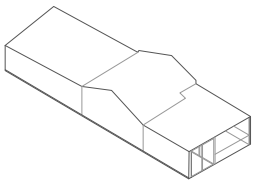
TOC

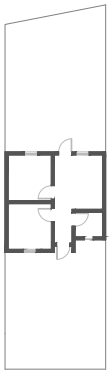
TYPE 2

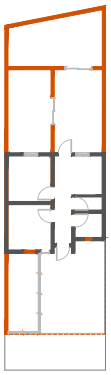
R9

AS BUILT
2010

INHABITED
2021







Ground Floor

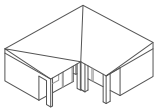
TOC

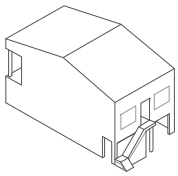
TYPE 1B

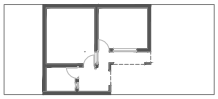
R10

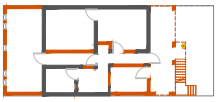
AS BUILT
2010

INHABITED
2021

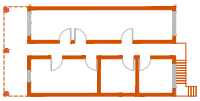




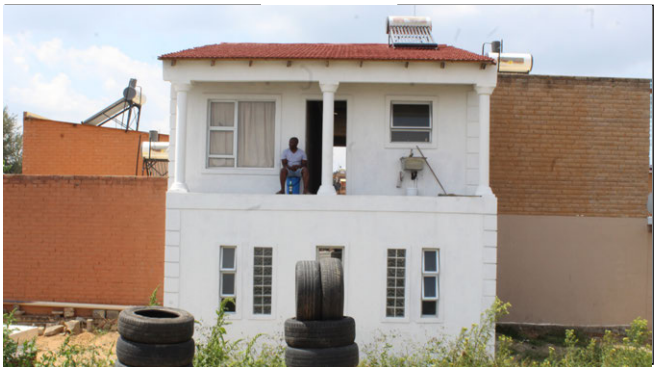




Ground Floor



First Floor



TOC

TYPE 1A

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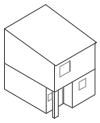
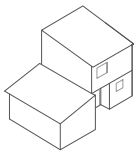
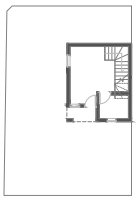
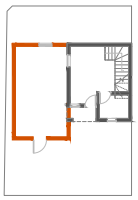
AS BUILT
2010

INHABITED
2021

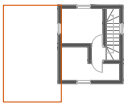








Ground Floor



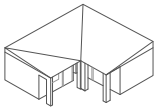
First Floor

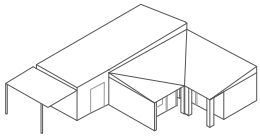
TYPE 1B

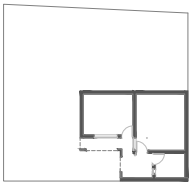
R12

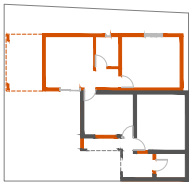
AS BUILT
2010

INHABITED
2021









Ground Floor

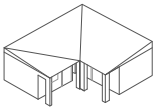
TOC

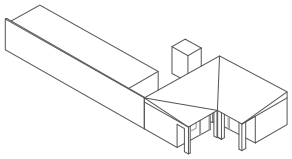
TYPE 1B

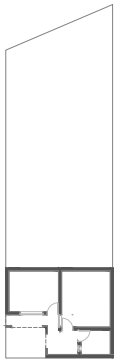
R13

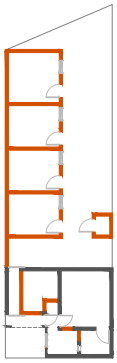
AS BUILT
2010

INHABITED
2021









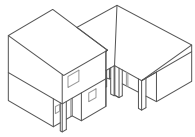
Ground Floor

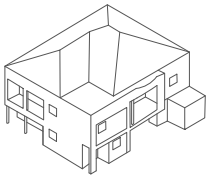
TYPE 1

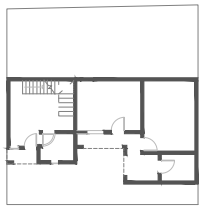
R14

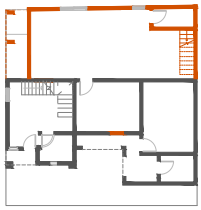
AS BUILT
2010

INHABITED
2021

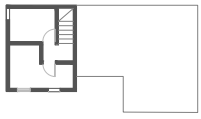


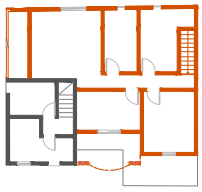






Ground Floor





First Floor

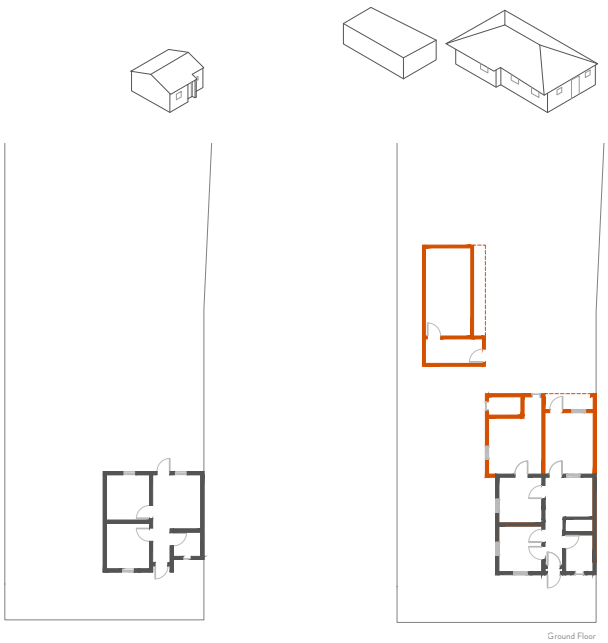
TOC

TYPE 3

R15

AS BUILT
2010

INHABITED
2021



Ground Floor

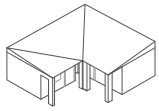
TOC

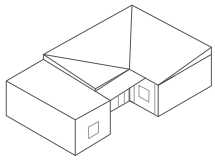
TYPE 1B

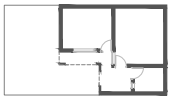
R16

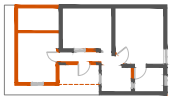
AS BUILT
2010

INHABITED
2021









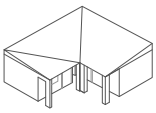
Ground Floor

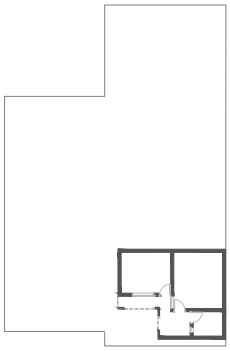
TOC

TYPE 1B

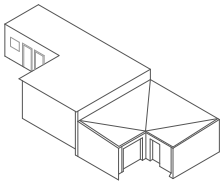
R17

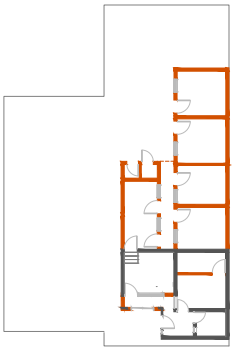
AS BUILT
2010

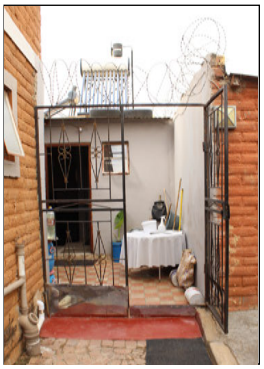




INHABITED
2021







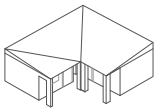
TOC

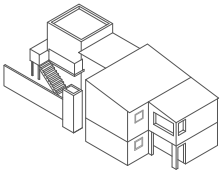
TYPE 1B

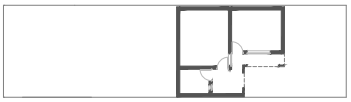
R18

AS BUILT
2010

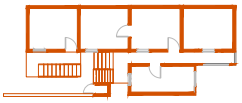
INHABITED
2021



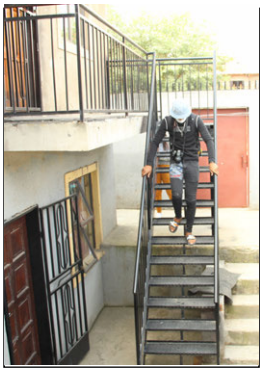




Ground Floor



First Floor



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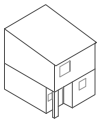
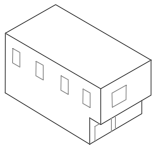
TYPE 1A

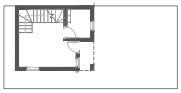
R19

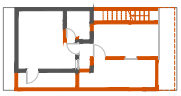
AS BUILT
2010

INHABITED
2021

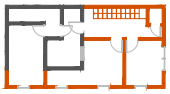








Ground Floor



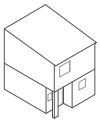
First Floor

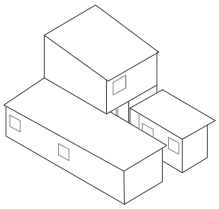
TYPE 1A

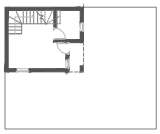
R20

AS BUILT
2010

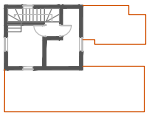
INHABITED
2021







Ground Floor



First Floor

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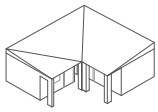
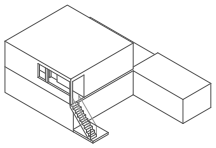
TYPE 1B

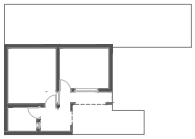
R21

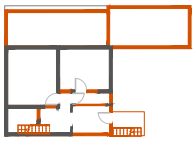
AS BUILT
2010

INHABITED
2021

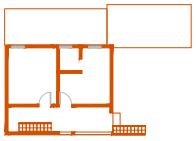








Ground Floor



First Floor

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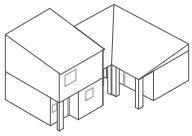
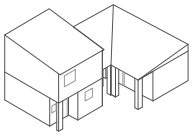
TYPE 1

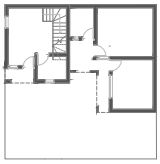
R22

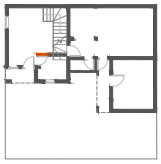
AS BUILT
2010

INHABITED
2021

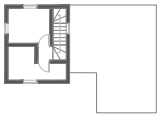


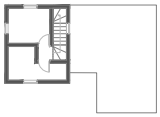






Ground Floor





First Floor

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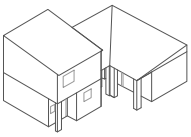
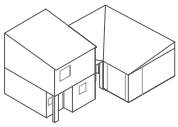
TYPE 1

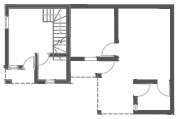
R23

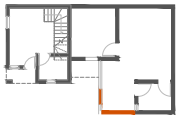
AS BUILT
2010

INHABITED
2021

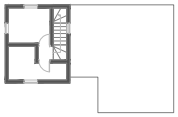


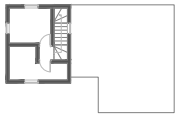






Ground Floor





First Floor

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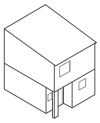
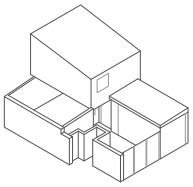
TYPE 1A

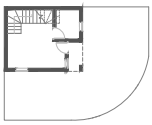
R24

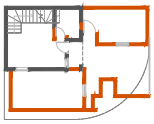
AS BUILT
2010

INHABITED
2021

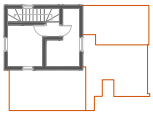








Ground Floor



First Floor

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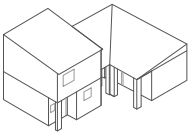
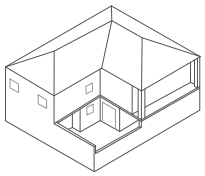
TYPE 1

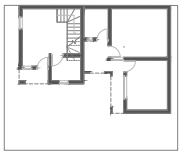
R25

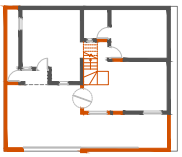
AS BUILT
2010

INHABITED
2021

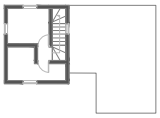


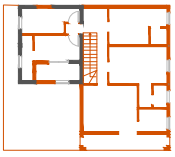






Ground Floor





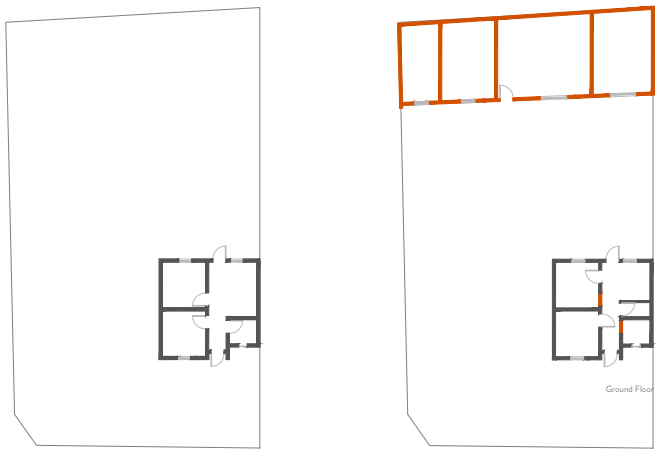
First Floor

TYPE 3

R26

AS BUILT
2010

INHABITED
2021



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APP. 2 List of Interviews with management or professional team of ARP/ K206

Interviewee	Organization	Role in Organization
Albonico, M.	Alexandra Renewal Project	Urban Designer
Szalovitz, A.	Alexandra Renewal Project	Architect, K206 Project
Baskin, J.	Alexandra Renewal Project	Managing Director ARP
Mavundla, S.	Alexandra Renewal Project	Community Liasson Officer (jurisdiction included K206 area)
Mkhonto, S.	Alexandra Municipality	Former area councillor
Nemakonde, M. and “Martha”	K206 Tenants association	Representative

APP. 3 Phase Layout of the K206 Project in the Far East Bank

Image above depicts 6 Phases of the K206 project that fill up swathe originally intended for road.

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Curriculum Vitae

Afua Wilcox is an architect and researcher with a diverse background in architectural practice, teaching, and advocacy. She began her architectural education with an undergraduate degree at the University of Cape Town, South Africa. After graduating, she launched her career in architecture, first in London and later in Johannesburg. During this period, Afua also started teaching part-time at the University of Johannesburg, where she contributed to architectural design education.

In 2012, Afua pursued postgraduate studies at the University of Witwatersrand, South Africa, where she earned a Master's in Architecture in 2013. Following her graduation, she joined Micheal Hart Architects as a candidate architect. Her work focused on RDP and social housing in South Africa, which sparked her passion for affordable housing across sub-Saharan Africa. Afua further expanded this interest by leading a design elective focused on housing at the University of Johannesburg while continuing her professional practice. During her tenure at Micheal Hart Architects, she also achieved registration as a professional architect.

In 2019, Afua began her PhD candidacy at Delft University of Technology, within the Department of Management of the Built Environment. Her research was supported by the NRF/Nuffic scholarship, a joint initiative between the Dutch and South African governments. Alongside her research, Afua has taught both undergraduate and master's courses at TU Delft and conducted online bachelor's courses for the University of Johannesburg.

Afua's commitment to empowering the youth extends beyond her academic work. In 2020, she founded the NGO "Youth and Women Up" in the Kingdom of eSwatini and South Africa, aiming to empower young women in the region. Her leadership in this space led her to participate in the Zanele Mbeki Young African Feminist Leadership Fellowship, where she deepened her understanding of civic leadership, healing, and African feminism. Afua has also represented eSwatini as the coordinator for the South African Women in Dialogue (SAWID) and the African Women in Dialogue (AfWID), advocating for women's voices in the Southern African region.

In addition to her advocacy and academic pursuits, Afua is a Delft Global Fellow and represented Delft Global at the World Science Forum in Cape Town in 2022. Her work continues to bridge the gap between architectural practice, education, and social empowerment.

Publications

Peer-reviewed journal papers

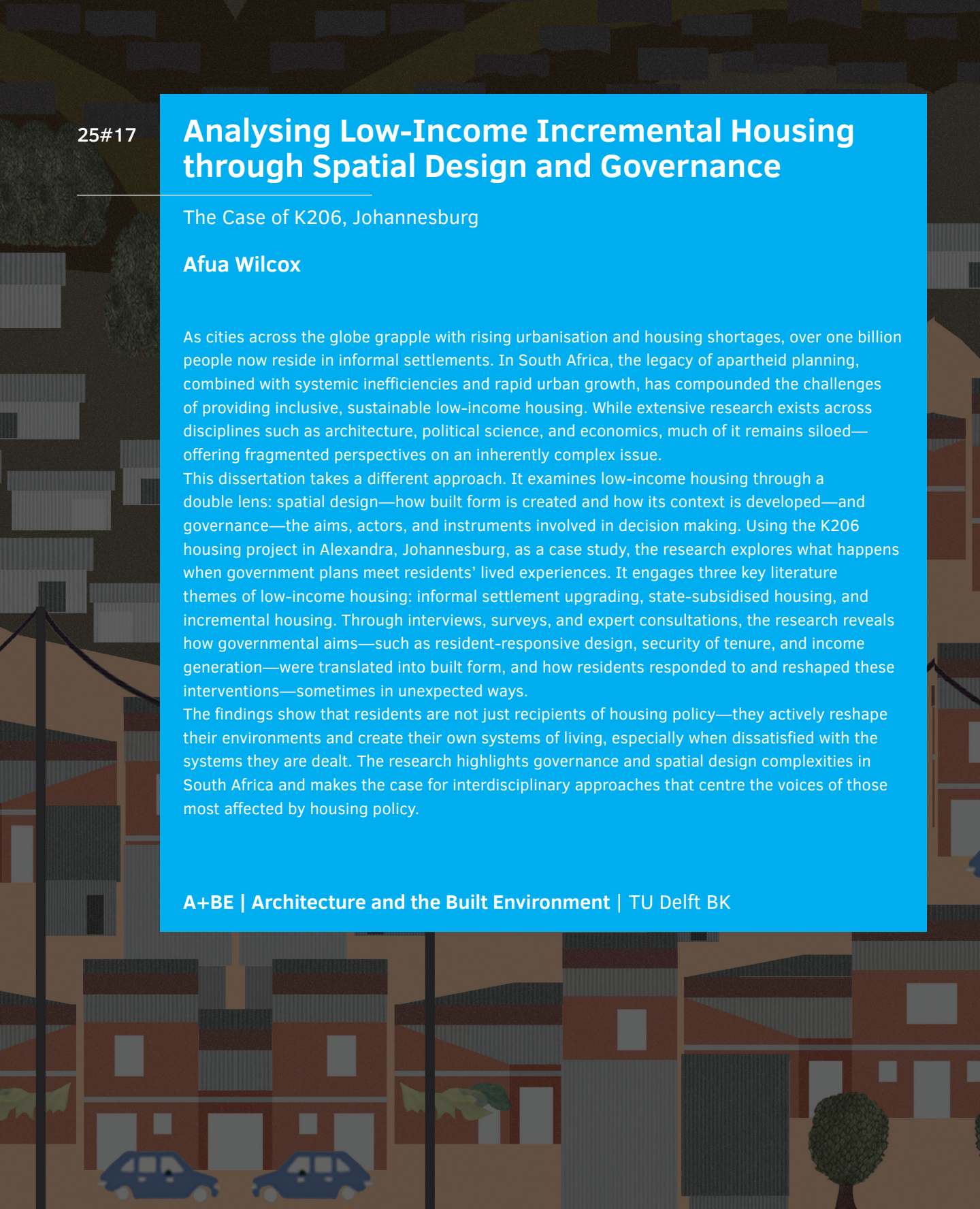
Wilcox, A., Mota, N., Haffner, M. & Elsinga, M. (2024). Compact housing for incremental growth: The K206 RDP project in Alexandra, Johannesburg. Urban Planning, 9, p.7736.

Wilcox, A., Haffner, M., Mota, N. & Elsinga, M. (2024). State-subsidized housing designed for income generation: The case of K206 housing in Johannesburg. International Journal of Housing Policy. p1-25.

Exhibition based publications and Conference papers

Wilcox, A. (2023). The power and powerlessness of designing low-income housing architectures in South Africa. In Reisinger, K. (ed.) *Material practices, positionality, methodology and ethics*, p. 39. Technical University of Munich.

Wilcox, A., Haffner, M., Mota, N. & Elsinga, M. (2021). It is easier to demolish a house than to build one: Informal settlement upgrading and redevelopment, displacement and inequality in sub-Saharan African cities. In Friendly, A. & van Noorloos, F. (eds.) *Proceedings of the CFP R2C1 Conference*, Antwerp, Belgium.



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Analysing Low-Income Incremental Housing through Spatial Design and Governance

The Case of K206, Johannesburg

Afua Wilcox

As cities across the globe grapple with rising urbanisation and housing shortages, over one billion people now reside in informal settlements. In South Africa, the legacy of apartheid planning, combined with systemic inefficiencies and rapid urban growth, has compounded the challenges of providing inclusive, sustainable low-income housing. While extensive research exists across disciplines such as architecture, political science, and economics, much of it remains siloed—offering fragmented perspectives on an inherently complex issue.

This dissertation takes a different approach. It examines low-income housing through a double lens: spatial design—how built form is created and how its context is developed—and governance—the aims, actors, and instruments involved in decision making. Using the K206 housing project in Alexandra, Johannesburg, as a case study, the research explores what happens when government plans meet residents' lived experiences. It engages three key literature themes of low-income housing: informal settlement upgrading, state-subsidised housing, and incremental housing. Through interviews, surveys, and expert consultations, the research reveals how governmental aims—such as resident-responsive design, security of tenure, and income generation—were translated into built form, and how residents responded to and reshaped these interventions—sometimes in unexpected ways.

The findings show that residents are not just recipients of housing policy—they actively reshape their environments and create their own systems of living, especially when dissatisfied with the systems they are dealt. The research highlights governance and spatial design complexities in South Africa and makes the case for interdisciplinary approaches that centre the voices of those most affected by housing policy.

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