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Urban Forum (2024) 35:603–619
https://doi.org/10.1007/s12132-024-09526-1

Social Networks within the City: Remaking the City through Movement and Collecting Materials in Johannesburg, South Africa

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Accepted: 7 October 2024 / Published online: 22 October 2024
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Abstract
This study examines the dynamics of networks among informal recyclers in Fietas, Johannesburg, South Africa, focussing on how these networks embody their struggle for the "Right to the City." By observing informal recycling activities across various Johannesburg suburbs, the study highlights how recycling not only provides livelihoods for the unemployed but also allows marginalised groups to assert their presence and rights within the cityscape. Building upon Adama's (2012) analysis of urban livelihoods and social networks, this research explores the interactions and spatial practices of informal recyclers in Johannesburg. Informal recyclers develop connections with city stakeholders that demonstrate interdependencies crucial for their survival and claiming space within the city. These networks are vital for accessing resources such as recyclable waste, which provides essential needs like food and shelter. These everyday practices underscore the importance of social connections in building networks that sustain livelihoods and assert a right to belong in the city. The nature of these networks varies by location, policies, and social relations. Some are shaped by power dynamics and monopolies, while others reflect interdependence and mutual support. This paper argues that recognising these diverse networks is key to understanding how informal recyclers navigate the urban landscape. In line with Harvey's (2003) "Right to the City," these networks reflect efforts to reshape urban spaces to meet recyclers' needs, despite structural challenges. As Sung (2021) shows, hierarchies and power dynamics influence access to resources, highlighting the contested nature of urban life for informal recyclers.

Keywords Recycling networks · Social networks · Informal waste sector · Sustainable livelihoods

Extended author information available on the last page of the article

Introduction

Informal recyclers, often known as waste reclaimers, play a crucial but frequently disregarded role in urban waste management systems (Coletto & Bisschop, 2017; Samson et al., 2022). They traverse the urban landscape, gathering recyclable materials from thoroughfares, waste disposal sites, and refuse containers and subsequently selling them to recycling companies or middlemen (Medina, 2023; Satori et al., 2020; Sseviiri et al., 2020). By leading an itinerant lifestyle, they move through a wide range of metropolitan regions, including residential neighbourhoods, commercial districts, and industrial zones (Mangarengi et al., 2020; Najihah et al., 2018; Rahman & Maryono, 2020; Ridha et al., 2021; Yousefloo & Babazadeh, 2020). Despite their marginalisation, informal recyclers make substantial contributions to waste reduction, recycling promotion, and the overall effectiveness of urban waste management (Ezeah et al, 2013; Nguyen et al., 2021; Scheinberg et al., 2011; Tong et al., 2021). Their actions align with various urban tasks, such as collecting, sorting and initial processing of waste products, which integrate them into the urban environment and underscore their crucial yet often underappreciated role (Menyuka et al., 2020; Yadav & Karmakar, 2020; Yousefloo & Babazadeh, 2020).

Building on Adama's (2012) examination of urban livelihoods and social networks, this research delves into how informal recyclers navigate and influence urban environments. Adama's work provides a foundational understanding of social networks in urban contexts, which is expanded here to include the specific experiences of informal recyclers.

The ties and networks established by informal recyclers are vital to their functioning and the broader urban environment. These linkages encompass interactions with local citizens, small businesses, other recyclers, and intermediaries or recycling firms (Bermúdez et al., 2019; Calvo et al., 2020; Sseviiri et al., 2020; Steuer et al., 2017). While these networks enable recyclers to exchange information and resources, enhancing their efficiency (Bermúdez et al., 2019; Mahayuddin et al., 2020; Wei et al., 2021), they also represent a form of spatial practice that asserts their "Right to the City." By navigating and negotiating urban spaces, informal recyclers lay claim to their place in the city, challenging conventional boundaries and contributing to urban life in ways that transcend mere economic survival.

Despite the economic and environmental advantages they bring, informal recyclers face significant challenges, including a lack of official recognition, unfavourable working conditions, and health hazards (Binion & Gutberlet, 2012; Gutberlet, 2020; Okwu et al., 2022; Tiwari et al., 2023). Nonetheless, in various cities, efforts are being made to integrate these informal recyclers into formal waste management systems, recognising their contributions and striving to provide them with better support and protection (Bermúdez et al., 2019; Dias, 2016; Gutberlet, 2020; Wei et al., 2021).

The informal recycling industry generates millions of dollars annually and creates a vast supply and transportation network that significantly impacts municipal

solid waste management programs (Cano & Mancini, 2017; Oduro-Appiah et al., 2020; Tong et al., 2021). While often marginalised, informal recyclers exercise their "Right to the City" by actively participating in urban processes, forming social networks, and influencing the urban landscape. This article argues that informal recyclers, though frequently perceived as immigrants and itinerants, engage in complex urban interactions that challenge traditional notions of urban belonging and citizenship. Their networks within Fietas, Johannesburg, illustrate how these recyclers navigate and shape the urban environment, asserting their presence and claiming their "Right to the City" in the face of systemic marginalisation.

Study Site Description

The research was conducted in a neighbourhood of Fietas, where a community of informal recyclers resides. During this period, the area was originally an apartheid town for Indian communities to segregate them from other communities. Vacant plots near and around 14th Street became visible post-apartheid signs when many people were forcefully removed (1969–1979) from the area of racial discrimination during apartheid. Fietas is infamous as the site of forced removals of non-white residents during the apartheid era and bitter resistance against these removals. Fietas is made up of two small suburbs: Pageview and Vrededorp. It was a multiracial area until the late 1970s, when most residents were relocated to faraway suburbs in the apartheid scheme (Moyo et al., 2021; Wotshela, 2023), separating the races under the Group Areas Act (Fintel, 2018). Traces of this history can be seen in the area's urban landscape: Victorian-era colonial houses and shopfronts are interspersed with mid-century council houses built for working-class white residents. The whole neighbourhood is pockmarked with vacant plots and collapsed houses—the scars of an incomplete but nevertheless violent forced removal process. Over the course of the following decades, many families who had resisted removal began to leave the neighbourhood, and urban decay set in. Currently, the neighbourhood is primarily working-class and slum-like, with poor municipal infrastructure and a largely deserted high street (Asiamah, 2023; Pacione, 2023). Below is a map of Johannesburg (Fig. 1) showing Fietas and 14th Street in the suburb. of the city. Fietas is having a central focus and importance for all informal recyclers.

Immigrants to the city began occupying some of these abandoned houses and vacant plots in the early 1990s. In the past decade, many have been evicted (ironically) as families of original residents make land claims on some of the plots. Outside the recently renovated mosque at the western end of 14th Street, a small informal recycler community continues to occupy several empty plots, living in temporary shacks and using the empty land as a makeshift waste-sorting facility. Two tiny neighbourhoods in the nearby areas, Vrededorp and Pageview, show how recyclers travel between Fietas and other locations. 14th Street of Fietas is prominent where informal recyclers used to live and store their waste, and it was the central position for all informal recyclers to do recycling activities and store their materials.

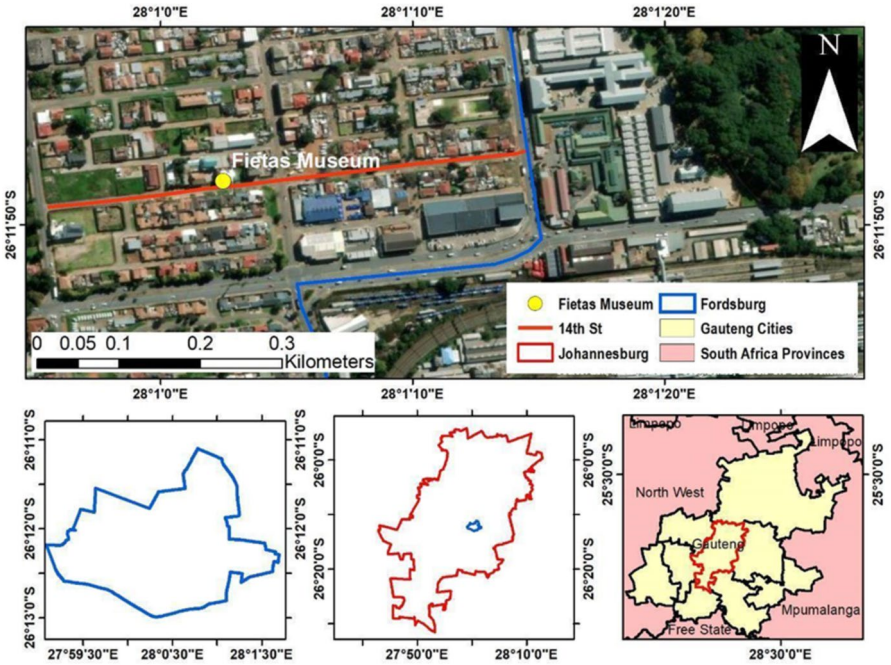

Fig. 1 Map of Johannesburg showing 14 Street in Fietas

For this study, their working approaches, the story behind selecting specific areas for collection, and the challenges they faced during migrations and the lockdown of the COVID-19 pandemic are much more important to know than what they collected. What emerged in the research process was the centrality of Fietas: an otherwise forgotten and abandoned neighbourhood moving to the informal economic opportunities of the city. It was essential to observe how this community managed to live on the same street for decades while formal residents lived on the other side of the same road. They used to sort and segregate waste on vacant plots by dividing it into distinct categories. However, later, they stored their materials in broken and partly damaged buildings. They were using all the vacant plots where forced removals happened due to racial discrimination in the Apartheid era (Howe, 2022; Moyo et al., 2021). In this way, Sarah Charlton (2014) has argued that these recyclers recycle not only objects but also space.

Fietas has become a kind of economic hub for all informal recyclers, even from other suburbs; they also segregate and store their materials here in Fietas. Informal recyclers' routes are essential to tracing, so local and broader routes are observed in the background of their migrations, professional perspectives, and frequency of their visits to their homes. Historically, it was a much-ignored suburb, but now informal recyclers have enhanced its value by making it central for all other surrounding suburbs and changed the identity of Fietas by making it dominant for informal recycling activities. Empty plots can be seen everywhere because racial discrimination victimised people living in Fietas under apartheid when people were forcefully removed

from these places. With time, homeless people from diverse backgrounds came in to reuse the area for their activities.

Methodology

The research methodology employed in this study was predominantly qualitative and ethnographic in nature. The purpose of this approach was to gain a comprehensive understanding of informal recyclers' experiences by closely examining their perceptions, behavioural patterns, language usage, and actions within their natural environment over an extended period of time (Creswell, 2014; Wua et al., 2022). The methodology incorporates components of grounded theory, which is an inductive technique of data collection that involves constructing theoretical interpretations using ethnographic observation, informal interviews, pictures, and transect walks. This approach is particularly valuable for understanding the dynamic interplay between informal recyclers and their urban environment, resonating with the 'Right to the City' framework, which emphasises the need for marginalised groups to have a meaningful influence over urban processes and the reconfiguration of city spaces (Harvey, 2003; Morange & Spire, 2019b; Oliviera & Triana, 2023).

The study focused on informal recyclers as the primary stakeholders. Specifically, the sample included 25 informal recyclers who were interviewed. These participants were selected based on their involvement in recycling activities within the Fietas area of Johannesburg. The data collection process from informal recyclers spanned nearly eleven consecutive months, commencing in July 2020 and concluding in June 2021. The comprehensive study methodology encompassed various processes for participant sampling and data gathering, including interviews, observation, and transect walks.

Ethnographic observation enabled the gathering of data that verbal enquiries alone could not adequately capture. This method facilitated a deeper understanding of how informal recyclers navigate and shape urban spaces, reflecting their right to influence the city's waste management system and their lived experiences within it.

Thematic analysis was employed to examine the data. This comprehensive procedure enables researchers to find several connections between the data and the emerging themes of the study (Brown et al., 2023; Nascimento et al., 2018; Yun et al., 2018). According to Pontis et al. (2015), adaptation in research patterns is facilitated through both inductive and deductive approaches. Cross-referencing with thematic analysis was used to explore relationships between variables and compare different sets of data (Adu et al., 2022; Morgan, 2022). The data interpretation process involved a six-stage thematic analysis approach: familiarisation with the data, creation of initial codes, exploration of themes within the codes, reconsideration of themes, determination and naming of these themes, and production of the final report (Adu et al., 2022; Xu et al., 2018; Zakur et al., 2023).

Participants were provided consent for the recording of some interviews and the capture of photos. Interviews were initiated systematically, with participants given consent forms to sign and permission to record. The interviews began with broad questions and gradually moved to more specific ones. Participants were invited to

share candidly about their experiences, daily routines, and aspirations related to their profession. It was noted that engagement was high initially but waned over time, prompting the use of more concise questions.

The interviews focused on various aspects, including participants' personal backgrounds, encountered problems, migratory experiences, local practices, broader professional connections, life experiences, and the impact of the COVID-19 lockdown on their path. The disruptions caused by the pandemic and lockdown measures presented challenges for data collection. Through informal means, sufficient acceptance and recognition were gained within the local community. Researchers adhered to COVID-19 SOPs to mitigate health concerns.

The pilot study indicated that discursive questioning without interference yielded useful findings, while simple questions were effective when time was limited. Participants, initially hesitant, provided detailed responses after gaining composure. Records of observations, situations, events, and information were meticulously noted to facilitate data organisation and analysis. Interpersonal dynamics and interactions between participants, residents, and law enforcement were observed to understand rights, responsibilities, and cultural norms.

To enhance data validity, the triangulation method, also known as the saturation method, was employed. This approach involves gathering data from multiple sources and focussing on specific thematic areas (Okwu et al., 2022). The methodology included comprehensive interviews, meticulous observations, and comparative analysis of data from various sources. Key informants and participants addressed any discrepancies or divergent viewpoints expressed.

By integrating the 'Right to the City' framework, this study highlights the crucial role of informal recyclers in shaping urban spaces and their right to influence urban processes. This perspective aligns with the broader objectives of promoting urban sustainability and resilience, acknowledging the contributions of informal recyclers to waste management and urban dynamics (Harvey, 2003; Morange & Spire, 2019a; Oliviera & Triana, 2023).

Limitations and Way Forward

This study only focused on place-based activities, which shaped informal recyclers' connections, routes, and living status in their socio-economic backgrounds during the COVID-19 pandemic. Acknowledgement of the limitations of a study and the steps taken to reduce the impact of these limitations are important considerations within any research project (Olson et al., 2023; Sala-Bubaré et al., 2023). Including these stakeholders could contaminate the results with unbiased findings from observations and in-depth interviews with informal recyclers. Hence, the focus was to only add informal recyclers' stories and experiences to capture their voices. To examine the lives of informal recyclers after the COVID-19 pandemic and their future perspectives, more research is needed. Such studies could examine the capacity of informal recyclers to handle traumas and changes in the country's approach and policies towards them.

Results

Most academic literature on informal recyclers has focused on the movement of informal recyclers through urban spaces and how these trajectories re-shape the city. However, during the research process, it became clear that the geographies of informal recyclers related not only to their itinerant daily livelihood activities but also to a broader connection that developed due to these activities. Most informal recyclers made Fietas their temporary locale from other parts of the city or beyond. Locating Fietas depends on distinct reasons, among them its proximity to the recycling centres in Fordsburg and/or the vast vacant land available. The results explore the social networks and connections with different stakeholders in society: informal recyclers, residents of Fietas, Pikitup, the local municipality, and the local police force.

Social Networks and Connections

Informal recyclers remake urban spaces where injustices, stigmatisation, and social rejections are visible in their lives. These processes can be understood through the "right to the city" framework, which emphasises the rights of marginalised groups to access, occupy, and transform urban spaces (Harvey, 2003; Morange & Spire, 2019b). This framework highlights how informal recyclers, through their daily activities and social networks, assert their right to reclaim and repurpose urban spaces, which are often marked by exclusion and inequality. This study analysed the broader relations of informal recyclers towards stakeholders directly or indirectly involved in their daily lives and how these might develop favourable or unfavourable networks and connections, reflecting their negotiation of urban space as an assertion of their right to the city.

Relationship of Informal Recyclers with Residents of Fietas

Many studies imply that residents are usually hostile towards informal recyclers (Ezeah et al., 2013; Satori et al., 2020). However, in this study, it was noted that residents of Fietas did not have many complaints and felt comfortable despite being in the presence of informal recyclers. This positive relationship reflects how informal recyclers have managed to carve out a place within the community, thereby exercising their right to occupy and engage with urban space (Harvey, 2003; Morange & Spire, 2019a). The residents' recognition of the recyclers' vigilance, especially at night, underscores a mutual understanding and respect that contributes to the social fabric of Fietas, affirming informal recyclers' claim to the city. However, instances of hostility, as described in the quote from Sipho, also highlight the ongoing struggle for acceptance and inclusion, which are essential components of the right to the city (Oliviera & Triana, 2023).

Relationship of Informal Recyclers with Pikitup

Pikitup is the city's official waste management service provider and is responsible for keeping the city clean and preserving an attractive and hygienic environment for residents and visitors (Niyobuhungiro & Schenck, 2021; Sharon et al., 2023). On small, narrow roads and pathways, Pikitup cannot gain access and thus cannot provide the required services; these informal recyclers fill the gap by providing services that indirectly support Pikitup. Informal recyclers share their responsibilities without charge. Informal recyclers indicated they wanted to leave a good impression after recovering materials from the bins by returning all garbage bags in the bin. Keeping roads and streets clean proves they are good citizens and want to work in a smooth and calm environment. This dynamic illustrates how informal recyclers, by integrating their activities with the formal sector, assert their right to contribute to and benefit from the city's resources and infrastructure, thus reinforcing their role in urban governance (Harvey, 2003).

"We cannot stand on their (formal sector) job; they have to pick up." Emanuel, a key informant.

Informal recyclers understand their work and routes to rescue recyclable objects, but in the meantime, they know people do not like them. Sometimes their schedules clash with the formal sector, especially in the morning when Pikitup vehicles approach to collect trash bags. If Pikitup collects trash bags from the same street, informal recyclers quickly approach another road that Pikitup has not yet reached to collect materials without wasting time. Informal recyclers are adaptable to following the rules and regulations by considering and acknowledging that the nature of their duties differs from theirs. However, informal recyclers feel they are more hard-working than Pikitup workers, as Pikitup workers have a better lifestyle because they work for an organisation. According to the informal recyclers, formal sector workers do not have to push heavy trolleys in severe weather because they have transport facilities with neat, clean, professional uniforms and monthly salaries. They indirectly respect the schedule and responsibilities of the formal sector, but meanwhile, they compare their lives with those of the formal sector without blaming the government. This comparison reflects the informal recyclers' assertion of their right to dignified and fair participation in the urban economy (Oliviera & Triana, 2023).

"Maybe their time is running out; only they collect the bags.". Stanly, a key informant.

The informal recycler's living style is murky and lacks all basic facilities like toilets, bathrooms, houses, and clean drinking water. Even though informal recyclers provide segregated materials to recycling industries and increase landfills' life span by providing raw materials for recycling industries (Ezeah et al., 2013; Wilson, 2023; Schneider et al., 2017), they are hardly acknowledged. People have accepted and welcomed Pikitup workers but exploited and rejected informal recyclers (Satori et al., 2020; Schneider et al., 2017). Fietas residents always welcomed them as a community on the 14th street. Nevertheless, informal recyclers positively connect with the formal sector by acknowledging their roles and duties. This connection reflects the broader struggle for recognition and equitable treatment within urban spaces as part of their right to the city (Harvey, 2003).

Relationship of Informal Recyclers with the Police of Johannesburg

Informal recyclers constantly face the threat of eviction from their neighbourhood or arrest at any time, which is unpleasant and uncomfortable for their relationships. The behaviour of the police constantly reminds them that they do not belong to the area of Fietas because they are continuously threatened to be moved away. According to the informants, the police of the area may ruin all efforts of informal recyclers and burn all their belongings from time to time, which were kept being sold at buy-back centres. Nevertheless, informal recyclers acknowledge the duties and responsibilities of the police force. In a few cases, informal recyclers were blackmailed and accused of involvement in illegal activities, which sometimes forced them to take money from their earnings (Bermúdez et al., 2019; Okwu et al., 2022). The relationship they hold with police officers is very strained, but at times, police officers provide a helpful hand to informal recyclers. In this research, it was found that in some cases, police were beneficial towards informal recyclers with outstanding behaviors. One informal recycler reported that a resident in another suburb was harassing him, and the police acted and gave him permission to collect materials safely. This strained yet occasionally supportive relationship underscores the challenges informal recyclers face in asserting their right to the city amidst formal enforcement mechanisms that often marginalise them (Harvey, 2003; Morange & Spire, 2019b).

Relationship of Informal Recyclers with Other Informal Recyclers

Through the observational study, it was noted that informal recyclers had strong feelings and emotions, fully understood social living values, and behaved by showing sympathy in a sharing and caring environment. They may have learnt to avoid those behavioural blunders and approaches with their peers as a result of constantly facing rejection from society (Okwu et al., 2022). They have learnt the ethics of solidarity and mutual aid, which can be seen in their daily interactions and support for one another. During one of the interviews, the researchers saw an incident where another informal recycler gave T-shirts to another community member. He could keep two of them and gave his friend an extra shirt, indicating their generosity. However, this generosity and loyalty were not confined to T-shirts; it was noted in the sharing of extra food, clothing, and other basic items with their neighbors. Sometimes they receive extra food from food point owners or restaurants and will offer their fellow informal recyclers extra food before they prepare their own dinner. The exchanging of good and surplus items creates stronger bonds within their circles (Marello & Helwege, 2017), and this is not something that is only confined to high- or middle-income societies but also as a means of establishing good terms in informal sectors.

Informal recyclers are concerned about their social terms with other informal recyclers. Informal recyclers try to refrain from drugs as they believe it can lead to many ills and destroy one's future, so they deliberately avoid having a relationship or connection with people dealing with or using drugs. Their connections with other informal recyclers were always beneficial materialistically and spiritually; when they needed moral support, they found their work friend with them. If they got sick, they would help and provide food to that informal recycler; if required, they called

emergency assistance from a nearby hospital, where they knew they would receive medical treatment without being ostracized. They were very respectful to each other, as they did not interfere in each other's matters but still cared for each other's belongings. These internal networks among informal recyclers can be seen as a form of asserting their collective right to the city, fostering a supportive and resilient community despite external challenges and marginalisation (Oliviera & Triana, 2023).

Conclusion and Discussion

This study builds upon Adama's (2012) findings about urban livelihoods by highlighting the essential contribution of informal recyclers in influencing urban landscapes. It emphasises how their spatial activities and socio-economic relations both contest and redefine urban policy and the traditional conception of space. Incorporating informal recyclers into urban systems demonstrates their impact on the sustainability and resilience of cities, enhancing the comprehension of how informal networks change urban environments (Cheng & Jiang, 2023; Harvey, 2003).

The interactions between informal recyclers and other urban stakeholders, including homeowners, law enforcement, and businesses, exemplify the complex socio-spatial interdependencies that support the urban waste management system. These partnerships, typically based on informal bargaining, illustrate how informal recyclers establish niches within the urban environment for their sustenance. Their interactions with people, merchants, law enforcement, and official waste management organisations constitute a complicated network that allows recyclers to obtain resources and generate mutually beneficial possibilities (Kalina & Samson, 2020; Wang et al., 2017). Despite intermittent difficulties, these encounters highlight the recyclers' essential function in preserving urban cleanliness and minimising trash. Urban policymakers should take these informal interactions into account when formulating more equitable and sustainable waste management policies (Scheinberg et al., 2011; Moalem et al., 2022).

These results correspond with the research of Schenck and Blaauw (2011) regarding the contentious dynamics among waste pickers, the public, and law enforcement agencies. Their research highlights that the stigma surrounding informal recycling can create conflicts between recyclers and local authorities, frequently culminating in harassment and criminalisation. In Johannesburg, informal recyclers report a spectrum of interactions with the police, encompassing both collaboration and coercion. The adoption of community policing initiatives, as proposed by Tirado-Soto and Zamberlan (2013), may enhance these strained relationships and foster improved collaboration between recyclers and law enforcement authorities.

Kalina and Samson's (2020) research highlights the ambivalence around informal recycling in discussions with householders. Homeowners frequently acknowledge the advantages of recyclers' services; nonetheless, apprehensions regarding noise, cleanliness, and security sometimes eclipse these benefits. This reflects the experiences of recyclers in Fietas, who report differing levels of collaboration and discord with residents. Some residents directly supply recyclables, aiding recyclers, while others oppose their existence owing to perceived security risks. This ambivalence

signifies wider socio-economic inequalities and the marginalisation of informal recyclers in urban settings (Godfrey, 2021; Muheirwe et al., 2023).

The combination of our data with existing research illustrates how informal recyclers manoeuvre through a complex network of relationships with many stakeholders. These relationships determine their access to recycling, affect their movement, and influence their overall socio-economic status. Analysing these connections within the framework of Harvey's (2003) "right to the city" reveals that informal recyclers establish their presence in urban environments, demanding space and resources in ways that contest conventional urban planning paradigms (Morange & Spire, 2019b). Their regular behaviours, albeit overlooked, signify acts of spatial reclamation and resilience that merit recognition in urban policy discussions.

The interaction between informal recyclers and formal waste management enterprises demonstrates a complex dynamic. Formal firms frequently perceive informal recyclers as both rivals and collaborators. Informal recyclers diminish the quantity of valuable materials accessible for official collection, and simultaneously, they mitigate landfill pressure by redirecting recyclables from the trash stream (Sholanke & Gutberlet, 2021). This dichotomy highlights the necessity for policies that incorporate informal recyclers into the formal waste management system, recognising their role in urban sustainability while offering them assistance and resources (Sung, 2021).

Furthermore, the connections between informal recyclers and merchants, along with other enterprises, highlight their essential function within the urban ecology. Retailers frequently collaborate with recyclers, gaining advantages from their waste management services, which lower disposal expenses and mitigate environmental effects (Gall et al., 2020). Nonetheless, concerns around hygiene and safety persist as obstacles to these connections. Consistent communication and well-defined collaborative practices between recyclers and enterprises should mitigate these issues and enhance cooperation (Wei et al., 2021).

The relationships among recyclers exemplify the intricacy of their socio-economic networks. Informal recyclers function within a framework that integrates cooperation and competition. Although they exchange information and collaborate to enhance efficiency, competition for limited resources may result in conflicts. Nonetheless, they preserve a robust sense of community, founded on collective experiences and reciprocal support (Dias, 2016; Ezeah et al., 2013). Fortifying these informal networks could augment the resilience of the recycling sector, facilitating more efficient collaboration and resource allocation.

The matter of identity documentation continues to be a significant difficulty for informal recyclers. In the absence of adequate identification, numerous recyclers encounter incarceration or extortion by law authorities, so constraining their capacity to operate freely (Satori et al., 2020). Resolving this issue via registration initiatives and the issuance of identity cards will empower recyclers, enabling them to traverse the city with greater autonomy and cultivating trust within urban populations.

This study enhances the existing literature on urban livelihoods by elucidating the intricate, varied ties that informal recyclers have with many urban stakeholders. These ties, though oftentimes tense, are crucial for maintaining the city's waste management system. By claiming their entitlement to the city, informal

recyclers contest conventional urban power dynamics, establishing their own niches within the urban landscape (Harvey, 2003). The socio-spatial aspects of these connections, especially with homeowners, businesses, and law enforcement, highlight the necessity for policies that acknowledge and bolster the essential contributions of informal recyclers (Morange & Spire, 2019a).

Policymakers must confront the systemic marginalisation of informal recyclers to promote a more inclusive and sustainable urban environment. This necessitates the incorporation of recyclers into the formal waste management system, along with granting them legal recognition and the requisite resources for unobstructed operation. Moreover, including communities and enterprises in cooperative initiatives helps mitigate tensions and foster a more amicable cohabitation. Acknowledging the significance of informal recyclers as important contributors to urban sustainability is crucial for developing cities that are equitable and resilient (Sholanke & Gutberlet, 2021; Uddin et & Gutberlet, 2020). A subsequent study ought to concentrate on a more in-depth investigation of the gendered and racial aspects of informal recycling, in addition to assessing the enduring effects of governmental interventions designed to enhance recyclers' livelihoods.

Acknowledgements I am deeply grateful to all the individuals who contributed to the development of this PhD article on the social connection of informal recyclers. Their help, guidance, and encouragement have been invaluable throughout this study.

First and foremost, I would like to express my deepest gratitude to Allah Almighty for granting me the strength, perseverance, and encouragement to complete this work. His guidance has been my constant source of inspiration.

I wish to sincerely thank my supervisors, Dr. Alex Wafer and Dr. Raeesa Moolla, for their expertise, insights, and mentorship, which shaped the direction and methodology of my project. Their unwavering support and constructive feedback have been instrumental in refining my research questions and approach.

I also express my heartfelt thanks to the participants of this study, the informal recyclers, for their openness in sharing their experiences and perspectives. Their voices and stories have been vital to this research, shedding light on the complex social connections within their communities and enhancing my understanding of their lived realities. I am grateful to the University of Wits for providing the resources, facilities, and institutional support that facilitated my research and fieldwork.

A special note of appreciation goes to my husband Abdul Qaddus Rabbani, whose unconditional love and belief in my work pushed me to achieve this publication. His constant motivation and unwavering support during challenging moments were instrumental in helping me reach this goal.

This research was made possible by the collective efforts of all those mentioned above, and while any errors or omissions are my own, their contributions were essential in completing this PhD article.

Thank you

Funding Open access funding provided by University of the Witwatersrand. I, Fehmida Qaddus Rabbani, affirm that I personally funded all expenses for my research, initially for my PhD project and subsequently for the papers. I conducted this research as a crucial component of my PhD program to publish a paper. The research was allowed by the ethics committee at Wits University to collect data from fieldwork and was classified as low-risk research. The study included human volunteers, with the primary source being informal recyclers from Fietas during the COVID-19 pandemic. The undersigned recognise the crucial role of informal recyclers in our communities and support the improvement of their social integration for a more inclusive and sustainable future.

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Declarations

Competing Interests Here are potential competing interests for this article on the social connections of informal recyclers in Fietas, Johannesburg:

1 Economic Interests: Formal waste management companies or businesses in Fietas may have economic interests that could be affected by the actions of informal recyclers. They can view informal recyclers as rivals or attempt to shape regulations to limit their actions.
2 Political Interests: Local government authorities or policymakers in Fietas may have conflicting political interests regarding trash management strategies. This may involve issues related to overseeing waste management procedures or handling grievances from citizens or companies regarding informal recycling methods.
3 Environmental Interests: Environmental groups or activists may have conflicting concerns about the environmental effects of informal recycling practices in Fietas. Informal recyclers can divert garbage and recover resources; however, there are worries about environmental hazards linked to their operations, like pollution and health risks.
4 Social Justice Interests: Community organisations or advocacy groups may have conflicting interests in social justice and equity for informal recyclers in Fietas. They may support the rights and acknowledgement of informal recyclers as crucial participants in the local economy and environmental sustainability while simultaneously tackling problems of exploitation, discrimination, or marginalisation.
5 Public Health Interests: Public health agencies or organisations may have conflicting interests in the health and safety impacts of informal recycling activities in Fietas. They may aim to control or reduce potential health hazards linked to informal recycling techniques, like exposure to dangerous substances or unsanitary working conditions.
6 Community Development Interests: Local people or community development organisations may have conflicting interests in the effects of informal recycling activities on the general progress and welfare of the Fietas community. These concerns may involve property values, aesthetics, or quality of life issues related to the presence of informal recyclers in the region.
7 Academic or Research Interests: Researchers or academics investigating informal recycling in Fietas may have conflicting interests concerning funding, publishing, or professional acknowledgment. They may aim to promote their own research agendas or viewpoints, which may differ from the interests of other stakeholders involved in the matter.
The conflicting interests illustrate the intricate dynamics and interconnections among stakeholders in the research on informal recycling and social connections in Fietas, Johannesburg. It is crucial to acknowledge and deal with these conflicting interests to enhance transparency, cooperation, and fair results in research and policy development.

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