

ASSESSING HOW AN ALTERNATIVE WASTE MANAGEMENT SYSTEM MAY FACILITATE SUBALTERN AND ENVIRONMENTAL JUSTICE: A THEMATIC ANALYSIS OF A ZERO WASTE PILOT CASE STUDY IN SOUTH AFRICA

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ABSTRACT

Waste is socio-political – a symbol of our economic and consumerist society. Since the Industrial Revolution, our manufacturing processes and materialist lifestyles produced more hazardous and nondegradable externalities than we were prepared to deal with. With environmental and consumer pressure building, we are at a crossroads between continuing with business-as-usual and justly transitioning over to a systemically different, zero waste society where the focus on waste *management* shifts to waste *prevention* so that, like Karl Marx, it challenges and eventually changes production processes, ownership, consumption, and ultimately, our connection with the natural environment and each other. South Africa's waste landscape is characterised by two things: its reliance on landfills and the thousands of informal waste pickers reclaiming the value of discarded goods. **So, what could a zero waste system that is just toward the environment and the subaltern look like in South Africa?** In exploring this question, I considered the work of waste pickers, as well as the case of an urban composting initiative for an inner-city market supporting the zero waste philosophy. Synthesising these, I imagine a gradual, deep bottom-up transformation in attitude, behaviour and eventually infrastructure with regard to our relationship with the environment, ownership and use, as well as the revaluation of the material and therefore waste 'management'. The role and insights of waste pickers and local, informal economies will be crucial and influential. Though South African waste pickers do not yet participate in the organic waste stream on a noticeable scale, the prioritisation of composting by the Warwick Zero Waste project and the National Waste Management Strategy sees the recovery and local, low-tech, low-cost composting of organic waste as a vital starting point in establishing a more regenerative food and waste system that will build solidarity and an attitude of sharing while revitalising the soil for future generations.

Keywords

Climate change; Consumption; Landfill; Organic waste; Polycrisis; Recycling; Waste management; Zero waste

DECLARATION

I hereby declare that this research report is my own unaided work. It has been written and is being submitted in partial fulfilment of the requirements for the degree of *Master of Arts (Development Studies)* in the Faculty of Humanities at the University of the Witwatersrand, Johannesburg. The report has not been previously submitted for any degree or examination at any other university.

A handwritten signature in black ink, appearing to read 'J. Swart' with a stylized flourish.

Ms Johanna Yvonne van Biljon (née Swart)

On the **7th** day of **March** in the year **2024**.

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ACRONYMS & ABBREVIATIONS

ARO	African Reclaimers Organisation
CJCM	Climate Justice Charter Movement
DEA	Department of Environmental Affairs (now DEFF)
DEFF	Department of Environment, Forestry and Fisheries
DSI	Department of Science and Innovation
EMM	Early Morning Market, Durban
EPR	Extended Producer Responsibility
NWMS	National Waste Management Strategy
PCC	South African Presidential Climate Commission
SAWPA	South African Waste Pickers Association
WPIP	Waste Picker Integration Plan
WZW	Warwick (Early Morning Market) Zero Waste project, Durban
ZWIA	Zero Waste International Alliance

TERMINOLOGY

Circular Economy / Secondary Resources Economy	An economic model for economic and environmental sustainability that seeks to imitate the cyclical nature of the natural world or ecosystems where resources are never lost or wasted but rather reabsorbed into the production system.
Eco-Socialism / Ecological Marxism	A Marx-inspired mode of analysis and systemic alternative to capitalism that does not merely consider the unequal socio-economic outcomes of capitalism, but also the way capitalism appropriates the natural environment for its profit and subsequently alienates humans from nature.
Extended Producer Responsibility	“An environmental policy approach in which a producer’s responsibility for a product is extended to the post-consumer stage of a product’s life cycle” (OECD, 2001).

Global South	Countries typically classified as Developing or Third World countries, and which are often considered formerly colonised countries. These countries typically experience vast inequality and unemployment rates.
(Deep) Just Transition	Democratic and transformative change (in not only the energy sector but also the entire economy) that seeks be just and beneficial to all people as well as the natural environment in terms of ownership, decent work, and the protecting of natural resources.
Polycrisis	A state in which crises interact to "produce impacts that are both different from and worse than the harms the crises would have produced separately" (Lawrence et al., online, 2024).
Triple Bottom Line	A sustainability framework that measures a business's success in the three key areas of 'profit', 'planet', and 'people'.
Zero waste	"The conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health" (ZWIA, online, 2018).

CHAPTER 1: INTRODUCTION

In recent years, the horrifying effects of waste pollution caused by the negative externalities of our productivist and consumerist economy, have gotten a tremendous amount of media coverage – especially those affecting marine life, near more informal human settlements, or dumped on countries in the Global South. Unfortunately, this environmental wound has also created many new opportunities for ‘green’ commerce either through attracting eco-conscious customers by claiming to support some conservation project or by selling an ‘eco-friendly’ lifestyle of biodegradables and non-disposables.

Because of widespread unemployment in many countries in the Global South, informal waste collectors (also referred to as *reclaimers* or *bageresi*, as in South Africa) thankfully collect recyclable and reusable materials from trash cans or landfills in exchange for money, effectively reducing and diverting garbage from landfills and rivers which would otherwise lead to more pollution and greenhouse gas emissions. Samson (2017, pp. 38, 39) describes the informal waste sector as the link between “the front and back-end of [the manufacturing] industry”.

But garbage is just the tip of the (melting) iceberg: Though waste, as described above, may not look like a significant problem to the average Jo – perhaps because it is purposefully removed and isolated from our everyday lives – waste signifies a multitude of economic, environmental, and social contradictions and challenges facing the world today. To some extent, it may even strengthen the case of a current *polycrisis* – “the causal entanglement of crises in multiple global systems in ways that significantly degrade humanity's prospects” (Lawrence et al., 2022, p. 9). Nonetheless – or for this reason – *waste* is a useful entry point into thinking about the ‘entanglements’ and interactions (both positive and negative) of economic and production models, communities, and the natural environment.

Around the world, subaltern and indigenous groups have also begun to voice *their* concern over the state and future of the natural environment and propose alternatives that are grounded in sufficiency, solidarity, and true sustainability (Satgar,

2018). One such alternative is zero waste: a waste prevention philosophy that has now gained traction also in South Africa. But what could it look like practically? Can zero waste counter the hegemonic economic system and instead work to the benefit of the environment and the local community?

1.1 Research context | Waste management challenges

The basic understanding of the Anthropocene – the era since the Industrial Revolution – is that we, as humans, have become a geological force that is responsible for our warming planet. Our modes of extraction, production, consumption and disposal thus emit so much carbon dioxide (CO₂), methane, and other greenhouse gases that the Earth has been warming significantly faster since the Industrial Age than before (IPCC WG1, 2021). To sustain life on Earth, the average rise in global temperatures needs to be maintained below 1.5°C (ibid.). This applies to waste management because “reducing carbon emissions requires reducing material [and energy] use,” (Kallis, 2017, p. 1).

The business-as-usual of production, packaging and transport, and post-consumption disposal of goods not only create vast amounts of waste (both solid, non-biodegradable as well as organic) which challenges governments to implement effective waste management systems but also pressures ecological and social structures affected by the unnecessary generation of products, food and subsequently, waste materials, which often leads to pollution and poor environmental health.

Finding ways to at least limit the further spread of non-degradable, polluting and dangerous post-use materials is complex and requires a multifaceted approach with various role players. These role players could include (a) *industries* and *industry bodies* responsible for the manufacturing and distribution of the typically polluting (although potentially fully-recyclable or reducible) materials – for example, through Extended Producer Responsibility (EPR), (b) *consumers* who (either responsibly or irresponsibly) dispose of these materials, (c) the *government* that can enforce

environmental policies and *municipalities* that are primarily associated with formal solid waste management systems, and (d) other, more *informal* solid waste removal networks such as waste picker or reclaimer organisations who collect the majority of recyclable materials.

Over the past decade, the contribution of waste reclaimers in South Africa – despite the many challenges they face – has received increasing attention. The word, ‘subaltern,’ as referred to in the title is understood in resistance to a dominant ‘hegemony,’ a Gramscian term referring to an economically influential group that has moved “beyond a position of corporate existence ... and aspires to a position of leadership in the political or social arena” (Gramsci, 1999, p. 20). In other words, a hegemonic role player(s) – common in capitalist economies with monopolies in certain industries – extends its footprint from merely the commercial to eventually influencing other areas of society such as politics, culture, or patterns of consumption.

As unpacked in more detail in the next chapter, these hegemonies in the waste sector are often multinational manufacturing industries that are caught in the capitalist mantra of constant financial growth at the expense of social and environmental wellbeing. However, on the other side stands the subaltern, the informal waste picker who cannot find another means of employment and thus collects waste to again sell (indirectly) to the same industry that manufactured the products in the first place. But since waste pickers have started organising in cooperatives and associations, they have been able to negotiate with the government and partner with other stakeholders – globally as well as in South Africa.

‘Waste’ is generally associated with uselessness, loss, dirt, repulsiveness, and a desolate, ruined, neglected space (Barles, 2014, p. 200). Through an eco-socialist lens (discussed below), waste is a symptom and symbol of a profit-hungry, linear capitalist system that uses natural and social-cultural ‘resources’ only to the degree that it can benefit from it and then dumps the residue with little regard for its long-term effects.

The call to restructure the waste management system is essentially a call to restructure the current take-make-waste economic system. It is crucial to work towards a more circular, closed-loop model that redesigns goods and processes to avoid and

minimise the generation of ‘waste’ and wastefulness (which often leaves the environment ‘ruined’ and ‘neglected’) and eliminates any futile burning or burying of materials that could have been reused, repaired, composted, recycled, and most importantly, redesigned. This study thus wanted to explore what such a ‘zero waste’ system – from the grassroots up – could look like in practice.

1.2 Literature review | An alternative is possible

Eco-socialism, a Marx-inspired mode of analysis and systemic alternative to capitalism, argues that capitalism’s accumulative nature values profit at the cost of people as well as the planet. As research has exposed, manufacturers have eagerly promoted a culture of convenience and ‘single-use’ for the past 70 years, rather than the more environmentally-considerate *reducing*, or at least *reusing* of goods and materials. This, and increased urbanisation, further alienated us as consumers from the natural environment too. Why? Because selling goods in non-reusable packaging or containers allows producers of these materials to continuously manufacture new ones and make profits.

This is well illustrated by the example of milk in glass bottles delivered to one’s home: *milk* is the product offered (or some might even consider it a service), as the glass containers are reused (up to 40 times) by the distributor after being used by the consumer. However today, the majority of people buy milk in carton boxes or plastic bottles. This pressures consumers, governments and waste pickers to responsibly discard or recycle these containers when the product could have been designed and delivered differently, effectively reducing the non-biodegradable waste generated.

How do we achieve this sustainable prevention of and reduction in waste that cannot be returned to the soil in the form of composting, or be reinserted into the production cycle through recycling? A Deep Just Transition is an opportunity to also introduce a more regenerative, closed-loop economy – led by subaltern voices of those who manually work with post-consumer waste every day.

1.3 The challenge: counter the business-as-usual

The challenge is thus this: we want to build a world that is just towards the subaltern and the natural environment, i.e., a world that values them as ‘things in themselves’ and not for their exploitable, profitable value. Unfortunately, hegemonic systems of production and consumption have not only created vast amounts of waste that pollute the natural environment, but their way of dealing with ‘waste’ – i.e., to mostly landfill or (claim to) recycle it – perpetuates the problem. This challenges real and sustained social and environmental wellbeing.

1.4 Research purpose & questions

The objective of this study is to reflect on the feasibility of a regenerative waste management alternative that prioritises social and environmental wellbeing – i.e., zero waste. What could a zero waste model in South Africa look like? And how would waste pickers contribute to or benefit from it, considering their unique role in our waste management system?

1.5 Research contribution | A subaltern alternative

1.5.1 Waste picker organisations as a subaltern

Much has been written on the challenges, opportunities and livelihoods of reclaimers – not only in Latin America or India where waste picker organisations have existed for several decades but also in South Africa. Around the world, subaltern and indigenous groups now voice their concern over the state and future of the natural environment, and offer alternatives to food production, knowledge-building and ownership that benefit the social group and the natural environment (or at least do not harm it) (Satgar, 2018). The hope is that this study can also contribute to the body of knowledge on South African waste picker organisations and their role in the organic

waste stream, as well as their contribution to education and awareness around waste and climate change mitigation.

1.5.2 Polycrisis, eco-socialism as well as zero waste as an alternative

This paper participates in the discourse on the current polycrisis as it discusses some of the interactions between a global economy significantly contributing to global warming and climate shocks, declining biodiversity and soil health, threatened food and social security, and a pending (energy) transition that could impact employment and livelihoods.

It also adds to the growing field of eco-socialism and regenerative alternatives by taking a holistic view of zero waste in South Africa: the theory and praxis of an alternative attempting to centre the subaltern waste picker. Though only one case study is used to explore the implementation of a zero waste model, its focus on organic waste is especially valuable since this is not typically part of research conducted with waste pickers.

Apart from discussing some gaps in zero-waste-in-practice at the end of this paper, I also imagine or synthesise what an ideal model could look like and what it could mean for closing the loop on food waste, job creation, etc. – i.e., the deep just transition and going beyond capitalism.

A la Karl Marx, any inquiry aims to ultimately transform reality.

1.6 Structural overview of the report

The remainder of the report is respectively comprised of the following sections: the theoretical framework presents the eco-socialist perspective that guided the research questions and thematic analysis; the literature review presents a systematic account of the generation and management of waste, including an overview of a transformational waste model such as zero waste; the methodology elaborates on the research paradigm applied in this study and presents the approach to gaining insights

through the thematic analysis of a case study; thereafter, I offer an overview of waste management in South Africa – the state of waste, the different role players, and specifically more information on waste picker organisations. The case study section gives an overview of the Warwick Zero Waste project which is then discussed at the hand of the three eco-socialist and sustainable development themes of *profit*, *people*, and *planet*. Lastly, the concluding chapter returns to the initial research questions.

CHAPTER 2: THEORETICAL FRAMEWORK & LITERATURE REVIEW

In this chapter:

- 2.1 Theoretical framework: Eco-Socialism
 - 2.2 The review of literature: waste in a capitalist society and its role in climate change
 - 2.3 Regenerative waste management
-

2.1 Theoretical Framework

The investigation of any phenomenon starts with a *conceptual framework* or hunch about the essence of that phenomenon (Riley, 1963, pp. 5, 6). A conceptual framework also informs the research questions and how one seeks answers to these questions (De Vos et al., 2011, p. 35). One aspect of a conceptual framework is that of a *theoretical perspective*. According to Baker (1988, p. 37), a theory is comprised of various intellectual elements with the purpose to explain and predict certain occurrences.

Based on the context of this study, i.e., waste management with economic, social and environmental interests and impacts, an eco-socialist or Marxist Ecology theoretical perspective was identified as most applicable, particularly for its holistic approach to evaluation: it speaks to the interplay between the economic, social, and environmental in a capitalist society. The sections below elaborate on the eco-Marxist framework and inform most of the literature review.

2.1.1 To critique & transform: a method of inquiry

During the 19th century, Karl Marx and Friedrich Engels critiqued G.W.F. Hegel's idealist dialectic thinking by suggesting that it is not merely our thoughts that shape the world (or our perception of it) – because our thoughts and social relations are also dependent on the *material* – the physical existence of the world (Foster, 2000, pp. 2, 5). Their *historical materialism* suggested that we should be able to “transform

our relationship to the world and transcend our alienation from it” by focusing on the concrete and material (ibid., p. 5). This *concrete* and *material* implies the need to investigate those elements outside of our own thought, even if some seem abstract, such as economic systems, social institutions and hierarchies, and the natural environment.

The ecological crises and the need to better value nature and its resources encourage the unpacking of society in a dialectic, materialist manner (Pillay, 2018, p. 151; Cock, 2007). The materialism of Marx and his insights into the capitalist system “provide an invaluable methodological foundation to critique contemporary environmental degradation and to envision social and ecological transformation” (Clark & Foster, 2010, p. 143). This ‘social and ecological transformation’, drawn from Marx’s idea of a society that distributes to each on the basis of need, stands in opposition to contemporary capitalist societies that rather produce, distribute and consume goods based on financial means, economic interests, and convenience. Marx’s materialism should thus allow a rethinking of our relationship with and use of ‘the material’.

2.1.2 Basic concepts of capitalism

One of the first themes Marx elaborately discusses in *Das Kapital* (“*Capital*”) (Vol. 1), is that of the value of goods in a capitalist society: *use-value* versus *exchange-value*, and that which gives material objects their value. In short, use-value is ascribed to functionally useful things: “without being an object of utility,” it has no value (Marx, 1887, p. 30). Except if these objects obtain exchange value by being produced for others – then it is labelled a ‘commodity’ and considered far more valuable than those merely for personal use (ibid.). The ‘value’ of a commodity, in turn, is calculated relative to the productiveness and time of labour contained in that object, apart from the quantity (which speaks to the notion of supply and demand): the more labour time needed to produce a certain object, the more valuable it becomes. It is for this reason that the mass production of goods – by machines – significantly lowers the value and the price of these goods and allows more people to attain them.

In discussing the commodification of natural resources (next subsection) and the disposability of waste materials and recycling, it is, of course, worth keeping in mind that these objects are further only considered valuable to the degree that there is a demand for their exchange and further use.

In Marxian terms, the hegemonic producer mentioned in the introduction is the capitalist – “the possessor of money” (Marx, 1887, p. 107): the personification of capital that seeks “ever more and more wealth,” through ‘chasing after exchange-value’ (ibid.). Owning *the means of production* (such as land and machinery, but increasingly more also political connections and a stronghold on markets) allows the capitalist to make money out of the use-value of material objects when they become commodities. The subaltern, however, is the proletariat labourer who does not own these means – not even the basic means of subsistence – and therefore sells their physical ability to produce goods (or services) to the capitalist in exchange for remuneration. The next section explains this interchange.

2.1.3 Marx’s concern for us & the environment

Contrary to popular belief, Karl Marx was “really interested in environmental destruction and capitalism, and his project of socialism will [later] include this dimension of [a] sustainable society” (Saito, 2019). The ignorance of the extent of Marx’s interest and insight today is largely attributable to the Soviet productivist interpretation of him, as well as Marx not being able to fully incorporate his later-interest in the natural sciences into *Das Kapital*; his ecological notebooks have, however, recently been studied and reveal valuable ecological critiques of capitalism (Saito, 2016, p. 25; *Climate & Capitalism*, 2019).

Metabolic rift & primitive accumulation

One of the main insights from Marx’s ecology is the idea that an economic system dependent on, and promoting excessive extraction (of natural ‘resources’ in particular) to make a profit, inherently disturbs the *universal metabolism of nature* and therefore causes a *metabolic rift* between the natural environment and humans

(Climate & Capitalism, 2019; Clark & Foster, 2010). He observed the growing gap between humans and nature when peasant farmers were forced from their land to work in factories once industrial capitalists (*the owners of the means of production*) began to accumulate land for capital accumulation (Pillay, 2013, p. 11) – called *the Process of Primitive Accumulation*. Acquiring land for industrial activities, including large-scale agriculture, meant countrymen were in many cases moved from the land on (and from) which they lived; their land was now earmarked for a different purpose than it was used to carry. It was a “process of accumulation through dispossession” (Satgar, 2018, p. 56). Marx noted the devastating effects on both those separated from their subsistence existence in the countryside, as well as the exploitation and impoverishment of the soil (Clark & Foster, 2010, p. 147; Foster, 2000, p. 221): those in the countryside who could depend on the natural environment for food, shelter, and medicine – their *means of subsistence* – could, after being forced from their land and compelled to work for a wage in factories or other commercial activities, no longer survive unless they ‘sold’ their *labour-power*. Even more, this new relationship in which they now stood with nature, made them accomplices in the exploitation of nature, alienating them psychologically and relationally too (more on this alienation later).

When individuals live in tune and directly interact with natural ecosystems, their services and rhythms, they enjoy natural resources in sustainable quantities which not only allow adequate time for regeneration but even fertilise the soil in the process (e.g., through essentially animal waste and decomposing of biomatter); however, with the rise of the industrial age, single-crop agriculture, deforestation, mining, stock farming, the dumping of unnatural and non-degradable waste products, etc. in effect ‘robbed’ the natural environment of its resources and nutrients without giving it back in a sustainable manner (a concept associated with Justus von Liebig) (Saito, 2016, p. 26; Shiva, 2016).

Marx’s socialism was thus not merely a model to address social (economic) injustices, but also to advocate for the responsible use of natural resources through *collective* stewardship – as opposed to capitalism valorising individuality and private ownership of particularly land but also the other ‘commons’.

The commons

Capitalism subdues or reduces the goods and systems of nature – and in a sense, the vulnerability of the proletariat – to private property (Kovel, 2007, p. 53). That is, something that can be used to one's benefit and will be taken care of in so far it is to that end. It supposes an unequal relationship. Above I mentioned the dispossession of land and therefore the dispossession of the means of subsistence – the essentials to live. Under capitalism, the community or common-held resources and their potential to produce food or shelter (the *commons* encompass not only water, land or forests but also labour, knowledge, and the social rules governing their use (Guerrero, 2018, p. 30; Bennie & Satgoor, 2018, p. 296)), had to become commodified to regulate access and in so doing, also create markets; what could once be shared by all (relatively speaking), becomes something that could only be acquired in exchange for money, therefore not accessible 'according to one's need' (Marx, 1875) but rather according to one's financial or social ability. It is here that private ownership – and the increasing ownership of the means of production and therefore means of subsistence – contributes to great inequality; private ownership also tends to contribute to a sense of scarcity and therefore threat, encouraging individualism. Marx, of course, promoted the opposite.

Through an indigenous approach to the natural commons, the Latin American philosophy of *buen vivir* (living well) – “an alternative vision of civilisation,” – offers such an alternative to capitalism's individuality: it not only challenges growth-driven ideas but devises “new ways of living *collectively*” (Acosta & Abarca, 2018, pp. 132, 133). Though not a concept of Marx himself, it is a philosophy ‘from below’ and “one that is rooted in the significance of community, and is purposefully not capitalist” (ibid., p. 133). Acosta and Abarca (2018, pp. 135, 136) argue that a first step to transforming society into one that is built on solidarity and equality, sufficiency, interrelatedness and reciprocity, is to “stop seeing Nature as a commodity.” If it is no longer a commodity, its scarcity (or limits) is not something to compete over but to protect and respect – for all.

Technology

What about technology and a socialist order? Technology as “a medium between man and his environment” (Barles, 2014, p. 220) largely subjugates humans and the environment to capitalism, but, at least for Marx, also held the potential for good. Saito (Climate & Capitalism, 2019) explains that Marx was critical of technological development (combined with advancements in science) when they became “productive forces of capital”: he was, for instance, disgusted by Robert Bakewell’s *selective breeding* practices in the 18th century that led to new sheep breeds with more wool and more meat as it would have increased its commercial value (Saito, 2016, p. 39). When used for capital accumulation, technology only widens the gap between humanity and nature. An eco-socialist perspective would thus be critical of mechanisms or technologies that are to the benefit of the economy but at the cost of human or environmental wellbeing and the familiarity between the two. The Soviet or even Chinese interpretation of Marxism that used technologies for large-scale extraction and production, and the oppression of the masses, is therefore, for instance, out of tune with the interpretation of Marxism valued in this paper.

2.1.4 Capitalism’s benefit from our alienation

Acosta and Abarca (2018, p. 135) admit that “fear of the unpredictability of Nature has been part of human life since its beginnings” and that it is this “struggle for survival [that] gradually turned into a desperate effort to dominate Nature.” The current changing global climate crises point toward the alienation between humans and nature: Since the Industrial Revolution, the rise of urbanisation, and the subsequent growth of fossil fuel capitalism, humankind has become a geological force inducing environmental degradation by disturbing this equilibrium of give-and-take (Satgar, 2018, pp. 47, 51). This is based on Marx’s (1887, pp. 329, 330) observations and he noted,

Capitalist production, by collecting the population in great centres, and causing an ever-increasing preponderance of town population ... *disturbs the circulation of matter between man and the soil*, i.e., prevents the return to the soil of its elements consumed by man in the form of food and clothing; *it*,

therefore, violates the conditions necessary to lasting fertility of the soil. (My emphasis).

The reason this divorce between the rural and the urban, and between humans and nature was so significant to Marx is that he believed that humankind should “respect the laws of nature” (Pillay, 2013) as it (humankind) is a part of nature, and “must maintain a continuing dialogue with it if he is not to die” (Foster, 2009, p. 191; Clark & Foster, 2010, p. 218). Neither individuals nor societies as a whole are “owners of the earth, they are simply its possessors, its beneficiaries, and have to bequeath it in an improved state for succeeding generations,” (Pillay, 2013). How should the interaction between humans and nature then be to achieve this?

Marx’s elaborate discussion on labour in *Capital* corresponds with his thesis on the metabolic rift when he argues that labour is “a process in which both man and Nature participate,” to the degree that it changes the form of nature while it also changes human nature (Marx, 1887, p. 127). When humans directly interact with the natural environment and own their *means of subsistence* (i.e., the access and ability to produce that which they need to survive), they are better able to know to what extent they can ‘take’ from the natural environment (and to what extent they should ‘give’ for nature to supply again) – hence the notion of *sufficiency* which is so central to socialism. As Friedrich Engels also observed, a communist society should allow one to know one’s ‘unity with nature’ (Clark & Foster, 2010, p. 217).

Indeed, the natural harmony that should exist between humankind and nature is fragile (Pillay, 2013). With increased urbanisation and the domination of industrialisation and technology which increasingly take the place of the labourer (commercial agriculture, factories, waste incineration), the human being interacts with the natural environment and its ‘products’ less and less, which leads to an alienation between the two (Marx, 1887). It is partly for this reason that Marx opposed technological advances as instruments of subjecting nature to capitalism.

The chemical industry’s development has further intensified this ‘distance’: pre-industrial societies did not use and discard waste made of artificial materials, hence it was more probable that it could degrade naturally; unfortunately, “most

industrial chemical products have never existed in nature" (Song, 2016, p. 20). Humans are thus in general far removed from natural products and the soil is not only deprived of elements like wood or animal skin that could re-enter natural cycles of decomposition but also poisoned by these human-made elements such as plastics, synthetic fabrics, etc. (ibid.).

Cock (2007) and Princen (2005) agree that humans – particularly those in urban areas – are increasingly distanced and alienated from the natural environment and their ecological footprint. In Cock's (2007, p. 10) words, "our interactions with nature are hidden": sanitation runs underground, garbage is disposed of in landfills or burnt in incinerators *outside* of cities, meat is sold perfectly cut and packaged in supermarkets, and electricity is merely understood as a switch in the wall (not the pollution, sweat and noise of the mining of fossil fuels). In some instances, people do not yet possess the knowledge of the intricate systems of life or are distanced from the sources of what they use and consume due to the health risks it may pose; but in other cases, it may be done so deliberately to not be concerned about their ecological footprint as they might otherwise be much more cautious about what and how they consume – again, emphasising the point that the closer we live to nature, the more we are aware of our dependence upon it and the importance to take care of it.

The result (and feedback cause) of this alienation has led to humans relating to nature merely as consumers (Cock, 2007, p. 38): consumers of its resources and means to capital but also its romanticised setting of blissfulness and exploration through game drives and hiking trails. Cock (2007, p. 42) quotes Ouedraogo (2005, p. 28) who argues that today's capitalist society which reduces everything to its exchange value to accumulate capital, makes the natural environment "a collection of merchandise offered for sale". How else would capital grow?

2.1.5 "The appropriation of nature..."

Explaining the growth paradigm, Pillay (2018, p. 150, 151) refers to Marx's idea of the *accumulation imperative* of capitalism: The force of "accumulation for the sake

of accumulation” is not only the goal but also what keeps the industrial system going (Clark & Foster, 2010, p. 145). In capitalist societies, no financial growth means instability and negative social consequences (Kallis, 2017, p. 1) – COVID-19 lockdown regulations have exposed this. In an extensive report by groundWork (2008), the proposed understanding of capitalism is essentially a productivist function. Its logic is...

...to turn more and more raw materials and energy into sellable commodities, commodities into accumulated profit and profit into investments which then expand the system as a whole ... it must keep consuming resources and creating an ever-growing pile of waste (Hallowes & Munnik, 2008, p. 79).

Capitalist accumulation or growth is achieved when money capital earns surplus *value* as it is transformed into a manufactured commodity and sold at a higher amount than the original value (Clark & Foster, 2010, p. 145). Kallis (2017) agrees that what differentiates capitalism from earlier forms of production is that surplus (energy, resources, labour, profit) are reinvested into the production cycle which means that “efficiency improvements lead to more, not less, resource use,” and more, not less, negative externalities such as waste. ‘Productivity’ is central to capitalism as it increases surplus value by maximising production and revenue “while minimising costs (in the forms of effort, investment, and/or raw materials)” (Latouche, 1993, p. 61). Latouche (1993, p. 61) equates the law of productivity with the law of progress and adds then that progress is none other than “the perfecting of nature”; or, as Marx explains capitalism, “the universal appropriation of nature,” (Clark & Foster, 2010, p. 148; Ouedraogo, 2005, p. 28) which reduces the environment to a mere object of utility: either a product for consumption or the means to production. Consequently, capitalism constantly recreates the conditions for making a profit by both increasing productivity and exploiting the planet for resources to transform, and new markets for consumers to buy its manufactured goods (Pillay, 2018, p. 150). When capitalist societies – especially in light of the climate crisis – see nature as an enemy to convenient human consumerism or economic growth (Foster, 2009, p. 215), it is because “the ‘problem of nature’ is

really a problem of capital, as natural cycles are turned into broken linear processes geared to private accumulation” (Clark & Foster, 2010, p. 142). These linear processes include extracting, processing, manufacturing, selling, consuming and disposing of ‘nature’ in a way that does not ‘feed’ the soil – while distancing and so alienating consumers from the majority of those processes.

Though capitalist industries are not oblivious to the ecological impact of economic growth, the cost of mitigating environmental degradation usually exceeds the alleged benefits of cutting fossil fuels or immediate profits (Ackerman, 2009, pp. 6, 7). Amid the threatening climate crisis, Gail Tverberg’s words that “an infinite economic growth model has created the need to keep the hamster wheel turning faster” (Thackara, 2015, p. 14), is effectively explained in the case of a multinational home furnishing company: It had committed to double its outsets by 2020 (from 650 million customers to 1.5 billion per year) “to finance the sustainability improvements”; it also aimed to ensure that by 2017, 50% of the wood (up from 17%) that is used for manufacturing furniture would come from recycled wood or responsibly-managed forests (ibid., p. 15). What about the other 50% of fresh and non-reliably sourced wood needed to produce enough furniture to ensure the company doubles in size (ibid., p. 15, 16)? Consequently, more *unsustainably* sourced wood will be used in the future than at present. It illustrates the growth dilemma faced by many industries, namely

...however hard they work, however many leaks they plug in production cycles, the net negative impact of a firm’s activities on the world’s living systems will be greater in the years ahead than it is today. And all because of compound growth (Thackara, 2015, p. 15).

In summary, the eco-socialist perspective as the theoretical framework for this study does not only pay attention to social inequalities as a result of industrial capitalist growth as one understands Marxism or socialism, but it also concerns itself with the (intentional) consequences of capitalism in the form of environmental degradation or *ecocide* as well as the separation of humans from nature. It reflects on the

relationship between the social, ecological, and economic, the value of cooperation and collective ownership of means of production and subsistence, and importantly, breaks with the Leninist Marxism of the 20th century and its productivist, Promethean logic that relies on industry and technology for a better life (Pillay, 2013). Eco-socialism believes that “as long as the capitalist system persists, there is an inevitable tendency toward the degradation of material conditions of production” (Climate & Capitalism, 2019).

2.2 Review of Literature

This overview of existing literature presents a historical account of the production and management of *waste*: how it not only “reflects the metabolism of societies and the linearization of material flows” but has also been deeply intertwined with capitalist production (Barles, 2014, p. 223). As will be noted, even since the first Industrial Revolution, the value of waste has never been consistent: when there is a productive use for it, it becomes important to collect and manage, but if there is no financial gain, there is very little political or economic interest for it.

This section builds on the theoretical framework’s overview of Marx’s critique of the divorce between the countryside and the urban setting as well as the idea of the linear production line as a model for capitalist economic growth. Apart from sketching a picture of the role waste has played in a capitalist society since the mid-1700s, this section also describes the way recycling and ‘eco-friendly’ products are falsely upheld as the solution, as well as the new mindset that is needed.

In section 2.3, I introduce the just transition and the promise of emerging alternative solutions to halt the challenges associated with garbage disposal, particularly closed-loop systems such as a circular economy and the zero waste model.

2.2.1 Waste *management* under capitalism

Moore (2009, 427) argues that *modernity* – which relies on the capitalist production system – is contradictory in terms of producing “an imaginary environment of order,

cleanliness, and rational space” (by ‘hiding’ nature) in urban and industrialised spaces while also being responsible for promoting mass consumerism (“the creation of everlasting wants”) which in turn creates waste, “the excess of modernity” (Pillay, 2013). In other words, garbage is “the foundational requirement of [economic] development and modernization” but also its biggest headache as the managerial challenges of waste will only increase with more capitalist economic development (Fredericks, 2018, pp. 20, 153). The below overview of urban waste and its management illustrates this well.

A history of waste (management)

“From antiquity to the eve of the Industrial Revolution,” excreta and sewage were the most challenging type of waste towns and cities had to manage – because few roads were paved at the time, discarded materials (other household waste) which were almost exclusively organic and biodegradable would simply become part of the soil if not dealt with by the animals roaming public spaces first (Barles, 2014, pp. 201–203). In a sense, it was a ‘zero waste’ society compared to today but, doctors and scientists would later realise, “the life expectancy of [urban] residents was lower than in the neighbouring countryside” and that “urban excess mortality was due to the cumulative effects of a contaminated ground saturated with putrefying waste” (ibid., pp. 203, 204); It became evident that the environment in which one lives, greatly contributes to one’s health and that it would become crucial to remove waste as far as possible away from people: a necessary evil.

Then, with increased urbanisation during the First Industrial Revolution (the 1760s), an increase in industrial agriculture to feed urbanites (who could no longer practice subsistence farming) became crucial (Barles, 2014, p. 204). It may also have meant an increase in production was necessary to make up for food waste along the new value chain. It was during this time (through to the Second Industrial Revolution) that Marx commented on the detrimental metabolic rift and depletion of soil nutrients that occurred due to the process of primitive accumulation, urbanisation, and industrial farming. Those responsible for food production noticed it too – the soil could not keep up with the agricultural demand. It was decided to recover those

“materials which the cities owe to the earth” – any organic/bio-based goods – and turn them into compost for farmers (Dumas, 1866–1867, as cited in Barles, 2014, p. 204). Certain types of waste could also be returned to the production cycle and therefore everything had to be collected, nothing could *go to waste*. It resembled a no-waste, closed-loop system. And it initiated an entirely new paradigm: the collection and use of waste to help fuel the industrial machine.

Residents' sense of ownership for sweeping and keeping their streets tidy “was [therefore] gradually replaced ... by the collection of tax and the organization of a public [waste collection] service that could be ceded to private enterprises” (Barles, 2014, p. 208). This introduced the monetisation of waste and waste management with market opportunities for the reuse of materials in agriculture and manufacturing. Public refuse heaps, or whatever was left after collection, could then be salvaged by “rag-and-bone men” who would again sell – well, rags and animal bone but later also other materials – to manufacturers or farmers, identical to our informal waste pickers today. In the mid-1800s these informal collectors in Europe and North America actually enjoyed an increase in revenue from their salvaging of in-demand materials. Scavenging was considered another necessary evil – “when practiced on the street it was harmful to salubrity, but as a supplier to industry it was one of the factors of economic growth” (Barles, 2014, p. 208).

With advances in chemistry and technology, what was once collected for organic fertiliser for food production – ‘the return of nutrients to the soil’ – or for manufacturing (like animal bones, metal, and rags) became obsolete as they were replaced by, e.g., mineral and chemical fertilisers that could yield more crops. By the late 1800s, this had increased the volumes of both unrecycled waste and new types of waste of which packaging was one. Again there were excess waste materials in the streets, this time required to be put in refuse bags or boxes (because of the diversity of materials), which contaminated much of the materials and made scavenging harder (Barles, 2014, p. 210). Nonetheless, there were valuable materials to be salvaged and so between the 1880s – 1920s, scavenging was industrialised: to improve efficiency, rag-and-bone men became specialised collectors at industrial sorting plants using conveyor belts and metal detectors (ibid.,

p. 212). Barles (2014, p. 213) notes that this shift took these self-employed men – who practised independent waste picking because of its freedom – to salary workers tied into the industrial machine.

England was the first to experiment with incinerators in the 1870s, largely for its efficiency in getting rid of urban waste right where it was generated, as opposed to having to transport waste far outside the city; its harmful emissions were of course not yet known. Though a country like France was at first hesitant to burn waste for fear of losing valuable materials, the massive advantage of energy and heat generation for urban infrastructure convinced more cities to add incinerators to their sorting plants (Barles, 2014, p. 213). That was until the 1930s when the operational costs of sorting plants outweighed its profits and, in most places, were turned into mass-burning plants (ibid., p. 214). “Techniques associated with garbage collection were no longer developed with *usefulness* in mind, but rather with the aim for disposal or storage at a *lower cost*” (ibid.). It is here that incineration (without energy generation), household garbage grinders (for kitchen waste that drains into waterways), and drainage to sea and land (landfilling), to get rid of bulky waste, became the status quo. That is because “the sudden emergence of [end-of-life electrical appliances and motor vehicles] appeared not to have been anticipated by policies which promoted their manufacture and sale to consumers” (ibid., p. 215). Though not all countries completely stopped recycling or repurposing discarded materials during the inter-war period of the early 1900s, the narrative had nonetheless changed: *it is simpler to remove discarded materials from urban areas than it is to try to do something useful with them*.

2.2.2 Is recycling the solution?

“What was at one time considered waste may no longer be considered so now, and what is waste today may not have been deemed so in the past” (Barles, 2014, p. 222). Ironically, there were times when consumer products were designed to last and not be discarded immediately (for example, returnable glass coldrink or milk bottles that could be used up to 40 times) (Hallowes & Munnik, 2008, p. 115). A few generations ago, people were used to reusing, repurposing and mending worn-out

goods and clothing. Craftsmen and manufacturers would pride themselves on the quality and durability of their goods. However, since single-use and disposable products and packaging could create “a massive expansion in the market and in profits” after World War II, throwing away became “the natural thing to do” (Hallowes & Munnik, 2008, p. 115).

For example, the groundWork report (ibid.) also points out that for most soft drinks (especially in the case of bottled water), the packaging is worth more than the drink itself as it “makes up the better part of energy it takes to commodify the [drink]”: In other words, to produce one single-use plastic bottle uses about a quarter of that bottle of oil. This means the production of single-use plastic bottled drinks – and particularly bottled water – has ever since been serving the fossil fuel energy sector too.

Set on more outputs and profits, manufacturers also often design products to only last a certain amount of uses or years, ‘forcing’ consumers to buy new products (Samson, 2017, p. 40; Smart, 2010, p. 84). As if this *planned* obsolescence is not enough, *perceived* obsolescence through the advertising industry also persuades consumers into buying the latest edition of something as they believe an older model is ‘outdated’, non-optimal, or not socially acceptable (this goes for clothing, electronic devices, cars, and even reusable straws). The tech giant, Apple, has, for instance, in recent years been accused of purposefully slowing down users’ devices through its operating system updates to motivate consumers to buy new cell phones or computers sooner rather than later (BBC News, 2020). That the European Parliament has, in 2022, finally called for a “right to repair” which would make it less expensive and in fact possible to fix broken appliances and electronics, also shows how the system does not by default allow or encourage long-term use and durability of products (European Parliament, 2022). Therefore, it seems to be in the corporate interest to generate vast amounts of waste – both industrial and post-consumer – as it keeps the hamster wheel of accumulation turning by forcing consumers to buy new products (Ackerman, 2009, p. 8).

Greenwashing

The response from the capitalist industries to the growing threat of waste pollution has been to focus on the *management* of waste instead of addressing the *origin* of the items that are discarded which is the capitalist interest of the extraction of resources and thereafter the production of goods (Hallowes & Munnik, 2008, p. 80). For example, *Keep America Beautiful*, an NGO, is well-known for its various campaigns aimed at the ‘litterbug’ consumer to clean up and recycle the trash in public spaces, effectively diverting the attention from big (packaging) manufacturers (Rogers, 2007). Indeed, if the effective management of waste (that is, waste out of sight and smell) can be guaranteed, it should ensure clean urban spaces, public stability, and most importantly, the allowance of economic development (Fredericks, 2018, p. 20).

Moreover, corporations have since been turning consumer garbage into a new means of capital accumulation through the recycling industry (Rogers, 2006; Samson, 2017, p. 41). Although recycling may seem promising as a way to keep trash from rivers or public spaces, any enterprise needs ‘fuel’ to keep it going. As Hallowes and Munnik (2008, p. 141) argued, recycling enterprises may “have the effect of creating a demand for waste to sustain itself”. And by comforting consumers that their trash can in theory be recycled (which does not mean it necessarily *will* be recycled), a study by Catlin and Wang (2013, pp. 123, 126) has shown that people are actually more likely to use disposable (although recyclable) products. MacBride (2011) agrees that recycling creates the ‘illusion of (environmental policy) progress’. We simply cannot recycle our way out of waste.

Both Rogers (2006) and groundWork (Hallowes & Munnik, 2008) had shown how capitalist industries have succeeded in benefiting from ‘greener’ consumerism. The ‘Greenwashing’ of corporations means adopting seemingly eco-friendly or sustainable practices while upholding the growth logic of capitalism (Rogers, 2006): Since the 1970s companies have claimed to recycle, sell organic goods, or in more recent years, ‘ditch the straw’ to attract a new (environmentally conscious) market of consumers. Marketing tactics like perceived obsolescence mentioned above are applied even by these companies – think of the various types of ‘new,’ ‘better,’ ‘more

convenient' straws marketed over the past few years in response to the outcry against plastic, single-use straws: metal, glass, bamboo, silicone. Does this not defy the purpose of 'eco-friendly' consumption? *No straw may be best.*

2.2.3 Conclusion: A new mindset needed

The literature offered above suggests that the mainstream way of thinking about and trying to manage waste – especially non-biodegradable materials – is outdated: both producers and consumers have been locked into a system of mass production and over-consumption. It creates tonnes of items and materials which are either considered to be useless or have indeed become obsolete by design – our current waste management systems cannot handle it in a non-environmentally degrading way. However, in a healthy ecosystem, nothing goes to waste: everything was designed to feed into the other – if one organism has had its meal, another few will come along to be nourished by the leftovers until only dust remains. And so, the cycle continues. Marx, Engels, and Cock especially alluded to this: how we've become alienated from natural rhythms and ecosystems – out of touch with how we should relate to and use things.

We need a mindshift away from *managing* waste to *preventing* waste (Prinsloo & Lyster, 2022, p. 23). For some, that means simply preventing it from being landfilled or ending up in the environment, for others it means preventing it from being needed to be managed entirely – after all, transporting, recycling, and incinerating waste still use energy which emits greenhouse gasses and so contribute to a warming and changing climate.

2.3 Regenerative waste management

Learning from nature, we can imagine an alternative way of thinking about the use-value and lifecycle of the things we produce and consume.

In this section, I introduce the idea of a regenerative economy and the way a new focus on waste *prevention*, through the principles of zero waste, can transform the way our economy and society work, while benefiting the environment.

2.3.1 The (Deep) Just Transition's regenerative economy

A Just Transition

The literature I cited above is not new: local and international bodies have long been calling for a change in how our productivist, fossil-fuelled economy causes rapid ecological degradation. One such call is for a *Just Transition* from one type of economy to another: In South Africa, the Congress of South African Trade Unions (COSATU) has highlighted since 2009 that we need to “protect the most vulnerable from the effects of climate change” and, in 2011, that a just transition to a low-carbon economy is necessary where the transition's impacts would be mitigated for working-class groups (The Presidential Climate Commission (PCC), 2022, p. 6). This is because to reduce emissions, the capitalist economy will need to reduce its reliance on the ‘material’ ((raw) input and (wasted) output, as well as consumption), and this will slow down its growth and thus ‘stability’ (Kallis, 2017, p. 1-3). On an international stage, a Just Transition is understood as a process for “greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind” (ILO, online, n.d.). The latter part of *leaving no one behind* is especially important for those who work in mines or manufacturing whose job security will be threatened by a move away from fossil fuel energy and carbon-intensive operations. It may also allow the opportunity for new types of work.

South Africa, under the Presidential Climate Commission (PCC), has also now adopted the Framework for a Just Transition (2022). Based on consultations with various stakeholders, South Africa's Just Transition to “reaching net-zero greenhouse gas emissions by 2050,” will be characterised by a transition that also

“contributes to the goals of decent work for all,” “puts people at the centre of decision making, especially those most impacted ... empowering and equipping them for new opportunities of the future,” and “builds the resilience of the economy and people through affordable, decentralised, diversely owned renewable energy systems; conservation of natural

resources; equitable access of water resources; an environment that is not harmful to one's health" (the Presidential Climate Commission, 2022, p. 7).

This aim is, for the most part, commendable – an eco-socialist will certainly support the majority of these principles. However, the Framework does not yet seem to advocate for deep, systemic change that addresses the current economic model but rather simply promotes the 'greening' of the economy. So, role players from academia to civil society organisations are demanding that the transition away from coal should instead be truly transformational for our entire economy and society: the South African Climate Justice Charter Movement (CJCM), for instance, wants to "inspire a break with the thinking that caused the [climate] crisis and that reinforces the obsession with growth, progress and domination," among other things, and calls for socio-ecological change that is built on "the importance of the life enabling [systems and] commons (land, water, biodiversity, energy, earth system and cyber sphere)" (Climate Justice Charter Movement, online, n.d.-b). Its own framework for a just transition strives to go even deeper than the PCC Just Transition framework – the Climate Justice Charter values climate, social, and intergenerational justice; participatory democracy and socialised ownership together with international solidarity, eco-centric living, as well as decoloniality to "affirm an emancipatory relationship between humans and with non-human nature" (ibid.). These principles, grounding the CJCM recommendations for systemic alternatives (which speaks to the protection of many of the life-supporting systems mentioned above), seek to ultimately address inequalities and injustices of the past as well as the current polycrisis and so secure a just, liveable and democratic South Africa for all. One aspect of achieving this is to establish communities and economies that *regenerate* these life systems (ibid.).

Regenerative economy

Another organisation working towards a regenerative economy, away from an extractive, productivist, disposal economy, is groundWork, an environmental justice organisation (Prinsloo & Lyster, 2021). Here, *regenerative* means a system that

generates again that which it has used and is *life-giving* as opposed to a system that extracts resources or energy but does not ‘re-cycle’ it.

A regenerative economy can be imagined as a closed-loop system, that “restore[s] the natural balance,” builds resilient communities, and “promote[s] equality and justice among all people” (similar to the South African Just Transition Framework) (ibid., p. 28). In terms of natural resources, a change from fossil fuel to renewable energy is a given, but what about our relationship with the things we use? “The economy needs to use natural resources at a rate that works with the natural cycles but does not use them up” and “only in ways that meet our needs” – which fits Marx’s insistence that the metabolism of give-and-take between humans and the natural environment be maintained; it also challenges mass consumption and excess (ibid.). This will, however, severely challenge capitalist economies, that rely on *the material*, to change its view on work, taxes, and governance. Work-sharing and fair compensation could allow for a better quality of life, liberating many ‘subalterns’ that slave themselves away; it should also decentralise governance: allowing those affected by things such as environmental degradation, pollution, or corruption, to have a voice (ibid.). In a regenerative economy where people recognise that “all things are linked” (think of ecosystems), there should also be a shift in worldview: as opposed to individual ownership and a consumer culture, respect, sharing, and solidarity would be valued (ibid., p. 29). Through shared governance or decision-making and a change in attitude about ownership or exchange, it can ultimately restore the idea of the commons.

Closed-loop (waste) systems: North versus South

What would ‘waste’ look like in a Regenerative Economy? As it is within natural ecosystems, a truly sustainable ‘waste’ system would eliminate any harmful or excessive materials that challenge the system’s balance and would instead feed (into) and ‘nourish’ the other (or the soil or the production system itself). The United Nations’ Sixth Global Environmental Outlook (2019) also suggested adding “oxygen to our economy” by going “circular”. According to the report, efforts to *embrace* (rethink, repurpose, repair, reduce, etc.) can break the linear economy’s *take-make-waste* model (which leads to disposal).

The idea of a Circular Economy has gained traction since the late 1970s and is based on the assumption that the Earth is “a closed and circular system with limited assimilative capacity,” hence, “the economy and the environment should coexist in equilibrium” (Geissdoerfer et al., 2017, p. 761). Such an economy and societal system would thus circulate resources, goods, and waste to create a closed loop reducing extraction and garbage (Gutberlet et al., 2017, p. 2). The Ellen MacArthur Foundation (EMF) has been instrumental in working with academia, businesses, and governments across the world to establish a Circular Economy that is “restorative and regenerative by design” (Geissdoerfer et al., 2017, p. 762). It has become so popular that the European Union adopted a Circular Economy Action Plan in 2015 which aims to “progressively de-couple resource consumption from economic growth” (EMF, online, n.d.). They state that “in a circular economy, the value of products and materials is maintained for as long as possible” and that ‘waste’ is merely a flaw in the design of things (therefore, presenting more opportunities for waste-as-a-resource) (European Commission, online, 2016, EMF, online, n.d.). **Figure 1** below, the widely adopted waste management hierarchy, shows that in managing waste (or making waste *manageable*), it is best to avoid/prevent/reduce the generation of items or materials that need to be dealt with; however, in the Circular Economy, the focus may be more on *minimisation* and *waste-as-a-resource* than mere *prevention*.

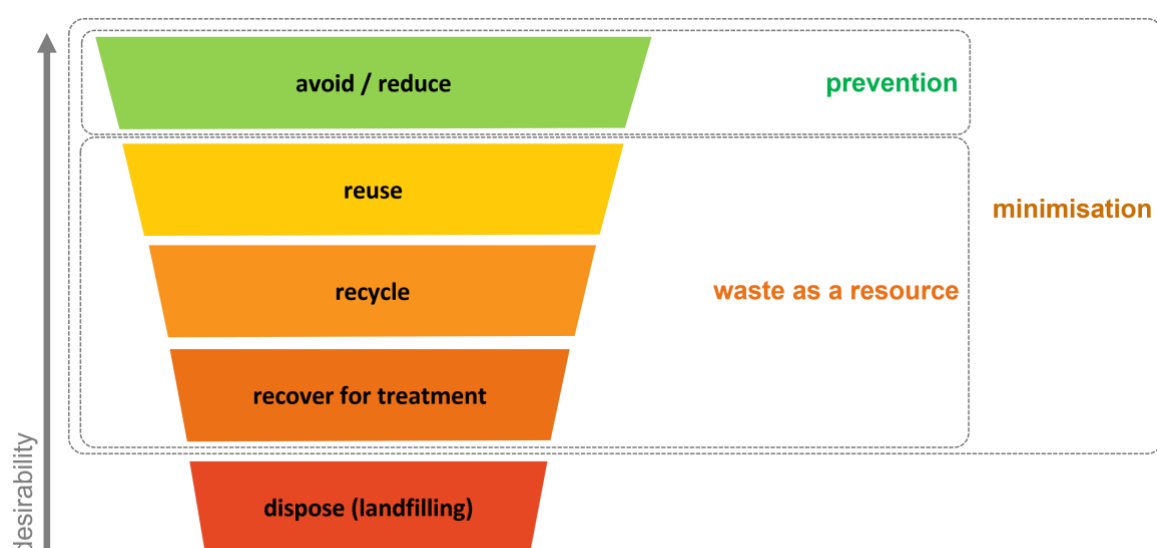


Figure 1 Typical waste management hierarchy (adapted from Nahman, 2010; DEA, 2019)

Geissdoerfer et al. (2017, p. 776) found that, across the literature, the Circular Economy “clearly seems to prioritise the economic systems with primary benefits for the environment, and only implicit gains for social aspects”. No particular emphasis is placed on how it would contribute to social wellbeing except when it refers to job creation (ibid.).

So, what does that mean for a *just transition* or *Regenerative Economy*? Gutberlet et al. (2017, p. 2) argue that, as a starting point, the idea of a circular economy “is highly relevant for countries in the Global South”: many people, and especially waste pickers, are very familiar with “different types of resource recovery” – either because of economic necessity or as part of the recycling industry. In 2018, several papers were published calling for the recognition and support of informal workers. These workers’ contribution to the economy and thus social-economic wellbeing, particularly in urban spaces where formal employment opportunities are limited and a means to subsistence is only available in rural areas, has proven to be significant (Chen & Beard, 2018). In the Global South, 50% – 80% of urban employment relies on informal economies (ibid., p. 3). However, the principles of the Circular Economy are not comprehensive enough to accommodate these socio-economic factors: elements of a Social and Solidarity Economy and an Ecological Economy would be more fitting (Gutberlet et al., 2017, p. 2). The former especially values “cooperation and reciprocity,” and the latter “resilience, de-growth and zero waste,” “belonging to ‘transition discourses’ that call for significant paradigmatic transformations” (ibid., p. 2, 3). It is, therefore, encouraging that in April 2023, the United Nations General Assembly adopted the resolution, *Promoting the Social and Solidarity Economy for Sustainable Development* – for the Social and Solidarity Economy’s role in promoting democracy and social justice and contributing to the Sustainable Development Goals (UNTFSSSE, 2023).

2.3.2 Zero waste

As mentioned above, *zero waste* is part of these transition discourses that promote social and ecological wellbeing in a closed-loop system. Zero waste is a waste philosophy and strategy that has become well-known among consumers, advocates

for informal waste pickers, and even the UN in the past decade. It is also mentioned in South Africa's Climate Justice Charter as a transformative alternative. As is seen in the definition below, its primary goal is the conservation of (natural) 'resources': it understands that our climate-changing world is due to capitalism's reliance on the over-extraction, production, consumption, and irresponsible disposal of nature. The strategy uses 'waste' as its starting point to challenge not only the entire value chain but also our relationship with the material. It aims at not merely managing waste, but, even more importantly, *preventing* it from having to be managed (Prinsloo & Lyster, 2022, p. 21). The widely accepted definition from the Zero Waste International Alliance (ZWIA) (ZWIA, 2018) reads that zero waste is:

...the conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health.

Note the emphasis on "the conservation of *all* resources" (ibid.): it implies resources still in the natural environment as well as those already in the cycle of production and use. A focus on *responsible production*, which will subsequently influence consumption, reuse, etc., is also imperative to reverse the perceived or planned obsolescence of design in current production models. (More on zero waste's emphasis on *redesign* is noted below). The definition of zero waste is likewise explicit about not using incineration or other treatment technologies that may result in harmful discharges or emissions as these are just another form of the same waste. Lastly, it is a commitment to both environmental *and* human health – if not prioritised, ecosystems, biodiversity, and human lives are at risk of being 'wasted' or lost, and gives the impression that they too are 'useless', to draw from Barles's (2014) definition of waste.

Transformative strategies for zero waste

As part of its hierarchy of waste (version 8.0), ZWIA offers a list of 46 policy recommendations and strategies in line with the zero waste philosophy (ZWIA,

2022). In supporting the emphasis on *prevention* as opposed to the *management* of waste, notably, RETHINK/REDESIGN (see below) has the most implementation recommendations of all levels and calls for change across the economy and society. They include a change in the design of goods so that they are durable, reusable, or repairable, and enforced Extended Producer Responsibility (EPR) where producers take back their products post-use; a change in economic policy that disincentivises the use of virgin materials and support local economies; as well as a change in consumer behaviour and the value we place on ownership versus sharing (ZWIA, online, 2018). See the zero waste hierarchy in **Figure 2** below:



Figure 2 **The zero waste hierarchy 8.0 (ZWIA, 2022)**

For the Global Alliance of Incineration Alternatives (GAIA), *zero waste* is about “shrinking waste disposal to zero” – not through incineration, waste-to-energy, or landfilling, but rather through redesign and increased material recovery (for reusing, repairing, recycling and remanufacturing, and composting) (Ribeiro-Broomhead & Tangri, 2021, p. 5). Strategies to do this would “include policy interventions to drive the redesign of products and delivery systems; and increasing access to reuse, repair, recycling, and composting” (ibid.).

These strategies could include policies such as those under EPR that, through a variety of measures, make the manufacturer carry the environmental or social costs of the waste their products produce and so force them to redesign goods to be waste-free, repairable, or recyclable (Nahman, 2010). These will transform the packaging industry and impact delivery systems as well as the service delivery economy.

The below are not necessarily system-shattering alternatives but some examples of how producers/businesses (intentionally or unintendedly) help pave the way for a zero waste-type society including zero waste grocers that let consumers bring their own reusable containers to weigh and buy only as much as they need; or *Philips* which sells lighting-as-a-service where they install, maintain, and take care of the end-of-life of lightbulbs (Philips, online, n.d.). Though Uber, Spotify, and Netflix are very much profit-driven companies, even they have unintentionally challenged the average consumer's perception of the physical ownership of things and, with great success, proved that people are getting more comfortable with the idea of a *service, subscription or sharing* economy which reduces the production and obsession with ownership of the past few decades.

GAIA's second point on zero waste strategies, namely, "increasing access to reuse, repair, recycling, and composting," is equally important after all unnecessary waste materials have been designed out (Ribeiro-Broomhead & Tangri, 2021, p. 5). For instance, *netbricks* sets an example of encouraging the reusing of Lego sets that people rent for their children, which ultimately reduces the number of sets needed and saves the consumer money (netbricks, online, n.d.). We see the same from reusable fabric baby nappies to hardware stores' DIY tools. It does not seem significant compared to older generations or smaller communities that are used to sharing but it is meaningful in a culture that prizes novelty and individual ownership. In terms of repair, the European Parliament's call for a 'right to repair' should also force manufacturers to both make goods repairable *and* to make parts accessible and affordable – they found that "77% of European consumers would rather repair their goods than buy new ones" (European Commission, online, 2020). Just as with consumers' willingness to repair goods, the intention to recycle or separate waste

for composting is not the biggest obstacle: infrastructure should exist to process these materials.

Though these examples rely on manufacturers to do their part, *reusing*, *repairing*, *recycling*, and *composting* are also practices that encourage society to reconsider the value they place on quality, fashion, and ownership – in essence, we should return to valuing things in themselves, and then for their *use-value*. When they are appreciated for their exchange- (or social) value, it is problematic (Marx, 1887, p. 30): the latter drives ‘fast fashion’ and perceived or planned obsolescence – (purposefully) neglecting the quality and durability of goods. In other words, if the economic or social system can value things for their use and durability, we could again see a reduction in waste. This agrees with the Climate Justice Charter Movement’s (CJCM) *Systemic Alternatives for Transformative Change* idea of *Zero Waste and Simple Living*, namely that energy- and waste-intensive ‘celebrity lifestyles’ should be challenged, along with a new value system of solidarity and sharing principles created (Climate Justice Charter Movement, online, n.d.-a).

Jobs in zero waste

Just as with the Just Transition, if zero waste shifts the focus from production and growth to environmental and social regeneration and justice, that includes ensuring livelihoods and the dignity of people through something like climate jobs. *Climate jobs* differ from merely *green jobs* in that they aim to reduce greenhouse gas emissions while building the resilience of communities (Ashley, 2018, p. 273).

GAIA’s research has shown that in nearly all cases, the waste approaches with the best environmental outcomes, also generate the most jobs (Ribeiro-Broomhead & Tangri, 2021). This is key, in particularly the Global South, where large proportions of citizens are unemployed or rely on precarious or informal work to feed their families: if the solution to excessive, non-biodegradable waste was to merely burn, bury, or use advanced mechanical technologies to process any garbage, it would not only harm the environment (energy-use, emissions, etc.) but also withhold income opportunities. Through its research in sixteen countries, GAIA has found

that repairing durable goods could create 200 times as many jobs as when those goods were landfilled or incinerated (404 jobs versus ~2 jobs per 10,000 tons), recycling could create 50 times as many (115 jobs per 10,000 tons) which, if then re-manufactured, creates an additional 30 times as many jobs as burning or burying waste (55 jobs per 10,000 tons), and composting could create 7 jobs per 10,000 tons (ibid., pp. 3, 4, 7). Though they were unable to calculate the employment gains for an overall reduction of waste when goods were reused, or consumed less and it may even result in job losses, it still shows that zero waste – because it values waste management methods other than incineration or landfilling – is beneficial both environmentally and socio-economically.

Incinerators or engineered landfills also require scale and large infrastructure to make them economically viable, and so are usually centralised: zero waste or more decentralised practices allow for local, community-led operations, especially reuse (sharing), repairing, and composting (ibid., p. 5). In this way, the zero waste alternative can strengthen communities by stimulating their local economies.

In essence, zero waste seems to boldly pursue solutions that are in the interest of environmental and social justice and sustainability – regardless of its impact on the economy. ‘Radical dematerialisation,’ and how we relate to things are crucial if we want to avoid dealing with waste and its costs. Satgar (2018, p. 340) agrees that as an eco-socialist alternative, zero waste is a systemic approach with the potential to transform not only consumption but also energy systems and production.

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This chapter explored the existing literature on waste management as set within its theoretical framework. I discussed lessons from the past, current industries responsible for producing post-consumer waste materials, as well as an alternative, regenerative way of thinking about the material emphasising *zero waste*. The next chapter presents the study’s chosen method of inquiry.

CHAPTER 3: METHODOLOGY

In this chapter:

- 3.1 Research questions
 - 3.2 Research approach: a qualitative interpretivist research perspective
 - 3.3 Study design
 - 3.4 Methods of obtaining data: multiple
 - 3.5 Ethics: considerations & application
 - 3.6 Data analysis, interpretation and reporting
 - 3.7 Methodological limitations
-

3.1 Research questions

The previous chapter provided an overview of the generation of waste in a capitalist economy and its *inadequate* means of keeping (seemingly) obsolete materials from polluting the environment and contributing to a heating planet. But it also offered an alternative way of thinking about the economy, and subsequently, ‘waste’: a regenerative ‘zero waste’ model that seeks to redesign waste out of the system without harming environmental or human health.

Considering this, I was curious how this is reflected in South Africa’s waste management context, particularly because of our big informal waste picker population and their role in establishing a circular system. I therefore ask,

What could a zero waste model in South Africa look like? How would waste pickers contribute to or benefit from it?

Below is a more comprehensive outline of the methods used to explore these questions.

3.2 Research approach

3.2.1 My role as a qualitative researcher

De Vos, Strydom, Fouché and Delport (2011, p. 308) argue that the qualitative researcher values *understanding* more than explanation, and *observation* more than “controlled measurement”. Badenhorst's (2008, p. 93) worldviews of the *qualitative* researcher also distinguish them from the *quantitative* researcher in that the qualitative researcher tends to believe that (a) multiple realities and truths exist which depend on meaning and interpretation, (b) a phenomenon is best understood within its context and complexity, and (c) immersing oneself in that research context, contributes to understanding its meaning (ibid.). The researcher also regards herself as an (a) interpreter and (b) transformer: an *interpreter* that presents her understanding of a particular phenomenon based on various data collection methods; as well as a *transformer* (or reformer) that can lead the reader to “acquire new insights and perspectives on some aspect of human interaction” (Glesne, 2006, pp. 174–175).

3.2.2 A Marxist interpretivist research perspective

As a *research perspective*, De Vos et al. (2011, pp. 309–311) offer Schurink's (1998, pp. 246, 247) interpretivism and constructivism as the most appropriate for qualitative research (Soares et al., 2013, p. 1403). For this study, the interpretivist perspective was suitable considering its ontology, epistemology, and methodology, as well as having chosen eco-socialism as a theoretical framework. The following outlines Schurink's interpretivism, then a Marxist (Ecological) methodology, and lastly a link between the two:

An interpretivist believes “the real world can be discovered by means of a systematic, interactive methodological approach,” and that it should be done “by means of participant observation, human documents and interviewing” that are “analysed systematically” (De Vos et al., 2011, p. 311). Marx similarly approached his inquiries: Marx and Engels opposed Hegel's idealist dialectic thinking by suggesting that thought and social relations are dependent on the *material*, i.e. the physical existence of the

world (Foster, 2000, pp. 2, 5). According to Soares et al. (2013, p. 1401–1402), Marx proposed an understanding of reality that sought “to bring the essence of reality to the plane of consciousness,” *revealing* “the connections among the sections of a given phenomenon as well as the connections between these sections and the social totality.” Reality *can* thus be interpreted, as opposed to, for instance, a constructivist or phenomenological perspective arguing that “no real world or truth” exists objectively and that reality is only known “by those who experience it personally” (De Vos et al., 2011, p. 311). Furthermore, ‘bringing the essence of reality to the plane of consciousness’ points to Marx’s belief that when one sets out to understand ‘reality’, one should set out to transform it (Soares et al., 2013, p. 1401).

The commonalities between the interpretivist perspective and a Marxist lens thus relate to two things in particular: (a) the belief that ‘all is not as they seem’ and that by systematically analysing a certain phenomenon, it is possible to discover what may not have been obvious to those experiencing it, and (b) that the aim of any inquiry should be to ultimately transform reality.

What enriches an eco-socialist (or a Marxist Ecological) approach further is its multi-dimensional understanding of reality: it does not simply consider the impact of hegemonic capitalist activities on social relations, but it also considers the impact of both capitalist activities and its consequential social relations on natural resources and the environment. As will also be mentioned in terms of data analysis and reporting, the economic or business impact on both the social and ecological will thus be evaluated.

3.3 Study design

3.3.1 Narrowing the scope: general waste

Waste and the disposal, management and recovery thereof are much bigger and more complex than merely post-consumer waste (more information in the next chapter). However, due to the nature and reach of urban as well as landfill waste reclaimers’ work, this research project focused more on general waste such as municipal solid waste, recyclables, and organic waste in urban areas and public spaces.

3.3.2 Two staged thematic analysis & case studies

In my search for an alternative waste management model that breaks from the capitalist imperative of working for-profit and harming the subaltern or the natural environment in the process, I conducted this study in two stages:

Part I: I aimed to understand the priorities of the waste management sector and, in particular, of waste pickers as the subaltern. This gave me insight into the opportunities and barriers to implementing zero waste in South Africa.

Part II: As I wanted to understand and assess how an alternative waste management model (such as zero waste that also recognises the subaltern) can restore some of the social and environmental injustices of the more linear or for-profit waste economy, I chose to look at a real-world implementation project and then conduct an evaluation.

3.4 Methods of obtaining data: multiple

Bogdan and Biklen (1998, p. 106) describe data in qualitative research as “both the evidence and the clues” as data collection and analysis “occur concurrently” (Baxter & Jack, 2008, p. 554). In other words, the researcher constantly evaluates the data already collected to ensure that not-yet-explored data sources will plug the gaps previous sources left. What makes up this data? Badenhorst (2008, p. 92) argues the *descriptions* of a particular context or phenomenon constitute its data, whether in the form of materials others created (official documents, media articles), or materials recorded by the researcher (interviews, field notes, observations) (De Vos et al., 2011, p. 399).

3.4.1 Criteria for identifying data sources

Data sources were identified and vetted, as (Baxter & Jack, 2008, p. 554) proposed, on an ongoing basis.

Part I – waste pickers: To understand waste pickers' principles and practices, I sought to include the voices of two key waste picker representative organisations in South Africa.

Interviewees and document sources for this stage were first identified in 2019/2020 when Unilever collaborated with ARO on a pilot project in Johannesburg, South Africa, which drew a lot of media attention. Desktop research also helped verify and/or clarify some of the interview outcomes.

Part II – Warwick Zero Waste: Based on the first stage of the study and its eco-socialist lens, I wanted to consider a case that (cl)aims to work with informal waste pickers or that supports a zero waste model. With the National Waste Management Strategy's (NWMS) emphasis on organic waste (see next chapter), insight into e.g., composting, would also make it more applicable. The Warwick Early Morning Market Zero Waste pilot (WZW project) was identified through a webinar by the Emancipatory Futures Studies public platform and considered suitable based on the above criteria.

3.4.2 Data collection

I made use of online and printed information sources, interviews, and participant observation to gather the 'descriptions' of how waste pickers work and how a zero waste project could be implemented. Below is a summary of the key documents analysed and persons interviewed during each research stage.

Stage I: Understanding waste picker principles and practices			
#	Organisation	Name of source/Interviewee	Date/duration
1	African Reclaimers Organisation (ARO)	Interview: Luyanda Hlatshwayo, Member of Organising Committee	01:49:04
2		Website	n/a
3	South African Waste Pickers Association (SAWPA)	Interview: Simon Mbata, (former) Chairperson	00:41:58
4		Interview: Itumeleng Mogatusi, Associate	00:35:33
5		Website	n/a

Stage II: Zero waste case study			
#	Organisation	Interviewee or name of source	Date duration
Warwick Zero Waste project			
1	Durban University of Technology	Urban Futures Centre Facebook page	2021 – 2023
2		Tamlynn Fleewood	2022 01:04:19
3	groundWork	Asiphile Khanyile	
4		groundWork newsletter vol. 23 no. 4	2021 n/a
5		groundWork newsletter vol. 24 no. 1	2022 n/a

Participant observations

Through participant observation, one “studies the natural and everyday set-up” of a particular situation or group “through looking rather than asking” (De Vos et al., 2011, p. 329, 330). It helps the researcher to grasp and interpret the influences, dynamics, or constraints of a community or space better when they know what the physical space or interactions between role players look like. With both below points of interest, I made use of field notes as well as photo and video recordings.

Part I – waste pickers: To get a better sense of particularly informal waste pickers’ work, I visited SAWPA’s Ikageng-Ditamating material recovery facility in Sasolburg where I conversed with waste pickers sorting their collections, as well as the Greenhouse Project in the Johannesburg central business district (CBD) where SAWPA members work. In general, I sought to engage with and observe how waste pickers operate in Gauteng.

Part II – Warwick Zero Waste: Though I was unable to take part in any of the WZW project activities such as the Tuesday collections or garbage bin audits, I participated in an official Markets of Warwick guided walking tour (offered by Asiye eTafuleni) – which also included the Early Morning Market. Afterwards, I also visited the Durban Botanic Gardens to see the weekly compost heaps (which was facilitated by a Botanic Gardens staff member, not the interviewees).

Interviews

I conducted semi-structured, individual interviews with three and then two participants, respectively for the two parts of the study. Interviews were meant to be open and consultative, therefore the semi-structured format.

Part I – waste pickers: waste pickers - Itumeleng Mogatusi, Simon Mbata (SAWPA associates), and Luyanda Hlatshwayo (ARO spokesperson) - were interviewed in person (except for Mbata) on their work as waste pickers as well as their definition of and role in establishing elements of the circular economy and zero waste in South Africa.

Part II – Warwick Zero Waste: Tamlynn Fleewood from the Durban University of Technology and Asiphile Khanyile from groundWork, both implementing partners on the Warwick Early Morning Market Zero Waste project, were interviewed in person.

Desktop & document sources

In preparation for participant observation and interviews, news articles, media statements, and open-source material on participant organisations were consulted. Among others, these included groundWork's newsletters and the Durban University of Technology's Urban Futures Centre Facebook page. Interviewees also provided additional documents or reports which I could refer to, such as a report on the Recycle with Reclaimers pilot in Johannesburg, or a presentation on the Warwick Zero Waste project.

3.5 Ethical considerations & application

3.5.1 Ethical clearance

The project would involve minimal risk: Interviews were specifically conducted with programme managers, coordinators and spokespersons of the respective organisations to avoid putting financially or socially vulnerable informal waste pickers, in a difficult position. A study such as this could have also potentially threatened relationships or perceptions of interviewees when questioning, e.g., the social relations between 'owners of the means of production' and the subaltern. However, interactions

with participants did not intend to advocate a particular standpoint and I aimed to remain neutral throughout interviews and analysis.

Ethical clearance was granted by the University of the Witwatersrand in July 2019 (protocol number **DVS20190110** – see appendices).

3.5.2 Anonymity & confidentiality

Issues of anonymity and confidentiality differed depending on the data collection method: Media statements and documents analysed to determine the attitudes and intentions of stakeholders, by default did not include any names of writers, speakers or respondents – anonymity was thus guaranteed. In the case of interviews, outcomes were preferably associated with at least the participant's role in the organisation or project. Participants were able to opt for anonymity if preferred but were otherwise aware that in this report, their names may be associated with their views.

Interviewed participants were selected and interviewed based on either their expertise or experiences and therefore sensitive or personal biographical information was irrelevant.

Apart from informing participants of the aim of the research report and that their participation was voluntary, a Participant Information and Consent Form also made it clear that interviews would be recorded and transcribed thereafter. Recorded interviews are stored on a password-protected mobile phone and personal laptop; interview notes and observations were compiled and stored on the same password-protected personal laptop.

Participants did not receive any direct benefits from participating in this study. I also declare no conflict of interest.

3.6 Data analysis, interpretation & reporting

In line with the nature of qualitative research explained earlier, my research *analysis* entailed the “non-numerical examination and interpretation of observations, for the purpose of discovering underlying meanings and patterns” (Babbie, 2007, p. 378). The interpretivist view suggests that data should be analysed systematically (De Vos et al.,

2011, p. 311).

To do this, I identified themes from the conceptual framework and literature review and sought them out in the data. More about this below.

3.6.1 Conceptual framework & themes for analysis

According to Miles and Huberman (1994, p.18), a conceptual framework assists the researcher in understanding what intricacies may be present, allows her to organise “general constructs into intellectual bins,” anchors the study, and is applied during data interpretation (Baxter & Jack, 2008, p. 553).

Apart from eco-socialist literature guiding my interpretation of humans’ relationship with nature and the growth paradigm of capitalism, the framework offered three key ‘bins’ in which I could group, evaluate, and synthesise data: (a) the (capitalist) economy or profit, (b) people or the social aspect of things, and (c) the ecological threat or benefit. These three correspond with principles of a zero waste philosophy as well as the notion of ‘sustainability’ and its ‘triple bottom line’. This approach fits Yin’s (2003) technique for analysis, namely “linking data to propositions.”

3.6.2 Methods for reporting (Chapters 4, 5)

A report, especially on case studies, should allow the reader to comprehend the study and results in a way that they can know whether and how findings would apply to *their* context (Baxter & Jack, 2008, p. 555).

Part I – waste pickers: After setting the scene of South Africa’s state of waste, I describe waste pickers’ contribution and approach to their work according to the themes of economic or financial factors, socio-economic or social priorities, and the environment.

Part II – Warwick Zero Waste: In Chapter 5, the case study’s context, objective and implementation are described and thereafter evaluated according to the themes mentioned above as well as linked to insights from the literature review (ibid.).

3.7 Methodological limitations

Unfortunately, any study proves to have had some limitations. Below are three methodological challenges this report presented, with limitations on the report's insights highlighted in Chapter 6.

3.7.1 Subaltern voice

Though it was deliberate to not interview individual waste pickers (due to ethical considerations), it may have resulted in slightly different insights if I had done so instead of merely speaking to their association representatives or leaders: the individual waste picker often merely works to make ends meet while their organisations are able to see and carry a longer-term vision about restructuring the waste management system or zero waste, as their representatives pointed out. On the other hand, feedback from informal traders or municipal officials about the zero waste project in Durban may have enriched my findings.

3.7.2 Single versus multiple case studies

Baxter and Jack (2008, p. 550) argue that a single case study has “limited transferability”. If I considered more than one case study – perhaps one that looks at another waste stream within zero waste, or at organic waste but in a residential area or municipal-driven programme – I would be able to compare themes and findings from the different case studies. This would have influenced the answers to my research questions in Chapter 6.

3.7.3 Research timeframe

The study was conducted from mid-2019 to the beginning of 2023, though it was not intended as such: this challenged me in terms of distinguishing between relevant or outdated data, and the various developments in the field over the past years.

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In this chapter, I discussed the eco-socialist and thematic analysis approach I took to studying a zero waste case study in South Africa, as will be elaborated upon in Chapter 5. The next chapter provides an overview of waste management in South Africa – both in policy and practice – as well as an overview of the different role players in the industry.

CHAPTER 4: THE SOUTH AFRICAN WASTE INDUSTRY

In this chapter:

- 4.1 About waste & waste management
 - 4.2 The state of South Africa's waste
 - 4.3 Possible interventions
 - 4.4 More on waste pickers
 - 4.5 Other role players
 - 4.6 Key observations
-

For most of the world, including South Africa, the remnant of a dominant linear economic model is still seen in its vast volumes of hazardous and non-hazardous waste produced and then disposed of at landfill sites – even recyclable, reusable, or compostable materials. Although reports, policies, and guidelines account for these items and now aim for a more circular waste system with ambitious targets of diversion-from-landfill, other types of ‘wastefulness’ from our capitalist activities are unaccounted for under this banner: the loss of ecosystems, biodiversity and human health. South Africa’s national waste sector guidelines do not necessarily call for systemic change in line with a regenerative or zero waste society, but informal waste pickers have been challenging aspects of the hegemonic economy concerning ways to reuse waste, building relationships across socio-economic planes, and valuing equality and solidarity.

While both the obvious (garbage and pollution) and less obvious (environment and human life) forms of waste are applicable in this paper, this chapter emphasises the former which is typically part of waste management systems. Here, I give an overview of waste and waste management in South Africa, particularly regarding landfilling, what the recent National Waste Management Strategy (NWMS) recommends in terms of establishing elements of a circular system, and who the key role players are. I also delve into how waste pickers work and organise to understand their potential contribution to zero waste.

4.1 About waste & waste management

4.1.1 What is waste?

Waste encompasses much more than the garbage that municipal trucks or waste pickers transport every day; it is even more than just that associated with dirt and uselessness. In a sense, waste is any of the externalities of our capitalist society – the excess from mining and manufacturing processes, metals, tyres, construction and demolition waste, health care risk waste from health facilities, sewage sludge, other hazardous matter, the unseen wastes in the form of pollution and most unfortunately, the ‘wasted’ eco- and human life.

Material, accounted for waste products

In terms of obvious types of waste, which is elaborated upon in this chapter, the *National Environmental Management: Waste Amendment Act* of 2014, defines waste as “any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, by the holder ... whether or not [it] can be re-used, recycled or recovered” – it is considered waste unless it is approved by the Minister as not-waste or has been reused, recycled or recovered (DEA, 2018, p. 15). As Prinsloo and Lyster (2022, p. 2) argue, “waste is not all waste. Much of it is resources in the wrong place” (or resources that have not yet been valued as such). This resonates with how 19th-century Europe and North America perceived such materials (Barles, 2014), as discussed in Chapter 2. In imagining change, a circular economy or zero waste model is thus only realistic to the degree that waste materials *can* be reused, recycled or recovered, which is largely dependent on whether there is the political will to do so.

4.1.2 The classification of waste types

Waste is usually regarded as either general or hazardous waste and is tabled according to its local generation, any imports or exports of that material, and which percentages were stored/stockpiled, recycled/recovered, treated (there are various ways), and disposed of (usually at landfill sites, but some also into the air) (DEA, 2018, p. 19).

General waste includes, among others, municipal solid waste, non-hazardous or non-classified commercial and industrial waste, non-hazardous construction and demolition waste, organic waste (food waste, garden waste, and wood waste from sugar, wood, paper and pulp mills), recyclables (glass, plastics, paper), municipal ferrous and non-ferrous metals, and tyres (ibid., pp. 15, 16).

Hazardous waste which has “a detrimental impact on health and the environment,” to name a few, includes batteries, gaseous waste (excluding greenhouse gases), oils, asbestos, pathological, infectious, sharp or chemical health care waste, electrical and electronic equipment waste (WEEE) from household appliances to medical equipment, solid or semi-solid sewage sludge from treatment facilities, slag from metals, as well as fly ash, and dust and bottom ash from coal-fired power plants, boilers and incinerators (ibid., pp. 17, 18).

4.1.3 The management of waste

Waste is either ‘managed’ by the producer onsite or sold to another – for example, the agricultural sector’s waste is often left in the field (and therefore not included in waste sector calculations) or processed into animal feed, or like some coal-power stations that sell ash to the construction industry (DEA, 2018, p. 36). Other times, once the waste is collected either by private, public, or community collectors (of which only around 60% of South African households were serviced in 2017), it may be taken to transfer stations before it goes to recycling and recovery facilities, treatment facilities, or disposal facilities (landfills) (ibid., pp. 42, 55).

Consumers are encouraged and supported (in some provinces more so than others) to separate their household waste into different bags or bins (called *separation-at-source*) enabling collectors to recover recyclable materials or dispose of others. Historically, the majority of recyclables in South Africa were collected by private entrepreneurs or agents for recycling companies which then work with the packaging industry to recycle them (Matete & Trois, 2008). (Informal) waste pickers, however, now play a key role in ensuring recyclable or reusable materials are intercepted either before they reach an incinerator or landfill, or at a landfill itself: they then reinsert these items into either informal economies or into the recycling industry through buy-back centres (ibid., p. 59). More on waste pickers later.

4.2 The state of South Africa's waste

4.2.1 Waste generation

Considering the categories above, South Africa generated more than 55.6 million tons of general waste and more than 52 million tons of hazardous waste in 2017: on average, 65.2% of general waste and 92.7% of the hazardous waste ended up in landfill sites (DEA, 2018, pp. 19, 31). Only 34.5% of general waste was recycled or recovered, versus 6.6% of hazardous waste (ibid.). This is already an improvement compared to 2011: since, there has been an increase in the recycling of paper, plastic, and glass while a decrease in the local generation of plastic and glass (for instance, due to a 30% weight reduction in PET bottles) – despite an increasing population and GDP (DEA, 2018, p. 41).

This paints a worrying picture of where and how much (especially hazardous) waste ends up in the ground and echoes the literature on how our economic system discards vast volumes of waste in its linear take-make-waste model, with still too little systemic change to facilitate the full 'circulation' of materials.

4.2.2 Landfill disposal

The National Waste Management Strategy (NWMS 2020), which provides policy and strategic interventions to waste sector stakeholders, rightly characterises South Africa's waste landscape by the challenges associated with such a reliance on disposal at landfills (DEFF, 2020, p. 11). The NWMS 2020 (ibid.) offers the following reasons why waste-to-landfill is such a problem:

- the commissioning, operating, and decommissioning of landfills that comply with licensing conditions are extremely expensive to local governments,
- a new landfill "is often resisted by communities neighbouring potential sites" (not to mention the health and human rights risks associated with them),
- "waste is no longer economically productive" once in the landfill (which refers to all the other reuse, recycle, or remanufacturing value chains that do not have any 'input' once waste cannot be retrieved), and

- if landfill gas is not captured sufficiently, it generates methane (which is considered 25 times more potent than CO₂ in trapping heat over 100 years – the number is at least three times more in the short-term (Moseman & Trancik, 2021)).

The operation of waste management facilities, including landfills, requires great technical knowledge and adherence to regulations and licencing – for both private and state-run facilities. They have to comply with regulations related to access control, management and operations, storage, types of permissible waste, and monitoring of ground, surface and upstream water (DEA, 2018, p. 56). External audits conducted at 25 *private* waste management facilities recorded relatively high levels of compliance to full compliance; however, the DEA's General Landfill Sites Project showed that of 73 *public* landfill sites assessed, 50 sites were less than 50% compliant with their license conditions (ibid., pp. 57, 58). Non-compliance with safety and environmental and health regulations poses a threat to flourishing life and may violate certain human rights – hence, health for all being a key zero waste principle.

Furthermore, according to the State of Waste Report, the estimated remaining airspace of some of our largest municipalities' landfills (based on 2014 and 2016 data) ranges from (then) 5 years for the City of Cape Town, 8 years for the City of Johannesburg, 25 years for Nelson Mandela Bay, 29 years for eThekwin, and 62 years for Mangaung (DEA, 2018, p. 49). Though waste pickers have contributed significantly to reducing landfill volumes, municipalities with only a few years of landfill airspace left before they have to be closed, need urgent intervention (DEA, 2019).

Considering the above, one appreciates the Department of Environment, Forestry and Fisheries (DEFF) acknowledging that South Africa's waste management sector is challenged by "weak enforcement, weak governance, insufficient budgetary provision, service backlog, low public awareness and negative attitudes which influence waste generation and management in the country" (DEA, 2018, p. iv). But treating these symptoms won't do much unless the root causes are also addressed.

4.3 Possible interventions

What can thus be done to divert waste from landfills? The DEFF's NWMS 2020 "has the concept of the 'circular economy' at its centre" and thus focuses on waste minimisation, compliance and awareness, and service delivery (DEFF, 2020, p. 7). It aims for 'zero waste to landfill', building "a culture of zero tolerance of pollution, litter and illegal dumping," and ensuring "cleaner communities" and "stable waste services" (ibid.). More about these themes below.

4.3.1 Waste minimisation

In minimising waste, the NWMS 2020 aims to divert 40% of waste from landfills by 2025 by focusing on, among other things, diverting or minimising organic waste (including food waste), recyclables (especially plastics), and construction and demolition waste; minimising hazardous waste (especially the 75% of hazardous waste that come from coal power stations) and WEEE which currently have very low recycling rates; implementing Extended Producer Responsibility (EPR) measures driving producers, distributors, etc. to redesign products (such as single-use plastics that should instead be made of bio-degradable alternatives), pay levies or taxes as a means to financially compensate for the management of waste generated, or to take physical responsibility for the appropriate removal or disposal of their products based on regulatory instruments (Godfrey & Oelofse, 2017, p. 7; Nahman, 2010, p. 6); and, in line with a circular economic model, "advance waste as a resource" (see Figure 1) which again emphasises organic waste for composting, investment in more material recovery facilities to increase recycling, and the implementation of the 2017 Chemical and Waste Economy Phakisa programme (DEFF, 2020, pp. 34, 35).

Organic waste

For this paper, I want to highlight this emphasis on *organic waste*: South Africa's (non-hazardous) organic waste made up 34.6% of general waste in 2017 which is much more than even the combined weight of 'recyclables' such as paper, glass, plastic, and metal (DEA, 2018, p. 19). Although most of this organic waste comes from paper and pulp, sugar or wood mills, still nearly 30% of *municipal* waste was comprised of garden

waste (residential and public areas) and food waste which could have been composted locally (ibid., p. 24). Unfortunately, 50% or 9.7 million tons of organic waste still ended up in landfill sites (ibid., p. 19).

The Western Cape government has taken the lead in putting targets and measures in place to immediately start diverting organic waste from their landfills: as was mentioned, their landfill airspace is severely limited and thus they aimed to divert 50% of organic waste from their landfills by 2022 and implemented a 100% landfill ban on organics by 2027 (Hanekom, 2018). Even though they did not reach their 2022 target, practical interventions (in collaboration with various partners) included supplying nearly 22,500 households with home composting bins, establishing drop-off sites for garden waste to be composted, and piloting a community composting site in Langa and the collection and composting of food waste generated by informal traders; a bigger emphasis still needs to be placed on restaurants and hotels' organic waste (GreenTimes, online, 2022).

Though the NWMS 2020 wants to “develop guidelines, norms and standards for redistributing surplus foods and composting of spoilt foods,” it also regards biogas digesters and organic waste technologies as key to diverting organic waste from landfills and using it as a resource (DEFF, 2020, p. 44).

4.3.2 Compliance & awareness

In its focus on ensuring compliance and awareness, the NWMS 2020 not only want to put financial mechanisms in place to enforce waste management facility compliance (as mentioned above), but also reduce pollution, littering and illegal dumping through a national awareness campaign, financial support for community clean-ups, and agreements with law enforcers to better monitor compliance with the Waste Act (ibid., p. 49).

4.3.3 Service delivery

The strategy also promotes effective and sustainable waste services so that South Africans can live in cleaner communities and waste services are well-managed and financially maintainable (DEFF, 2020, p. 36). It wants to promote better rates of waste

collection (currently around 60%), separation-at-source, and integrated waste management planning with waste pickers (ibid., pp. 36, 37). The National Waste Picker Integration Guidelines, also published in 2020, outlines a 7-step Waste Picker Integration Plan (WPIP) to be implemented by particularly local government but also industries as more EPR rules are introduced (DEFF & DSI, 2020, p. 5). The WPIP is also “recognised as contributing towards a just transition to a low carbon economy” (DEFF & DSI, 2020, p. i). It, however, focuses particularly on the recycling industry as a key component of establishing a circular economy but does not necessarily speak to zero waste or waste prevention as much.

4.4 More on waste pickers

In South Africa, thousands of men and women who cannot (or could not) find other means of employment, now put food on the table due to a gap in the waste sector from ineffective *formal* reduction, sorting and processing of waste. Waste pickers sort through and salvage from trashcans and landfills for recyclables and other useful goods, and sell it by the kilogram to the recycling industry or within informal economies (Godfrey & Oelofse, 2017, p. 6). As not all waste pickers are registered or formally part of an association, their estimated number varies from 62,000 (DEFF, 2020, p. 55) to 215,000 people (Godfrey & Oelofse, 2017, p. 6), with an estimated 80% of them foreign citizens (depending on the location) (L. Hlatshwayo, interview, 2020). Across the globe, waste pickers still face various health and safety hazards, are socially stigmatised, and are largely undervalued since governments reap many benefits from their activities “without paying” (Dias, 2016, p. 3; Fredericks, 2018; Hallowes & Munnik, 2008; Samson, 2008). In South Africa, groups such as groundWork and Women in Informal Employment Globalising and Organising (WIEGO) have in the past decade worked hard to have reclaimers recognised and included in formal waste management structures. One such initiative was through cooperatives but unfortunately, more than 90% of them failed (DEFF & DSI, 2020, p. 49).

Though much has been researched and written about their day-to-day activities and challenges, it will not be covered here. The various roles waste pickers play will, however, be elaborated on below, loosely based on the themes of the *environment*,

economics, and *people*: (1) the reduction in waste and thus benefit to municipalities and the environment, (2) their power to influence the price of commodities in the recycling market, and (3) the political and social consciousness they expose. This section is based on literature, reports, and interviews with three waste picker representatives.

4.4.1 Waste pickers & a circular/zero waste model

Reuse & recycle

Waste pickers address challenges caused by the linear production model – the same as the rag-and-bone men of the Industrial Revolution (Barles, 2014). As Gutberlet et al. (2017) argued, waste pickers in the Global South have been establishing ‘circular economies’ before they became a mainstream ideal in the Global North during the 20th century: they supply input for the recycling industry and second-hand/repaired goods in informal economies.

Even though various recyclable materials have no buy-back value and are thus not collected by most waste pickers (such as many bottle caps or transparent fruit containers), waste pickers still (a) reduce the amount of waste disposed of in landfills and so increase the lifespan of landfills (saving South African municipalities around R700 million per annum in collection and disposal fees (DEA, 2019)), and (b) supply around 90% of materials to the recycling market that would likely otherwise end up in landfills (or have already) (Godfrey & Oelofse, 2017, p. 6; Schenck et al., 2019, p. 2). Apart from recyclables, reclaimers also collect usable household items or clothing which they can use themselves or re-insert “into spheres of consumption and exchange”; many also collect discarded food for their own consumption (Samson, 2008, p. 6; 2017, p. 55). This acts as an injection for informal and local economies, linking to Gutberlet et al.’s (2017) reference to the Social and Solidarity Economy and green jobs.

Minimising pollution

Waste pickers also (c) “protect the environment by enabling materials to be reused or reprocessed” as less material can pollute the natural environment. Strengthening the

recycling industry should, in theory, reduce the need for the extraction of raw materials (Dias, 2016, pp. 3, 4). A spokesperson for the African Reclaimers Organisation (ARO) calls waste pickers “accidental eco-warriors,” because of their (unplanned) contribution to fighting pollution (L. Hlatshwayo, interview, 2020). He admits “there is no reclaimer that wakes up in the morning and says, ‘I am going to save the environment’”. They pick waste because it is an independent means of putting food on the table (ibid.). However, their innovative ways of salvaging recyclable waste benefit the natural environment: some reclaimers would cast large nets over storm pipes to catch plastic bottles going downstream – unintentionally keeping streams and rivers waste-free (ibid.)

4.4.2 Influence on the recycling market

Waste pickers have also become an economic force. Considering the dominance of the productivist economy, Samson (2017, p. 42), in making sense of ‘value’ in waste, distinguishes between ‘devalorisation’ and ‘devaluation’. Devalorisation refers to the end-of-life of a certain product as it cannot be further used or recycled, and devaluation refers to an unrecycled material merely because it is not profitable to do so, but “if it was to be used as raw material for new commodities”, it does indeed still hold value (Herod et al., 2013). This links with the European Union’s view on the Circular Economy that retains value. Waste pickers “actively shape conditions for the de- and re-valuation of waste” – waste pickers thus influence markets and the economy (Samson, 2017, p. 43). Economic crises, for example, affect the value of waste as do different seasons and holidays, which then affects the livelihoods of reclaimers because of the devaluation of many waste products; but that also encourages the majority of reclaimers to start collecting non-typical items for recycling, reuse, and reselling, effectively increasing the amount of ‘formal value chains’ “of reproduction and informal exchange” they became a part of (Samson, 2017, p. 53). If recognised, formalised, and supported by producers and industries, reclaimers could divert even more waste as there will be an incentive to do so. “If all the packaging materials were made from recyclable materials, there will be no waste but (instead) resources for waste pickers” (SAWPA, online, 2022).

Since waste pickers have come together in associations and organisations, they are also able to work together to influence the supply and demand of certain materials in the recycling industry: they may, for instance, decide to collectively hold onto the glass they have collected until the industry reports a higher demand and thus a higher price per kilogram – when they sell their materials then, they receive more money from the buy-back centre (L. Hlatshwayo, interview, 2020). Though this is not sustainable or without its consequences, it shows that they are a force to be reckoned with.

4.4.3 Social influence

Uncovering the hidden

Considering Cock (2007) and Princen's (2005) descriptions of distancing and alienation, especially in urban areas, waste pickers further also challenge the divisions and illusions of our modern, unequal society. The large number of city-dwellers with nothing but 'their labour-power' to sell, is to some degree the result of a long history of colonisation, capitalism, and Apartheid that has deprived many black Africans of land and the means of reproduction (DEFF & DSI, 2020, p. 4) – as was argued by Marx in *Capital* (Vol. 1) in terms of Primitive Accumulation (Marx, 1887, pp. 507–509). In this way, waste pickers' presence in the streets of big cities and fancy neighbourhoods exposes the previously hidden 'inconvenient' or 'disgusting' realities of modern society's lifestyles. Samson (2008, p. 7) describes waste pickers as those connecting the front- and back-end of industries and the garbage dump: they enable the re-distribution of discarded goods connecting the formal and informal economies, different parts of the city, and even urban and rural areas.

Building bridges

Recycling with Reclaimers was a pilot project in Johannesburg's Bordeaux, Brixton, and Auckland Park neighbourhoods that sought to create awareness of waste pickers' work and take hands with residents to separate their waste. On reflection, "both residents and reclaimers indicated that the pilot was highly successful in transforming their relationships with each other," adding that residents were now more aware of

both the social and environmental impact of their waste as well as the contribution of waste pickers (Samson et al., 2021, pp. 28, 29).

Including the excluded & working together

ARO was formed around 2015/2016 when it became apparent that those with waste collection cooperatives would have exclusive rights to collect materials in certain areas of the city. Although the cooperatives model was very attractive in terms of the advantages of being supplied with a truck, diesel, plastic bags, a driver – all operational costs for upscaling – according to both waste pickers organisations, it excludes foreigners. However, ARO estimates that nearly 80% of waste pickers in South Africa are non-South Africans. Of course, this is because waste picking is part of the informal economy: “Foreigners don’t like something that is formal. Because then it will require documentation... they are not legally here, they don’t have papers,” SAWPA says (I. Mogatusi, interview, 2020). Though SAWPA understands that a cooperative would need to be able to ‘show value’, for instance, in terms of growing employment as they are funded by the government, SAWPA instead strives to *protect* waste pickers’ jobs “irrespective of nationality” because they “also have partners in other countries” (ibid.). Here they are referring to organisations and advocacy groups particularly in South America and India where waste pickers are increasingly organised and recognised.

This is also one of the key reasons why ARO rejected the cooperatives model instituted by the City of Johannesburg between 2015/2016 and rather registered as a non-profit organisation (NPO): an NPO allows *collective* ownership and is “able to incorporate everyone, whether you’ve got an ID or you don’t have an ID, you have a passport, male or female” (L. Hlatshwayo, interview, 2020). Even ARO’s name – *African Reclaimer Organisation* – is intentional and seeks to promote *solidarity* and belonging among reclaimers from across Africa even when they only work in South Africa.

It is also encouraging how waste pickers work together even though their money is hard-earned. “Amongst us are university drop-outs, former teachers, ex-mine workers, ex-offenders looking to make an honest living...” – organisations like SAWPA and ARO strive to build (or build upon) a culture of *cooperation* and solidarity (ARO, online, n.d.). ‘Members’ are regarded as equal partners with a democratic

constitution affording everyone the chance to vote for leaders or share ideas. There are also many stories of how they support each other: in some places, male waste pickers would work on landfills so that female waste pickers could work in the streets where it is safer; or the ex-teacher waste picker who started a creche where they may drop off their children when they need to start working at 04:00; or how they may keep aside any WEEE for a certain waste picker that will try to repair the appliance or otherwise take it apart and make jewellery from its precious metals (L. Hlatshwayo, interview, 2020).

4.5 Other role players

The NWMS 2020 considers the government (national, provincial, and local), the private sector (“as generators of waste, providers of waste-related services, recyclers of waste and consumers of recycled materials – as well as providing an important interface to consumers”), the informal sector (waste pickers), and civil society (consumers as well as any community organisations) as the key role players to implement its waste plan (DEFF, 2020, pp. 51–56).

In **Table 1**, I summarise the interests and influence of each of these groups based on a combination of sources, among others the NWMS 2020, interviews with and reports by waste picker associations, and online declarations by stakeholders in the private sector.

In this case, *interests* refer to objective or subjective factors that drive their behaviour regarding production, consumption, recycling/disposal, etc. *Influence*, then, is the outcome of these behaviours on the waste management system.

Table 1 **Waste sector stakeholder interests and influences**

Stakeholder type	Interests	Influence
Civil society	- Care about the environment (want eco-friendly products/packaging, may lead to separation at source (S@S)) - Want a clean neighbourhood - Want to support their local waste picker	Pressures producers through buying preference and behaviour Influences effectivity, profitability of waste pickers and waste management services through S@S (can be driven by residence associations)

	• Adhere to budget and cannot always 'buy' eco-friendly lifestyle • Often gives into convenience (in consumption and waste management)	
Informal sector	• Want to put food on the table • Want more recognition and thus remuneration for their contributions • Want a bigger, more intentional recycling ('waste minimisation') system to ensure more demand for their work • Want to be able to have a voice in how the waste management system works	• Saves municipalities costs by reducing the need for landfill space, maintenance • Influences de- and re-valorisation/valuation of materials based on what they collect and resell/recycle • Influences supply-and-demand of the recycling market based on when they 'sell' or 'hold' (sometimes intentional)
DEFF	• Coordinate, guide, and get cooperation from stakeholders • Find cost-effective but compliant ways to manage waste, e.g., reduce waste to landfill • Maintain and monitor regulation-compliant waste management facilities (for human health and environment)	• Draft and guide targets, waste management plans with the help of industry experts/stakeholders • Enforce waste management facilities' licencing agreements or adherence to legal dumping, non-pollution • Influence waste pickers' work, remuneration, and the extent of their impact
Industries / producers	• Conduct business in an economically viable manner • Retain clients and so 'sell' an image and/or goods that consumers would approve of • Expand offering and into new markets of consumers to grow economically • Comply with regulations (production, disposal, EPR, etc.) • For some, source good quality recyclables for remanufacturing (may work with the informal waste sector for this)	• Determine the reusability, recyclability, and repairability of goods through materials and production thereof and so determine the types of waste the waste sector must deal with • Influence market value of recyclable goods based on whether they can/want to use it in remanufacturing • Promote and support or mislead consumers into more 'eco-friendly' purchases • Influence waste pickers' remuneration

4.6 Key observations

What does all of this mean for a zero waste alternative? It shows that there is an urgent need for alternatives that can prevent and divert all types of waste from landfills so that they are either processed in a more cost-effective way that 'does not pose a threat to the environment or human health,' or again become part of the production cycle.

Reducing and composting organic waste is the most pressing priority. Producers and distributors are also expected to take more responsibility for the end-of-life of the waste they produce (packaging is a good start), and the recycling industry should be developed to allow for more materials to be recovered and enter production streams again (circular model). It also shows that the South African waste sector is, in principle, open to learning from the subaltern waste pickers and finding ways to integrate them into the formal waste structures to strengthen the existing system and to recognise them for their contribution.

From waste pickers, we can appreciate and learn from their spirit of cooperation and solidarity, and their small-scale interventions that have a big impact on waste diversion and pollution. Unfortunately, it is also evident that, within a capitalist economy, a system that greatly relies on profitability (the production and recycling sectors), cannot easily make allowance for those things that are not profitable: despite their intentions, waste pickers still (have to) participate and sometimes even use the free-market game to their advantage. Systemic change is thus necessary to make an alternative economic model sustainable.

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This chapter delved into the state of waste and waste management in South Africa – its challenges, government guidelines, and key role players. Apart from sketching a picture of waste in South Africa, is also sought to understand the context and way in which waste pickers work.

CHAPTER 5: CASE STUDY FINDINGS & DISCUSSION

In this chapter:

5.1 The Warwick Zero Waste (WZW) project

5.2 Eco-socialist analysis of the WZW project

“The Markets of Warwick is a space where Waste Management, Urban Informality and Climate Change are intertwined” (Khanyile, 2021). In the heart of the inner city of Durban, South Africa, a three-year collaborative effort (2021 – 2023) between academics, non-governmental organisations, the local municipality, and informal workers resulted in the Warwick Early Morning Market zero-organic-waste-to-landfill Project. It aims to raise awareness about the zero waste philosophy and demonstrate a closed-loop, localised, low-tech, low-cost, inclusive, do-no-harm solution to the tons of organic waste generated at the fresh produce Early Morning Market.

Below I give an overview of the context and setting of the Market and informal workers (traders, waste pickers); I then provide more information on the zero waste project itself – the different role players, its three components (*Participatory Research, the Demonstration Project, and Mobilisation and Education*), its projected impact, as well as lessons learnt and future potential. Thereafter I thematically discuss and evaluate the project through an eco-socialist lens based on its emphasis on and benefit to the natural environmental and social justice and inclusion, as well as its break from the capitalist growth model.

5.1 The Warwick Zero Waste Project

The following section explains the where, what, and how of the Warwick Zero Waste (WZW) project. The information (data) is based on desktop research on the Markets and project, interviews with two of the project partner representatives, and my observations during a Markets of Warwick walking tour.

5.1.1 The context of the inner city & informality

As background to the case study, I briefly describe the setting of the Warwick Markets: its location, informality, different ‘sectors,’ and waste management. In the next section, I give an overview of the various project stakeholders and role players.

Markets of Warwick location

In the heart of Durban – South Africa’s main harbour city, a melting pot of different cultures, and the site of dire social unrest and environmental disaster the past few years – lies its public transport interchange. With nearly 500,000 commuters via rail, taxi and bus, it is the ideal setting for the more than 6,000 informal traders of the area’s nine distinct markets (Markets of Warwick, n.d.). Informal workers in the area include street vendors, market traders, barrow (transport) operators, and waste pickers. This informal hub of markets called the Markets of Warwick, originated during the Apartheid years with indentured Indian and black Africans trading on the sidewalks; their economic contribution was later acknowledged (though not without its struggles) so that trader committees work with the local municipality to maintain the markets. In 2009, however, the Municipality planned to grant a 50-year lease to a private developer to build a mall in the middle of the Warwick Junction which would effectively not only close down many street vendors but also direct commuters away from these informal traders (Chen & Beard, 2018, p. 23). With the legal support of a local organisation supporting the informal economy, Asiye eTafuleni, the Municipality’s plans were revoked and since 2010, the Markets of Warwick has been made accessible to tourists through daily walking tours.

Urban informality & informal workers

The Markets of Warwick claims to be “the only informally structured market in a public space of [its] magnitude” (Markets of Warwick, n.d.). Whereas South Africa’s national and urban average percentages of informal workers are less than the rest of Africa (40% average informal employment rate in South Africa (32% in urban areas), compared to 76% average informal employment in Africa, 2018 (ILOSTAT Explorer, 2022; Chen & Beard, 2018, p. 9)), the informal sector still contributes significantly to

the socio-economic wellbeing and stability of our society. With inflation on the rise and formal employment opportunities not increasing adequately, we can expect urban areas' informal economies to continue to grow in the coming years (T. Fleewood, interview, 2022).

The coordinators of the Warwick Zero Waste project believe that any major (socially and environmentally just) change to waste management systems should be inclusive of informal workers (ibid.). According to GAIA's report, if Durban recovered 80% of compostable and recyclable materials, nearly 4,500 additional jobs would be gained (ibid., p. 15). From there, the Warwick Zero Waste project was implemented both *in* an informal market space as well as *with* informal workers (ibid.): this makes the project findings contextually relevant and more likely sustainable, as well as challenges the assumption that climate change mitigation has to be high-tech or capital intensive (A. Khanyile, interview, 2022).

The different markets of Warwick

The nine markets include the Victoria Street Market which is the most 'formal' market in Warwick; the Brook Street Market sells mainly clothing and offers services such as sewing and internet/printing cafés; the Friday Bead Market sell handmade crafts; the Lime and Impepho Market offer clay and incense, similar to the Herb Market that sells ingredients for traditional medicine; the collaborative effort between PRASA and informal traders at Berea Station offers traditional and religious attire and accessories; the large bridge linking many of these markets offers space for live music and other items; the Bovine Head Market's walls are black with smoot from the fires that prepare a true local delicacy for lunch-time commuters – the bovine heads are prepared at the market; lastly, the Early Morning Market (EMM) (more than 110 years old) sells fresh produce bought directly from farmers to other informal traders operating in the city, and offers live chickens and seedlings, as well as a creche for young children to be cared for while the mostly female traders sell their goods. In other areas, many stalls also either sell second-hand electronics or parts or take them apart (presumably to resell reusable or recyclable parts).

Taking the walking tour offered through Asiye eTafuleni, one would need at least an hour to walk through all the markets – without wasting time browsing or interacting. It is thus quite big and spread out.

Waste in & around the Warwick Junction

Informal, inner-city spaces are unfortunately often excluded from regular or adequate waste management or removal services, for various reasons, and the Warwick Junction is no different. During my visit to the market, I noticed various types of waste: (potentially reusable, recyclable, or compostable) cardboard boxes from the Early Morning Market; human hair from barbers; animal hair, skin, and bones from the Bovine Head Market, and, of course, general waste like polystyrene takeaway boxes, wrappers, bottle caps, and banana peels – other recyclable materials were probably already collected by informal waste pickers. Other organic waste will be discussed below.

Though I noticed one woman sweeping, I did not notice anyone picking through bins as one often sees in other parts of the city; there are some general waste removal services but no specific focus on separation at source or recycling as in other parts of Durban. With very few restrooms and no dedicated cleaning services, human waste in public areas is a significant concern to traders (T. Fleewood, interview, 2022).

5.1.2 WZW stakeholders & role players

The Warwick Zero Waste project is a collaborative effort between the Durban University of Technology's (DUT) Urban Futures Centre (UFC) and the Department of Horticulture, groundWork, an environmental action group, and *Asiye eTafuleni* (AeT) a non-governmental organisation supporting informal economic spaces and urban regeneration based in the eThekwin metro (Durban). The Durban Botanic Gardens, the oldest remaining botanic gardens in Africa, which falls under the eThekwin Parks' Recreation & Culture Unit, is also an instrumental partner. The project is funded by an external party.

Informal workers – both those at the Warwick Markets in Durban as well as national organisations representing them – are also key partners in the project. On the ground, specifically, informal traders and informal waste pickers were consulted in the design of the project through interviews and job-shadowing; they are also central in helping residents and local government learn about zero waste and integrating waste pickers. *The South African Waste Pickers Association (SAWPA)*, *the African Reclaimers Organisation (ARO)*, as well as *Women in Informal Employment: Globalising and Organising (WIEGO)*, were also engaged in how to conduct a granular waste audit, for example.

WZW has, on occasion, also partnered with other organisations such as the *South African Local Government Association (SALGA)*, an autonomous body representing the interests of local governments; the *Council for Scientific and Industrial Research (CSIR)* which has done in-depth research into the work and lives of informal waste pickers in South Africa; and the *United Nations Industrial Development Organisation (UNIDO)*. GAIA is a strong advocate for zero waste and should be able to use the project's findings to lobby on an international stage for feasible zero waste waste management alternatives (T. Fleewood, interview, 2022).

5.1.3 The three project components

The WZW project consists of three components, focussing on (a) participatory research, (b) demonstrating a feasible zero-waste-to-landfill model, and (c) creating mobilisation and awareness around zero waste.

a. Participatory research component

The participatory research component entails the data generated during the project and serves a dual purpose: it collects data about the state of waste and informal workers in the Durban CBD and aims to put together a case for the zero-organic-waste-to-landfill model to be replicated and lobbied for elsewhere (see next component). It is led by the DUT UFC in collaboration with the project partners, Asiye eTafuleni and groundWork. Fleewood (2022) notes that this component was critical in understanding

the landscape at the start of the project, though it also continues throughout in the form of strict monitoring and evaluation of various data points. To date (September 2022), five key research activities have been conducted – more on them below:

- (a) Understand the Warwick Junction (EMM) landscape through the eyes of informal workers (informal traders, street vendors, and waste pickers). The project partners – which now included some of the informal traders and waste pickers of and around the Early Morning Market – were trained by the UFC on basic research and data collection methods (Khanyile, 2021). This enabled them to conduct a series of qualitative research activities with informal workers such as taking pictures of waste and garbage they saw around the Warwick Junction, saying why they took that picture and what it makes them feel. It was here that the project team could get a sense of the needs of informal workers concerning sanitation and waste services.
- (b) Assess the Early Morning Market (EMM) waste, including a granular waste audit with SAWPA. This provided both information to plan the demonstration project (next section) and valuable baseline data against which final data can be compared to make a case for such a project. SAWPA's expertise made it possible for the team to know how to conduct such a granular audit of a waste bin.
- (c) Visit and learn from the Cape Agulhas Municipality and Zero Waste Association of South Africa (ZWASA) organic waste project in Bredasdorp. Though this activity did not collect data, it did help the project team to learn about zero-organic-waste-to-landfill initiatives, and what they could consider applying to their EMM demonstration project.
- (d) Monitor weekly organic waste volumes and compost piles once the demonstration project commenced. This data is important in recording the challenges, successes, and savings such a model can offer when initiated in other spaces. More in the next section.

b. Closed-loop demonstration pilot

The essence of this pilot component is to demonstrate a zero-waste-to-landfill waste management model that is closed-looped, local, low-cost, low-tech, inclusive, and does no harm is possible. In this case, the project focuses on the organic waste generated at the Warwick fresh produce Early Morning Market (EMM). Though the organic waste stream is a low-hanging fruit, it is nonetheless an important entry point to minimise the challenges of landfills.

Why a zero *organic* waste-to-landfill model?

One would not typically associate organic waste with waste pickers – in South Africa, the collection thereof doesn't have the same economic incentive as does the recycling of plastics, metals, or cardboard, for example (DEFF & DSI, 2020, p. 13). However, it is crucial in decreasing the pressure, costs, and consequences of landfilling: as mentioned in section 4.3.1, organic waste is the biggest single contributor to general waste volumes with food and garden waste making up around 30% of municipal solid waste; less than 50% of organic waste is diverted from landfills (DEA, 2018, p. 19, 24). It both takes a lot of landfill space that generates leachate and methane but also contaminates other materials that could have been, e.g., recycled easier if it was simpler to recover them. The former encouraged especially groundWork to focus on reducing waste to landfill: A reduction in methane emissions needs urgent intervention (Khanyile, 2022, p. 10). ZWIA (online, 2018), in its zero waste hierarchy and strategic recommendations, also makes special mention of organic waste and composting: it recommends “[expanding] systems to keep materials in their original product loop,” “[maintaining] diversion systems that allow for the highest and best use of materials, including organics,” and “[supporting] and [expanding] composting as close to the generator as possible (prioritising home, on-site or local composting).” Both the National Development Plan: Vision 2030 and the NWMS 2020 also emphasise the importance of diverting organic waste to fast-track landfill diversion rates and create economic opportunities (DEFF, 2020, pp. 18, 34, 35).

In the context of the EMM, baseline research found an average of 7.6 tons of waste per week with bins 90% full of organic waste (T. Fleewood, interview, 2022). If all of that could be composted and diverted from the landfill, that could divert nearly 400 tons a year (ibid.).

How the intervention works

Informal traders, as they normally do, discard peels or rotten fruits and vegetables they do not manage to sell into municipal bins in the EMM. These bins are then wheeled to the bin area, as usual. At this stage, waste pickers may salvage some materials, including possible recyclables. From here, the WZW team, including collectors from the Durban Botanic Gardens, empties the EMM bins into their project bin each Tuesday and transports the waste to the Botanic Gardens. The Durban Botanic Gardens is a mere 1.5km drive from the EMM and therefore, much closer than the closest landfill which is 23km away (based on Google Map searches, that is the DSW, Marianhill Landfill Site), assuming it was indeed taken directly to the landfill site and not first to a waste transfer site. Since these EMM bins now contain about 90% compost-ready, organic waste and thus low levels of contamination from other waste streams, there is rarely the need to separate or 'clean' the waste collected. This saves time and resources and illustrates the value of effectively 'keeping materials in their original product loop,' as the ZWIA recommends.

Once at the Botanic Gardens, the bins are emptied and having been already measured (types of vegetables, contamination levels, etc.), are mixed at a 1:1:1 ratio of (brown) leaves, (green) plant matter, and the organics from the EMM. These 'browns' and 'greens' are from the Botanic Gardens. The week's compost-to-be pile is then somewhat covered with a strong black plastic sheet which is weighted down by bricks – it allows for the circulation of oxygen, therefore an aerobic compost model. Piles are then clearly marked so that the team can distinguish between them when monitoring their temperature each day. This process is repeated each Tuesday for the duration of the pilot project.

By February 2023, the team sifted some of the compost to remove any remaining non-organic materials or rocks before it became starters for more compost, used at the Botanic Gardens, and tested to compare its quality with that of

commercially available compost (UFC, Facebook, 2023). If the quality of the compost is sufficient, the municipality may make use of it for its green spaces instead of paying for commercially produced compost or fertiliser.

As mentioned in *a. Participatory Research Component*, the project team captures granular data from the collection at the EMM, to the compost piles at the Botanic Gardens. This potentially builds strong evidence for the replication of such zero organic waste projects.

Additional comments on the zero-organic-waste pilot

Informal traders and waste pickers: This aspect of the greater WZW project does *not* involve informal workers (apart from their contribution to the research conducted in preparation for the pilot's implementation). Due to waste pickers not typically being interested or involved in organic waste management, as well as their mobility and independence in the inner city, there were no dedicated waste pickers or obvious roles for them in this component (T. Fleewood, interview, 2022). See my recommendations on why this may be a missed opportunity.

Cost-savings model: The initiative saves the municipality money on transportation (fuel and wear-and-tear), as well as in landfill space and maintenance; it also emits fewer emissions when being transported and processed, as compared to the business-as-usual model. WZW coordinators explicitly stated that the project seeks to offer a cost-savings model and does not aim to make a profit in any way, not even from the compost produced (T. Fleewood, interview, 2022). These immediate monetary cost-savings are to the benefit of the local municipality and could enable them to remunerate (informal) waste pickers and ensure the composting is sustained permanently.

Low-tech, local zero waste: A big economic and environmental advantage of this project is that it does not rely on mechanical or advanced technologies: high-tech composting or other waste management solutions can be very costly both to build or install, to operate, and to maintain. Because of these high costs and the need for scale to make it economically viable, such operations are not easily replicated or operated close to the source; this again adds to transport costs and emissions when processed

at a centralised facility. This pilot can thus illustrate a low-tech and local model that also brings people along: “We want to make zero waste something that everyone can be attached to, something that people can have a feeling towards,” because large, mechanised, isolated solutions can make “people feel excluded” (A. Khanyile, interview, 2022).

Composting site: In general, on-site composting should be even more cost-effective or emissions-saving, and potentially create employment. However, the advantages of collaborating with the Botanic Gardens are that of allowing for a dedicated space for the compost piles and additional, on-site green and brown plant matter that enriches the compost mixture. Since it is a public space, it can also create access and awareness about the importance of and strategies for composting: project coordinators report that each week members of the public meet them at the Botanic Gardens, curious to learn the basics of composting and determined to try it out at home (T. Fleewood, interview, 2022).

c. Mobilisation & education component

This third component of the greater WZW project complements the demonstration project in seeking to create more momentum and diversification of the zero waste movement – among local governments and civil society. Apart from groundWork working to register informal waste pickers on the South African Waste Picker Registration System and aiding in setting up structures to recognise and potentially compensate them for their work (or ‘integrate’ them), they also provide platforms for waste pickers to share their expertise and create awareness around separation-at-source, for example. This part of the project thus specifically works with and involves waste pickers.

By the time of the interviews, the WZW project had established the African Zero Waste Learning Hub – a virtual space for co-learning with a multitude of local and international partners. One webinar they co-hosted, titled “Learning with Waste Pickers/Reclaimers,” involved ARO, SAWPA, SALGA, CSIR, and UNIDO (Khanyile, 2021). An especially valuable platform the project created, in partnership with SALGA,

was for waste pickers to engage with local government officials about how they work and what the 2020 WPIP entails. Another special event at a gallery restaurant allowed waste pickers and residents from a neighbourhood near the inner city to engage on what waste pickers do, what is recyclable, and how they could start separation-at-source.

By involving allies and promoting the zero waste 'narrative' and how it ties in with climate change mitigation, it could 'prepare the soil' for more buy-in and collaboration between formal and informal players, as well as consumers.

5.1.4 Projected impact

As the project was not yet completed and thus official findings had not yet been published by the time of writing, one can only envision what its effects may be. As the DUT UFC (UFC, Facebook, 2021) celebrates, "working with informal workers to co-create zero waste models for our city is a win-win for the city's social, economic, environmental and climate change goals." Using these criteria, one can expect positive outcomes in terms of the following:

Socio-economic & social

Apart from the media attention the project has received, it has created platforms for waste pickers to engage with local government on integrating them, as well as with residents on how they work and how households may do their part to minimise waste. If the WPIP can be implemented because of the relations fostered here, it will benefit the working conditions and livelihoods of waste pickers, as well as help the municipality implement national guidelines and divert waste from local landfills.

Relationship-building between waste pickers and residents can also have many positive outcomes: the Recycle With Reclaimers pilot in Johannesburg (Samson et al., 2021), as well as the Ikageng-Ditamating Waste Picker Cooperative project in Sasolburg (DEFF & DSI, 2020, pp. 47, 48), hints at what this may be: from residents doing their bit to separate their waste which simplifies waste pickers' work, to

increasing positive attitudes towards waste pickers which strengthens trust and feelings of patriotism across historic socio-economic divides, to independent initiatives or collaborations between resident associations and waste pickers.

Environmental & human health

In terms of the actual pilot in the Warwick EMM, baseline findings suggest that if all organic waste was diverted from the Market, nearly 400 tons of waste would be diverted from Durban's landfills every year. That may mean significant reductions in fuel emissions, landfill leachate and methane emissions, which would improve urban air and groundwater quality, and reduce heat capture. If overall recycling rates improve because of better cooperation between residents, waste pickers, and the municipality, these benefits would be even greater.

The composting of organic waste will contribute to restoring nutrients into the soil which would again affect different ecosystems and may, if done on a large scale, even improve the nutritional value of food.

Though the diversion of organic waste from the EMM may not have an impact on the health of informal traders, the WZW project has collected valuable data and insights into the needs of these workers and may inspire further intervention by either the municipality, the traders, or other organisations to ensure a more hygienic working environment.

Finances

Unfortunately, I could not source data that show what the estimated cost-saving of the diverted organic waste to the eThekweni municipality would be, but such a calculation would consider a reduction in spending on fuel and vehicle maintenance as well as the various costs associated with the regulation compliance of landfill sites. If this can be sustained, including improved recycling rates because of better separation-at-source or the integration of waste pickers, there may be other costs associated with landfill commissioning or decommissioning that are also reduced. Theoretically, if scaled, a reduction in emissions or polluted soil and groundwater could also mitigate

environmental or health risks and climate change effects and so, save expenditure on disaster management, for individuals, organisations, and government.

Of course, it is imagined that at least some of these costs saved should be ringfenced to remunerate waste pickers and provide infrastructure to support their work, ultimately improving their livelihoods and communities as well.

5.1.5 Lessons & gaps for future projects

Lessons & gaps

Possibly one of the biggest limitations of this case study in seeking to demonstrate a solution for vast amounts of landfilled waste, is that it only focuses on organic waste with a very low percentage of contamination of other inorganic materials. Though it made the implementation of the WZW easier, other composting or waste streams projects will face other components of waste ‘management’ this demonstration project did not deal with such as:

- (a) **Contamination of waste:** Because of the ‘source’ of the WZW organic waste, namely the Early Morning (fresh produce) Market, the bins were by default not too contaminated with inorganic materials. In other spaces, locals or residents would have to be educated on and participate in separating their wet and dry waste ‘at source’. Generally, contaminated or mixed waste may also necessitate (and offer) employment to assess the levels of contamination or sort materials before further processing.
- (b) **Behaviour change:** As alluded to in (a), other projects or waste streams may require those generating the waste to adapt their habits or lifestyles to buy differently, consume less, repair goods, or sort their waste. Though the WZW project did raise awareness around separation-at-source, the project or compost also did not *rely* on residents, consumers, or even traders to correctly sort or dispose of their waste. An overall reduction in consumption is necessary for zero waste.
- (c) **Need for technology and space:** Some of the key success factors of this project are its little to no need for mechanical technology as well as the source’s proximity to the Botanic Gardens where it could be composted. However,

recycling other inorganic materials needs lots of space for sorting and cleaning materials before they can be processed (waste pickers know this all too well). Processing also requires more water and energy. Because of the necessity for mechanical or advanced technologies as well as various processing stages and scales (e.g., cleaning, baling, and pelletising of plastics), “low-tech, low-cost, local” solutions are not easily feasible.

- (d) **Role of producers:** With (c) being said, the volumes of materials to be recycled in environmentally and socially compromising ways would drastically reduce when goods are redesigned in order to be reused or repaired; producers should also take responsibility for the ‘after-life’ of materials so that the onus of recycling or processing does not fall entirely on consumers, waste pickers, or municipalities. This is key in preventing the generation of waste to ‘manage’.

Future projects

At the time of the interview, project representatives believed that the informal market organic waste model was replicable and that they could consider finding similar markets with land available close by to use as a composting site. Although they did not foresee an expansion to other waste streams, they noted the potential of leftover cooked food being composted/processed with bokashi: this could be done at the source (effectively saving costs and emissions by not transporting it) and would prevent wet waste from contaminating potentially recyclable materials or ending in a landfill.

Asiye eTafuleni was also conducting research into men’s perceptions of using urinals instead of urinating on the ground: though not necessarily a closed-loop model, having designated facilities for urinating could contribute to a more dignified and clean working environment for the informal workers (T. Fleewood, interview, 2022). These could, for instance, employ alternative toilet or sewage set-ups that require less water or where the contents could later become part of a composting system.

The Durban Botanic Gardens are also eager to include the composting project in their school education programme in the future.

5.2 Eco-socialist analysis of WZW

In each of the three themes and its sub-topics below, I briefly recap the most applicable literature or principles of eco-socialism and zero waste as discussed in Chapter 2. I then comment on the WZW project application or adherence to these principles. I lastly comment on the value or insight this case provides on eco-socialism and waste prevention.

5.2.1 Financial or economic priorities

Cost-savings model

Without EPR guidelines or increasing pressure from civil society that producers ‘take back their waste’, the responsibility of ensuring safe and effective waste management services still falls on municipalities and the government – of course, not without the help of consumers and the informal waste sector. As alluded to in Chapter 4, the default option of landfilling comes at a great financial cost to local municipalities without the added benefits of increased employment (considering GAIA’s estimates of job creation per waste management level) or a stronger secondary resource economic boost.

The WZW organic waste model can be commended for not seeking to profit from the initiative but instead valuing environmental and human health: it proves that, particularly for organic waste, a simple and low-tech composting solution, with the right partners, can be implemented without major expenses to the local municipality and without compromising the subaltern or the environment for profits.

Employment or remuneration

The WZW project is important in that it decreases the municipality’s expenses associated with landfilling so that it can boost local employment opportunities for informal workers. This is, however, just in theory as the project did not actually pay or prove a workable model to hire informal waste pickers to work with organic waste. Though GAIA does not believe that the organic waste stream (composting) would create as many jobs as other streams that allow for the repair or recycling of materials,

it would still be fitting to emphasise work or remuneration opportunities for waste pickers in the organic waste stream. Ashley (2018, p. 273) rightly points out that these jobs will reduce greenhouse gas emissions and can build resilience in communities, both economically and socially.

5.2.2 Environmental priorities

Metabolic rift & revitalising the soil

Both in *Das Capital* as well as Marx's later notebooks on ecology, he explained the metabolic rift that occurred (and still occurs) with increased urbanisation, industrialisation, and general alienation from nature (Cock, 2007): natural ecological cycles and systems are disturbed and what we 'take' from nature, isn't returned in a responsible or regenerative manner; it deprives the soil of nutrients (and consequently also all who eat produce from that land).

So, at face value, any project that seeks to divert compostable waste away from the general waste stream or even from recycling, contributes greatly to a reduction in fuel emissions, water use (for cleaning recyclables contaminated by wet waste), as well as methane and other potent landfill greenhouse gasses. Though research into the quality of the project's compost piles was not yet available, WZW importantly sheds light on composting as a practice to put nutrients back into the soil for other parts of the ecology to thrive; in part, it also restores Marx's metabolic rift.

However, though it is encouraging that the WZW pilot project wants to make the compost available to the municipality or the Botanic Gardens, an extension of the project could involve the farmers that supply directly to the market: either for them to remove the organic waste from the market and compost it on their farms, or to at least work some of the compost back into their fields. This could reduce the need for, especially small-scale farmers, to buy or use commercial compost or fertilisers, and boost the nutritional value of their produce which would again benefit the health of the labourer or informal worker buying from the street vendor. Chemical fertilisers have many disadvantages to other living organisms and so encouraging and enabling the

use of organic fertiliser, is an overall important environmentally-just practice. Those selling seedlings at the Early Morning Market could also benefit from using (or learning to make) the compost. Involving the market's suppliers would demonstrate a true closed-loop model that boosts soil quality and provides nutrient-rich produce.

Organic waste, methane & the decarbonisation of the just transition

Food waste is a problem globally as well as in South Africa. More than a third is wasted along the value chain with 45% of that lost during processing, packaging, distribution and retail – only 5% is from consumption (DEFF, 2020, p. 14). This points to two alarming realities:

(1) the farming and agriculture industry produces more food than is necessary as it compensates for the projected loss in produce: this overproduction of food uses more land, resources, and energy than is strictly needed as not all the produce is ultimately consumed (ibid.). Industrial farming – at a scale above what we consume – depletes the soil and water at a rate higher than its output, and still relies to a large degree on fossil fuels (in machinery and transport) that contribute to greenhouse gas emissions and global warming.

(2) The dumping of unused or spoilt food (organic waste) at landfills – 50% or 9.7 million tons – contributes significantly to methane production (DEA, 2018, p. 19). As alluded to in Chapter 4, dangerously high levels of this greenhouse gas from landfills is a key reason why the NWMS 2020 call for waste minimisation and an increase in composting. If the Just Transition calls for the decarbonisation of society – i.e., a move away from practices that contribute to global warming and a changing climate – then finding ways to reduce methane (which is more powerful than carbon dioxide emissions), is paramount.

Initiatives such as the WZW are thus an important first step in raising awareness and developing a replicable model with regard to diverting organic waste from landfills in an attempt to curb methane emissions – in this case, the portion of the 45% of 'food' lost during distribution and retail.

The role of technology & locality

According to Saito (2016), Marx criticised the increasing use and interference of technology in natural processes to benefit economic output: not only does it objectify living organisms or tamper with the intricate balance through which these things exist, but it also further alienates us as humans from the natural rhythm and ‘metabolism’ we are part of. In this way, using advanced and mechanical technology to try to rectify the imbalance we’ve already caused, may only cause more dissonance. Mechanical methods are also often energy-intensive and need big volumes to operate economically: this discourages local or small-scale processing and further challenges low-emission, sustainable solutions. The zero waste philosophy agrees that methods and technologies used to minimise or manage waste (and its emissions) should not in any way be harmful to the environment or human health; it also favours local systems (ZWIA, 2018). For Cock (2007), it is also important that we should not be removed and ignorant of our ecological or waste footprint: bringing back waste processing (or composting) into public spaces, could prompt us to consume better, just as informal waste pickers have already been instrumental in ‘reminding’ people of the waste they produce by working in residential areas or sorting waste in public spaces.

The WZW prides itself on not making use of technologically-advanced methods to process or compost the organic waste – even when advanced bio-digesters exist. They use the most natural method of breaking down the materials – with no added commercial or synthetic additives and with no fossil-fuelled electricity needed. Their commitment to making the solution low-tech agrees with zero waste principles. However, one must admit that organic waste is a low-hanging fruit (though an important one) as it *can* break down naturally through simple composting – other waste streams are not as simple.

Partly because this composting is so low-tech, it makes it feasible to manage the organic waste relatively close to its source: indeed, apart from reusing or repairing goods to extend the usability of an item, organic waste is the only waste stream that even those living in apartments can ‘manage’. Composting the waste close by reduces, as mentioned, the fuel consumption and emissions from transporting trucks full of

general waste to a landfill further away. It is thus valuable that this project demonstrates the feasibility of inner-city, public composting, thanks to the facilities of the close-by Botanic Gardens.

In addition, (putting any social dynamics or legislature with regard to public spaces aside) processing some of the organic waste at the market itself could reduce the costs of transporting all the organic waste, as well as increasingly educate and capacitate the informal traders and waste pickers in organic waste management and composting.

Again, however, this adherence to eco-social and zero waste principles is possible because of a simpler stream like organic waste.

5.2.3 Social or subaltern priorities

Based on principles of eco-socialism, a solidarity economy or zero waste, it would be important for a waste prevention/management model to not only appreciate but also build on the lived experiences and expertise of the subaltern group – the informal traders and informal waste pickers.

Informal workers

The WZW project can be commended for its partnership and consultation with informal workers.

Firstly, it chose an ‘informal’, public area where the existing waste management system could not ensure waste removal that is regenerative as opposed to landfills or provide a hygienic and dignified workspace to the many informal traders and workers. As Fleewood (interview, 2022) mentioned, private shopping centres, office parks, or housing estates are more likely to be able to afford onsite or high-tech waste processing systems to manage their waste, but not busy public spaces such as an inner-city market space. In this sense, it is commendable that the project aims to benefit spaces and people often neglected by municipal service delivery or other investments.

The project’s initial participatory research component, therefore, relied heavily on the experience and knowledge of informal workers and waste pickers to understand

the lay of the land and, for example, how to audit a waste pile. Their experience greatly informed both subsequent project components.

Whereas waste pickers merely helped steer the direction of the project during the inception phase, they were the key role players in the mobilisation and education component: the project coordinators facilitated various platforms for waste pickers to not only have their voices heard but also to allow them to build connections and support whether with residents or with local municipal officials. This challenges historic and traditional hierarchies of power, strengthens waste picker integration, and builds solidarity among different stakeholders, like when ARO worked more closely with residents.

However, as interviewees reported, the mobility of informal waste pickers in the inner city, as well as that waste pickers are rarely interested in organic 'waste', makes it difficult to involve them more in the organic waste stream. Though understandable, ideally, a platform or project such as this could be used to create skills and opportunities among (informal) traders and waste pickers about the value and importance of minimising food waste and diverting organic waste from landfills.

Food waste & food insecurity

In a country such as South Africa where more than 30% of people are unemployed and thus severely vulnerable to being food insecure or malnourished, it is a sad reality that tons of (likely edible) food does not end up nourishing someone. Food insecurity, particularly in urban areas, also supports Marx's concern over how the subaltern loses their means of subsistence once they lose access to land that could have produced food (or because the climate is too unpredictable to guarantee a harvest). Ultimately, food waste and insecurity are a question of both ill-distribution and of urbanites' alienation of a means of subsistence, à la Marx.

When speaking of waste *prevention* in terms of organic waste, the question should not only be with regard to diverting waste from landfills but also preventing items from landing in a bin where they will quickly become inedible. In other words, though this project rightly claims zero-organic-waste-to-*landfill*, it does not yet prevent *wastage* by minimising or reusing the fresh produce.

A suggestion? When fresh produce – even in these informal settings – is near ‘expiry’ or when the typical consumer would not be interested in paying for it anymore, systems should be in place to intercept those food items and either turn them into another food product or distribute it to those unable to pay for it; only the last remaining scraps should then be earmarked for composting. That would be true waste *prevention* and a system that also prioritises the nutrition, health, and dignity of those often financially excluded.

5.2.4 Recap of recommendations: an ideal model

Involving market suppliers

Involve the market’s fresh produce suppliers and seedling traders in either the processing or utilisation of the compost: this can return much-needed nutrients to the soil where the food is grown and reduce the need for chemical fertilisers. If the market’s fresh produce – which is sold across the city by street vendors – can be more nutritious, it could improve the health of especially low-income citizens.

Food distribution & waste

Minimise food and organic wastage: use the project or platform to redistribute near-expired produce to cooks or those unable to pay for fresh produce – this way it not only reduces the volumes of organic waste to be transported and processed but can also provide more food security to urban workers who do not have the means or land to produce fresh food themselves.

Compost climate jobs

Create awareness, skills, and opportunities for informal workers around organic waste as this is an often neglected waste stream among waste pickers because of the little resell or economic value thereof. Such a project can place a bigger emphasis on involving both traders and waste pickers in the food and organic waste prevention stream. For example, some of the organic waste can also be composted at the market where it is not ‘removed’ out of sight. A project such as this creates the opportunity to introduce, develop, and even fund climate jobs.

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Chapter 5 presented the zero waste case study of this paper after which I discussed and evaluated the Warwick Zero Waste project through an eco-socialist lens.

CHAPTER 6: CONCLUSION

In this chapter:

- 6.1 Overview of the research project
 - 6.2 Contributions & conclusions
 - 6.3 Limitations of insights
 - 6.4 Questions for future research
-

6.1 Overview of the research project

6.1.1 The need for an alternative production model

The challenge

This paper sought a waste management alternative that challenges the linear economic model that relies on the extraction, production, consumption, and disposal of goods in a manner that is detrimental to natural ecosystems as well as the wellbeing of the previously disadvantaged or economically vulnerable subaltern. As is the call for a Deep Just Transition and the decarbonisation of society, such an alternative model should seek to rethink systems of production, distribution, ownership, and ‘waste’ – instead valuing local, low-tech solutions that regenerate the natural environment and integrate the subaltern – in this case, the informal worker – to restore justice to her. This criterion is based on a post-capitalist, eco-Marxist view of the economy that calls on us as humans to instead live close to, and in unity with our natural environment as we acknowledge that its resources are just as vulnerable to economic exploitation as the labour-power of the proletariat. *Zero waste* is such an alternative.

The South African context

The global linear take-make-waste economic model also challenges the South African government’s ability to adequately ensure clean communities and healthy environments. It is to such a degree that landfilling has become the easiest way to ‘manage’ waste. Though more than a hundred thousand informal recyclers

unintentionally aid citizens and the government in collecting and recycling waste, they receive very little compensation and support. Though there are positive policy and guidance developments in the waste sector such as the recent National Waste Management Strategy (NWMS), Extended Producer Responsibility (EPR) ideas, and the Waste Picker Integration Plan (WPIP), *systemic change* in how goods are made and how they are dealt with after use, is still pending.

Research purpose & question

Considering both the need for an alternative economic and consumption model as well as the context of waste management in South Africa – particularly in terms of the role and approach of waste pickers – what would a zero waste model in our country look like, and how would waste pickers participate in or benefit from it?

6.1.2 Methodology

About the subaltern & her approach

(a) Following literature and desktop reviews, I conducted interviews with leaders in the informal waste management space in South Africa to better understand informal reclaimers' perspectives on their work, how they cooperate in organisations or associations, and the future of managing waste. Reports and testimonials on their contribution – both in tonnages diverted from landfills and in changing consumer attitudes and behaviour – were noted.

About implementing a zero waste model

(b) To learn how a zero waste approach – that ideally embraces waste pickers – would practically work, I considered a waste minimisation initiative around a large inner-city market in Durban. The Warwick Zero Waste project sought to divert, on a weekly basis, around seven tons of organic waste generated at a fresh produce market away from a local landfill, into composting. To complement this effort, it also created platforms for informal waste pickers to engage with local government on the WPIP and with residents on waste separation. Though it merely focused on organic waste and did not

actively involve stakeholders such as industry producers or consumers, it still provided some insights into a zero waste approach, discussed below.

6.2 Contributions & conclusions

To conclude what a zero waste model in South Africa could look like, I will first summarise key insights from the previous chapters that apply to implementing zero waste, thereafter sketch a picture of what the ideal alternative would look like – especially based on the case study – and then return to what it would mean for realising a post-capitalist society.

6.2.1 Insights into key concepts

The key themes of this research paper included *eco-socialism* (with a focus on the metabolic rift, alienation, the dispossession of the commons, and the capitalisation of ‘sustainability’), a *deep just transition* from a mass production and consumption society to one with ‘zero’ waste, cooperation and solidarity among *informal waste pickers*, and *organic waste*. Below I briefly summarise key insights.

Eco-socialism

Karl Marx’s conceptions of the process of primitive accumulation, a growing alienation between us and nature, and the out-of-balance give-and-take (metabolic rift) between our economic activities and the environment, are all still evident today. I therefore used his insight into the impact of capitalism on the natural environment and our relationship with it as a theoretical framework. *Eco-socialism* is a Marx-inspired mode of analysis for a systemic alternative to capitalism; it values cooperation and collective ownership of the means of production and subsistence; importantly, it opposes the Leninist Marxism of the 20th century and its productivist reliance on industry and technology for a better life (Pillay, 2013).

In South Africa, our cities and their precarious workers, including informal waste pickers, reflect many black Africans’ historic dispossession of land as a loss of a means to subsistence and reproduction. Similar to what Marx witnessed during the Industrial Revolutions, countrymen flock to urban areas in search for work, selling their labour

power to survive when not too long ago they could rely on living off the land – either in part or in entirety. Cock (2007) rightly describes our increasingly alienated relationship with nature, food and other resources, and that, unfortunately, it is to the benefit of a capitalist economy when people either remain unaware of their ecological footprint and therefore consume as they please, or become disgusted and inconvenienced by natural orders (think of waste, death, seasonality) making them humans ‘against’ nature instead of ‘of’ or ‘in’ nature. This alienation is to the detriment of both *our* wellbeing and the environment’s health.

As both Marx and Barles (2014) noted, the Industrial Revolution’s industrial and agricultural activities deprived the soil of the necessary nutrients and it soon became clear that organic matter had to return to the soil to keep people well fed. Today, we face a similar problem except that it is magnified by the vast volumes of inorganic waste materials that end up in the soil or waterways, polluting ecosystems and the air and water we consume. Unfortunately, the capitalist wheel of production and growth has to keep itself turning and therefore the problem persists.

Post-productivism? The capitalisation of environmental destruction

Marx was hopeful that capitalism’s exploitation of, and injustice to the proletariat (as well as the environment) would eventually ‘combust’ itself and so allow us to enter a post-capitalist, post-productivist society. That has not yet come to pass. Unfortunately, capitalism has been so resilient that despite its seemingly crumbling base, it manages to use it to its advantage. Today, it preys on our concern for and fear of environmental destruction by greenwashing goods and services – essentially establishing new markets – all in the name of environmental ‘sustainability’. This includes everything from technologies to consumer goods to waste management. Though in some cases it encourages a change in consumer behaviour, it also often clouds objective thinking about the problem and creates a false sense of living ‘eco-friendly’. Sadly, mass consumption continues to be promoted because it keeps the production machine going. So, even though consumption (of goods as well as energy) is a key aspect of what needs to change in our current system, the system can unfortunately only really change if there is far less emphasis on consumption (including ownership), and this needs to be enforced through policy and the will of the people.

A deep just transition towards a post-capitalist, eco-socialist society

Leaders around the world – including the South African government – admit that a reduction in the economy's reliance on fossil fuels will affect employment and economic stability and livelihoods, and therefore support the idea that a transition away from coal, has to be just to the subaltern. From an eco-socialist perspective, it is of course not only the use of coal that has to be transformed, but all energy and resource-intensive practices that harm the environment or the subaltern. The call should therefore be for deep, systemic change and be 'just' in more than just employment opportunities but also in revitalising positive values of community, solidarity and sufficiency, as well as life-supporting systems.

How could we get to reducing the economy's reliance on the material? In this paper, I looked at zero waste as a systemic alternative. In a nutshell, it seeks to conserve natural resources in a way that will not cause harm to the environment or humans, now or in the future. It is important to point out that zero waste differs from merely the circular economic model that similarly seeks to 'design waste out of the system': Even though many people use them interchangeably, the more nuanced meaning of zero waste suggests the 'radical dematerialisation' and 'degrowth' of the economy, to the benefit of both the environment and human life – a *deep*, systemic change. The Circular Economy seems to be less radical in its approach and certainly less concerned with the social impact of a capitalist economy, therefore also making it less applicable in a Global South context.

Because of the way zero waste challenges – and could eventually change – the way people relate to the natural environment and each other, as well as how they buy, use and dispose of goods, producers and policymakers will need to respond accordingly; in turn, zero waste policy can speed up the reform of the economy and how it mines, designs, manufactures, distributes, and processes resources. A key aspect of this change will need to be around ownership of both everyday goods and the Earth's systems and resources, back to valuing the commons: that is, we need *deep democracy* as part of the (deep, just) transition to ensure the people decide how their

communities and environments function. Another key aspect is that manufacturers and the government must enable durability, reuse, repair, recycling, and composting. This reform of both the economic system and the social structure of our society can ultimately introduce a post-productivist, post-growth, post-consumerist, post-materialist paradigm: a society built on sufficiency and sharing – eliminating excess and therefore producing ‘zero’ waste. In this way, zero waste becomes both a means (to change the economic system) as well as an end in itself.

The subaltern waste picker

Waste sector influence: Informal waste pickers are at the coalface of our waste management problem. As middlemen, they rely on the vast amounts of recyclable materials generated and their livelihoods would be threatened if waste generation was suddenly drastically reduced. They also provide a massive and mostly unintended service, without much compensation, to the economy, the citizenry, and the natural environment. Despite their dependence on a consumerist society, they also witness the extent of the waste that needs to be managed and have (perhaps ironically) therefore become agents of change: advocating for a change in the design, consumption, sorting, and reuse/recycling of materials. And this is crucial as zero waste’s promotion of the prevention/minimisation of waste includes putting infrastructure in place to intercept end-of-use materials and reinserting them into the production line. In this way, ‘waste’ is not waste but rather a ‘resource’ or ‘input’ material. It is here that waste pickers can play a vital role, participating in the creation of thousands of new (climate) job opportunities as GAIA outlined it.

Indirect contributions: Through desktop research and interviews, it also became clear that waste pickers offer more than merely their insight into the recycling system. Their *attitude* towards one another – to not discriminate based on something like nationality but rather be democratic, inclusive and in solidarity, to cooperate to ensure the best collective outcome – and their *ability to connect* formal and informal economies, different parts of the city, different socio-economic classes, and even urban and rural areas, make them a group of people inspiring a society that is less divided and deliberately more connected: much like a closed-loop or regenerative community.

Policy and awareness: The co-development of the Waste Picker Integration Guidelines, the recognition of their role in other waste management reports and policies, and the opportunities afforded to them by academics, organisations, and municipalities to engage on their issues and insights, are encouraging. As mentioned above, they make critical partners in imagining what systemic alternatives – particularly around climate (waste) jobs – could look like.

Organic waste: At the time of enquiry, the Warwick Zero Waste initiative's organic waste collection and composting component unfortunately did not involve informal *waste pickers* nor to a real extent any informal *workers*. Unfortunately, since organic waste does not have the same 'recycling' market as other materials, waste pickers have not actively participated in its recovery or processing. It highlights how ill-regulated and unsupported the free (recycling) market still is and how much more will need to be done to ensure better processing or recycling of all materials. But, organic waste also therefore presents the opportunity to establish a completely new value chain – one that is based on the principles of a regenerative and zero waste philosophy.

Diverting organic waste from landfills

The Warwick Zero Waste initiative provided the following insights on composting, consumers, and costing: If waste types are separated from the start, it enables and simplifies reuse, composting, recycling, and repurposing. Monitoring of what goes in would, however, remain a priority. Then, we see that composting can be done in a local, low-tech, and low-cost way – the more local or decentralised, the less space is needed. There are also other smaller-scale, low-tech food waste 'composting' options available, such as bokashi. Many consumers and residents are curious and willing to learn about composting or the separation of their waste: zero waste, because it seeks local or low-tech solutions, can bring 'nature' back into urban spaces and inspire people to take action instead of waiting on hegemonic role players or even government to restore ecosystems or dignified workspaces. Lastly, prioritising environmental and human health above profitability or economic growth, does not have to mean it is unnecessarily expensive – sometimes it can actually save costs and emissions, such as with the diversion of organic waste from landfills.

6.2.2 Zero waste in South Africa

Economic principles

So, what could a systemic alternative (starting at waste and facilitating subaltern and environmental justice) in South Africa look like? Based on the insights from this research project, we can imagine a system or model that primarily aims to be *regenerative* and *closed-looped* – respecting and working in step with seasons and ecosystems, within planetary limits. The first step is the *redesign* of materials or products to ensure excess or harmful residue/externalities are either eliminated or fully reusable, repairable, sharable, recyclable or degradable/compostable. If goods are *designed* to be used differently or to last better (perhaps coupled with policy on repair or reuse), the *value* of materials or their manufacturing/repair would no longer depend on their profitability (characteristics of a post-capitalist and post-growth society): instead, everything that is extracted, grown, processed, manufactured, consumed, or repaired would be appreciated for its little environmental impact (at any point of the value chain), durability, shareability, and safety ('no harm to environmental or human health'). If exchange or social-status value is not the prominent indicator anymore, the current economy's growth imperative will certainly suffer and it is here that a *deep just transition* and care for the vulnerable is important.

Human wellbeing

A society that actively addresses and underwrites its waste management industry (e.g., through EPR financing), can create *climate jobs* that improve livelihoods while reducing the need for extraction, deforestation, emissions, and pollution – ultimately slowing down the climate crisis. Just as the new way of organising our communities or society needs to be less harmful to the environment, so it must also continue to work for just, safe, and healthy living and working conditions for all people. The outcome could be a wasteless society with massively reduced and transformed manufacturing systems and commercial consumer behaviour. Because of a positive change in how we relate to and consume resources, we strive toward a society that places less emphasis on individual ownership and material wellbeing and frees people from a

mindset of scarcity, allowing them to value a sense of *community* and *sufficiency* above all else.

Managing waste: A closed-loop system for food production

In terms of significantly reducing waste-to-landfill/waste-to-incineration and *closing the production loop*, I agree with the NWMS that organic waste is a crucial yet easy waste stream to address. When organic waste is completely separated/removed from the regular refuse system, other materials are instantly less contaminated and easier to collect, clean, and recycle – effectively reducing tons of waste previously destined for a landfill or incineration both directly and indirectly. Uncontaminated materials are also less troublesome and time-consuming to process, and more dignifying to work with (such as for waste pickers). When organic waste is composted at its source (residential) or close by (commercial), its processing saves transport costs, fuel emissions, water as well as methane and other greenhouse gases. All of these will streamline our waste management system in a way that ultimately mitigates further rapid global warming. Of course, the best part is that, unlike any other material, the composting or use of *organic* waste as feed for animals is truly regenerative, providing nutrients for the next crop or animal, and strengthening ecosystems and soil health: it ceases to be waste but rather becomes a zero input cost.

How would it practically work? Organic waste can either be locally ‘centralised’ as was described in Chapter 5, ‘decentralised’ when consumers reuse/return it through a local farmer who can compost and/or use it on their land/for animals, or consumers can keep their own composting heap or chicken coop at home. A model that encourages the local, circular processing of organic waste (apart from at-home composting), will also strengthen decentralised fresh food networks or food sovereignty initiatives: we could see more (informal) community markets (including ones such as the Warwick Early Morning Market) if small-scale farmers or businesses can produce eggs, chickens or quality fruits and vegetables by having the nutrients of organic matter return to their gardens. Just imagine the impact on the soil if no organic waste was ‘wasted’ in landfills or incinerators. It would be a true closed-loop production system.

But what about preventing organic waste from needing to be processed? What about the 'wasted' nutrients, water, and energy of producing food that is not consumed in time? As mentioned before, there is sadly an overproduction of food to account for the massive volumes of fresh produce that go to waste either before it reaches the consumer or which is not perfect-looking. Whether it is because so much of the processing is mechanised or because grocers want to present only the best-looking produce to the customer, it is again something that can be reduced through more decentralised fresh food systems that link the producer and the consumer more directly. In a capitalist system, goods that are not sold in time, often lose their (exchange) value, become worthless, and are simply discarded. In many forward-thinking countries such as France or the Netherlands, but also South Africa, many grocers already donate near-expired food to organisations with feeding schemes – in a zero waste society, this will be the norm: ensuring (fresh) food is intercepted before it is too late, and in a more Social-and-Solidarity-Economy fashion, refuses some to go hungry when there is enough food to share.

On the informal sector

If it were not for waste pickers and other informal workers (such as traders or those repairing goods) who already 'close the loop' and call for better policies and infrastructure to recover or recycle materials, South Africa would be even further away from mitigating climate change through better waste prevention. Waste pickers, as part of the informal sector, will not only have an important role to play in establishing zero waste communities and systems but will also benefit from them. On the one hand, their current informal trading or collection and redistribution of repurposable materials should inform much of what needs to happen on a bigger scale such as designing out unnecessary materials, education, separation-at-source, and more processing facilities – ideally, they will have the platforms to drive and own small-scale, local solutions; in turn, more income opportunities will present themselves as well as overall greater support for their grassroots work in the meantime.

In summary

In South Africa, a systemic alternative that addresses the problem of the take-make-waste model and seeks to be just to the subaltern and environment can start with just a local fresh produce market and the composting of its organic waste. Working with small-scale farmers, informal traders, reclaimers and other organisations to establish local closed-loop production cycles would mean bringing farmers and consumers closer to each other in order to support local economies and make food more affordable, fostering a sense of solidarity and fairer resource distribution to the poor (in the process minimising wastage), and finally enabling organic waste to return to the soil from which it came.

Even if only on a small scale and within only one waste stream, a shift in ownership, excess, wastefulness, and 'value' would have occurred, paving the way for a post-productivist, post-capitalist society.

6.3 Limitations of insights

Several questions on the practicality of a zero waste approach and the ultimate influence of the subaltern, remain. These are discussed below.

6.3.1 Applying a zero waste approach

Zero waste for other waste streams

This research project's ability to extend to and inform zero waste for other waste streams was limited by the case study used: the Warwick Zero Waste project, even though it includes a 'mobilisation and education' component seeking to get local government and consumer buy-in, further focuses solely on diverting *organic* waste from landfills – an important and worthy, though simple waste stream to deal with.

Zero waste & waste *prevention*

Is the composting of organic matter the same as the recycling of plastics? Is it merely another waste *management* solution or does its benefit to the soil qualify it otherwise? 'Zero waste,' as described by the Zero Waste International Alliance (ZWIA) and others in support of the radical dematerialisation of society, encompasses much more than

merely diverting waste from landfills – at a minimum, it seeks to rethink the entire economic system that generates waste that then must be managed. The project, unfortunately, does not provide much insight into the *prevention* of vast amounts of organic waste, let alone more complicated waste streams such as other post-consumer solid waste or even biohazardous waste. Therefore, I argue that the chosen zero waste case study, though its principles were in line with eco-socialist priorities, did not reflect the literature on (or ideal of) zero waste *in its entirety*. It did not offer enough insight into its impact on production and thus producers, or consumption and simple living – ultimately commenting on prevention – as the literature suggested (Satgar 2018, p. 340; Pillay 2018, p. 151).

6.3.2 The subaltern in zero waste

The case study was somewhat unsatisfactory in illustrating an alternative ‘from below,’ i.e., a waste minimisation or zero waste initiative that is *led* by informal workers or by default offers social or community strengthening. That is not to say it does not happen in other places, but in this context, it was unfortunately not evident.

6.4 Questions for future research

Based on the limitations of the chosen case study – but within zero waste and the eco-socialist framework of considering the subaltern – it would be important to learn how informal workers influence and lead the *prevention* of waste (as opposed to merely the minimisation of waste, as per Figure 1), both in terms of producers and consumers.

Finding a low-cost, low-tech, local model for organic waste that directly involves and compensates or remunerates waste pickers the same as with other waste streams, is also vital in really driving down organic-waste-to-landfill and increasing composting rates.

Lastly, it would be encouraging to know how zero waste could be applied to waste streams that can not necessarily be managed in a low-tech or local way. May we see more responsibility and involvement from manufacturers? How could it really change the way we think about ownership, sharing, and simple living?

xxx

For now, we can play our part by becoming truly conscious of the interests and false narratives of industries so that we can use and share goods more responsibly, learn to live more in step with the natural environment, and support efforts that restore justice to those previously disadvantaged and vulnerable in a rapidly climate-changing world.

APPENDICES

Appendix A: Ethics approval



SOSS Human Research Ethics Committee

Clearance Certificate

Protocol Number: DVS20190110
Project Title: The role of reclaimers in leading the transition from a linear to circular economy
Investigator's Name: Swart, Johanna Yvonne (1919322)
Department: Development Studies
Date Reviewed: July 2019
Decision of Committee: Approved / Unconditionally
Expiry Date: June 2021
Date:

Head of School

A handwritten signature in black ink, appearing to read "Mucha Musemwa", written over a horizontal line.

Professor Mucha Musemwa

CC supervisor: Vishwas Satgar

Declaration of Investigator

To be completed in duplicate and one copy to be returned to Ms. Sarah Mfupa in the School of Social Sciences, Room 152, 1st Floor, Robert Sobukwe Block.

I fully understand the conditions under which I am authorised to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. If any departure from the research procedure as approved, I undertake to resubmit the protocol to the committee.

A handwritten signature in black ink, appearing to read "Swart", written over a horizontal line.

Student Signature

26 July 2019

Date

Appendix B: Template documents for data collection

1. Interview Participant Information Sheet
2. Interview Participant Consent Form
3. Observation and Interview Guide

Other supporting documents are available upon request.

1



Participant Information Sheet

Dear participant

My name is Jani Swart and I am a MA Development Studies student at the University of the Witwatersrand in Johannesburg. As part of my degree, I am undertaking a research project.

The social impact of consumerism, waste, and environmental degradation interest me greatly and therefore I am exploring **alternative waste management systems in South Africa** that can be just, both socially and environmentally, and can challenge the large-scale extraction of resources and pollution. From initial research, zero waste seems like a good fit, especially considering the role of waste reclaimers or waste pickers in the Global South.

Through this study, I will document a case or cases in which waste management alternatives are explored, particularly in collaboration with the subaltern. It should then contribute to the body of knowledge on eco-socialism, zero waste, and informal waste pickers.

As part of this project, I would like to invite you to **take part in an individual interview**. You were selected on the basis of your involvement in a waste management alternative in South Africa. The interview should take no more than an hour. With your permission, I would like to record the interview for transcription purposes.

You will unfortunately not receive any direct benefits from participating in this research, and there are no disadvantages for not participating either. You may withdraw at any time and do not have to answer any question you are not comfortable with. As you are regarded as an expert in this project, I would prefer to cite your views using your name and/or institutions or organisations you are associated with.

This study will be written up as a research report in partial fulfilment of my Master's degree. If you wish to receive a summary or copy of the report, I'd be happy to share it with you. If you have any questions about this project, any concerns or complaints during or after the interview, you are welcome to contact either me or my supervisor on the details listed below.

Sincerely yours,
Jani Swart
janiyswart@gmail.com
+27 73 851 4918

Supervisor
Prof Vishwas Satgar, University of the Witwatersrand
vishwas.satgar@wits.ac.za
011 7174387

Consent Form

Subaltern waste management alternatives in an emerging circular economy?

By Jani Swart

MA Development Studies

I, _____, hereby agree to participate in this research project. The objective of the study has been explained to me and I understand what my participation will involve.

Hence, I am aware of and agree to the following:

1. That my participation will not remain anonymous and that my views may be cited in the final report as well as any further publications.
2. That the interview may be audio recorded and transcribed.

_____ (signature)

_____ (name of participant)

_____ (date)

1. Observation grid

DATE _____ TIME _____ LOCATION _____

Types of observations	What is observed	What it tells me about the context – what is there/missing?
Senses: sounds + smells + light + temperature + crowdedness		
Interaction / interconnectedness of role players		
Where do waste pickers fit?		
What types of waste / how is it dealt with	Other markets: Early Morning:	
Resist? Reduce? Reuse? Recovery? Recycle? Repurpose? Residuals?		
Products/production?		
Consumption (by users and by sellers)		
Threats to human/environmental health		
Reflexive notes		

¹ Zero waste: ? Make my own theory afterwards?

² Ethnographic methods: <https://www.emeraldgroupublishing.com/how-to/observation/use-ethnographic-methods-participant-observation>

2. Stakeholder Identification Matrix (adopted from AUTHeR, North West University)

Stakeholder group	Who are they	Their role in general + in the intervention	What they want/need from the space + intervention	What they bring to the intervention
Traders				
Vendors				
Waste pickers				
Other on-the-ground				
Representative body/ass. / community forum/network				
Funder				
NGO/NPOs	groundwork, Asiye-eTafuleni,			
Academic institutions	Urban Futures Centre, Durban Uni of Tech; Waste Learning Hub(?)			
Industry partners (if any)				
Government/municipality				

3. Interview questions, 15 September 2022



Project background

- How did the project come to exist?
- What was there before you can in/independent of your involvement?
- What does it aim to achieve? For whom/by whom?
- Why work with the informal sector (“urban informality”), and mostly organic waste (methane has been neglected)? Is it not the industries and rich consumers in recognised public spaces we should focus on? (~placing the burden of zero waste on the informal sector)

Project inception/initial data

- Talk me through the project roadmap: where are you hoping to achieve what? Timelines? (2022 focus on organics.. then what?)
- Sept/Oct 2021: 116 surveys which showed 80% is organic waste: who does surveys? Is that data available?
- Nov 2021: granular audit demonstrated RE understanding ‘volumes and types of waste streams’ What was the outcome? Is data available?
- What do you observe of the informal workers...what are their motivation/priorities?

Zero waste

- Why zero waste and not just speaking about the circular economy like the government and the private sector? Is there a difference? About the Just Transition??
- What is the social aspect/benefit of zero waste?
- You agree with the definition of the International Alliance on ZW. Zero waste viewed through what you do at the Markets: how would you define it?

What this means for other spaces

- How can a case such as the Markets lead to policy/practice of zero waste in SA?
- ⊕ Sense-check the observation grid/stakeholder matrix
- ⊕ Do you have a mapping of the layout of the market/where what happens? Perhaps done with the informal workers?
- ⊕ Which other resources/data are available on this that I can use? Can I contact you again?

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