



Double Whammy Wicked: Street Vendors and Littering in Mankweng Township and Paarl, South Africa—Towards People-centred Urban Governance

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Abstract

The article probes the complexity of dealing with two interrelated wicked problems, namely informal, self-employed street vendors, and their experiences of littering. This paper describes the themes that emerged from 92 qualitative interviews to determine the perceptions of street vendors regarding reasons for littering on the streets where they operate as well as their experiences of working in these littered environments. By drawing on the themes emerging from semi-structured interviews with vendors, we suggest how stakeholders could engage with the concerns around street vending and littering by means of the use of adaptive management or co-management, engaging, and integrating diverse perspectives, the facilitation of self-organisation, and establishing safe boundaries to evade system thresholds. In this way, complexity-based strategies can promote people-centred urban governance that empowers and includes citizens in attempts to manage the wicked problems of growing cities inclusively.

Keywords Waste management · Littering · Street vendors · Complexity theory · Wicked problems · Sustainability

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Introduction

Difficult policy issues have been described as “wicked” when they are seen as socially, economically, environmentally and politically complex, intractable, open-ended, and have multiple actors and multiple solutions (Head, 2008; Lonngren & van Poeck, 2021; Peters, 2017). They have also been depicted as problems that do not respond to conventional linear models of policy and programme interventions (Peters, 2017; Wong, 2020). In principle, May et al. (2016) view typical wicked problems as having rights- and justice-based origins. On a broader canvas, Turner and Baker (2019) distinguish wicked problems from simple problems (identifiable and solvable with simple solutions) and complex problems (agreed-upon problems with potentially different solutions). Wicked problems signify non-agreed, context-specific problems and solutions. To attempt to address these issues or problems is a matter of trying to “tame the untameable” (Turner & Baker, 2019).

The discourse about wicked problems started 30 years ago with critique regarding policies that attempted to solve complex problems with a simple singular blueprint and top-down solutions (Head, 2008; Lonngren and Von Poeck, 2021). Criticisms targeted policies and programmes that overlooked contexts, culture, values, multiple and competing views, and lived experiences of the role players and those affected or involved (Head, 2008).

Researchers have stated clearly that there is no magic or silver bullet for wicked problems (Biggs et al., 2015; Everest-Phillips, 2014; May et al., 2016; Peters, 2017). Instead, evolving participatory processes to develop a better understanding of the problem and the co-production of possible multiple solutions provide a sounder approach. Wicked problems require deliberation and debate concerning the nature of the issues and exploration of alternative ways forward. Accordingly, transdisciplinary teams are better equipped to deal with wicked problems.

Complexity theory is regarded as a theoretical framework that can assist in explaining and understanding wicked problems (Biggs et al., 2015; Head, 2008; Turner & Baker, 2019; Wong, 2020). However, there is no unified theory of complexity; instead, the idea of complexity draws on diverse interpretations and disciplinary lineages (Audouin et al., 2013; Preiser et al., 2018). Using an approach drawing on complexity, in contrast to strong reductionist approaches, involves a self-reflexive and post-reductionist stance (Audouin et al., 2013). It is an attitude based on the premise that knowledge is limited and that we cannot have a full comprehension of complex systems (Preiser & Cilliers, 2010; Preiser & Woerman, 2019). Preiser and Woerman (2019) describe complex systems as comprised of multiple, interrelated/interconnected components and processes. In this case, interrelatedness is of more interest than the components. The complexity lies in the interaction or interrelatedness of the parts that are unique in each system (Peter & Swilling, 2014; Turner & Baker, 2019). Preiser and Cilliers (2010:282) state: “[T]here are no simple solutions to problems that emerge in complex systems. Because we do not have full knowledge of a complex system, we cannot be in a position to calculate what the exact cause of a problem is and how to solve it.”

Everest-Phillips (2014), Biggs et al. (2015), as well as Lonngren and van Poeck (2021), regard current sustainability challenges as significant wicked problems. Complexity theory has been proposed as a suitable angle of approach to some challenges in solid waste management (Gaeta et al., 2021). With regard to plastic bag disposal, for example, Aurah (2013:96–97) indicates the encompassing and complex nature of the issue since it impacts “the sustainability of the natural resources, life support systems, social harmony, human rights, economic growth, and people’s participation in making decisions affecting lives”. Littering can therefore be interpreted as a wicked problem affecting socio-ecological systems (SES).

Another wicked problem intersecting with the problem of littering in the context of solid waste management relates to informal street vendors. Informal vendors have been studied through the lens of complexity theory from an architectural perspective within the context of informal railway markets (Mitra, 2008) and from a design perspective in relation to the formal sector in the urban environment (Patil & Dongre, 2014). The aim of this article is to bring together these two wicked problems in the South African waste management context. We explored street vendors’ experiences and multiple views on the proliferation of littering in the areas where they operate in two urban areas in South Africa. This article further suggests people-centred governance to deal with both these wicked problems, drawing on the complexity-based strategies identified by Everest-Phillips (2014) and Biggs et al. (2015) to manage SES characterised by uncertainty and change. These strategies must be viewed as interrelated and include the use of adaptive management or comanagement, engaging and integrating diverse perspectives, the facilitation of self-organisation, and establishing safe boundaries to evade system thresholds (Biggs et al., 2015). The study uniquely builds on the National Waste Management Strategy (NWMS) 2020 (DEFF 2020) which proposes an increased understanding of waste management issues in the South African context and how they can be collaboratively approached.

Wicked Problem 1: Street Vending

Street vending has been defined as a mobile, space bound, predominantly urban practice (Adama, 2020), or it refers to the practice of offering goods for sale to the public without having a permanently erected structure from which to sell (Asiedu & Agyei-Mensah, 2008). It is further seen as one of the most visible occupations in the informal economy (Roever & Skinner, 2016). It takes place on sidewalks, in parks, at intersections, and at outdoor shopping malls. In different forms and shapes, street vending is a phenomenon that cuts across all developed and developing countries and historical periods (Wardhaugh, 2009). As a result of the high and growing unemployment rates in the developing countries (Chitotombe, 2014), it is particularly in developing countries where the street is a popular and indispensable resource of income for the unemployed (Adama, 2020; Rugoho, 2017). Street vendors are also linked to high human traffic, taxis, commuters, and other activities (Chitotombe, 2014).

An estimated minimum of 1 million street vendors operates in South Africa (Arias, 2019). They represent a significant proportion of the workforce and

contribute to both the informal and the formal economy. Street vendors mainly sustain low-income, often women-headed households, and migrants (Arias, 2019; Roever & Skinner, 2016).

Roever and Skinner (2016) argue that street vendors should be viewed as business owners with a right to practise their occupation. Desiring independence, they instead work under uncertainty and are subject to evictions, relocations, and exclusionary policies. Roever and Skinner (2016) suggest that global and local policy choices of relocations and evictions are motivated by the ideal of modern, hygienic, and gentrified cities. The assumptions seem to be that the presence of street vendors signals “backwardness” and promotes dirty cities, and that street vendors are “out of place” (Roever & Skinner, 2016; Yatmo, 2008). Authorities view street vendors as the undesirables of the urban landscape and bad for tourism. There is very little room for small-scale livelihoods if the ideology of planned and orderly cities remains a core belief. Yatmo (2008) argues that it is difficult for the policy makers and planners to meet with informal workers such as the street vendors and work towards collaborative solutions.

Street vendors operate in open and highly contested public places and spaces. Contested spaces result from the tension between the street vendors and the local government, the public, and the formal businesses (Rugoho, 2017). Consequently, key unresolved debates have developed over the years (WIEGO, 2020). These debates and tensions mainly involve the street vendors’ individual and collective rights to work, registration and taxation, urban governance (Adama, 2020; Arias, 2019; Asiedu & Agyei-Mensah, 2008; Crush et al., 2015; Muyanja et al., 2011), and waste management issues as street vendors are often blamed for the littered and dirty streets (Chitotombe, 2014; Gamiendien & Van Niekerk, 2017).

Despite the drive towards urban inclusivity, street vendors still experience workplace insecurity, exploitation, harassment, confiscation, and eviction (Roever & Skinner, 2016). Self-made rules, especially by self-appointed leaders or “landlords” of contested spaces intensify tensions (Adama, 2020; Arias, 2019; Rogerson, 2018; WIEGO, 2020). In the South African context, migrant street vendors experience increased vulnerability due to rivalry to obtain space through their complex networks (Arias, 2019) and xenophobia (Gamiendien & Van Niekerk, 2017). Rogerson (2018) gives one such example where migrants have to pay inflated rent for the space to set up their business. The vulnerabilities of the migrant street vendors, according to Crush et al. (2015), increase to the point where they take their lives into their own hands when they trade on the streets. Chen et al. (2016) put the dilemma of the street vendor clearly: they are inside the punitive but outside the protective arm of the state. The Habitat3 report for the New Urban Agenda of the United Nations (UN-Habitat, 2017) that declares the inclusion of the informal workforce in the urban environment is therefore welcomed.

Some literature on street vendors and littered streets attribute blame to street vendors and links dirty streets to their food preparation and sales (Chileshe, 2020). In the South African context, it is estimated that 70% of all street vendors sell food (Arias, 2019; Gamiendien & Van Niekerk, 2017; Govender & Reddy, 2020; Muyanja et al., 2011; Rugoho, 2017). They sleep on the streets when they cannot leave their

stalls and products and are blamed for the condition of the public ablution facilities – if they have access to these facilities (Rugoho, 2017).

Wicked Problem 2: Littering

Globally, littering is perceived as the most visible sign of environmental pollution (Ojedokun, 2011). Littering in South Africa creates major challenges for waste managers of towns and cities. Nkwocha and Okeoma (2009), Wanjohi (2016), and Schultz et al. (2013) view littering as waste being disposed of in the wrong place and littering behaviour as the process by which waste ends up in the wrong place, thus affecting people's quality of life. Litter causes environmental, economic, health, and aesthetical problems. It decreases property value and reduces sales for the formal and informal businesses alike. A study on the reasons for littering throughout Nigeria, related littering largely to street vendors, particularly to food sale practices (Nkwocha & Okeoma, 2009).

Research Setting

The study took place in the Paarl central business district (CBD) and Mankweng township. These areas form part of the larger “clean city/town” project funded by the Council for Scientific and Industrial Research (CSIR) Waste Research, Development and Innovation (RDI) Roadmap, aiming to understand the reasons for littering and illegal dumping in South Africa. Of the four towns involved in the project, only Paarl and Mankweng have street vendors. As can be seen on the map below (Fig. 1), the two towns are situated in two provinces and have very different demographic profiles.

Paarl is the main urban centre of the Drakenstein local municipality, a secondary city¹ in the Western Cape, a province of South Africa (Drakenstein Municipality, 2021). The street vendors are active in the CBD of the town. Some street vendors operate in the main streets and some in the smaller back or the side streets leading to the busy taxi rank.

Mankweng is a township with a mixture of formal and informal areas and is part of the Polokwane local municipality in the Limpopo province. Mankweng is 27 km east of Polokwane city, which is the capital of Limpopo and is regarded as a secondary city. Mankweng originated in the 1960s when the then apartheid government established the University of the North (now the University of Limpopo). The three main areas where street vendors are active are the shopping complex near the University of Limpopo, the area next to the Paledi shopping mall, and the two taxi ranks. The Paledi shopping mall is next to the highway that passes through Mankweng on the way to Magoebaskloof and the Kruger National Park, two major tourist attractions in South Africa.

¹ Secondary cities imply cities positioned somewhere around the middle level of the national urban hierarchy and playing a supplementary role in respect of functions (Donaldson et al., 2020).

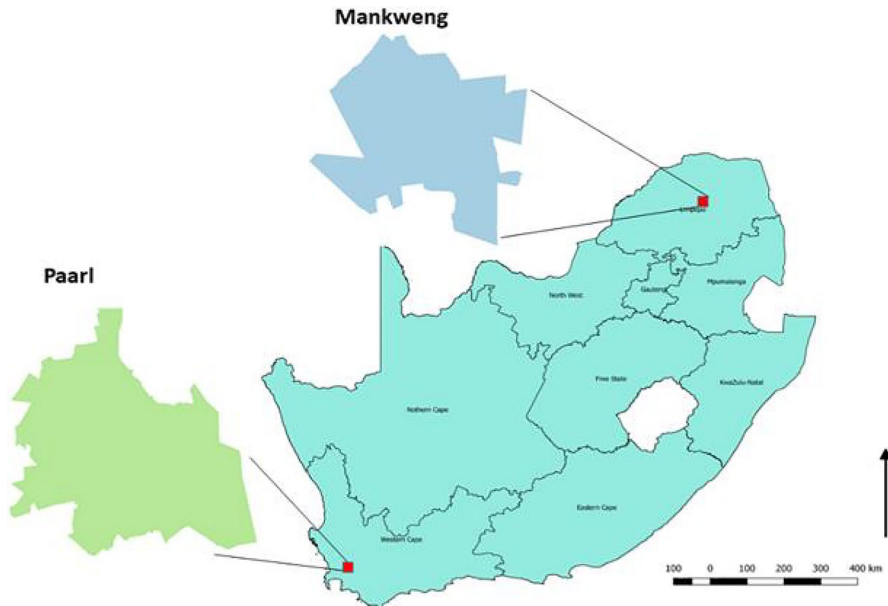


Fig. 1 Map of South Africa indicating Mankweng and Paarl. Source: Alex Kimani

Methods

To study wicked problems from a complex theoretical perspective requires a qualitative research methodology that can elicit lived experiences and the relational aspects (Gear et al., 2018). The research on the street vendors was a qualitative exploratory study with semi-structured interviews with 92 street vendors in Mankweng and Paarl. In both areas, convenience sampling was used. The fieldworkers conducted interviews with the street vendors available and willing to be interviewed. Street vendors selling food as well as other products such as clothes, hair products, and toiletries were included. Data collection in Paarl took place during October 2019, while data was collected in Mankweng during November 2019 (pre-COVID).

For the research in Paarl, a group of postgraduate students from the University of the Western Cape were trained to interview the street vendors; while for the Mankweng setting, a group of postgraduate students from the University of Limpopo, situated in Mankweng, were trained to act as fieldworkers. Student interviewers from the respective universities were selected because they could speak the local languages of the participants (Afrikaans, English, and IsiXhosa in Paarl, and Sepedi in Mankweng). The researchers also conducted some of the interviews in person where the language was not a barrier. Researchers were present to deal with any issues that could occur while collecting data. Aligning with the aim and theoretical framework of the project, semi-structured questions were used. Interviews were conducted until the fieldworkers reported data saturation. For the purpose of this study, only two of the questions were analysed and reported on. A question “*What is the reason for the*

Table 1 Summary of themes

Theme 1: reasons for littering	Theme 2: experiences of working in the littered area
1.1. Street vendors' perceived characteristics of the customers and pedestrians as litterers	2.1. Street vendors' experiences of littering in their working environment
1.2. The complexities of the waste infrastructure	2.2. Littering affects the street vendor's business
1.3. Lack of sanitation adds to littering	2.3. Health and food concerns
1.4. Littering creates jobs	2.4. Limited alternatives or choices for work
1.5. Presence or absence of cleaners from the municipality	2.5. Street vendors own the responsibility to clean

research data

littering in this area?" was posed. We further explored their experiences of working in these littered areas.

Ethical clearance for the study was obtained from the Human and Social Sciences Research and Ethics Committee (HSSREC) of the University of the Western Cape. Each participant was requested to complete a consent form. Interviews were not recorded due to the noisy surroundings, and the fieldworkers wrote down the responses of the participants. The responses were captured and manually, thematically analysed by the first author and confirmed by the coauthors. The responses from both towns were first analysed separately. The themes were compared and found to be similar and will be presented as such. It is only Theme 1.5 which emerged in Paarl and not in Mankweng.

The limitation of the project is that the results are context-specific and cannot be generalised. The fact that most of the themes were similar might be an indication that the themes may be relevant to the broader South African context.

Findings

Table 1 below provides the summary of the 10 themes identified from the two questions posed to the street vendors.

Theme 1: Reasons for Littering

Theme 1.1: Street Vendors' Perceived Characteristics of the Customers and Pedestrians as Litterers

Several scholars have linked littering as a disposal practice with perceived characteristics. Govender and Reddy (2020) emphasise the negative behaviour patterns of citizens as contributing to littering. Southall (2018) describes people who are littering as selfish. Wilson (2020) says culture, values, norms, and the environment play a role. In a study on personality attributes, Ojedokun (2011) concluded that characteristics such as altruism and locus of control play a significant role in environmental

behaviour. However, Ojedokun (2011) also found that people cannot display responsible environmental behaviour if sufficient facilities are not provided. Nkwocha and Okeoma (2009:155) argue that littering is “a brutal expression of loss of hope among urban dwellers” whose behaviour may be a reaction against the authorities.

Street vendors in Paarl and Mankweng associated certain perceived characteristics with litterers. Paarl street vendors commented: “*There are enough bins but people still throw on the grounds*”; “... *ignorance...*”; “*People are lazy*”; and “*They do not want to open the bins.*” Others pointed out other behavioural aspects: “... *habit...*”; “*Some are in a hurry*”. “*They think it is too far to find a bin.*”

Some comments by Paarl street vendors focused on the lack of education: “*Naivety – they don’t know about using bins*”; “*Lack of education*”; and “*It is how they were raised.*” One participant emphasised that littering “... *is about people – it is not the fault of the municipality, it is people who should learn.*”

In Mankweng, the comments of the street vendors singled out certain attributes: “*People don’t care about the cleanliness of our environment and health*”; “*People are just reckless, they litter everywhere, even in the mall toilets, they are dirty*”; “*It shows how irresponsible they are*”; “*The customers are ignorant and do not want to listen to us*”; “*It’s people’s untidiness and stubbornness to give us extra work.*”

Similar to street vendors in Paarl, the street vendors in Mankweng notably did not blame the municipality: “*Even if the municipality places bins around, people will still litter*” and “*People are too lazy to carry the waste to the bin.*” Moreover, street vendors in Mankweng were also linked to littering: “*Misinformed vendors litter and dump everywhere.*”

Theme 1.2: the Complexities of the Waste Infrastructure

Willemse (2011) conducted a study among street vendors in four South African cities. One of the major constraints highlighted by the street vendors in her study was the lack of infrastructure for proper waste management such as waste receptacles. Chitotombe’s (2014) research in Harare, Zimbabwe, as well as studies by Govender and Reddy (2020) and Alfes et al. (2016) in Durban, confirm the necessity to have sufficient and effective infrastructure for waste generated by the street vendors (such as food waste and the packaging in which the food is sold). The need for proper waste infrastructure is amplified by its effect on waste disposal behaviour. In this regard, Wilson (2020) points out that people receive environmental cues from dustbins. These receptacles should be prominent and context-appropriate: they should be colourful, and both the size of the bins and the distance to the bins are important. However, our findings indicate that infrastructural provision is complicated by the interaction between people and these artefacts. In Paarl, some participants felt that there were enough bins, but highlighted challenges in this regard. Not all people choose to dispose of their litter in bins: “*There are problems with working together.*” A further problem was that receptacles were often appropriated or damaged: “*There were dustbins but they disappear*” and “*People break bins alongside the road.*” In an attempt to prevent the plastic bins from being broken or burned (especially during protests), the municipality installed receptacles or bins made from concrete. Even

some of these bins were vandalised. One person elaborated: *“Even cement bins get broken.”* Furthermore, bins may not be visible enough: *“Maybe the people can’t see the dustbins.”* Some participants mentioned that receptacles were not appropriate: *“Bins are too small”* and *“Bigger bins should be provided.”* In Mankweng, participants associated the visibility and size of receptacles: *“The reason is that the bins around are small and might not be visible to the people”* and *“The bins are too small for our customers for people in general to see.”*

In Paarl, vendors explain that bins were also used for other purposes, for example as a source of recyclables, but this was done in a disorderly manner: *“I can’t understand there are bins but some people scratch in bins and throw them out, for example cans.”* This comment referred to informal waste collectors looking for recyclable waste such as valuable aluminium cans. Lastly, some participants disagreed that there were sufficient dustbins and even suggested that there were not enough receptacles: *“... too few bins”*; *“There are no bins”*; *“People drop because there are no dustbins.”* However, in Mankweng, most participants highlighted the lack of sufficient bins in the vicinity: *“Because there are no bins close by so people litter as [they] please”*; *“The bins are few”*; and *“People are not willing to travel far for disposal”*.

In Mankweng, one of the street vendors articulated a need for individual receptacles for each vendor: *“There should be one next to me.”* This need was justified in view of the amount of waste generated by vendors and the challenge of the disposal: *“Street vendors have lots of waste so they feel it is okay to put waste at the side where it is not interfering with their work.”* Moreover, the vendor acknowledged that in order to keep their own stand clean, they dump their waste *“elsewhere”* (in an open veld) when there are not sufficient receptacles. The literature confirms this reality of street vending. Iwu et al. (2017) found that in Nigeria, street vendors generate an average of at least 7.5 kg waste per vendor per day, in particular those who prepare and sell food. Bins or other receptacles are therefore critical for pedestrians, buyers, and street vendors alike. However, as Nkwocha and Okeoma (2009) and Schultz et al. (2013) caution, merely adding more receptacles does not make a difference: the distance to the receptacle is pivotal. Bins should be well-placed and less than 20 feet (6,6 m) away from each other.

Additionally, participants from Mankweng recommended that bins should be managed and regularly cleaned: *“There are not much people (workers) on the street”*; *“The management of bins is very poor”* and *“There is no proper waste management.”* Nkwocha and Okeoma (2009) found that the absence of waste collection and cleaning of the bins contributed to the increase in littering and that if bins were too high for children to use, the waste would simply be dumped.

Theme 1.3: Lack of Sanitation Adds to Littering

Authors such as Cierjacks et al. (2012) and Singh and Kaur (2021) emphasise the relationship between sanitation and waste and add that the lack of sufficient and clean sanitation facilities provides cues to people to litter. In both research areas, participants linked a lack of sanitation and/or unsatisfactory sanitation to a lack of

cleanliness: “*The area is not good because there are no toilets, shades and dustbins*”; “*Everywhere is dirty here*” and “*Toilets are also dirty and smell bad.*”

Vendors were concerned about toilet practices such as public urination at shops and nocturnal defecation in the vending areas. In Paarl, one vendor observed: “*People do not go to the toilet – just pee here. People use the place (name of the shop) as a toilet.*” In Mankweng, a vendor referred to people using the vending premises as a toilet area at night: “*It is not safe because sometimes in the morning I find faeces of people where I work. I really feel very bad.*” Additionally, in Paarl, unclean ablution facilities were also linked to homelessness: “*The homeless use the toilets.*” These comments confirm findings by Muyanja et al. (2011) linking insufficient infrastructure (such as clean toilets and washing facilities) for street vendors and customers to increased possibilities of littering. Muyanja et al. (2011) express concern that these facilities are crucial for street vendors working with food to be able to wash their hands and utensils. In Harare, Zimbabwe, Rugoho (2017) found similar infrastructural difficulties: no or few open and clean toilets for street vendors and buyers. Rugoho (2017) confirmed that street sleepers tend to use the streets as toilets or use the available public toilets, adding to the dirty environment for vendors and complicating the management of these spaces.

Theme 1.4: Littering Creates Jobs

Littering contributes to a negative working environment, which may affect the income of street vendors (Asiedu & Agyei-Mensah, 2008). Accordingly, vendors generally clean in front of their own stands and some will ask people to pick up their own litter or put it in the bins. In both Paarl and Mankweng, the street vendors indicated that the pedestrians do not readily respond to these requests. According to the street vendors, littering is associated with possible job creation for the unemployed: “*They [the pedestrians and customers] don’t mind, they will tell you that there are people who get paid for that [to clean]*”; “*People just say there are people that will come and pick up*” and “*People litter to create jobs for EPWP workers.*” Their perception was that people expect the government to generate these job opportunities: “*To give the municipality opportunity to hire people to pick up the waste*”; “*We are not feeling okay but for the fact that EPWP people assist in cleaning the streets then we just appreciate the efforts*”; “*If we don’t drop rubbish, these people [the EPWP workers] will not find jobs.*” The latter comment relates closely to the next theme.

Theme 1.5: Presence or Absence of Cleaners from the Municipality

This theme emerged only from the comments made by street vendors in Paarl. In Paarl, the street vendors acknowledged the fact that the “*municipality sends people to clean up two to three times a day*”. Their view was that “*it’s a place owned by government so people just litter knowing that government people will clean up*”. This acknowledgement of the role of the local government in keeping the environment clean was juxtaposed with the unabated practise of littering: “*The cleaner always cleans, but people always throw things.*”

In Mankweng, no reference was made directly to cleaners, but the participants expressed concern about *“the [lack of] service that the municipality provides”* by not having sufficient bins and cleaners.

Theme 2: Experiences of Working in the Littered Area

A further question was posed to the street vendors to determine their experiences working in these littered areas and how it may affect their business operations. The themes identified were the following.

Theme 2.1: Street Vendors' Experiences of Littering in Their Working Environment

In Paarl, the street vendors explained that they are obliged to keep the space in front of their stands clean (this was confirmed by the municipality). Despite their efforts to keep their stands clean, the pedestrians create litter. Comments/words such as *“I feel angry and hope to move”*; *“Uncomfortable”*; *“Unpleasant”*; *“Feels dirty – smells terrible”*; *“I hate it”*; *“Not happy at all because nobody likes working in a dirty place”*; *“Not good to sit next to waste all day”* reflected the negative impact of littered and dirty vending premises on the vendors. In particular, those working with food related their discomfort about the implied health risks of food vending: *“Uncomfortable, as I work with food.”*

Generally, only a few cities, globally, successfully balance the need to support livelihoods with the need to manage public space (Roever & Skinner, 2016). Where street vendors are concerned, the management of public space and the negotiation of the use of such space is complicated by conflicting understandings of “how and by whom urban space should be used” (Young, 2017). Literature on street vendors in the Global South, particularly in sub-Saharan Africa, confirms the repression of informal street vending (Young, 2017). Some studies from the Global North indicate that local authorities do not regard informal vending as a priority (Boels, 2014; Nelken, 2006; Recchi, 2021). Accordingly, street vendors are generally portrayed as operating in an environment that is not favourable for the street vendor, the public, formal businesses, or the local authorities. This creates tension and frustration, and the comments above serve to confirm the perception of street vendors concerning an undesirable working environment that is not regularly maintained or cleaned.

One of the participants in Paarl referred to the importance and value of work as a source of income and sustenance but described how the working conditions counteract this potential benefit: *“Work is making people healthy but a dirty environment [does not help].”*

In Mankweng, the experiences were similar: *“The place is not always clean so it makes me feel very dirty sometimes because I feel like people are just throwing trash all over me”*; *“I do not feel good at all, it’s smelly”*; *“I don’t feel good about it because I don’t like working around dirty environment.”* Similar to street vendors in Paarl, those selling food in Mankweng expressed concern: *“I am selling food and the area should be clean”*; *“At times the place looks like a pigsty which makes it very*

uncomfortable to work at.” An interesting comment by a migrant vendor confirming the state of the environment also reflected the power dynamics between locals and foreigners: *“Very annoying because as a foreigner, I don’t have power to tell natives to clean.”*

Theme 2.2: Littering Affects the Street vendor’s Business

One of the major concerns of the street vendors was that littering in the streets affects their business, in particular, as mentioned before, for those who prepare and sell food on the street (Kok & Balkaran, 2014).

In Paarl, the street vendors expressed concerns about the effect of littering on their business. One of the vendors remarked: *“Illegal dumping and littering affects my business as clients won’t buy from me when it smells bad.”* Another vendor commented: *“Many clients can pass because the place is dirty – you want to give customers a clean environment.”* In Mankweng, more participants highlighted the effect of littering. It resulted in a dirty environment that is not conducive to business: *“This (littering) makes the working environment ‘not ideal’ – it should be clean.”* Another vendor added that the environment should be *“appealing to the customer”*.

Some of the participants were convinced that they lose customers because the area is dirty: *“I lose customers who come to buy food that I sell”* and *“It is terribly bad and I find it difficult for me to cope and the customers do not want to buy food-stuff in a dirty environment; some customers tend not to buy when your stall is filthy or has rubbish.”* However, not all vendors felt strongly about this problem: *“I don’t really see much of a problem because my customers and I are not affected”* and *“I don’t care how I feel. As long as customers buy and I make money.”*

Theme 2.3: Health and Food Concerns

Arias (2019) found that 70% of the street vendors in Johannesburg sell food and therefore health concerns expressed by the street vendors were not surprising. Muinde and Kuria (2005) emphasise the growing increase in food vending in African cities and towns and that street vendors selling food are the biggest source of food for the urban poor (WIEGO, 2020).

Although the street vendors in this study expressed their concerns that littering may affect their business (under the previous theme), street vendors in Paarl had much fewer health concerns than those in Mankweng. Moreover, in comparison with Paarl, many more food vendors were visible in Mankweng.

It was observed that the street vendors in Mankweng conducted business more frequently in dusty, unpaved areas while the street vendors in Paarl were located in paved or tarred areas. Dust and litter are not conducive to food vending. Relevant comments by Mankweng vendors included *“I sell food and sometimes this dirt ends up on the items I sell”*; *“The waste can end up making us sick”*; *“The trash (such as papers) are blown by wind into my stall”*; and *“I feel that this is a health hazard because the place is not clean and hence we are selling food.”* In Paarl, concerns

were raised that “*when the rubbish is here, the dirt spoil the meat, it can cause disease*”.

Our results regarding the concerns of street vendors correspond with findings by Muinde and Kuria (2005) and Muyanja et al. (2011), who confirmed that the environment plays a big role in the safety of the food sold by the vendors. Furthermore, the vending environment may pose a direct threat to their livelihoods. As it stands, food vending presents one of the viable job opportunities available to those with limited opportunities to earn an income. Therefore, it is important to understand and mitigate factors posing risks to these jobs.

Theme 2.4: Limited Alternatives or Choices for Work

Street vending is one of the most popular and active self-employment opportunities for the unemployed (Alfers et al., 2016; Roever & Skinner, 2016). In this study, the street vendors in Paarl as well as in Mankweng raised the concern that the deleterious, dirty circumstances in which they work (as well as other factors such as harassment) pose a threat to their livelihoods, but they do not have other options of earning an income. This is their livelihood: “*I love myself and would want to work in any environment that is healthy and conducive. However, I do not have a choice to go elsewhere because I can’t afford to pay or rent a building*”; “*I’m not happy at all but I have to be here just because I got to make money*”; “*I do not have a choice to go and work anywhere else hence I am unemployed but self-employed*” and “*I have no choice but to keep working here.*”

Theme 2.5: Street Vendors Own the Responsibility to Clean

Many of the street vendors indicated that they take responsibility to clean the areas around their stands. Some vendors noted that one is generally expected to clean in front of one’s own stand: “*Everybody should clean in front of himself.*” One vendor in Paarl mentioned extra care spent in this regard: “*Buy stuff to wash pavements.*” Vendors organised cleaners independently: “*Get someone to clean up and that person is responsible for taking the dirt away and dispos[ing] of it*” and “*Get someone to clean in front of my place. Sweep the street and gutter, sweep the pavement as the wind gives problems and blows papers.*”

Some vendors took pride in taking care of their environment around their working space: “*... feel good because our place is always clean*” and “*It feels good because I clean and make sure that the environment I am working in is clean.*” Some of the vendors argued that if street vendors take the responsibility to clean in front of their stands, the area would be clean: “*... keeping the area clean yourself and sweep. Not so unpleasant that we make a fuss.*” However, this perspective was not shared by all: “*It angers me because I have to clean my space.*”

In Mankweng, some of the street vendors also took responsibility for their own workspace: “*It is not good to work in a filthy environment but I always try to make sure my working environment is clean.*” However, some were angered or disheartened by the never-ending task of cleaning up litter: “*It makes us feel bad because*

we as the street vendors are the ones who clean the place” and “It makes me feel irritated ’cause we clean twice a day but people litter anyway.”

There were street vendors in Mankweng who made provision for customers’ litter: *“I have a box that customers put their waste in.”* The interviewer observed that the area around the street vendor was clean; the vendor swept it properly, and he had a “dustbin”. The interviewer further wrote that the respondent’s working station was clean and that he swept it every morning to keep it clean. The vendor cleaned and put the waste in a bag for the municipality to come and collect it. The interviewer commented: *“He says it’s boring but he tries to clean where he works.”*

Not all vendors actively provided for cleaning the vending area. Two comments from the vendors reflect resignation about the condition of the vending premises: *“I don’t feel anything as I found the work environment as it is”* and *“It is not that bad. The waste disposed is mostly paper and plastic and don’t smell that much.”*

The literature indicates that street vendors who do not clean up vending premises have other priorities or lack awareness. Rugoho (2017) reported that some of the street vendors in Harare (Zimbabwe) indicated they had much more pressing problems than cleaning their environment and saw it as the function of the municipality. Alfery et al. (2016) suggest that it is very difficult for individual street vendors to consider their health and safety habits when the broader environment in which they are operating is so unfavourable. Mukhola (2015) found that the vendors working in littered environments are not always aware that it is dirty.

Discussion

As far as could be ascertained, literature focusing on littering and street vending does not frame the issues as wicked problems or utilise complexity theory as a lens. Solutions presented by different authors from developing countries, include public education, the need for new and updated service levels, improved infrastructure, increased monitoring and evaluation, effective leadership and participatory governance, increased citizen involvement, diminishing of negative behaviour patterns, effective compliance by the state (municipalities), increased effective enforcement of laws; effective waste management systems, policies to reduce urban poverty, and political will to mention but a few (Arias, 2019; Govender & Reddy, 2020; Mlambo, 2021; Nkwocha & Okeoma, 2009; Roever & Skinner, 2016; Sinay, 2019). These studies propose the creation of bargaining and negotiating platforms to counter the lack of transparency and top down decision-making structures towards participatory governance structures and processes. The study by Essien (2021) provides a participatory model of governance towards the integration and participation of street vendors and all actors in open-air markets in Accra Ghana.

We concur with Everest-Phillips (2014) that the wicked problems of waste management in developing countries, like littering (and street vending) can be approached using complexity theory. Everest-Phillips (2014:17) proposes that complex issues should be approached with complex adaptive thinking which asks “not how to solve the problem, but how to navigate them” with all actors involved. We recommend that the four complexity-based strategies identified by Biggs et al.

(2015) be considered in developing participatory adaptive management strategies. These include the use of adaptive management or co-management, engaging and integrating diverse perspectives, the facilitation of self-organisation, and establishing safe boundaries to evade system thresholds (Biggs et al., 2015). The four strategies, provided by Biggs et al. (2015) are described below.

Use of Adaptive Management or Co-management

Biggs et al. (2015) point to management practices such as solid waste management, as deliberate experiments that facilitate learning while doing. The process of adaptive management has been combined with participatory processes of co-management with shared rights and responsibilities. In adaptive co-management, the active engagement of stakeholders play an important role. Action research, which is iterative and cyclical, facilitates this type of learning and engagement. Adaptation works by making small changes, observing the results, and then adjusting again (Everest-Phillips, 2014).

Turning to the findings of the present study, a vision relating to littering and informal street vending can be created and objectives set through participatory processes involving local government, informal street vendors, and researchers. With reference to a South African case study, Biggs et al. (2015) illustrated that participatory governance processes can address both environmental and economic objectives and recognise the knowledge of local stakeholders as well as their culture and history. For example, to address the perception that a lack of sanitation contributes to littering, objectives can be set for sanitation provision. After options have been identified and selected collaboratively, they can be implemented. Adaptive implementation can then be followed by an adaptive evaluation to determine whether the perception was confirmed by this strategy of strategic adaptive management. Moreover, community monitors can be involved in the adaptive evaluation and receive training to collect relevant data on the effectiveness of a selected sanitation solution and the subsequent effect on littering practices. Other themes that can be addressed by adaptive management are infrastructural challenges such as a lack of waste receptacles, inadequate size of or unpractical spatial distribution of such receptacles, and the impact of the presence or absence of street cleaners.

Engaging and Integrating Diverse Perspectives

Biggs et al. (2015) point out that partial understanding of a system is one of the inevitable consequences of complex systems. However, understanding can be increased and uncertainty appraised to a greater extent, if different perspectives and solutions are considered. This strategy also enhances trust, facilitates learning, and promotes a wider understanding of management problems involved in a system. Biggs et al. (2015) acknowledge various challenges in the implementation of this strategy, such as diverse worldviews, and they recommend the use of

participatory scenario planning and the provision of institutional structures that support engagement and integration.

In relation to the findings of the present study, a future relevant scenario exercise could investigate various ways in which the informal vending arena could be transformed into a platform for a satisfactory shopping experience that will benefit both the informal vendors and their customers. The possible exploration of this scenario exercise is supported by an observation of one of the leaders of the street vendor committee. During the data collection, one of the street vendors in Paarl explained to the researcher that “*coming to town is a dress up and go shopping. We do not like shopping malls, we like the CBD.*” One of the leaders of the street vendor committee elaborated on the importance of a clean environment in respect of their customers and emphasised that it is the responsibility of all stakeholders to work together to achieve this goal. If the exercise is facilitated skilfully and all stakeholders exhibit a willingness to engage in discussion, scenario planning can lead to consensus on a viable way forward and facilitate understanding and relationship development (Biggs et al., 2015). It can also provide the space for deliberation over points of disagreement, uncover assumptions, and allow alternative options to be articulated (Biggs et al., 2015). Establishing forums or working groups can also provide mechanisms to promote engagement and build trust, understanding, and agreement, on the condition that they are well-implemented, functional, and motivated by a sense of ownership.

Some of the themes identified from the interviews indicate that the strategy of engaging and integrating a diversity of stakeholders is necessary. This assumption is based on the perception that littering has an impact on the street vendors’ business, health and food concerns, limited alternatives for work, perceived characteristics of customers and pedestrians as litterers, and the effect of the presence or absence of street cleaners. To address these themes, a diversity of perspectives from street vendors, their customers, pedestrians frequenting the area, the local unemployed, street cleaners, and local government representatives are needed.

Facilitation of Self-organisation

The facilitation of self-organisation is another strategy identified by Biggs et al. (2015). Importantly, no central authority or external entity imposes organisation through plans but facilitate self-organisation and development (Biggs et al., 2015). Based on our findings, key leverage points could for example be context-sensitive waste infrastructure and waste management service. In addition, community cohesion and trust could be fostered through job creation by employing local residents as cleaners and monitors in the informal vending areas. Communities could also be strengthened by training coupled with other incentives to encourage community ownership of waste infrastructure and vending areas.

Establishing Safe Boundaries

Biggs et al. (2015) focus on setting and revising safe boundaries based on information and changes. In the context of local solid waste management, setting safe boundaries (e.g. minimum waste service delivery levels, minimum staff required to function, minimum operational vehicles, minimum cleaning staff, minimum waste receptacles and sanitation infrastructure, maximum vendors allowed per informal vending area) can consist of defining operational goals that mark the boundaries of the local complex waste management system. These boundaries need to be maintained to meet, for instance, the goal of a clean informal vending environment that benefits the people in the context, such as the vendors, the customers, other pedestrians, street cleaners, and the local government. When the safe boundary upper or lower levels are reached, it can trigger a stakeholder meeting to decide on the action to mitigate the change or find a new safe boundary.

Conclusion

The article probed the complexity of dealing with two interrelated wicked problems, namely informal, self-employed street vendors, and their experiences of one of the wicked problems of waste management in the South African urban environment – littering. The study explored the perceptions of the street vendors in Paarl and Mankweng regarding littering. The results highlighted that reasons are perceived as the interplay between characteristics of people, the complexities around waste infrastructure that can be too far and few between, too small or big or just not visible. The results highlight the perception that waste is and can be a source of job creation in contexts where unemployment is high, and the interrelatedness of waste and sanitation emerged. The results tally with what was found in international studies on reasons for littering, except for the job creation potential. The results highlighted the effect littering has on the activities of the street vendors and the expressed predicament they experience as informal street vending is their only option for creating an income in the context of the high unemployment in South Africa.

The study framed littering and street vending as wicked problems approached through the lens of complexity theory. It probed the complexity of dealing with informal, self-employed vendors on the streets of Paarl and Mankweng, and their experiences of one of waste management's wicked problems – littering. As stated in the introduction, there is no magic or silver bullet for “wicked problems” (May et al., 2016; Peters, 2017) – rather, attempts could be made to navigate through participatory processes to promote a better understanding of the problems and possible multiple possible solutions.

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