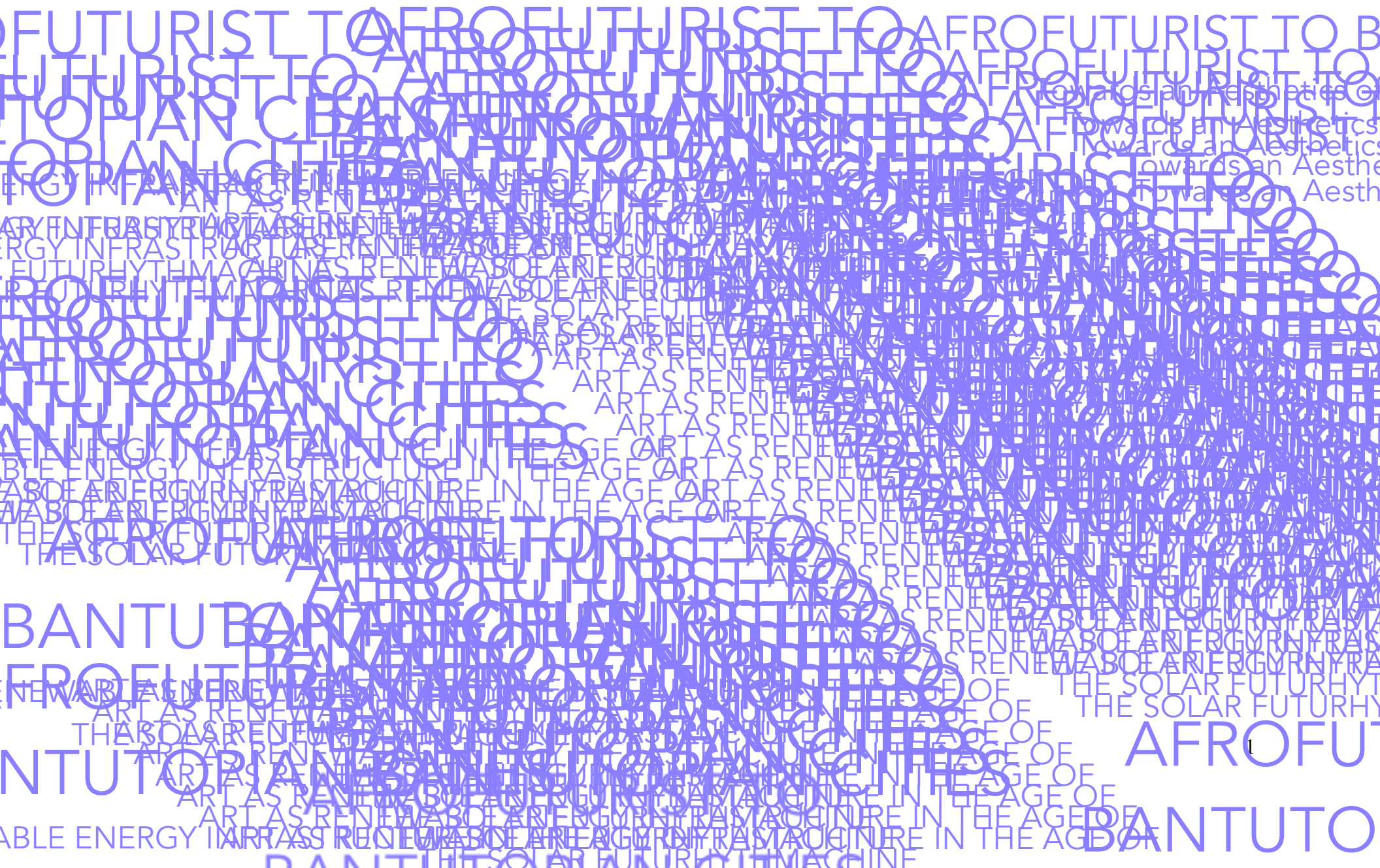
AFROFUTURIST TO BANTUTOPIAN CITIES:

Towards an Aesthetics of Sustainable African Cities



Declaration

I Michelle Nhlamulo Mlati, 771941, am a student registered at the University of the Witwatersrand for the course Master of Architecture (Sustainable & Energy Efficient Cities) in the year 2017. I hereby declare the following in regard to this document:

I am aware that plagiarism (the use of someone else's work without permission and/or with- out acknowledging the original sources) is wrong. I confirm that the work submitted for assessment for the above course is my own unaided work except where I have stated explicitly otherwise. I have followed the required conventions in referencing thoughts, ideas, and visual materials of others. For this purpose, I have referred to the Graduate School of Engineering and the Built Environment style guide. I understand that the University of the Witwatersrand may take disciplinary action against me if there is a belief that this is not my unaided work or that I have failed to acknowledge the source of the ideas or words in my own work.

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ABSTRACT

In my thesis I explore the aesthetics of sustainable African cities through the lens of Afrofuturism as an inclusive design approach. It explores this through studio-based research in site specific contexts of Joburg, *Dunusa* (which means to bend over in Zulu) to co-create an embodied culture of sustainability using solar power as central technology of interest. Through various interventions such as guerilla gardening and performing as an informal solar 'trader' as an active participant of the city, I question sustainable city paradigms of 'green' and 'smart' cities that are exclusive to black inhabitants in the inner city of Joburg and spatially explore how they can be inclusive amongst the practices of urban African communities through interventions that suggest a new urban language.

Though this critical spatial practice, these interventions manifest a relational aesthetics of sustainability namely Bantutopianism. Through Bantutopianism we challenge Afrofuturism's inability to adequately deal with the praxis of utopianisms engaged with true lived black vernacular realities in urban space to decipher the relation between humans and non-humans alike. This is in the context of informal trading spaces in African cities such as Dunusa. It explores an ethics of relationality which seeks to embed an embodied consciousness to sustainability that advances a post anthropocentric view underpinned by the philosophy of Ubuntu. This leads to the production of art for renewable energy infrastructure wired towards climate change mitigation and adaptation with the endeavor to generate earthly-cosmological ontologies that guard our planetary futures. Where energy poverty persists, the right to the city becomes the right to the sun. This research through a visual essay and literary aesthetics illustrates the necessary artefacts and rituals of the future such as those provided by the solar futurhythmachine as a resourceful sustainable architectural tool for devising alternative energy utopias inspired and centered around black cultural life to understand an aesthetics of sustainable African cities.

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1 Introduction

Current discourses on the 'aesthetics of sustainability' have been unable to adequately deal with contemporary African cities. Often Sustainability has been disseminated within very pragmatic and utilitarian frameworks with little regard for aesthetic values. Many Sustainability discourses are reduced to the cliché of green which has become a homogenous vision to sustainable city design. This has given little regard for nuances amongst various local communities in context to psychological, cultural and visceral aspects. Furthermore, current literature has highly emphasised the aesthetics of sustainability in the virtual realm through various visualizing models used for monitoring the efficiency of cities that assess how different systems of cities are performing. This kind of utilitarian aspect of the measure of Sustainability further advances an incorporeal understanding to environmental behaviours as a representation of an aesthetic of sustainability. Furthermore, these tools of representation are left to the auspices of experts and citizens with the capacity to engage with these on virtual platforms. In cities where access to the internet remains a human right (Lakha-Singh, 2017) for many to attain due to high data costs, the creation of the aesthetics of sustainability remains an exclusive activity.

At the grassroots level, the shortfalls to sustainability approaches is apparent in the New Ecological Paradigm (NEP) scale as a ''survey-based metric'' conceived by the American sociologist Riley Dunlap designed to measure environmental concerns of groups of people through disagreements and agreements based on 15 statements according to Mark Anderson (2014: 260). It is ''used in environmental education, outdoor recreation, and other realms where differences in behaviour or attitudes are believed to be explained by underlying values, a world view, or a paradigm'' (ibid.). Its critics mention it presents shortcomings as it omits a biocentric worldview that

emerged from 20th century environmental ethics literature (ibid.) which is concerned with an ethical viewpoint that extends inherent value to all non-human life, regardless of its sentience. The use of fifteen statements to assess perception on the basis of agreements or disagreements reduces the assessment to cognitive processes, which is a very limited paradigm. It is resonant with a Cartesian dualism mentality that posits ''the mind to be separate from the body'' as articulated by Sechaba Maape (2016: 27). Embodiment [1]becomes important because ''changing people's relationship to a place requires embodied persuasion, and not merely engaging them through a cognitive rationalist-guided dialogue'' (Maape, 2016: 231). The possible effects for the logic of The New Ecological Paradigm leaves minimal room for embodied persuasion, which allows people to adapt their behaviours through embodied approaches towards addressing wider environmental concerns such as climate change. In the context of African cities with a multicultural and multilingual population, the adaptation of such tools also becomes limited by the mere fact that the English language is the criteria by which such interventions are diffused and assessed. This necessitates a deeper interrogation of the diffusion and assessment of sustainability theory and practise from a relevant socio-cultural perspective that goes beyond linguistics, and looks at aural, visual & haptic culture for communication in spatial production. If we are to understand the formation of an aesthetics of sustainability at a grassroots level, an embodied approach is necessary open to

[1] Embodiment: The term referring to the conceptual and actual unity of mind and body ultimately postulating that the human (and other sentient beings) are an emergent phenomenon and cannot be merely reduced to mind combined with body.

Embodied Practice- These are physiological practices that induce various psychological states including trance.

multiple forms of representation rather than cognitive based measures as practiced through the NEP scale.

1.1 Background

Ilaria Di Carlo (2016: 14) has asserted that there is no concise position to recognize ''a specific language or aesthetic for the sustainable design of cities and territories'' at an international level. Whilst manifestos such as 'One Planet One Community' or 'Triple Bottom Line' exist, these have been critiqued to provide a dogmatic vision of Sustainability rather than a seductive one. This is because it is articulated through ''improved technological performance than through a new urban language'' (ibid).

This dogmatism is also exhibited by voluntary organizations such as the Green Building Council in South Africa (GBCSA). This is based on how their institutional framing is encoded to address environmental (green) and technological (buildings) concerns rather than the social dimension at core. It is especially relevant if we are to understand Sustainability as environmental, economic and social intersecting processes necessary for enhancing or sustaining a particular quality of life (Di Carlo, 2016). The social aspect where culture is embedded and its interface with the environmental and technological aspect is overlooked. This is even made more apparent by how the GBCSA fails to acknowledge vernacular architecture as a tool for green building that has manifested multiple cultural aesthetics especially in an African context. The aesthetics of 'green rated buildings' remain highly embedded in a modernist universalist form that maintains a homogenous aesthetic, which implies uniformity just like 'One Planet One Community'. This approach insinuates there is little aesthetic variation in how we build our cities in addressing climate change given the phenomenal differences amongst diverse communities of differing

socio-economic groups including that of other non-human species we co-exist with. This is important when aesthetics (as an embodied sense stimulating phenomena) through art/building helps us to sense climatic change.

In African cities such as Johannesburg, the pursuit of sustainable architecture is perpetuated in the contemporary logics of spatial injustice. This leads to not recognizing cultural differences regarding the aesthetes of a place given these socio-economic differences when green buildings are saturated in high income areas. This is important because we are all adapted differently to a place and the way we are embedded in a place is fundamentally mediated by aesthetics which has direct implications for how we think and interact with our environment. This is affirmed by Di Carlo (2016) when she asserts ''the importance of the 'Aesthetics of Sustainability' is clearly fundamental to the success of a new model of green planning, and not just from an environmental and economic point of view, but most importantly, from a social and mental one''. ''Mental and social aspects, that deal practically or theoretically with subjectivity – and which are so much part of the experience of reality-are somehow dismissed, or at worst forgotten'' (Di Carlo, 2016: 32).

1.2 Problem Statement

The challenge of this research is to suggest and diffuse a new urban language of an aesthetics of sustainable African cities to locate in the broader field of the aesthetics of sustainability.

The current unsustainable modes of production and consumption patterns in urban society, with African cities increasingly emulating those of ''developed'' countries in the West, are accelerating the problem of sustainability that has become ''more than technical'' (Claus, 2003:

175). This necessitates the shift of notions of sustainability to be culturally understood, as well as steered towards a localized cultural worldview, and subsequent behavioural change beyond the technocentric approach. According to Maape (2016: 231) the technocentric approach becomes inadequate in light of the assumption that using climate data as a persuasion tool and adopting new technologies will enable reasonable human response to mitigate against climate change. This is premised on Maape's (ibid.) argument that ''after many years of climate data & warnings, people have failed to respond, usually only responding when the crisis is felt'' which he concludes is indicative of the flaw of the current approach. In addition, Demos's (2016:10) argument further supports Maape's view when he states that agreements regularly signed at events such as UN climate meetings in keeping temperatures from rising ''more than two degrees Celsius above preindustrial levels (or 1.5C, agreed at COP21), …are effectively meaningless when voluntary and unenforceable''. Furthermore, this conundrum we are faced with is how can we sense climate change with our bodies before the disaster hits, as it would seem we respond to the crisis when our bodies have to bear it, making apparent its prolonged insensibility to our contemporary species. As a result, the aesthetics of sustainability need to be explored to be responsive to the problem of this insensible nature of climate change within the current sociopolitical context. Especially how it interfaces with not just economic and environmental dimensions as simplified understanding of Sustainability but an engagement with cybernetics (systemic thinking) including ecology and adaptation systems as central to understanding it. This is to locate the enquiry of the aesthetics of sustainability within an evolutionary approach given how ''aesthetic responses evolved because they enabled people to better solve life's problems'' (Di Carlo, 2016: 49). Therefore, linking aesthetics and ecology will be imperative ''to define

aesthetics as an adaptive system and, as such, it 'can function (or continue to exist) only if it makes a continued adaptation to an environment that exhibits perpetual novelty'' (ibid). This problem of sustainability is clearly asserted through a duality between the cultural and ecological approach Maape (2016) demonstrated in the literature on bushmen spatiality. Whilst a problem of sustainability being that it lacks seduction to compete with the charms of the unsustainable city, it is also a problem of how environmental problems are framed which Di Carlo (2016) asserts is a problem of ecophenomenology.

1.3 Rationale

This research wishes to advance Guattari's critique of an ecology solely related to the environment that has perpetuated an unhealthy divide between culture/ecology and human/nature through a new urban language. This is to work against those practices that position environmental aspects to sustainability in a silo from the social and political contexts through which they are embedded in practice. This is evident through the conservation of land for wildlife in favour of preventing poaching of endangered species rather than preservation of land for indigenous communities as propagated by the green agenda (Simon, 2016: 67). David Simon (2016) critiqued that this instilled the idea that animals are more important than humans whilst on the other end others would argue national parks create jobs and promote tourism enabling economic sustenance. However, these views characteristic of planning discourses fail to take into account views of indigenous communities that have always been post anthropocentric responsive to the intersections of human with nature and culture with ecology. Many of these preindustrial societies have ''endured for many centuries precisely because they 'designed nature in' and lived in environmentally relatively

sustainable ways'' (Simon, 2016: 62). The framing of issues in this context further complicates unsustainability making apparent the colonial and middle-class postcolonial projects that are not just irrelevant to the poor but is inherently embedded in racist segregationist law such as the Group Areas Act of 1950 in South Africa that ought to previously keep particular racial groups in certain areas as a manifestation of whitewashed utopias.

However, because many sustainability discourses have focused on rural contexts this research will focus on urban environments such as Johannesburg due to very few studies exploring sustainable livelihoods in urban African communities and their accompanying aesthetics. The question of sustainability becomes difficult in South Africa as a country with a racist historical legacy that is starkly spatialized and visualized as represented through maps and images of everyday life in cities such as Johannesburg. This often paints a dystopian picture of black life. In response this research wishes to visualize a different aesthetics of sustainability that depicts an alternative reality that aims to advance a positive experience of blackness, given the historical marginalization black inhabitants face in the contemporary moment. This will be primarily explored through Afrofuturism defined as the intersection of the imagination, technology, future and liberation (Womack, 2013). It provides tools for exploring and articulating techno-cultural perspectives from a black cultural lens often neglected in mainstream techno centric approaches to sustainability.

This research primarily explores the cultural shift in sustainability discourse to articulate alternative aesthetics of sustainability that goes beyond the greenwashing perpetuated by technocrats. It addresses the social dimension of sustainability often overshadowed by the economic and environmental aspects in isolated ways that

does not take into account cultural differences amongst populations and differing power dynamics including access to climate technologies. This overlooks the importance of the intersections of the different ecologies (economic, social, environmental, technological and political) and the aesthetic products that they produce.

1.4 Aim and Objective

The research aims to illustrate how existing signs of sustainability in African cities have not been included in the discourse of the aesthetics of sustainability. It will appraise how current green rating tools (sustainability tools) are unable to adequately account for urban African communities in the context of spatial inequality. This will be visualized to relate urban praxis to theory to give form to an aesthetic approach to sustainability for urban African communities.

It will also imagine future African cities through art and a black speculative fiction lens through Afrofuturism to articulate the aesthetics of sustainable African cities. This is to contribute to discourses on the aesthetics of sustainability that create positive experiences of blackness given the lack of representation of black communities in mainstream practice and aesthetics that define sustainability.

Di Carlo (2016) asserted that Sustainability as an ethic is a given whilst the aesthetics remain poorly emphasized. However, she failed to provide what the ethical dimension of it entails. Given how contemporary African cities are highly unaccounted for with regards to what an ethic of sustainability entails so does the accompanying aesthetics given the inseparability between aesthetics and ethics as articulated by Guattari. Therefore, the aesthetic product that will result from the research process will simultaneously express an ethical imperative as the objective of the research has a central focus on solar

technology in relation to urban society.

1.5 Exploring the Aesthetics of Sustainable African Cities

Main Research Question:

How might the aesthetics of sustainable African cities be understood in Dunusa, Johannesburg with solar technology as primary medium using Afrofuturism as a framework?

1.5.1 Sub question 1 Dunusa

What are the practices amongst urban African communities in Dunusa and display practices of solar technology?

1.5.2 Sub question 2 Afrofuturist to Bantutopian Cities

How can Afrofuturism as an inclusive design tool be used to co-produce a new urban language for solar tech/sustainable architecture/machines in the urban environment with Dunusa inhabitants?

1.5.3 Sub question 3 Bantutopia

Using the speculative fiction approach of Afrofuturism how can an aesthetics of sustainable African cities be narrated as literary ecocriticism based on findings from Dunusa?

1.6 Expected Findings/Hypothesis

Aesthetics of sustainable African cities will be embedded in actions and induce an embodied approach to Sustainability. It will manifest a relational aesthetics that reveals an ethic of Sustainability in urban African communities from different income groups. The research will conceptualize and visualise an aesthetics of

sustainability based on interventions pursued collaboratively through a speculative approach. In addition, based on the evaluation of solar power infrastructure design, it has not been rigorously evaluated in relation to aesthetics. The status quo of these which to a large extent resemble repetitive reproduction can be diagnosed as a pathological symptom of modernism. To reiterate Kenneth Frampton's (1981) argument, this repetitive reproduction ascribed to modernism has to a large extent been the reason for the inability to produce significant form due to homogeneity embedded in its design principles. The expected findings for this research will develop context specific design in relation to solar power infrastructure. This is because there are no current studies trying to understand the harnessing of a localised meaning framework in African built environments and sustainability in design, particularly linked to solar tech. The study will demonstrate the kinds of considerations designers of solar tech should consider in relation to non-Western contexts particularly in Africa.

1.7 Limitations

The limitations that can be anticipated is the difficulty to conduct immersive field research at night in the inner city of Johannesburg due to the possibility of the researcher's safety being compromised. As a result, the interventions conducted, and data collected will be unable to reflect the dynamics of the place at night other than between 5am and 7pm during ''business hours''.

1. 8 Chapter Outline

Chapter two introduces a literature review on discourses of the Aesthetics of sustainability by firstly defining it as an adaptive system, then in relation to definitions of Sustainability. It will discuss six general models that constitute contemporary aesthetics of sustainability: Baroque Supermanierism, Bio-Mimeticism, Analytic,

Hyper-Technologic, Regulatory and Eclectic. This will be appraised in relation to Afrofuturism as a techno-cultural aesthetic from a black cultural lens that has tried to address African subjectivity in context to technology, inclusivity and the environment. This is to make apparent the inability of current discourses of the aesthetics of sustainability to deal with urban African communities and draw lessons from Afrofuturism to create an alternative perspective more suitable for the context.

Chapter three outlines the research method used which focuses on critical spatial practise (embedded research) operating within an Afrofuturism framework. It will highlight how interventions conducted on research site in the inner city of Johannesburg were designed and carried out through participant observation. This method will help to define the formation of the aesthetics of sustainability relationally in urban African communities within a critical framework.

Chapter four will present status quo practices of urban communities and practices of solar technology in the Dunusa precinct to illustrate the aesthetics of these. It will also illustrate how existing sustainability tools and discourses on the aesthetics of sustainability are not adequate to address the aesthetics of the practices and infrastructure in the Dunusa precinct. In addition, Afrofuturism will be used as a mode of interpretation (hermeneutic) to provide an alternative perspective of sustainability by discussing adaptation systems of urban African communities in complex environments as a cultural-ecological approach to sustainability.

Chapter five will discuss the findings from conducting interventions in Dunusa. The first section will discuss the intervention *Ama Blue Blocks* (2017) where the researcher poses as an informal 'solar' trader to create an embodied consciousness to sustainability through solar powered art. This creates a relational aesthetic of sustainability with city

inhabitants. The second part will discuss the intervention *Inclusive Green-Smart Cities?* (2017) through guerrilla gardening to illustrate how an aesthetics of sustainability can be co-produced amongst urban African communities. These findings will be related to the economic, environmental, technological and social aspects of Sustainability. It will borrow from cybernetics[2] to illustrate systemic thinking in the context of creating sustainable architecture through art, culture, technology and urban society. This is important due to the art interventions comprising solar powered radios and lights that lead to a design solution in the next chapter. Understanding how systems are sustained is imperative to understanding sustainability.

Chapter six illustrates a sustainable design solution for the Dunusa precinct through a speculative design approach informed by the tools of Afrofuturism. Using the black speculative fiction tradition, this chapter envisions Bantutopia through literary form and photography that imagines an alternative future African city speculating on findings from Dunusa.

Chapter seven concludes on how Afrofuturism can serve as a mode for critical analysis of adaptation systems amongst urban African communities to theorize an aesthetics of sustainable African cities informed by actions. Through intervention, the interaction between Afrofuturist Cities and urban society manifests Bantutopianism coined by Sechaba Maape as a mode of creating utopias in the context of complex environments in African cities that attends to the needs of diverse black communities. This synthesizes an inclusive approach to

[2] Cybernetics is the scientific study of control and communication in the animal and the machine', cybernetics uses a transdisciplinary approach to explore regulatory systems (their structures, constraints and possibilities), including concepts like adaptation, communication, social control, emergence, efficiency, efficacy and connectivity. Cybernetics provides a means for examining the design and function of any control systems and self-organizing systems, to be more *efficient;* in other words, more sustainable.

designing sustainable African cities that addresses energy poverty and spatial inefficiency by inventing new types of machines and sociotechnical networks centred around climate change concerns.

2 Literature Review

Jacobs, in her 'Death and Life of Great American Cities' in 1961, declared that 'the diversity of cities that marked their quality is the diversity that was formed from countless individual decisions, generated from the bottom up'. The sentence is of particular relevance if we consider proper the definition according to which there is 'Aesthetics 'anywhere the qualitative processes of reception and production, of pleasure and making are examined' because it contains a logical association between quality, hence aesthetics, and the evolutionary bottom-up model. (Di Carlo, 2016: 65).

2.1 Aesthetics of sustainability as an adaptive system



Figure 1Anthocharis cardamines, camouflaged at rest on garlic mustard

A discussion about the aesthetics of sustainability is one that entails assessing the reception and production of quality as asserted by Di Carlo (2016) above. This is particularly important as it enables subjectivity to be factored, in the assessment of what is considered beautiful. Beyond examining aesthetics on a superficial level what is often not highlighted is its fundamental importance to survival as an adaptation system. This is particularly true when we assess an aesthetic viewpoint with regards to maintaining a particular quality of life. For example, a butterfly's ability to camouflage itself within the natural environment is an adaptive strategy which enables it to hide from predators. The type of transformation it undergoes is fundamentally an aesthetic response to an environmental threat. This example, makes apparent aesthetics should not be taken for granted as it enables modes of adaptation to natural or built environments to assess and understand how a

species sustains its livelihood. This locates the enquiry of the aesthetics of sustainability within an evolutionary approach given how 'aesthetic responses evolved because they enabled people to better solve life's problems' (Di Carlo, 2016: 49). Therefore, linking aesthetics and ecology will be imperative 'to define aesthetics as an adaptive system and, as such, it 'can function (or continue to exist) only if it makes a continued adaptation to an environment that exhibits perpetual novelty' (ibid). This is further supported by Lance Hosey's (2012: 6) assertion that 'aesthetics, or sensory appeal, are not just icing on the cake. In both nature and culture, shape and appearance can directly affect success and survival.'

2.2 Aesthetics of Sustainability

In our contemporary moment there are 'six macro groups' of aesthetics of sustainability according to Ilaria Di Carlo (2016: 44). These comprise the following as highlighted below:

2.2.1 Baroque Supermanierism

Baroque Supermanierism is an aesthetics that stems from projects that are mastered through the use of



Figure 2 Baroque Supermanierism: marcosandmarjan, Self-sufficient City: Khataba (Al Jadida) Agropolis, Egypt, 2009

morphogenetic algorithms characterized by 'excess and redundancy' (Di Carlo, 2016: 44). This is the biological

process that results in the development of an organism's shape. It is also described as an aesthetics embodying 'a link to processes of growth and of physiological evolution, adaptation and multiplication' (ibid.).

2.2.2 Bio-Mimeticism

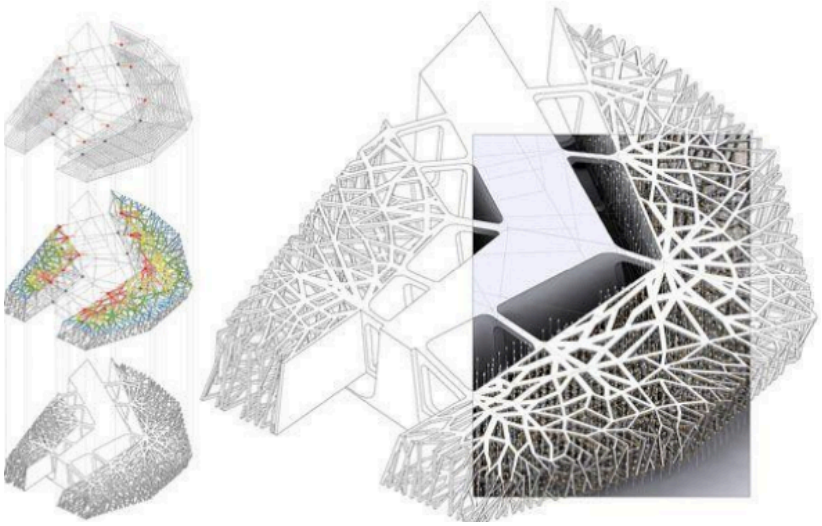


Figure 3Bio-mimeticism: Ocean, New Czech National Library in Prague, 2006

Bio-Mimeticism is referred to as 'the aesthetics of artificial naturalism' (ibid.) and contains two subgroubs. The first is aimed at studying and rehabilitating 'the performance of and the metabolic processes of biological systems' (ibid.) in certain environments which examine enquiries of cause and effect. The second group superficially copies a naturalistic aesthetic where aesthetics of sustainability is reduced to 'pure branding' and 'graphism' (ibid.). Built structures mimic forms of nature.

2.2.3 Analytic

The analytic aesthetic is defined as 'vectorized aesthetics of processes' (Di Carlo, 2016: 45). What this means is that it is a computer programming style that visualizes urban, social, economic performance and processes in a spatialized format. This formatting of space is considered 'the basis of the formal research of Analytic' (Di Carlo, 106: 45). It enables the visualization of scales as the research object at urban and regional scales. It does so by illustrating flows, meshes, paths and densities. Its

aesthetic essence lies in being able to illustrate an inseparable whole of city systems through continuous processes at a topological level.



Figure 4 Analytic: Ecologic studio, Regional Algae Plant, Simrishamm, 2011

i. Sugar-scape model

The sugar-scape model for urban systems analysis also fits into the formal aesthetics of the analytic. This model 'synthesizes data from communications and transportation networks' by visualizations that depict 'patterns of daily life in Rome' (Di Carlo, 2016: 149). In this way it enables access to citizens to make informed decisions with regards to their environment.

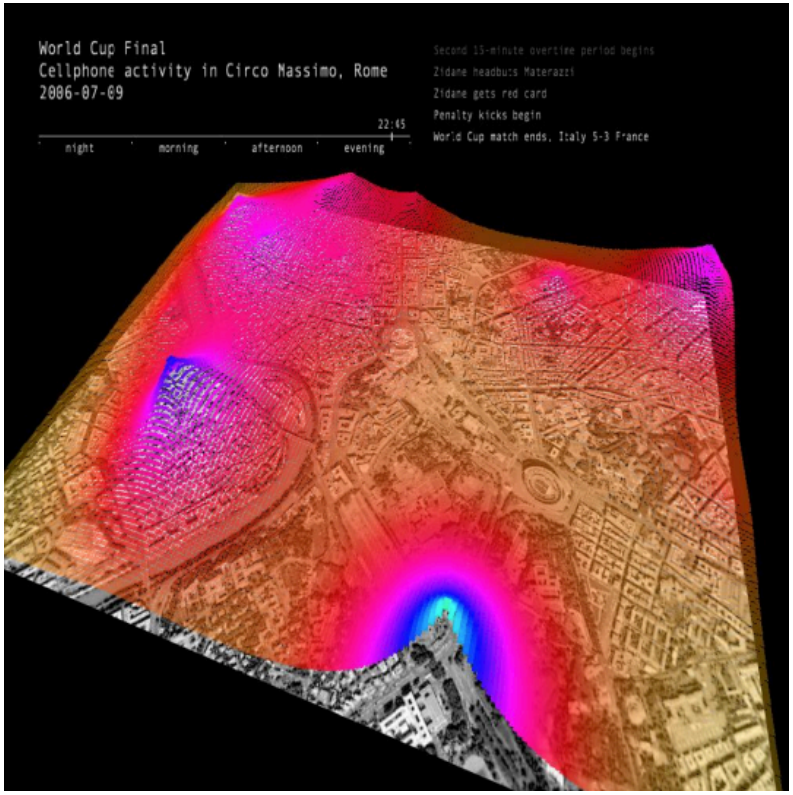


Figure 5World Cup Final, cell phone activity at Circo Massimo, Rome

As opposed to being 'artificial intelligence based' the data is 'really intelligent' as it simulates micro-level behaviours on a macro-scale that depicts interactive patterns (ibid.). However, the formation of these aesthetics remains utilitarian and only accessible to those with access to data/internet.

2.2.4 Hyper-Technologic

The Hyper-Technologic is referred to as the 'addictive aesthetics of high tech' (Di Carlo, 2016: 44). When dealing with sustainability the High Tech aesthetic solution is considered as most accommodating as most understandable. It encompasses 'super-tech' and cerebral aesthetic rather than sensual. Its aesthetics comprise 'specialised elements, components, of hyper-trophic green in the form of roof gardens' (Di Carlo, 2016: 45-46). Di Carlo (ibid.) describes it as 'the cliché of sustainability, where virtue makes up for beauty, and the development of techniques has sacrificed a certain sophistication and aesthetic sensibility'. However, the hyper technological can be associated with the utilitarian efficiency of energy production. According to solar company Sinetech (Personal communication, 2017) in order for solar panels to be more efficient the PV cells have to be dark in order for them to absorb more heat, therefore the utilitarian aspect determines the aesthetic. This is also affirmed by how many designers restrict environmental performance to 'INVISIBLE' green considerations such as embodied energy, material resources, chemical content' (Hosey, 2016: 6). According to Hosey (ibid.) this is partly due to these being easy to regulate. This is opposed to what he refers to as '*VISIBLE*' green factors such as form, shape, and image with particular emphasis on their impact for conservation and comfort (ibid.). This is especially relevant given Senegalese poet Baba Dioum's statement that ''we conserve only what we love'' (ibid).



Figure 6 Hyper-Tech: ARUP, Dongtan eco-city, China, 2009

According to Hosey (2012: 7) ''we don't love something because it's non-toxic or biodegradable—we love because it moves the head and the heart''. Therefore, it becomes apparent that we are less likely to get rid of something we treasure which fuels that desire to preserve it and therefore makes us less inclined to destruction (Rachel Carson cited in Hoser, 2012: 7). We begin to see that the relationship between aesthetics and sustainability rather than a superficial pursuit is an environmental imperative where beauty has the potential to save the planet (ibid.). Therefore, a sensual appeal to sustainability is essential that considers *VISIBLE* green factors of green techniques. This might help to establish new poetics of sustainability. In this sense 'sustainable design must offer more to meet the eye—and the ear, the nose, and the skin. If design is to act like nature, it should take our breath away' (Hosey, 2012: 8).

2.2.5 Regulatory

The regulatory is considered 'the an-aesthetic' of sustainability. In simple words it is informed by 'prescriptive rules' (Di Carlo, 2016: 46). The problem with this is that rules lack an 'emotional, mediatic, persuasive and seductive power of design' (ibid.) and therefore argued to perpetuate a dogmatic concept of sustainability resulting in an aesthetic that is boring.



Figure 7Regulatory: Dunster, Bed Zed, UK, 2001

2.2.6 Eclectic

The eclectic is an aesthetic defined as an aesthetic embodying all the above categories at varying degrees. However, this is argued by Di Carlo (2016) that it gives no clarity to an aesthetics of sustainability already given its immature and limited language.

Most of these modes of representation remain very techno centric and give little understanding to how a human embodied approach to sustainability can be achieved. The analytic is the closest to illustrating the interaction between social, economic and urban processes, however, their representation remains limited in terms of the psychological, visceral impacts of these on urban society. Therefore, the reception and use of these illustrations remains limited to specialists or professionals which perpetuates a top down formation of these aesthetics. This is opposed to those that emerge from the bottom up as informed by the evolutionary approach where species devise their inherit or cultural aesthetic methods to ensure their sustainability like in the case of the butterfly.

2.3 Defining Sustainability

The mainstream definition of Sustainability emerged from the 1987 Brundtland Commission report which informs the common conception of Sustainability to date. This report defined sustainable development as ''development patterns that manage to address the human needs of everyone (intra-generational equity) without compromising the needs of future generations (inter-generational equity)'' (Brundtland, 1987). According to Pieterse (2011: 2) the premise of this conception implies that development can be defined in a way that balances economic, social and ecological concerns through the idea of a triple bottom line. This has been critiqued as flawed due to the Brundtland definition employing ''a consensual model of political decision-making'' assuming ''all conflicts and contradictions'' are resolvable through ''rational democratic deliberation'' (ibid.). It implies interests that cannot be reconciled are ignored advocating a 'let's play it nice' situation (Pieterse, 2008) which can result in the unjust status quo being maintained. The bottom line triplication is also embedded in an extractive capitalism logic where the economic aspect is non-negotiable and is the basis for social and ecological reforms (Pieterse, 2011). Critics have suggested unless there is a paradigm shift, ''that economic systems are embedded in natural systems, and not the other way around, it is impossible to have sustainable capitalist processes'' (Porritt, 2007; Jackson, 2009 cited in Pieterse, 2011: 2).

An alternative concept of sustainability that is more suitable for this research is provided by the National Science Foundation Workgroup whom conceive of it as follows:

... a definition of sustainability that focuses on sustainable lives and livelihoods rather than the question of sustaining development. By 'sustainable livelihoods' we refer to processes of social and ecological reproduction situated within diverse spatial contexts. We understand processes

of social and ecological reproduction to be non-linear, indeterminate, contextually specific, and attainable through multiple pathways [...] Within the terms of this definition, sustainability:

** Entails necessarily flexible and ongoing processes rather than fixed and certain outcomes; * Transcends the conventional dualism of urban versus rural, local versus global and economy versus environment; and * Supports the possibility of diversity, difference and local contingency rather than the imposition of global homogeneity (NSFWUS, 2000: 7).*

2.3.1 Concepts of Urban Sustainability

With regards to urban sustainability Adriana Allen's (2002: 16-17) work has differentiated five different aspects of sustainability. These are economic, social, ecological, physical and political sustainability.

Economic sustainability is the local economy's ability to sustain itself without causing irreversible destruction to natural resources it is dependent on without increasing the ecological footprint of a city.

Social sustainability is characterized by actions and policies that aim to improve the quality of life and enabling fair access and distribution of rights over how the natural and built environment gets to be used or appropriated.

Ecological sustainability is about urban production and consumption impacts on the integrity and health of city regions and global carrying capacities.

Physical sustainability pertains to the capacities and aptitudes of urban built environments and techno-structures for up keeping human life and productive activities.

Political sustainability is about the quality of governing systems that guide the relationship and actions of different actors in the above-mentioned dimensions. It entails democratisation and participation of civil society in all areas of decision making.

2.3.2 The relationship between aesthetics of sustainability and concept of sustainability

Di Carlo (2016: 189) defined aesthetics of sustainability as 'negotiation between personal subjectivity and collective subjectivity as forms of knowledge, and as processes and tools for aesthetic creation — that cannot be separated from the socius and the environment.'

This definition advances an understanding of sustainability that conceives of the social and environmental aspects of sustainability as inseparable. This is aligned to Guattari's critique of an ecology solely related to the environment that perpetuates the culture/ecology and human/nature dualism. This is furthermore supported by Merleau-Ponty's 'rejection of dualism between nature and humankind' and considers 'artificiality as a component of nature' given how technologies arise from natural resources and therefore can be considered the artificial rather than natural evolution of raw materials. This is also in line with the definition of sustainability put forward by the National Science Foundation Workgroup that advance a definition of sustainability that transcends conventional dualisms of 'urban versus rural, local versus global and economy versus environment' *(NSFWUS, 2000: 7).*

Within the Brundlandt conception of sustainability its advocacy for development that addresses human needs intergenerationally and equitably without compromising those of future generations fails to conceive an aesthetic framework for understanding sustainability. Given how this definition implies a consensual model of political

decision making as critiqued by Pieterse (2011) regarding what warrants importance in a sustainability political agenda that has resulted in cliché's such as triple bottom line or win-win is inadequate due to implying irreconcilable interests remaining ignored which maintain unjust status quos. When these critiques of political sustainability are brought into the world of aesthetics it becomes a question of identity politics linked to environmental, economic, social and physical sustainability. This is based on the close links between art and politics (Sholette, 2010), where art can illustrate power dynamics that enable environmental, economic, social and physical aspects of the world to be represented, contested and negotiated through aural and visual cultures. This includes how Allen's (2002) conception of political sustainability encompassing all other dimensions of sustainability entails democratisation and participation of civil society in all areas of decision making. For purposes of this research decision making for aesthetic creation operates within the logic of political sustainability. This is founded on the idea of identity politics as the basis of aesthetic creation using my subjectivity as a black woman resident in Joburg to create an aesthetics of sustainable African cities collectively with other city inhabitants. This encompasses Di Carlo's (2016: 189) conception of an aesthetics of sustainability as the ''negotiation between personal subjectivity and collective subjectivity as forms of knowledge, and as processes and tools for aesthetic creation — that cannot be separated from the socius and the environment.''

Sustainability may represent a new form of humanity — more precisely, the fourth human metabolic system — but, as proposed in many urban and landscape projects, it often lacks a quality essential to any anthropic space: seduction. (Di Carlo, 2016: 24)

2.3.3 Defining the City

We are currently in an era where the city is better

conceived as an informational system which is ''dynamic, complex, evolutive and interactive'' (Gausa cited in Di Carlo, 2016: 10) as opposed to solely being a formal object existing in a formalist paradigm. Instead it is one that has advanced to be defined by activities of the city and exchange of information. Therefore, the city is made up of new operative structural logics. According to Gausa (ibid.) these include dynamism (evolutionary), complexity (simultaneity), diversity (plurality), transversality (connectivity), and interaction (exchange). It is within this understanding that the definition of a city will be studied in this research as an informational system with complex components that occur simultaneously because it reflects the complex reality of what a city is. Therefore, the question of sustainable African cities will be studied within the framework of these components of a city. These will be reduced to existing paradigms of green and smart cities that inform the conception of the sustainable city.

i. Green City and Smart City

According to Chan and Marafa (2018) the idea of the green city and smart city are emerging concepts characterizing sustainable urban development that operate as marketing concept of cities similar to the creative city and the sustainable city. Whilst the smart city and green city are distinct they overlap on various attributes which have evolved in separate paths to urban development (ibid.). They integrate in the context of energy supply and consumption (e.g. innovative uses of technology) (ibid.) which is of relevance to this research. Other elements that characterize these include ''greenery and utility infrastructure'' which according to Chan and Marafa (2018: 2) ''may be more visible and have stronger power to catch public attention, which may in turn become the positive attributes for city marketing and development''. Given their operation as a marketing concept this city branding aspect characterizes it as an

informational system that operate on an aesthetic level for economic gains. This seems to focus them from an economic sustainability perspective which Chan and Marafa (2018: 3) argue ''might override other important aspects such as socio-cultural concern and quality of local residents''.

ii. Green City

The idea of the green city has been in existence long before the sustainable development concept which has evolved through environmental and sustainability movements (ibid.). It is generally accepted as development that moves towards long-term environmental sustainability. This is also affirmed by precolonial societies that have always 'designed nature in' to their settlements (Simon, 2016). It makes apparent the idea of the green city is not new as the Garden City Movement and urban design/planning theories from the North seem to forget (Simon, 2016). Green cities consider aspects related to embracing an environmental friendly approach related to ''disease control and the public health implications, chemical and physical hazard reduction, high quality urban environments, minimization of urban–rural transfers of environmental costs, and sustainable consumption'' (Chan and Marafa, 2018: 3). However, the recent growing literature on green cities is moving towards non-economic aspects within this frame of urban development through the focus on health, environmental, learning and community building. This move is also indicated by urban attractiveness as a measure for successful green urban growth. However, this growth aspect remains linked to the economic through aesthetic persuasion. The green city paradigm later evolved to other paradigms such as eco-, resilient and sustainable city. However, in literature, there is still little emphasis on the aesthetic variation in the approach to green city paradigms amongst specific communities especially

urban African communities. This fails to account for differing cultural viewpoints of these in practise. However, the green city paradigm has also evolved to value progressive use of advanced technology and the 'nature-culture interaction' in environmentally sustainable forms in development (ibid.).

iii. Smart City

The smart city approach to development is not seen as separate but as a form of natural development. This is reinforced by Merleau-Ponty's view on 'artificiality as a component of nature' given how certain technologies arise from natural resources. We can therefore conceive of the smart city as having emerged from evolving from nature in ontological terms through the human-nature interaction. According to Chan and Marafa, 2018: 4) it is ''not a separate trajectory but as a natural development, evolution and integration of information and communication technology (ICT) in every aspect of urban development, and urban sustainability''. However, ICT has been the focus of this paradigm which scholars have recognized encompass a wider scope that includes ''human and social capital, infrastructure, quality of life, natural resource management, governance'' (ibid.) etc. Key aspects of the smart city are moving to optimal and efficient use of resources, ''leadership, inter- and intra-generational interaction and human-technology urban integration'' (Chan and Marafa, 2018: 5). The variable measures of the smart city include Cohen's ''six-dimensional smart city wheel and Dameri's ''land-people-infrastructure-government'' model. It essentially proposes the human dimensions in smart city urban development. The utilization of ICT concentrates on the development of urban centers that are ''integrated, habitable and sustainable''; that can enable optimization and wiser use of urban resources ''determined by individual citizens,

Areas of Green–Smart Overlapping	Descriptions	Source
Parks and green spaces, and green infrastructure	• Green spaces as an important dimension of smartness. • Smart city initiatives rely on a more developed infrastructure than polluted cities with limited green areas.	Neirotti et al., 2014 [92]
ICT	Smart city encompasses different socio-environmental aspects and ICT applications.	Shaw, 2013 [62]
Economic development	Smart city is an engine of economic opportunity, e.g., the case of Vancouver to improve its "green city" brand.	Rosol, 2013 [62]
Multi-dimensional integration and sustainability	Smart city shares or integrates elements from both creative industries and environmental sustainability.	Deakin, 2014 [90]
Multi-dimensional integration and sustainability	The overarching conceptualization of sustainable development, ecological modernization, and regenerative sustainability implies a major overlap in various city categories.	De Jong et al., 2015 [31]

Table 1Examples of overlapping ideas in green and smart city initiatives

community, enterprises and collectively, the entire society'' (ibid.).

iv. Green-Smart City Integration

Substantial research on the integration of green and smart cities has been on place marketing with exception for when urban green spaces were attributed to the green city brand promoting human nature interaction at a local level. One of the areas that have warranted comparative study of the integration of green cities and smart cities has been on 'hard and soft infrastructure-oriented strategies that considers all aspects of urban sustainability. This is crucial for determining the operative logics of city infrastructure

in relation to urban society to invent new types of ICT which can be translated to a new urban language. This is where cybernetics becomes crucial as the study of control and communication in the animal and the machine in making and emerging urban technology to operate in a controlled form responsive to urban complexities and dynamics. It is this aspect this research will pursue to explore the aesthetics of sustainability through an interdisciplinary approach integrating aspects of the green city and smart city in articulating aesthetics of sustainable African cities. This will be conceived through the idea of the city as an informational system. Within the literature of overlapping ideas of green-smart city this fits into the multi-dimensional integration and sustainability area mentioned in table 1. This is where smart city shares or integrates elements from both creative industries and environmental sustainability (Deakin, 2014).

v. Exclusive Smart Cities

One of the major discourses of smart cities is that they have run the risk of being exclusive. Whilst it has been argued that most of the activities occurring in urban spaces are no longer conditioned in physical space (Greenfield, 2013: 24), others contradict this argument by the mere fact that access to the internet has become a human right as discussed by Reshma Lakha-Singh in *Human Rights in a digital world* (2017) therefore restricting access to informational processes of the city. This is responsive to the reality that there are those that still have no access to it due to variable circumstances of urban poverty, where things such as data are prohibitively expensive and to an extent even for the middle class, in South Africa. Therefore in articulating notions of the smart city, it becomes critical to explore the activities and actions which dodge the 'smartness' of surveillance technologies operative for the purposes of their own networks in order to include 'hidden' communities in the discourse. This is to understand the smart city discourse beyond ICT based

measures of this paradigm Chan and Marafa (2018) mentioned and to articulate it from a human behavioural perspective as ''a personally networked device and acted upon at the level of individual choice and behaviour'' (Greenfield, 2017). However, notions of smart cities also argue ''that space and time of cities is shared with semi-autonomous agents of a nonhuman, indeed non-biological, nature, from drones to algorithms'' (Greenfield, 2017). This view therefore alludes to a biocentric worldview of cities, recognizing all entities existing within cities. This needs to be negotiated with the human perspective to avoid a very anthropocentric view, at the same time avoiding a too technocentric view in order to conceive a smart city approach inclusive of both human and non-human factors.

vi. Exclusive Green Cities

In trying to decipher micro-scale responses and market mediated transitions to greener urban areas according to Harrison, Bobbins, Culwick, Humby, La Mantia, Todes & Weakley (2014: 52) ''at the micro-scale, the strategies translate into interventions, which can be implemented at the building scale together with the associated behavioural change.'' This assertion is however, problematic, as it firstly makes the assumption that micro scale urban 'greening' begins at the level of buildings and fails to recognize the spatial practices that do not operate within the rigidity of buildings in the context of various businesses that operate at the street level and often inbetween buildings and on sidewalks such as informal markets.

Furthermore, the prescription of such micro-scale responses to urban greening where Harrison et al., (2014) identify the Green Building Council of South Africa (GBCSA) as a voluntary body implementing green

building rating tools, fails to provide the framework for those activities which do not occur in buildings and therefore ephemeral infrastructures of informal businesses. These are unaccounted for by the GBCSA tools & standards. The GBCSA also lacks a position regarding perceptions of aesthetic or culturally appropriate solutions for green interventions and understanding of the consciousness of non-European perspectives of ''greening''. One of these aspects is how they overlook vernacular architecture. The assessment of comfort in relation to biophilic design also remains peculiar whether there is a consideration and understanding of the phenomenological variations of perceptions regarding this. Furthermore, regulatory mechanisms such as SANS 10400-XA do not account for these 'informal structures' where energy and spatial efficiency is a matter of concern. These aspects, which are not accounted for, include requirements for hot water supply, energy usage and building envelope, orientation, floors, external walls, fenestration and roof assemblies. This leads to the conclusion that the formulation of the GBCSA and SANS 10400-XA are exclusive from energy and spatial concerns, and the needs of informal economies in urban spaces. These operate within the traditional framework of architecture being simply seen as the buildings. This limits the understanding to buildings as objects in isolation, rather than the open urban space in its entirety. Hence these green building narratives and their *modus operandi* will struggle to be inclusive to those that do not inhabit buildings for multiple activities, at a wider city scale based on the framing of objectives that highly emphasise buildings as the lab rat and centre of experimentation. Harrison et al. (2014) recognize that these micro-scale market related interventions to green-building and urban greening run the risk of being exclusionary towards sustainability transitions, which it is. Therefore, the non-existence of a formal framework responsive to informal African spatial contexts therefore

justifies the use of Afrofuturism as a framework of creating and understanding a paradigm responsive to informal African contexts.

There has been recognition that it is households and businesses with the ability to afford micro-scale market interventions who can implement green building technologies, whilst the poor are those ''subjected to unreliable, low-quality services as the related infrastructure weakens and deteriorates'' (ibid.). This makes apparent methods of addressing culturally relevant sustainability interventions for the less privileged are in short supply and inadequate to deal with contexts such as informal urban spaces with urban African communities.

Whilst urban greening is mostly accessible at the level of urban commons such as city parks, there remains a gap in the literature which makes clear how urban greening is implemented at the level of informal economies or those that do not operate in an institutional or traditional architectural context, and therefore remaining underrepresented in 'green' discourses.

Sustainability discourses are also characterized by 'green' and 'brown' agendas. Traditionally the former has emphasised aesthetics for ''green leisure spaces'' (Simon, 2016) biased towards central or downtown areas, including middle and high-income residential areas. Furthermore, the conservation of National Parks vs. conservation land of settlement has evoked a dualistic approach to sustainability agendas, with the latter encapsulating the brown agenda and the former the green agenda. The green agenda expresses focus on preventing poaching of endangered species, which has implied animals are more important than indigenous communities according to Simon (2016: 67). The framing of issues in this context further complicates unsustainability, making apparent the colonial and

middle-class postcolonial projects that are not just irrelevant to the poor but are inherently embedded in racist segregationist law, such as the Group Areas Act of 1950. This sought to previously keep particular racial groups in certain areas as a manifestation of whitewashed utopias of the apartheid regime. In the urban context the poor are kept further away from aesthetically pleasing spaces socially, culturally and architecturally. This can be better understood in context to John Clammer's (2015: 11) notion of 'visual Justice' as the right of everybody, and not just the rich to beautiful and pleasing environments with all the holistic benefits this brings. A parallel can be drawn to the initial experiments in urban master planning of Georges-Eugene (Baron) Haussmann which values beautification whilst these gardens also function as a form of urban control, implicating access to aestheticized environments as a paradox of promoting access and control simultaneously (Simon, 2016). The sustainability agenda finds itself embedded in a complex web of systems which necessitate analysing how the emphasis on 'urban resilience' addresses the limitations of sustainability theory. The green agenda, whilst it may protect natural resources such as national parks, is strengthened when integrated with the brown agenda invested in ''housing construction and infrastructural installation in order to improve access to basic needs often still lacking in rural areas'' (Simon, 2016: 67). This may address the creation of garden suburbs to dissolve the boundaries between what is rural or urban as a way forward for building sustainable and resilient communities. Integrating these agendas enables local populations to engage in efforts of conservation, to advocate for environmental justice, which initiates broad participation to conserving natural resources, and interventions that are sustainable and locally appropriate as Simon (2015: 67) has argued. However, whilst integrating green and brown agendas is emphasised in rural areas, it has been less emphasised in the city or

urban context, which this research will be doing.This integration might be better understood through the concept of Afropolis premised on the term of dissolution addressing key characteristics of African cities which ''the close links between urban and rural space, as Filip De Boeck has described in the case of Kinsasha, are another aspect of dissolution'' (Pinther, Forster & Hanussek, 2012: 17).

2.4 On Afrofuturism and Technoculture

Afrofuturism has been originally defined as ''a techno-cultural perspective accompanying engagement in a form of cultural production, originating in practices of black urban dwellers in North America after World War II'' (Anderson and Jones, 2015: viii). Anderson and Jones make the correlation between Afrofuturism and the urban, which makes apparent that it is an aesthetic and ethical movement born in context of the city. It is a relevant framework to employ for conducting empirical research located in the city of Johannesburg due to the majority of inhabitants being a diverse black population. With its values emerging from African moral consciousness, Shutte (2008: 16 cited in Munyaradzi) states ''if Africa is to play a part in the worldwide ethical discussion it cannot be content simply to rehearse its ancient wisdom in the forms in which it was first formulated. It has to find a way of articulating its ethical insights that engage with a scientific culture''. This research pursues just that.

2.4.1 Afrofuturism Origins

The term Afrofuturism was coined by the cultural critic Mark Dery to describe ''signification that appropriates images of technology and a prosthetically enhanced future'' as speculative fiction that was emergent in 20th century techno culture, addressing African American concerns in his essay *Black to the Future* (1993). However,

the practices of Afrofuturism predate its existence as an academic discourse. This is apparent through W.E.B Du Bois' short story *The* Comet (1920), Sun Ra's music and Credo Mutwa's first edition of *Indaba My Children* (1964) as a ''speculative fiction told through African mythology'' (Shezi, 2015: online) amongst many others.

Afrofuturism has grown into a global movement, which Lisa Yaszek (2012) has elaborated upon it as a science fiction written by Afrodiasporic, and African authors, with its history taking root from the 1850s to the present, as is apparent in various literatures discussed in Yaszek's *Race in Science Fiction: The Case of Afrofuturism* (2012). Yaszek's (ibid.) emphasis on Afrofuturism being authored by Africans highlights how the movement has not solely been about Afrodiasporic concerns, but about African concerns at its core, centering these society's relations with technology, although the movement has overly emphasized Afrodiasporic concerns.

2.4.2 Afrofuturism as an Aesthetic

As a global aesthetic movement, it encompasses ''art, film, literature, music, and scholarship'' according to Yaszek (2012:1) which Eshun (2003: 301) has elaborated that the expanded field of Afrofuturism includes the theoretical, fictional, digital, sonic, visual and architectural. However, the tropes of Afrofuturism have not been rigorously assessed in Sustainability theory and practise in real time. These are implicated in the literary works of Octavia Butler who is also attributed as one of the key founders of Afrofuturism. Through literary aesthetics, Butler (1993) imagines the futurity of everyday life alluding to sustainability in the ritual of burial practices of the future where corpses are transformed into seeds to replant into the earth to grow as trees. This is a radical manner of re-imagining spatial efficiencies in graveyards in her speculative fiction *Parable of the Sower* (1993). This is deeply engaged with biblical texts in an evolutionary

context. Furthermore, this might also be viewed as transcending the dualisms between humans and nature advanced by Guattari. However, whilst Afrofuturism has been said to encompass the architectural by Eshun (2003) in cities such as Johannesburg where architecture remains exclusive to some this necessitates locating the study of Afrofuturism in public space. It therefore makes sense to locate the enquiry within sustainable cities discourse. Furthermore, it has not been examined as a methodological approach through critical spatial practise. This is given critical spatial practise's emphasis on spatial practise that falls inbetween art and architecture, operating as a form of criticism which is spatial. This makes apparent the gap in literature and practise, which this research will be exploring through co-creative processes to formulate an aesthetic approach to sustainability within African contexts that might be more inclusive.

Simply, the goal of Afrofuturism is a tool to use that decolonizes the imagination in time and space, creating the ideal conditions of the human imagination to explore, not bound by the systems of the world, which after it has been explored, creating something to bring back to the world to incorporate into the structures of society rather than facilitating the art of escapism.

2.4.3 Afrofuturism, Evolution, Adaptation and Resilience as Mastering Survival (Sustainability)

In the contemporary moment Afrofuturism has been defined as the intersection of the imagination, technology, the future and liberation by Ytasha Womack (2013). Womack (2013) defined it as ''the creative ability to manifest action and transformation essential to survival'' whilst its liberation edict provides a ''prism for evolution''. It's important to appreciate Afrofuturism as a framework which firstly recognizes African and

Afrodiasporic people as surviving subjection of white domination/supremacy (in the context of slavery and colonialism in an evolving industrial technological age). This has had implications for the transmutation of our people's cultural traditions, rituals and relations, in a multiplicity of ways to enable our ability to adapt to hostile circumstances in a new environment. Hence, this could be viewed as a mastery, or perhaps endurance, of alien worlds–a science fiction reality–that black subjects inhabit, often mentioned by its authors. This resonates with the views Womack (2013) expressed that at its core Afrofuturism values improvisation, adaptability and imagination as components of resistance. According to Smith (cited in Womack, 2013), improvisation is understood as a technology of survival–a form of mastery of survival. He asserts that this is opposed to the Western view of improvisation as a failure and something done ''when something goes wrong'' (Smith cited in Womack, 2013: 38). Womack's (2013) evaluation of Afrofuturism as valuing improvisation, adaptability and imagination as components of resistance I argue posits Afrofuturism as a theory of sustainability of black people throughout history to our contemporary time. This is based on Womack (2013) defining it as a creative ability to manifest action and transformation that is essential for survival. This survival understood as the oppression black people have endured historically through slavery and colonialism which has led to the transformation (evolution) of black cultural life in relation to their environments. This is illustrated by the invention of music styles such as Jazz which illustrates the transformation undergone from oppression to freedom mastered through improvisation as one of the significant cultural artefacts conceived which made surviving hardships more bearable (Womack, 2013). However, when we look at the status quo of urban black life today the levels of oppression are very much still apparent through spatial inequality that still disenfranchises black people in African cities.

2.4.4 Afrofuturism and Vernacular Cartography

A practical example that illustrates the creative and liberation edict of Afrofuturism is evident through the actions of African American slaves opposing their oppression understood through the concept of vernacular cartography. According to Nettrice Gaskins (2015) the activist and slavery abolitionist Harriet Tubman rescued slaves through the use of quilts as maps that use stars to navigate the road to freedom. The artist Sanford Biggers (cited in Gaskins, 2015: 27) referred to her ''as an astronaut who traverses the south to the north by navigating the stars''. This is made apparent by how she ''followed the North Star by night, making her way from the South, to and from Pennsylvania and Canada while guiding others to freedom. Passengers followed codes embedded in quilts hanging in front of the safe houses with symbols telling them where to go and when the next ''train'' would come. These quilt-based maps may be viewed as cultural or vernacular space that emanate from the customs and rituals of a given community'' (ibid.). These coded quilts made of basic shapes arranged in particular patterns represent trails, the North Star, safe houses and other landmarks. According to Gaskins (ibid) ''as vernacular maps, these artifacts are reduced representations of the physical world' similar to symbols on Global Positioning Systems or on Google Earth…''. This example illustrates the elements of an Afrofuturist art project which entails creating a link between extraterrestrial space in relation to the terrestrial which according to Eshun (2003) projects of Afrofuturism are obliged to employ. The mode in which this will be employed in this research is creating a link between solar energy emanating from the sun (extra-terrestrial space) to solar technology as urban infrastructure where the energy is deployed (terrestrial space) by using art to illustrate a

vernacular cartography to inform an aesthetics of sustainable African cities. In environmental terms this could be understood as the relationship between the heliosphere (solar system), biosphere and technosphere as different spatial and temporal scales of interaction.



Figure 8 Sanford Biggers, Harmonics, 2012. Source: http://africanah.org/quilts-sanford-biggers/

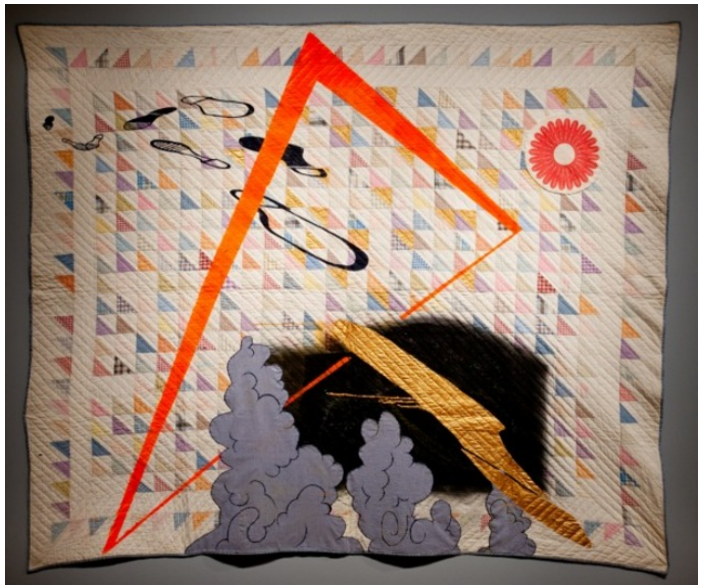


Figure 9 Sanford Biggers, Coded quilt drawings. Source: Nashville Scene



Figure 10Sanford Biggers, "Codex". Source: Nashville Scene

2.4.5 Afrofuturism as Inclusive Design Approach

From a human-centred point of view Afrofuturism envisions an inclusive design approach for technological innovation to address engineering challenges of the century more equitably (Winchester III, 2018: 41).

In a more generalized sense, it advocates for technological advancement unhindered by the Western imagination in order to foster deep design engagement that address complexities ''to advance health informatics, provide access to clean water, and restore and improve urban infrastructure'' (ibid.). The depths of these engagements go beyond finding technical solutions to problems and seriously address the social, political and cultural (including racial) implications of the design and deployment of technology.

In the context of wearable fitness technologies that track physical activity such as Fitbit, Afrofuturism plays a transformative decision-making role in order to have an inclusive impact. This is evident on the impact of certain wearable fitness technologies on African American women where differences in levels of health exist. A recent study revealed that ''skin colour (skin pigmentation) of participants affected the accuracy of wrist-based devices that use optical heart-rate monitors'' (Winchester III, 2018: 42). The inaccuracy therefore resulted in higher error rates of energy expenditure that signal the rate of caloric burn (ibid.). These inaccuracies were more prevalent for women with darker skins (ibid.). It was viewed highly problematic especially given its potential to be used to mitigate various health problems African American women are prone too. This made apparent ''algorithmically, these technologies are also seemingly lacking in responding to the physiology of the black body'' (ibid.).

The first step towards using Afrofuturism as an inclusive design framework was to get my then HP computer to recognise the word Afrofuturism as I type it on to the desktop (Mlati, 2015). In my response to Unpacking Europe (2001), I presented a short film featuring ''Black Desi'' remarking, in the presence of his colleague "White Wanda", that cameras installed in Hewlett Packard (HP) computers were racist as only his colleague's face was recognized upon testing the web-camera, unable to track his face (BBC News, 2009: online). In defence, HP's spokesperson told BBC News ''of a potential issue with the facial- tracking software included on some of its systems, which appears to occur when insufficient foreground lighting is available'' (BBC, 2009: online). Systems of ''othering'' become apparent in the products created by multinational corporations' dominant in Europe that seem to tailor the product specifications to suit their favoured market. This further makes apparent how black bodies are virtually ''othered'' or ''unrecognized'' by certain facial recognition technology. Afrofuturism opens a space to intervene in the decision making of ensuring an inclusive design impact of technology that recognizes everyone (Winchester, 2018).

Polaroid is also suspect to this claim; artists Adam Broomberg and Oliver Chanarin suggest that Polaroid cameras were inherently racist in their chemistry. This is underlined by The Polaroid Revolutionary Workers Movement in 1977 that achieved boycotting them from South Africa when the young chemist Caroline Hunter found evidence that her ''multinational employees were indirectly supporting apartheid'' by providing the ID-2 camera system to South Africa to produce images for the ''infamous passbook'' (Broomberg & Chanarin, 2015: online). The boost button which increased the flash when photographing subjects with dark skin ascribed to its racist characteristics. Products that do not cater to an African market's specifications, makes apparent the



Figure 11Olalekani Jeyifous, Energy in 2050. Source: Vigilism

market exclusivity for technological products. Therefore, Afrofuturism in this instance provides a decision-making consideration of the interface between social and technical aspects of technology being designed for mass consumption. This recognizes the limitations of techno centric approaches to design that requires a deeper rethinking of design applications where race is an important matter of consideration.

Therefore, cybernetics becomes crucial for making socially and politically responsive design decisions that enables inclusive control and communication systems in technology.

2.4.6 Afrofuturist Cities: Art, Architecture & Solar Energy

The work of Olalekani *Jeyifous Energy in 2050* (Fig 11) is identified as an energy vision for sustainable African cities for Nigeria through art which envisions a mostly off-grid city. It alludes to ''proposed energy prototypes that combine public and private initiatives by transforming infrastructures—recycling generators and appropriating high-tension cable masts as urban architecture'' (Jeyifous, ND: online). It also becomes clear that an Afrofuturist city values open green spaces as illustrated in figure 11. This illuminates a vision of sustainable African cities that might be achievable and therefore is progressive rather than being escapist. It also makes apparent the co-productive role of art and architecture in producing visions of sustainable African cities. As a practising artist trained as an architect Olalekani's work makes apparent the capabilities of creating consciousness to renewable



Figure 12 Olalekani Jeifous, Shanty-Mega Structures. Source: Vigilism

energy infrastructure through his depiction of solar PV infrastructure and the large screen illustrating an energy monitor with the amount of clean energy produced in future Lagos. Its dissemination is in the context of gallery spaces as the work was exhibited at the Museum of Modern Art (MoMa). However, it still exists in the realm of

the imagined as opposed to projects which exist in physical reality for the intended Nigerian communities.

Furthermore, his renderings of the Shanty-Mega structures (Fig 12) illustrate a somewhat dystopian image which highlights the reality of poverty facing Makoko communities. It does this with the employment of solar panels bringing the element of technology. It alludes to physical and ecological sustainability based on infrastructural focus and mega structures connoting high carrying capacity to accommodate dense populations. This also depicts vertical transport systems that address spatial limitations due to water bodies on surface. This shows that addressing environmental conditions in the context of the urban poor requires more than an environmental intervention towards mitigating climate change, by being engaged with the lives and livelihoods of people as posited by Pieterse (2011) for a relevant conception of Sustainability which this is considered with regards to energy, housing and transport.



Figure 13Makoko Floating School, Source: eficienciaenergtica

A project that goes beyond the imagined and are rather applied within architectural practise is Nigerian architect Kunlé Adeyemi's pilot project Makoko Floating School.

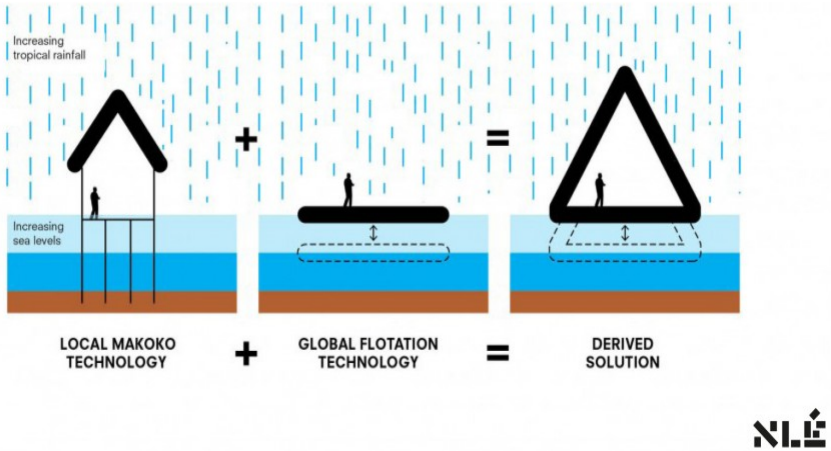


Figure 15Makoko Floating School Concepts. Source: Nle Works

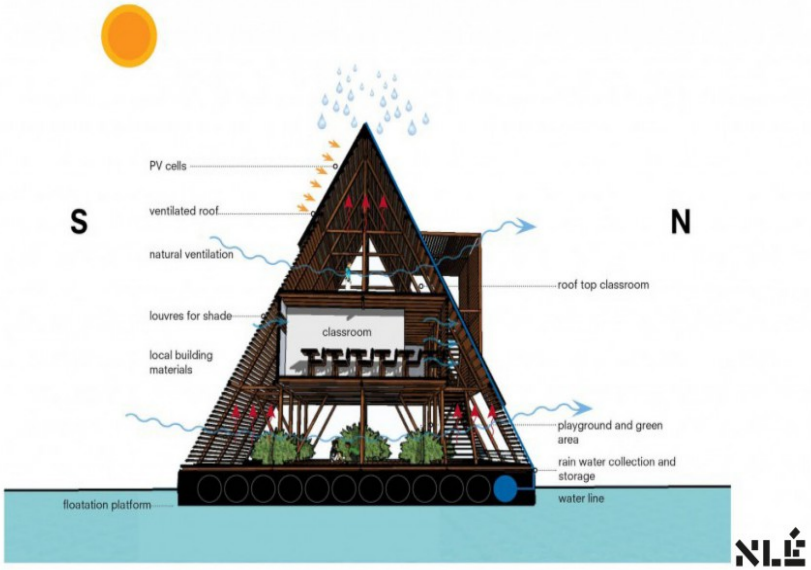


Figure 14 Makoko Floating School Structural Design, Source: Nle Works

This is a project Natalie-Claire (2016) identified as an Afrofuturist City embedded in a sustainability paradigm by its use of timber attributed as a sustainable material which I am uncertain whether materiality qualifies it as Afrofuturist as it seems more critical regionalist. Furthermore, what is distinct about it is its responsiveness to a local African community's social and physical needs ''in view of the impact of climate change and rapidly urbanizing African context" (NLÉ's, 2012). It depicts its regenerative capacity for sustainability, ecology, alternative building systems and urban water cultures for the local population of African coastal regions (ibid). It is a floating structure adaptive to tidal changes with variable water levels, which according to Boundaries (2013: 66)

makes it ''invulnerable to flooding and storm surges''. In addition, the specificity of its design utilizes renewable energy for energy, recycling organic waste and harvesting rainwater (ibid.). The combination of Makoko technology and floatation technology leads to the creation of a new solution as indicated in figure 14 and 15 with the use of eco-friendly material such as bamboo and wood sourced locally from a sawmill. The prototype is furthermore economical and fluid through the employment of a ''triangular frame that allows flexibility for customization and completion based on specific needs and capacities'' (ibid.). From an Afrofuturism perspective, the local community has adapted to its climatic conditions through the Makoko technology it has created. This illuminates the survival edict of African urban communities to adapt to their environments, which makes apparent how the community manifests its own utopias from the bottom up, and in this sense, utopias can be understood as identifying things that work and ensure survival (Womack, 2013). In this way NLÉ's practise builds on to what exists by employing other technologies to build something innovative. The use of locally sourced materials shows a critical regionalist approach and a spatial practise that is not overpowered by global capitalistic endeavours in the practise of architecture and urbanism in African cities in embodied ways. This is responsive to Eglash's critique (2002 cited in Anderson and Jones, 2015: ix) that Afrofuturism is developed to focus on black humanity and manifests ''true, vernacular reality''. In light of the argument that Afrofuturism draws ''too much on unexamined tropes, references to Egyptology", the Makoko floating school goes on to create architectural histories not related to Egyptology but contemporary cultures and further applies it into a scientific sphere in urban water cultures which incorporates vegetation in the design as biophilic design, although to the minimum.



Figure 16 Collapsed Makoko Floating School, Source: Pulse

However, the project came to a halt after three years of service, when a thunderstorm occurred resulting in the building collapsing, fortunately causing no fatalities (Fig 16). What the specific structural cause of this was remains unknown, however, it becomes important to learn lessons from the impact of this in order to make water structures safer. It is better to be an optimist than giving into dystopian realities, which is shown through a second



Figure 17 Makoko Floating School, Venice Biennale. Source: Dezeen

improved prototype which was produced at the Venice Biennale as illustrated in figure 17. In upholding the integrity of architectural practise, it is important to create buildings that are safe, especially in experimental projects. Whilst the initial structure was said to be unsafe by Nigerian officials whom opposed the structure, the reality of its collapse affirms that. However, such conflict

must be viewed as important for coproduction in the context of collaborative practise. It is in that context in which Afrofuturist Cities can be strengthened. However, the political context of a country must be engaged with, which one assumes and identifies NLÉ's project as possibly performing a role that the government, who is tasked with improving housing infrastructure in Nigeria for the underserved, was not being delivered adequately. The question of political sustainability becomes key in this case to understand the governing processes that affects decision making around how buildings are designed and structured. NLÉ's project depicts an applied Afrofuturist project with sustainability embedded in it through physicality, equity and responsiveness to the climatic context for African urban communities. However, this engagement is with architecture on bodies of water, while this research extends the enquiry to informal urban public spaces on land. This research project will therefore employ both the approach employed by Olalekani Jeyifous and Kunlé Adeyemi of creating visions (aesthetics of sustainability) through art, architecture and spatial practise. However, the conceptual design brief will be articulated through speculative fiction writing engaged with city inhabitants at the street level through co-creative processes in Dunusa.

2.5 Using Afrofuturism towards Aesthetics of Sustainable African Cities

Two parallels can be drawn between adaptation systems with respect to aesthetic perspectives for sustaining lives and livelihoods. The butterflies' ability to camouflage itself within the natural environment as illustrated in the above example is an adaptive strategy which enables it to hide from predators. Similarly, the coded quilts produced by African Americans by the likes of Harriet Tubman enabled slaves to follow maps that led them to freedom to ensure their survival. When we take the definition of

sustainability related to sustainable lives and livelihoods *(NSFWUS, 2000)* the assessment of quality of life is mediated through the aesthetic products produced. Both the butterfly's camouflage technique and maps produced as coded quilts helping slaves to navigate safe houses or landmarks acted as mechanisms ensuring survival. In this instance the cultural and ecological approach to sustainability is collapsed. This makes apparent how aesthetics therefore functions as an adaptation system as noted by Di Carlo (2016) and Hoser (2012) with regards to ensuring survival in their environments. Womack's (2013) understanding of Afrofuturism having the creative ability to manifest action that ensures survival is also apparent through the use of coded quilts discussed by Gaskins (2015) and therefore an adaptation method understood through cultural practise with regards to the environment. We are also able to see how the technocentric aesthetic approach to sustainability demonstrated through modalities of Baroque Supermanierism, Bio-Mimeticism, Analytic, Regulatory and Eclectic remain incorporeal expressions almost divorced from the interface of social and political sustainability necessary for sustaining lives and livelihoods advanced by Pieterse (2011). The analytic whilst able to illustrate social, urban and physical processes they do so for utilitarian ends for monitoring the performance of cities and fail to account for psychological and visceral impacts of sustainability on urban society. It also remains exclusive to those whom have access to view these platforms. In the research Afrofuturism will be used to suggest an inclusive design approach in relation to the design of solar technology to propose an aesthetics of sustainable African cities. This will be in context to spaces perceived as subjected to energy poverty. It will take precedence from Olalekani Jeyifous and Nle's projects that incorporate solar technology in the creation of sustainable architecture in an African context. Furthermore, the notion of aesthetics of sustainability, vision and urban language will be used interchangeably.

3 Methodology Cosmology

3.1Afrofuturism as Method

As a method Afrofuturism has been mostly notable as a way of reclaiming theorizing about the future (Nelson, 2002: 3 6). However, the most recent understanding of Afrofuturism as a method speculates on three spheres (David Deluliis and Jeff Lohr (2015: 178):

-To write a global history attentive to the African voice in global development
-To create an a-historical/a-global history unencumbered by the master/slave framework
-To introduce a horizon of future possibilities for a positive experience of blackness

The methodology this research employs is primarily informed by the conceptual approaches of Afrofuturism guided by the three above mentioned spheres of speculation. In addition, action research and critical spatial practise also inform the primary methodology.

Afrofuturism is used as an analytical tool for providing a status quo appraisal of particular environments to appreciate adaptive measures taken amongst urban African communities. This method is applied by writing about environments as they present themselves. In this way, the actions of a place are already making their own theories of sustainability based on identifying actions that sustain a particular community. When these actions are analysed through this bottom up perspective it implicitly counters other developmental futurisms by formalised institutions such as NGO's, government or private sector. It is also used as a conceptual tool for art making used in

the multiple studios as a tool of criticism and creation employing aesthetic dimensions of extraterrestiality, mutation and imagining a sonic process (Eshun, 2003) in the visions it constructs and enacts because aural design is important in the Afrofuturist context. The reason it is important to have an aural design in an Afrofuturist vision is based on the reality that many African histories have gone unseen and survive through oral history and sound. Therefore, aurality is a moral imperative to the creation of new worlds and futures especially those narratives that have been marginalized.

Critical Theory and Critical Spatial Practise

Furthermore, the use of critical spatial practise as a primary methodology will be used in terms of its objectives as a critique that manifests through spatial practice. This employs critical theories, which according to Raymond Guess in *The Idea of Critical Theory* are distinct from natural science theories because they are 'reflective' rather than 'objectifying', by taking account for their procedures and methods. According to Jane Rendell (2003: 23) they provide an opportunity to be reflective on existing conditions and imagining something different — ''to transform rather than describe''. Therefore, the use of critical spatial practise as conceptualized by Jane Rendell will be applied with an imperative on critique and transformation of cultural processes in the built environment through spatial practise.

Jane Rendell (ND, 1) described critical spatial practise as a tactic in the tradition of de Certeau, who works against the practices (strategies) which operate to maintain and reinforce existing social and spatial orders and distinguishing it from those practices (tactics) which seek to critique and question them. Rendell (ND, 3) favours the distinction, which she terms the latter (tactics) as critical

spatial practise – ''a term which serves to describe both everyday activities and creative practices which seek to resist the dominant social order of global corporate capitalism.'' The latter methodology will be employed but with the outlook to go beyond critiquing and questioning practices, but rather creating an approach that is collaborative and self-reflective. This is to fill a gap where there is no language or coded position to articulate an aesthetics of sustainable African cities. This is pursued through modes that seek to resist global corporate capitalism by focusing on a local orientation of the project that is site specific rather than globally oriented, but cosmologically oriented. However, it's important to recognize the ways in which the local is embedded in global processes of production, distribution and consumption where issues of sustainability are a matter of concern. One of the concern of central interest being inclusivity in green and smart city discourses as a sustainable city paradigm given their exclusiveness in urban African communities in Joburg inner city. The application of critical spatial practice is shown in the respective methodological approaches discussed in the Dunusa studio in chapter 5.

Dunusa Studio

The studio was undertaken in Dunusa as the specific site in Johannesburg that comprises the primary context for the research. The methods applied in this studio included fieldwork, participant observation, photography and critical spatial practise. The fieldwork entailed spending some time identifying solar power infrastructure, speaking to the local traders and asking questions about their businesses, the governance structures of the place, and structural & social issues they face in the area. This was to get a sense of what is working and what is not, including the understanding of the actions of the place. This is important as action research seeks to understand actions

rather than decipher who is acting. Therefore, I observed how the infrastructure interacts with the people, vice versa, and how things such as weather impacted the space, to understand how people behave to the climatic context in creative ways. It was important to decipher what is not working to identify the real dystopian element of the place, whilst using Afrofuturist tools for analysis to observe how these urban informal communities were adapting to things which are experienced as not working and those that are working. Ytasha Womack (2013) discusses Afrofuturism being an adaptive tool for creating alternatives to given situations through action. In this sense adaptation tools can be viewed as the creative ability to manifest action for survival, and in that sense a utopian process, that as a method in this research, helps to identify areas of concern for designing the interventions which try to answer what the aesthetics of sustainable African cities are. This includes exploring what collaborative practices could serve as mechanisms for addressing sustainable African cities, as opposed to the technocratic approach using solar technology as a medium. This process seeks to understand how this informs the design process. The photography was used to also document activities in the place without photographing the direct facial identity of inhabitants to respect the identities of passers-by and traders. This also documented the infrastructure in the place at various times of the day to observe how it behaved and to affirm statements made by the local people. Furthermore, in this process I worked to be observant, reflective and critical of practices in action. The conceptual tools of Afrofuturism that encapsulates creation and criticism (Eshun, 2003) enabled the use of Afrofuturism as a framework to be critiqued, and therefore manifest new paradigms, such as Bantutopianism. This is illustrated through the interventions, as they help to justify the shift from Afrofuturism to Bantutopian Cities.

This is explored in greater detail in chapter 6 through speculative fiction piece by narrating Bantutopia using Afrofuturism as method of speculation. The work speaks to what the possibilities for an aesthetics of sustainable African cities could be in true lived black vernacular reality as an ecocriticism around solar technology and the industry. This is similar to an architecture design thesis in which students may design a building, I have instead presented a speculative piece through literary form. This is fully justifiable given the acceptance of the design thesis and its speculative architecuture. The design thesis for MArch (Prof.) is equally speculative and in fact science fiction because the clients, budget and socio-political context in the inception of these projects is fictional. They are necessarily speculative and utopian because they need to give us an alternative world. I choose photography, language and also invent words (neologisms) to present this alternative world as a design approach which employs Afrofuturism through communication and speculative narrative.

Afrofuturism through Communicology and Speculative Discourse

David DeIluliis and Jeff Lohr (2015: 167) assert that 'Afrofuturism responds to a society in which the black body is invisible' and secondly recognizes how the human body is overlooked by the world wide web (Web 2.0) through 'the machines they sit behind'. Therefore, the development of Afrofuturism into Afrofuturism 2.0 becomes 'a doubly dehumanizing concept' (ibid.) where the black body in certain contexts is both invisible in real time and in virtual time. This reduces the black body to be disembodied which DeIluliis and Lohr (ibid.) argue handicaps 'Afrofuturist interpretation and inquiry'.

However, the human science of communicology[3] combats these dehumanizing tendencies by ''approaching the speculative discourse of Afrofuturism as an embodied event that foregrounds the experience of invisibility and, second, inviting Afrofuturism into a methodologically-rigorous discourse that preserves—and privileges—its experiential roots'' (ibid.). This enables Afrofuturism to rewrite ''discursive narratives of inhumane contexts through critical examination of cultural artifacts of the black experience'' (DeLuliis and Lohr, 2015: 168).

Therefore, this helps to formulate a method of using Afrofuturism to create a new urban language (aesthetics) through communicology to articulate invisibility of subjects in urban African contexts through critical examination of lived experienced. In this context we then have to conceive of the city as an informational system as mentioned by Gausa (2010: 10) in the literature review, in which to use to create an aesthetics of sustainable African cities.

In addition, the experiments I conduct are open ended and go to Dunusa to use my body as a sensing tool to use my subjectivity as a supplement of the ''objective knowledge'' of the place. The open-ended experiments are a form of way finding. The world I propose does not exist, so I am co-collaborating with the place itself which I am embedded in using my subjectivity as a conduit.

[3] Communicology is a science of human communication that ''refocuses attention on the performance and practise of persons communicating'' (Lanigan, 1992: 2). It seeks to understand human discourse and interaction as embodied practices that situate people within their worlds by revealing oneself through expression of cultural codes (i.e., race, gender, and sexuality) that in turn shape and constitute an expressive body. As method it explicates human consciousness and behavioural embodiment discourse within global culture which allows for the study of Afrofuturism through speculative fiction and the experience of blackness from Africans and the African diaspora. Communicology shares with Africological theory its attention to the inventive power of language to define ''what it means to be human in inhumane contexts'' (Woodyard 2003: 133). For communicology, inhumane contexts reduce the experience of communication to information transmission.



4DUNUSA

Figure 18 Dunusa Trading Shelter, Photograph by Michelle Mlati

Thousands of strides exchange turns as humans of Joburg hustle and bustle in a rhizomatic pattern emanating from the MTN Taxi rank, some from the Noord, some from Park station and some from spaces unknown passing by or gathering in a bending over contest in the pursuit of retail satisfaction converting the non-place into a place.

4.1 Trading in Dunusa

The main site of this research project is located in a densely populated area of the Johannesburg Central Business District (CBD) called Dunusa. It is also commonly known as 'The Piles' according to Mamokete Matjomane, (2018: 143). *Dunusa* according to Zilungile Mnisi (2015) means to bend over with your bottom in the air in Zulu and is called such because it is an outdoor space where informal traders sell piles of second hand clothing that you have to literally bend over to find the winning garment. Hence, this idea of bending over to find something is not only poetic but practical to inspiring an embodied persuasion. Secondly, the fact that thousands if not tens of thousands of second hand clothing are available for sale makes apparent that there is a major culture of recycling consumable goods happening in an African city that you don't often see in the mainstream media still offering a one of a kind buy. This marks an important practice of sustainability within an African city, that there is a huge culture of recycling textiles. Instead of being dumped in waste dumps, is being resold and reused. Therefore, this is indicative of an underground culture that depicts sustainable African cities in practice. According to informants that spoke to the Mail & Guardian (2016) the De Villiers street on which Dunusa is situated offers textiles at affordable prices to communities whom cannot afford retail prices. However, it also attracts young fashionistas and frugal students with limited budgets like my peers and myself. Therefore, trading second hand clothing characterizes one of the primary activities in this particular urban African community.

4.2 Dunusa and Embodiment

Dunusa is certainly not one of those places global positioning systems has adapted into its cartographic language nor google maps and other mapping technologies alike, making apparent it does not exist as a place in the domain of the virtual geopolitical spectra of things. This signifies not just the lack of representation of 'informal' economies of African cities in virtual space but the lack of access for some, to such virtual spaces resulting in them remaining invisible. It exists in the realm of ''vernacular cartography'' at the street level that being an aural & haptic manifestation from the subjectivities that inhabit these spaces to which is known through embodied encounter and experience of bending over and perking your buttocks to thrift through towers of the second-hand clothing market. That was how I first encountered it prior to being told the name of the place by my studio mates. Hence, the activity deciphers the name Dunusa. What can be understood then is that ''the objects that populate our world greet us with their meaningful affordances as we engage them in activity'' (Johnson, 2015: 36). It affirms Mbembe's (2008: 60) analysis of Johannesburg that ''mostly, the appropriation of the city space is tactile, allegorical, and onomatopoeic'' (Mbembe, 2008: 60).

This account of embodied meaning can further be understood in J.J. Gibson's notion of perceptual ''affordances'' where Gibson cited in (ibid) ''saw that objects are and mean the possibilities for experience, both actual and simulated, that they afford us. What any object affords is the result of the nature of our bodies and brains—our perceptual apparatus, or neural binding capacities, our affective responses, our motor programs—as they interactively engage patterns and structures of our environments'' (ibid.). So as human beings with fingers, hands, and arms, Mark Johnson (ibid.) notes ''a ceramic

cup affords pick-up-ability'' whilst it might afford ''climb-up-ability to an ant''. Similarly, as humans with spines a pile of clothing on a low-lying surface may afford bend-down-ability. This encapsulates how our meaning is relative to our modes of interaction in relation to our characteristics as organisms and the objective characteristics of our environments. What can then be concluded is that embodiment plays an important role in our urban practices of placemaking through the forms afforded by the mobile infrastructures in Dunusa which in itself creates an urban language. Furthermore, for AbdouMaliq Simone (2008: 68) the activities of people in cities constitute infrastructure as opposed to the understanding of infrastructure in physical terms ''as reticulated systems of highways, pipes, wires, or cables''. This is particularly contextualized through the last two decades which ''have depended on the ability of residents to engage complex combinations of objects, spaces, people, and practices'' which becomes ''an infrastructure—a platform providing for and reproducing life in the city'' (ibid.). In Dunusa, people's activities also play that infrastructural role enabling mobility of the goods that traders sell using their bodies as a locus of display. When we take account of Simone's (2008) conceptualization of people's activities as infrastructure, Adriana Allen's (2002) conception of physical sustainability pertaining to the ability of urban built environments and techno-structures for maintaining human life and productive activities fails to account for the active human body as a mode of infrastructure that sustains itself. Therefore, it is important we conceive of the active human body as a biophysical infrastructure in articulating physical sustainability for the purposes of aesthetic creation where quality of life and livelihood is assessed. From this example we can already see that the human body is excluded from the conception of the aesthetics of sustainability discussed in the literature review. This is especially evident in the case of the Hyper-

Technologic aesthetic that deals with aspects of physical sustainability of technology. The human, technology and urban interface is unaccounted for which is the weakness of the current discourse on the aesthetics of sustainability which in practise formulates the physical and social dimensions of sustainability as separate. Within Simone's (2008) conception of human activities as infrastructure we therefore can conceive of the physical and social dimensions of sustainability as intergrated in Dunusa. This again advances Di Carlo's (2016) definition of the aesthetics of sustainability where subjective and collective forms of aesthetic creation cannot be separated from the socius and environment in its built or natural form.

4.3 Infrastructure and Display Taxonomies

Modes of display in Dunusa trading stalls is characterized by gazebo structures that are organized in a vertical rhythmic pattern along the stretch of De Villiers Street. These are covered on rainy days and very hot days whilst they are left uncovered on temperate days as illustrated in figure 19 and 20. Matjomane's (2018: 149) findings also affirms this gazebo response to weather changes. This constant change in infrastructure to the weather makes apparent a type of architecture that is impermanent. What is then argued is that this ephemerality makes apparent the existence of architecture responsive to climate variation. This is responsive to Maape's (2016: 234) argument that ''most importantly is that an architecture that can readily deal with issues of climate change and sustainability has to be an architecture of impermanence'' which Dunusa as a place affirms this to a degree. In the case of traditional architecture this could be viewed as ''counter-intuitive'' due to the conception of architecture as solid making it unresponsive to time and change (ibid).

From an economic point of view, rainfall has not prevented traders from continuing with business as usual

as indicated in figure 19 & 20 where the researcher observed the traders to be setting up from 5:30am on three consecutive days where heavy rains were experienced. However, a Street Trader (2017) cited in Matjomane's (2018: 150) research mentioned ''most traders have gazebos to erect when it is raining, or the sun is blazing''. These structures are where clothing merchandise is kept under as a browsing area for customers.

From a sustainability point of view, these structures counter Fletcher and Tham's (2014 cited in Clammer, 2015: 56) critique that ''fashion systems, as they are integrated into other cultural systems of display and consumption, are often not very sustainable at all, but involve frequent discarding or destruction of perfectly wearable items…'' which is more applicable to the mega mall culture. Dunusa alternates the fashion system firstly based on its low ecological footprint based on the fact that the stalls do not sit in a building requiring less embodied energy. The reliance on natural lighting also implies there is no reliance on fossil-fuel based energy. However, whilst some stalls are placed optimally to receive day lighting, stalls under the permanent shaded shelter as illustrated in the cover image (fig 18) of this chapter are not, due to the type of shading preventing natural lighting from entering. In addition, there are solar powered lights installed under the shelter which are broken according to traders operating under it. However, there are tall street lights that can be observed along the stretch as indicated in figure 21 above the gazebos where one light is on during the day. It makes apparent a waste of electricity due to inadequate management of city infrastructure. Therefore, this brings to question the physical and political sustainability aspects pertaining to the upkeep of physical infrastructure and its governance based on the apparent lack of smart and efficient control systems in the engineering of streetlights responsive to daylighting and how the City manages its infrastructure.



Figure 19 Dunusa Traders with Uncovered Gazebos, Photograph by Michelle Mlati



Figure 20 Dunusa traders setting up on a rainy day



Figure 22Steel baskets for placing clothing stock



Figure 21Dunusa trader setting up stall

Below the gazebos are square steel baskets (Fig 21) approximately two by two metres which traders assemble daily as illustrated in figure 22. When most traders have erected their gazebos it often gets very crowded and when it rains this makes mobility more difficult for pedestrians. According to a trader this is due to the drainage system being outdated and resulting in flooding when it is raining which slows down business (Matjomane, 2018: 150). Another trader mentioned, ''when it rains, we put up our tents and business becomes slow'' (ibid.). When the gazebos are closed some traders perceived this as preventing passing by traffic from being able to see what is on display due to both weather conditions and the crowding effect. This makes apparent how the heaps of clothing themselves play the role of advertising accompanied by the trader's voices. There is

a continuous outburst of traders loudly exclaiming ''underwear, bra, underwear, bra'', ''jackets, jackets, jackets'', ''ladies skirts, skirts,''etc. This mode of advertising characterizes Dunusa as having a strong aural identity and culture due to the reliance of the trader's voice to sell. The aural culture was further made apparent by the South African artist Sho Madjozi's *Dumi Hi Phone* song loudly playing in the background from one of the shops. From a sustainability point of view this mode of advertising opposes the endless consumption of information in print media used to seduce the masses to the latest trends as asserted by Clammer (2015: 56). However, there is still minimal use of cardboard boxes marked with prices which appear to be reused as they are attached on the gazebos and appear worn out as shown in figure 19.

4.4 Aesthetics, Sustainability and Seduction

With regards to the links between seduction and sustainability, Di Carlo (2016) mentioned that the problem with sustainability was that it lacked seduction. However, this contradicts Clammer's (2014) view that asserts that print media as a form of seducing masses to the latest trends in fashion results in unsustainable fashion systems. In the case of Dunusa, seduction is created visually by the clothing itself as the object of desire as opposed to an image of it distributed through print. Consumers are also seduced aurally through the trader's voices used to draw crowds towards their stalls. What is furthermore significant is that crowds are drawn in to the trade of recycled clothing seduced by the aesthetics of the activities of the human body creating a relational aesthetics of sustainability both physically and socially. This results in an almost zero carbon method of advertising with a low ecological footprint.

Relational aesthetics was coined by the art critic, curator and author Nicolas Bourriaud in 1996. This defined an art practice characterized as participatory, open ended and inclusive which are able to enhance'' and intensify human relations and their social context by strengthening social connections rather than through a detached independent and private visual experience'' (Di Carlo, 2014: 14). Its roots stem from world-wide urban culture and engages humanity in significant social exchanges which produce intersubjective encounters. According to Karl Marx this aesthetics is representative of a social interstice used ''to describe trading communities that elude the capitalistic economic context by being removed from the law of profit […]. Within this context relational aesthetics is intrinsic in the idea of connection based on the exchange of information with no economic obligations. It posits dialogue ''as the actual origin of the image-making process and the exchange of information, the intersubjectivity, as the aesthetic experience'' (Di, Carlo, 2016: 15). As a result, the aesthetics of sustainability in Dunusa are apparent through dialogue formed between a trader's voice creating a link between recycled clothing as an image itself and the source of the voice itself as an aesthetic experience created through sound which forms social bonds. The apparent sonic process audible in the aesthetics of Dunusa's soundscape makes apparent an important element of Afrofuturist design which Eshun (2003) mentions includes the sonic. This aural dimension will therefore have to be an important consideration in the design process.

4.5 Display of Solar Systems

Within the Dunusa area there are two modes of displaying solar technology. The first kind are those sold in electronic stores. These are characterized by free standing solar panels placed on the floor vertically alongside other electronics such as fans, heaters and LCD screens (fig 23).

This includes a red miniature sized solar powered radio and lights stacked in little boxes on shelves amongst other products such as kettles, toasters and hairdryers (fig 24).



Figure 23Solar panels in Dunusa area electronics store



Figure 24Solar powered products in electronic store

Within the second type these are physically embedded in the urban infrastructure above the permanent trading shelter (fig 25). The difference between the two modes are that the first group are a moveable consumable product that can be used both in the interior and exterior of buildings and has warm colours in the case of the radio, whereas the second group exists as an immoveable communal good to be used collectively on the exterior of buildings. This has an uncaptivating dull grey colour which does not easily attract the eye and therefore not seductive.

However, the solar panels embedded in city infrastructure is covered in barb wire to prevent it from theft. This is problematic because from an aesthetic view point rather than being associated with beauty connotes to pain and design approach associated with violence. This creates a challenge to embed an Afrofuturism speculative



Figure 25 Solar panel covered in barbed wire on Dunusa trading shelter

imperative as a method that aims to create a positive experience of blackness within the urban environment given the majority of inhabitants being black people. The infrastructure potentially vilifies its user from an aesthetic perspective. Whilst the reality of crime in the inner city of Johannesburg must be acknowledged the resort to barb wire is a lazy design approach. This aesthetic is characteristic of the regulatory aesthetic Di Carlo (2016) discussed which she mentioned resulted in a boring aesthetic.

These panels were mentioned to not be working according to a few women trading under the shelter which was dark as we spoke whilst some traders had no idea that they were solar panels. It becomes apparent that technical, social and political aspects with regards to the design, installation and maintenance of solar urban infrastructure is misaligned hindering its physical and social sustainability in that regard and inhibiting visual comfort for the traders and customers due to the dark atmosphere created by the shelter.



Figure 26 Traders under trading shelter with dysfunctional solar panel not improving lighting conditions

However, in practise the lack of adequate lighting has not stopped traders from continuing business as usual despite the physical infrastructure's unsustainability. This shows how resilient the communities are towards sustaining their livelihoods even when their visual comfort is compromised as the aesthetic dimension of sustainability. Within Afrofuturist discourse this affirms the creative ability to manifest action for survival (Womack, 2013).

It becomes clear aspects of political, socio-cultural, and physical sustainability have been neglected in Dunusa. The political aspects ignored are those pertaining to the governing processes that do not deeply consider the design and installation of solar technology in urban environments for African urban communities. This also includes the lack of maintenance of these energy infrastructures by the City.

From a social point of view, traders have mentioned that there is a lot of pickpocketing customers are subjected to. Whilst the traders have independently employed security to ensure safety, this still remains a problem. This might be due to crowding and lack of lighting under the permanent shaded shelter. It is possible the lack of good lighting under these exacerbates crime activities. Therefore, certain policies would need to be put in place to ensure social sustainability within the environment. Whilst there are metro police who patrol the area, on a different occasion I witnessed a police officer kick a trader's bananas on the floor which raises questionable relationship between the police and traders.

From a physical sustainability point of view this necessitates more inventive and inclusive technical solutions to the design of culturally responsive solar infrastructure. Special attention needs to be directed to creating beautiful environments, to work towards healing

our landscape to inspire more positive attitudes towards the environment rather than assuming a vilifying design approach as an initial approach. This must seriously consider the human -technology-urban interface through deep design engagement.

4.6 Findings

Dunusa as a place is primarily characterized by trading as the practices of this urban African community as a relational aesthetics. The aesthetics of sustainability with regards to solar technology encompass the regulatory (Di Carlo, 2016) aesthetic which maintains a boring aesthetic playing the role of the police such as barb wire to prevent its theft. However, through an Afrofuturism perspective the goal is to suggest an inclusive design approach of solar technology that aims to encourage a positive experience of blackness with respect to the malfunctioing infrastructure. The aesthetic approaches that connote to a positive experience of the environment are those related to music and therefore a strong aesthetic approach is identified in Dunusa's sonic identity which will be important in the interventions and final conceptual design in the next two chapters. The solar powered radio and lights as indicated in the first typology of solar aesthetics in Dunusa therefore presents design elements of warm colours, sound, light and solar technology to consider in the design of urban solar infrastructure as the practices and aesthetics identified in the space.

We discovered that the status quo of sustainability discourse has been unable to deal with contexts such as Dunusa. It is unable to properly address basic things that are often highlighted in the brown agenda (Simon, 2016) such as infrastructural upgrading in order to make provision of access to adequate shelter and basic services such as water and electricity in praxis. Furthermore,

existing institutional practices and regulatory frameworks for sustainable built environments advanced by the Green Building Council and energy efficiency building codes is exclusive of informal contexts such as those in Dunusa. This is by mere fact there is no account of how those operating inbetween buildings should be accounted for in terms of infrastructural and energy requirements. In addition the frameworks of GBCSA make no aesthetic considerations for how solar tech should be engaged with in spatial contexts of those such as Dunusa to understand the phenomenological variations to how African urban communities can be included in green-smart discourses, which they are currently meaningfully excluded. Furthermore, these tools have straightjacketed themselves to buildings as a lab of experimentation. Therefore, this systemic exclusion results in the informal self-organization of inhabitants that have adapted infrastructures to their own needs to support their livelihoods, which this understanding of infrastructure is analogized to the activities of the human body as a locus where livelihood is determined as insinuated by Simone (2008). Through an Afrofuturism perspective this adaptability as reiterated by Womack (2013) makes apparent the creative ability to manifest action important for survival. This self-organization results in urban African communities setting up their own social and economic structures whilst manifesting their own cultures of sustainability on the premise of the ephemeral infrastructures constituting an architecture that allows for flux and change to the micro climatic context which this adaptability Maape (2016) has described constitutes a sustainable architecture. In this way urban African communities already pursue sustainable practices that have a lighter impact on the environment as opposed to that of neighbouring buildings, which, however, impacts their quality of life and livelihoods given the structures incapacity to properly deal with thunderstorms causing flooding of the space due to poor drainage and very hot

days to prevent the urban heat island effect. However, their resilience has been made apparent by how traders are able to quickly adapt to rainstorms and very hot days through the covering of gazebos with additional plastics and quick uncovering of the gazebo when weather conditions are temperate. The aesthetic of the gazebo therefore is central to the embodied culture of the place in relation to the climatic context in understanding the relational aesthetic between informal traders, the climate and built environment.

5 AFROFUTURIST TO BANTUTOPIAN

In the blazing afternoon of the first day of spring the spacecraft landed at the approximate coordinates of 26°11'56.1"S 28°02'42.1"E otherwise known to Earthly inhabitants as the intersection of 55 De Villiers and Wanderers or ''the piles'' and primarily as Dunusa in black vernacular expression

5.1 Introduction

In response to creating a new urban language, this chapter responds to sub question two to understand how Afrofuturism as a speculative discourse and communication tool can be used to create an inclusive design approach to articulating an aesthetics of sustainability collaboratively with urban society. It discusses the first intervention initiated in Dunusa, namely, *Ama Blue Blocks* (2017) by firstly providing the rationale for its design and using participant observation to observe the actions it induces in both the participant's and from the researcher's embodied experience. It will then discuss the second intervention which was an experiment called *Inclusive Green-Smart Cities?* (2017) which used the method of critical spatial practise through guerrilla gardening in order to critique and question the reality of exclusive green-smart infrastructure and vegetation in Dunusa through visual communication in spatial production. This is to explore the aesthetics of sustainability through the use of solar powered art and nature to explore green-smart city integration amongst urban African communities collaboratively. The data gathered from these experiences will then be used to answer how collaborative practices affirm an inclusive mechanism for co-producing a new urban language for solar technology in the context of urban African communities. In addition, it will make apparent the relational aesthetics it induces amongst humans and non-humans based on how people interact with these artefacts in terms of deciphering an ethics of relationality to articulate notions of Afrofuturist Cities and Bantutopianism.



Figure 27 Ama Blue Blocks Intervention, Photograph by Vipua Rukambe

5.2 *Ama Blue Blocks* as Informal Solar ''Trading''

The name of the first intervention was titled *Ama Blue Blocks* (2017) and is named such to adapt words such as 'solar photovoltaic panels' and 'sustainability' into street jargon to experiment with new ways of changing the climate change narrative not just through language but embedded in more embodied approaches, as opposed to cognition to work against the traditions of Cartesian dualism mentality that posit the mind to be separate from the body. The intervention attempted to create a new reality of a new meaning related to solar to create new associations as the original intention of this experiment. Its design comprised of an array of monocrystalline solar photovoltaic cells, three solar sculptures I modelled in the Joburg studio, a solar powered radio and speaker including a collection of identical miniature mirrors placed on a crate the same way traders in the space do so as illustrated in figure 27. The importance of using PV cells was to help to disassociate the technology as a finished product to help dissolve that association and induce creative possibilities of its aesthetics by participants for ritual making to produce new meanings. The use of the solar sculptures was to also disrupt the aesthetics of the place to draw attention to it and encourage other aesthetic possibilities, however, the experiment also remained open ended. The significance of using solar powered sound systems was linked to music played from various stalls being characteristic of the place. The mirrors functioned as a temporal marker of the present. In addition, the mirrors play the role of a utopia as a placeless place. This can be understood through Foucault's (1967: 4) discussion of utopias and heterotopias regarding how ''in the mirror, I see myself there where I am not, a sort of shadow that gives my own visibility to myself, that enables me to see myself there

where I am absent: such is the utopia of the mirror.'' In addition, *Ama Blue Blocks* is also the creation of a heterotopia functioning as an ''other'' space relative to the status quo of existing spaces in Dunusa as illustrated in chapter 4. It is a heterotopia ''in so far as the mirror does exist in reality, where it exerts a sort of counteraction on the position that I occupy'' (ibid.) enabling one to identify their absence from the place. ''The mirror functions as a heterotopia in this respect: it makes this place that I occupy at the moment when I look at myself in the glass at once absolutely real, connected with all the space that surrounds it, and absolutely unreal, since in order to be perceived it has to pass through this virtual point which is over there'' (ibid.). This sort of heterotopia might be understood ''as a sort of simultaneously mythic and real contestation of the space in which we live'' (ibid.).

Prior to landing at the intervention site on the intersection of De Villiers and Wanderers at about 2pm, as we left the Joburg Art Gallery (JAG) into Kerk street heads were already turning and drastically staring at the *FRAGILE* labelled crate. As we were crossing the pedestrian crossing by a traffic light, a man remarked in Zulu to the researcher's assistant: you're walking so calmly, it could be your child in that crate which was a rather morbid remark to make giving it the analogy of a coffin. Furthermore, as we continued to walk a man grabbed my buttocks and my immediate response resulted in me yelling at him as my impulsive physical response was to smack him but due to carrying the crate I could not react that way, so we continued to rocket through the crowd as fast as we could. Once the crate was plotted on the concrete ground before I could even open it to offload the creatures from another planet, bodies were bending over, peeking inside the crate whilst bums were perking in the air which in itself created a spectacle setting the

mood for people to *dunusa*. Based on the attention the crate created this can be attributed to its seductive qualities which Di Carlo (2017) and Hosey (2012) affirmed is what sustainability lacks. Therefore, the seducing power of the crate already affirms the aesthetics of sustainable African cities embedded in objects that create curiosity. A female voice inquisitively questioned in Setswana:

''*Ke eng se?*'' (What is this?)

A moment of silence persisted with the city soundscape projecting as background noise whilst I was caught in the moment of unpacking and priming myself to get into character for this new reality I was supposedly creating. This was whilst crowded by peeping heads, which made me slightly nervous as I was catching my breath from carrying the crate with my assistant from JAG. Before, I could even respond in the midst of placing PV cells on top of the crate another head peeping down remarked:



Figure 28 Man insisting to purchase solar powered radio. Photograph by Vipua Rukambe

''Ke Solar!'' (It's Solar!).

The answer seemed to satisfy the crowd, and everyone averted back into their respective journeys in the pedestrian rush of month end craze. The woman's response made apparent that there was already knowledge of renewable energy technology as demonstrated by the PV cell as medium, which signals that the PV cell on its own has the ability to create that consciousness of renewable energy in its non-functional form in 'technical' terms. Furthermore, my verbal silence in this initial stage enabled passers-by to embody the object through sight, before naming it, which enabled a reciprocal form of knowledge sharing—from object, sight and dialogue. In this instance co-creation occurs through my verbal silence allowing the intervention to speak itself as a visual communication tool and the city inhabitants reciprocate through dialogue. City inhabitants themselves play the role of articulating this knowledge to other people. This mode of dissemination of the technology certainly did not project a didactic methodology, however, the actions of inhabitants were responsive to making apparent how city inhabitants themselves play a central role in the diffusion of information of such technologies as a collaborative practise. This depicts the information database characteristic of smart cities as being embedded in human activities as opposed to mechanical infrastructure solely signalling street smarts in action. Within the literature on smart cities, this brings the human perspective defining city smartness through smart citizens being central to information sharing which goes beyond ICT based measures of city smartness which Chan and Marafa (2018: 4-5) argued that key aspects of the smart city encompass human and social capital in this paradigm including ''leadership, inter- and intra-generational interaction and human-technology urban integration''. It affirms the shift from city smartness being solely defined through infrastructure but rather by people. Therefore, this responds to the second sub question of how co-creative collaborations and processes serve as the

mechanics of a culturally guided diffusion practise that creates an urban language where vernacular is integrated into the technology's name affirmed by the words ''ke solar''. From an aesthetic point of view this entails a relational aesthetic which the event creates a relationship between objects and people through knowledge sharing. The aesthetic product is found within the dialogue which is emphasised through enunciation. This is affirmed by the bond Guattari (cited in Di Carlo, 2016: 11) identified between ''the concept of Ecology and the enunciation of subjectivity'' which for him is synonymous ''of both a form of knowledge and a tool for aesthetic creation''. This produces a type of subjectivity related to solar energy and that in itself is an aesthetic of sustainability experienced through individual and collective subjectivity when we take Di Carlo's (2016) definition of aesthetics of sustainability, where the socius and environment are inseparable in how we create meaning individually and collectively. Here, technology does not come fully formed as a product as the basis of knowledge to be subscribed to through monetary form as Gbadamosi (2015: 187) has posited in the interpretation of technology. In the intervention elements of the technology lead to the interpretation of it in its fragmented form as consciousness raising agent of solar power at the street level.

A man in a purple shirt (fig 28) approached the intervention space enthusiastically wanting to know what this was, whilst lifting the rectangular speaker towards his gaze. I explained to him it's a solar powered speaker that is powered by the sun, and so it's free electricity to play music. He asked how much I was selling it for and I replied that I wasn't selling it and wanted to show him that it is free electricity and that it exists. He then asked where he could buy it from and I told him he would have to go purchase it online from Bid or Buy or Builders Warehouse if he wanted lights. He replied that he doesn't know where

it is and I replied that there are many in Johannesburg. The man wearing a MTN bib sitting on top of a yellow bollard (fig 28) included himself into the conversation remarking:

''You must not show people, you must sell!'' Then the man in the purple top insisted he wants to buy the speaker. I asked, ''Why must everything that's here be sold?'' He responded ''if you show me something and I like it then I want to buy.''

The MTN man responsively ranted that if ''some people see the speaker and they like it and they don't know how to go online and that some people might not know where that shop is because they're staying in Thembisa or going to Durban… they might be running for the train and they like the speaker and they want to buy so they can play music.'' This resulted in him giving me tips on how to advertise my ''products'' by advocating I should bring four speakers next time. Just like him many other participants and other traders also expressed their interest to purchase this often holding the speaker towards their ear (fig 29).



Figure 29 Traders lifting speaker towards their ear

By not selling the speaker, the creation of a heterotopia emerges. This is apparent through how the intervention dislodges the usual schema from the conventional status quo framework to give the whole activity a new meaning through this other space.

The objects become a ritual artefact because they resolve the current reality by bringing objects that are yet to be given meaning. The insistence of the MTN man for me to sell these illuminates his discomfort by his forceful pleading for me to stay loyal to the usual practise which depicts him being discomforted by the unusual. This insistence also makes apparent how there is an attempt to try put the objects in an existing schematic framework here being the commodification of goods. This dislodging creates a liminal space as a space for potential meaning making where now people are faced with the reality that you can't buy the objects. This pleading to relate the objects to a familiar practise affirms the heterotopia created ''as a sort of simultaneously mythic and real contestation of the space in which we live'' (Foucault, 1967: 4). From an aesthetic point of view the object is desired but the non-commercial practise in which is embedded is rejected. In this context the aesthetics of sustainability are created by the relationship between people and objects where their sustenance is implicated as a commodity whilst it also exists as an informational process of creating subjectivities around solar technologies adapted in vernacular English through the saying ''Ke Solar''.



Figure 30 Couple captivated by Ama blue blocks intervention

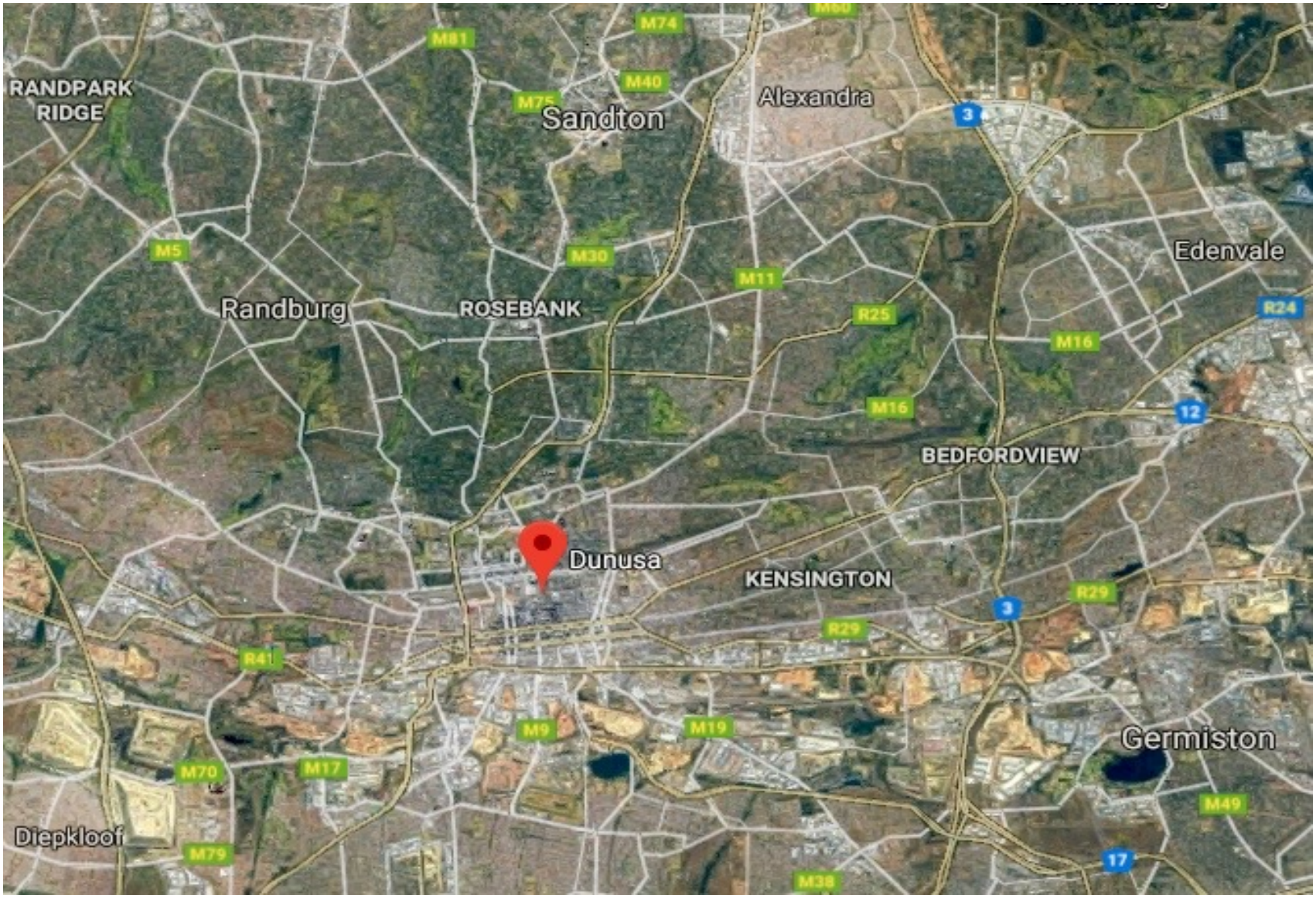


Figure 31 Google map illustrating distinction between green Northern suburbs of Joburg to brown/concrete of inner city and Alexandra township

5.3 Guerrilla Gardening Dunusa as spatial critique and Green-Smart City integration

Inclusive Green-Smart Cities? (2017) is an intervention as both artistic and spatial practise which applied the methodological approach of critical spatial practise understood as ''a method of criticism to be a form of practise, one that is critical and spatial'' (Rendell, 2006: 193). Guerrilla gardening as critique and urban gardening as green-smart city integration simultaneously affirm Afrofuturism's imperative of creation and criticism becoming synonymous (Eshun, 2003).

The intervention takes its precedent from Joseph Beuys tree planting and the Labofii collective's art and activism approach of radical theatre, performance and civil disobedience in which they protested ''polluting instruments of capital with play and guerrilla gardening''… ''digging up the asphalt to plant flowers, and setting up sandboxes and bouncy castles in the middle of the capital's busy intersections'' in London (Demos, 2016: 125).

However, *Inclusive Green-Smart Cities?* (2017) firstly questioned what the notion of green and smart cities being exclusive means as a spatial and embodied phenomenon. It critiqued the reality that green spaces are plenty in the affluent Johannesburg suburbs of the North as illustrated in figure 31 at the macro scale whilst townships, informal settlements, and the inner city are characterized by brown spaces and concrete. Furthermore, it was engaging with that notion of green cities being exclusive to green leafy suburbs and smart cities not inclusive of urban informal economies by virtue of there being hardly any vegetation in certain spaces such as Dunusa as the green city component. This was also in context to solar powered infrastructure meant to power lighting under trading sheds being broken and

under maintained if at all whilst some traders have limited knowledge of solar technology which made apparent a deficit in smart city infrastructure. This made apparent how notions of green and smart cities in the reality of inner city Johannesburg in informal spaces are not inclusive of the activities of urban African communities in meaningful ways. The smart cities dimension existed as merely surveillance cameras, broken solar panels, and heavy policing by officers, some of whom instead of protecting traders' activities exploit their stock made apparent by an officer whom kicked a banana stall onto the road as observed during the *Ama Blue Blocks* (2017) intervention. *Inclusive Green-Smart Cities?* (2017) responded to this terrestrial reality of a deficit of green space in Dunusa, which is made evident by tools such as google maps (figure 31) and experience of the city at the street level. The critical and spatial response to the exclusivity of green space was realized through guerrilla gardening of an empty planter. Whilst the planting of a solar powered artwork in the same planter was a critical and spatial response to the deficit and inaccessibility of smart infrastructure in Dunusa. However, this also explored embodied approaches for creating a culture of sustainability with communities by exploring to what extent collaborative practise serves as the mechanics of such culturally guided diffusion processes to create a new urban language. Furthermore together, the plant and solar powered artwork proposes a relative dissolution between green and smart city infrastructure to address city making in less dualistic approaches.

More specifically the map in figure 31 makes apparent how the Northern suburbs of Johannesburg are green in areas such as Sandton, Illovo, Cresta, Rosebank Houghton Estate etc relative to the inner city smothered in concrete where I have created a pin for Dunusa in google maps in order to represent the place in the virtual domain which enable a vernacular cartography to be further symbolically

embedded. According to Gaskins (2015) ''as vernacular maps, these artefacts are reduced representations of the physical world''. In this case it is a reduction of the embodied world through language into Google Earth which Gaskins (ibid.) mentions that these are similar to symbols that are displayed by Global Positioning System (GPS), Google Earth, virtual maps and geographical information program. In this way I use the Afrofuturist paradigm to embed vernacular into the naming of places, so they are represented in mapping systems such as google maps virtually. However, one still recognizes how these forms of classification will never capture the essence of what to *dunusa* is and how it exists beyond a single point on a map. Therefore, the intervention plays an important role in actually giving meaning to what *dunusa* means through the action of bending over in the making of a place as I have illustrated through planting in figure 32. Given how the place *Dunusa* came into being based on the actions of bending over when shopping in ''The



Figure 32 Researcher planting Areca palm Dunusa Style, Photography by Yoliswa Dlamini

Piles'' one posits the action of bending over as an aesthetic of sustainability that is embodied amongst these urban African communities which gives formation to the poetics of sustainable African cities which has already created an urban language.

An Areca palm was selected to be planted merely for its scale to fit appropriately into the planter and because of its rhythmic pattern as the design orientation for this whole project is influenced by an affinity towards rhythm as an important design element of biophilic design.

I initiated the guerrilla gardening by firstly identifying the most appropriate planter where to do this. Based on the initial intervention a planter well located in a pedestrian walkway was identified as most appropriate as it was not in the direct space of the traders as to not block off the clientele's access to the stalls.

As I began digging a hole, the ground was slightly damp as it had been raining throughout previous days. The deeper I got into the ground beyond soil and little rocks emerging along the way I encountered bits and pieces of



Figure 33Participant Digging hole. Photograph by Yoliswa Dlamini

bark that had softened into the ground which made apparent that there was a tree before in that planter. Later on, that day, a woman affirmed that there used to be a tree there, but it was cut down, however, she did not know why and by whom it was cut down when I asked. As I continued to dig the hole a man approached me (fig 33)

and asked if I needed help. At this point I had started sweating heavily as I had reached a point of digging where the ground became very hard, so I decided a break from digging was needed and therefore handed the tools to the man offering to help. This was also to allow participation to those drawn to the activity. He continued to dig as illustrated in figure 33 and also was challenged by the hardness of the ground occupied by the remnants of the past tree the deeper he dug.

When he had finished digging the hole large enough for the plant to fit, I proceeded to measure the plant to ensure it will fit and inserted the palm (fig 34) into the hole and covered the openings with the surrounding soil. As I was smoothing out the soil on the surface the man who helped to dig the hole mentioned to me he was hungry. This implied that he needed money. In my mind I quickly rationalized whether paying him would contradict the purpose of this critique that there is no vegetation in that particular precinct of the inner city in an attempt to establish meaning. However, in conversation with my research assistant as I opened my backpack to check if I had cash, I asked for her perspective in confidence what she thought. I stated I would give him money for the fact he is hungry, but unsure if it would contradict the fact that he offered his contribution in this process and discredit the critique by formulating a meaning corroded by the commodification of labour. She affirmed that I do not owe him anything because he offered to participate but if I want to pay him I can. However, I concluded I will pay him because he is hungry and the importance of the intervention through art for renewable energy and regenerative infrastructure in Dunusa can only be relevant to urban society with its relation to economic upliftment. This is given the importance of economic sustainability which enables the ability of the local economy to sustain itself without causing irreversible damage to natural resources upon which an economy relies without

increasing the ecological footprint which Adrian Allen (2002) conceives for a holistic understanding of urban sustainability.

This deliberation of whether to compensate the participant also reiterates the workings of informal economies that are not regulated and rather based on improvisation which Afrofuturism understands as a technique that ensures survival as articulated by Womack (2013).

This incident made apparent unemployment and urban poverty is a reality that cannot be ignored even in the context of creating beautiful and healthier spaces, which points to a bigger question of how we go beyond the economic. This highlights a difficulty of inclusive green-smart urbanism we are faced with. We cannot make green spaces without considering how people occupy those spaces and make a living in Dunusa and other places alike.



Figure 34Researcher measuring size of hole for plant. Photograph by Yoliswa Dlamini

However, during this process another man approached me and remarked whatever we were doing is ''beautiful''. He asked me if I planted the Areca palm because I love my country, but I responded I'm just planting it to see if people here like nature and solar power (pointing to the solar sculpture) and if they will take care of it. I emphasised this project had nothing to do with the country but more so the city and how people want it to look. Based on his interest to understand what we were doing we then agreed he would maintain the plant voluntarily and I subsequently handed him the tools we used to plant with.

Once we had inserted the plant and artwork into the ground, the researcher stepped back to observe how passers-by interact with it. There were people tapping the top of the solar powered artwork as the lights flickered due to the PV cell being faced down into the soil. Some people ran their hands through the plant as they wondered around the area or passed by. A young kid kept on staring at the work whilst a woman, assumedly his mum, was browsing through some clothing at one of the stalls. When the solar powered artwork tilted the man, whom offered to maintain it appeared out of the blue to place it rigidly into the soil as indicated in figure 36. The man's participation in the maintenance of the work at his own will made apparent an embodied co-creation of the place. His commentary on the work as beautiful also made apparent a subjective experience of a space which is aesthetically pleasing. This helped to diffuse symbolic representations of green and smart cities that are inclusive in embodied ways. The embodiment of the works by participants highlighted that there are those that desire both green and smart spaces in the urban environment. Furthermore, the numerous gazes the work attracted made apparent the consciousness raising ability of art as a communication tool in spatial production to an ''other'' space such as in figure 30. It likens two seemingly disparate spaces of nature and technology into one

boundary of the planter to highlight whilst they may be distinct there is an important relationship between the two to address their real exclusivity as identified in the space to reconcile their inclusivity simultaneously. Furthermore, embedding Afrofuturist aesthetics of extraterrestiality in the solar sculpture is a spatial manifestation of contesting the conventional technocratic aesthetic prevalent in the same space. It contrasted the regulatory aesthetic consisting of broken solar panels covered in barbed wire to the solar powered artwork I had made covered in flickering copper wired lights (figure 35) which can be touched without causing any harm to the hand. Therefore, the extra-terrestrial aesthetic inspired by stars creates a sensual aesthetic which is successfully achieved based on its seducing power which attracted head turning attention. This illustrates the relational aesthetic created is very critical for an aesthetics of sustainability to operate in action. To a large extent the relation of solar panels in black occupied spaces such as in Dunusa and some townships in South Africa has been covered by barbed wire as illustrated in chapter 4. This creates an association of the tech with pain through the embodied aesthetics it implies which I argue works against the imperative to create a positive experience of blackness, given Afrofuturism as a method to create a positive experience of blackness.

Through the lens of my own subjectivity valuing sensual aesthetics of solar powered art is linked to creating a positive experience of blackness within the dimension of the social and economic upliftment of the place. This is given how urban gardening results in co-production of beautiful environments whilst creating an economic opportunity for those looking for employment like in the case of the man who was hungry. These actions device an ethics of relationality to be discussed towards the end of the chapter as alluding to ideas of Bantutopianism. Furthermore, the practice of planting, and using my body

to plant this, yet again created a heterotopia and a way for people to enter the reality I was creating.

In addition the relational aesthetics of the gardening intervention was important in that the plant creates an embodied link to the cycle of the cosmos, whilst the solar powered artwork also relies on the source of sunlight to be able to shine its light, therefore this extra-terrestrial reality is brought to interact with the terrestrial through art and reciprocated by urban society which helps to generate an embodied consciousness of these multiple spatial dimensions. This contests Lefebvre's (1996) argument that the future of art is not artistic but urban, because the future of man is not discovered in the cosmos, nor in production or in people but in urban society. One thing Afrofuturist cities has been successful in doing in the context of solar energy is contesting such a view in recognizing the interrelatedness between cities, the cosmos, artistic production and people (urban society) as constituting aspects that are all interlinked in the creation of an aesthetics of sustainable African cities.



Figure 35 Researcher wrapping artwork with solar powered LEDs



Figure 36 Participant who called the intervention beautiful maintaining plant. photograph by Michelle Mlati



Figure 37Inclusive Green-Smart Cities?, 2017, photograph by Michelle Mlati

The next day I briefly went to Dunusa to observe whether the artwork was still there. The solar sculpture had been removed whilst the plant was still intact with a banana peel leaning on it. It was also raining which made apparent a reciprocation of natural systems feeding the plant as an element of co-creation that extend to non-human origins as illustrated in figure 38.

On the third day, two men gathered around the plant with one of the man's foot on the edge of the planter (fig. 39). This kind of embodiment to the plant revealed the power of nature as a placemaking agent in Dunusa. Furthermore, it made apparent human affinity to nature as both resting and recreational space in the city. It makes apparent the potentiality of manifesting green spaces, which create places for people to gather around so they may possibly experience biophilia which is an articulation of the relationship between nature, human biology and design of the built environment ''so we may experience the human benefits of biophilia in our design applications'' (Browning et al. (2014: 4).

However, when I returned to town to observe the plant on the fourth day it was stolen (fig. 40). The planter was trashed with a Heineken beer bottle, Styrofoam container and a banana peel amongst other things. This pointed to the dystopian aspect of Johannesburg indicative of the tragedy of the commons. Having spoken to one of the traders there selling socks whom had been observing the interactions, she pointed out that during the first day later that day as people passed by, they were touching both the plant & solar powered artwork and she flashed her hands to indicate the flash light effect of it which I had left in flash mode. It is clear that the work's tactility aroused the haptic sense of passers-by making apparent an embodied sensibility to the artefact.

In addition, one of the MTN ladies had mentioned to my research assistant that they would steal this plant and sell

it for R10 the same way clothing there is sold at that price as indicated on the under R10 batch of clothes in chapter 4. Her prediction of theft was accurate, however, not within the time frame she speculated, which its three-day existence made apparent its will to exist, enabled to do so by both the inhabitants frequenting the place reciprocating positively and the rain further giving it life. As a result, the work *Inclusive Green-Smart Cities?* (2017) manifested a relational aesthetic between humans, nature and technology. However, the ''green city'' perhaps outsmarted the ''smart city'' if we are to assess this based on which lasted the longest in the planter. Although, one might argue the first one stolen is also indicative of which is most desirable or presumably valuable and perhaps seductive. However, the methodology of applying this though critical spatial practise as participatory manifested Bantutopianism as the ethics of relationality for making this particular utopia to come to life, rather than the Afrofuturist City because the hardware did not last long in the space it was embedded due to the tragedy of the commons failing to liberate or foster sustained engagements between humans, nature & technology for the common good. However, collaborative practice of manifesting the physical reality of *Inclusive Green-Smart Cities?* fosters the reciprocation between humans, nature and technology in urban society attests to a manifested reality of praxis towards uplifting the urban commons as a mechanism of creating an interactive urban language.



Figure 38 Rain on day two, photograph by Michelle Mlati



Figure 39Two men gathered in conversation on day three. Photograph by Michelle Mlati



Figure 40 Plant removed on day four and planter filled with waste of all sorts. By Michelle Mlati

5.4 Bantutopianism as the new urban language

What has particularly stood out for me in terms of devising an aesthetic response to diffusing solar energy in urban society in the proposition of an alternative reality, has been the relations it has drawn between humans and non-humans through participation to give physical structure to a utopia co-created.

These two interventions have emphasised a localized worldview of African city realities in relation to planetary concerns to articulate Bantutopianism. It takes the first point of encounter that relates our current locality in relation to the cosmological locus to articulate a different relation between African people and their relationship to their environment and universe. Bantutopianism's aspirations also stem from the notion of vernacular cosmopolitanism which simply put is ''an oxymoron that joins contradictory notions of local specificity and universal enlightenment'' (Werbner, 2006). Furthermore, vernacular cosmopolitanism is talking about ''non-elite forms of travel and trade in a postcolonial world'' (Werbner, 2006). In this sense we aim to create cultures that can be widely practised by users as a form of sustainability in the context of marginalization from a local to global scale in respect to universal goals of mitigating and adapting to climate change in the context of diverse cultures through a paradigm that allows for difference.

This cosmology I am trying to articulate of Bantutopianism, is the phenomenon I ascribe to the existence of the Bushmen and their ritual practices as the first nations of Southern Africa. The architect and phenomenologist Sechaba Maape (2016) argues that the Bushmen developed technological mechanisms such as the trance dance as a tool of dissolution that enabled them to detach themselves from their environment and

lead a nomadic lifestyle. This aided in their adaptation to climate variability important for their survival, which was ''underpinned by an embodied/embedded relationship to their environments'' (Maape, 2016: ii). According to Maape's (ibid.) study it ''found that Bushman ritual practices such as trance constituted a critical adaptation tool in response to perpetually variable environments. Through such practices and their related tools such as art, space and myth, such communities managed to sustain a synchronised dialogue with place thus facilitating for on-going dissolution of maladaptive behaviour.'' It is important to emphasize the trance dance as a technology that moves far beyond the techno-scientific understanding now prevalent that has implications for our contemporary climate and to begin understanding it ''as an existential phenomenon to be primarily resolved through relevant /responsive ritual practices to facilitate our own transitioning and continued resilience'' (ibid.). In situating this project in the realm of existentialism, the notion of a Bantutopianism is not necessarily predetermined by colonialism nor slavery characteristic of the prevailing understanding conceptualized in the Afrofuturist context and might want for a better word be called Bantutopianism because it aims to embrace differentiation to access Ubuntu through transculturation in a technological age which has always been post-anthropocentric in assembling embodied utopianisms of sustainability.

Since the focus of Afrofuturism where technology is concerned has been highly emphasised in the domains of the internet and other digital technologies, here, Bantutopianism brings the question back to what Ubuntu is in real time, face to face. This is in context to where other technologies such as renewable energy i.e solar power generating technologies are a medium of interest that mediate relationships between people, however, not limited to that technology. The MTN man in the Ama Blue

Blocks intervention premises the importance of pursuing a face-to-face interaction on his perspective that many people inhabiting the Dunusa vicinity do not necessarily have access to the internet due to escalating data prices also made apparent by mere fact of ''access to the internet as a human right'' (Lakha-Singh, 2017). For me the questions of interest that inform Bantutopianism is to what extent does the concept of Ubuntu apply to humans and can it apply to machines since it already includes animals and nature? These are gaps in literature important to better define views that engage biocentrism, which is research for another paper to adequately establish what Bantutopianism is. However, to my mind it would seem applicable based on Schalk Mouton's (2017) description of what constitutes a person as ''an entity capable of reflective self-control'' and for robots developed with ''the right abilities to be classified as persons'', ''it is important that we start looking at this type of vision of how we interact with robots'', ''if we create a new form of sentient being on the planet, we should treat that being in the same way we should behave towards other sentient beings'' whilst he concludes the current poor treatment of animals he posits as unethical treatment pointing to the conditions other sentient beings might be treated in the future. In light of this relationality he discusses, it describes the philosophy of Ubuntu which might help to articulate the interrelations of these things within African worlds and beyond, in the context of building utopianisms. The same can be said for humans especially those of African descent given the oppressive ways black people have been treated historically and the structural conditions of poverty they are still subjected to. In that sense, shortly put Sechaba Maape (personal communication: 2017) who coined the term, Bantutopianism, alluded to it as creating utopias in the context of hardship (poverty being one of them) with Ubuntu being a central philosophy in deciphering this which I posit should be framed as useful tool to address

technological progress relative to our human progress as to advance a post-anthropocentric vision of sustainability in contemporary urban African. Furthermore, the same way 'self' driven cars are being mastered, if these runs someone over who will be accountable as Mouton (2017) questions. Therefore, Bantutopianism becomes a resourceful tool to add to the discussion by embedding Ubuntu into analysing these concepts in the relationship between technology, nature and people or humans and non-humans.

As a word the etymology of Ubuntu can be traced to the Bantu speaking people which according to Murove (2016) with ''linguistic evidence it is abundantly clear that the concept of Ubuntu is an ethical concept which originated with the Bantu people since time immemorial''. This becomes important for acknowledging the origins of the concept which also resonates a sense of timelessness because its origin is not traced to a specific time. Furthermore, when we add the concept of utopianism, it should be understood in the description given by Marxist philosopher Ernst Blocch (cited in Sunstrum, 2015: 147) ''that utopianism is a universal human characteristic without which we cannot live''. Utopianism is further enhanced by Bill Ashcroft's emphasis that it ''is fundamental to human consciousness because humans are always striving forward, anticipating, desiring'' (ibid.). He further differentiates between utopias and utopianism through the explanation that the former exists in the future and the latter as anticipatory consciousness invested heavily in the present (ibid.). This explanation is further justified in how ''utopian function in post-colonial (and perhaps I might add, its function to becoming revolutionary) is located in its practise as well as its vision – its practise of confronting and transforming coercive power in order to enable and produce visions of an imagined future (Sunstrum, 2015: 147-148). This pursuit of utopianism as opposed to utopia according to Koyunchu

(cited in Sunstrum 215: 148) ''permits the becoming revolutionary to constantly escape being subsumed within cultural definitions set out by the dominant majority''. Bantutopianism therefore analyses the relationality amongst things as instigated by the philosophy of Ubuntu as a post anthropocentric philosophy in the creation, criticism and praxis of utopianism within spatial, temporal and metaphysical dimensions within any geographical or spiritual locus.

Furthermore, whilst this intervention places us as researchers in a liminal subjectivity in that we are not an established entity or institution of any sort, the actions that occurred during the intervention, altogether, we devised a new ethics of relationality where solar power and electromagnetism is an actor, mediated by both humans and non-humans being the art & tech through practise of our intervention in physical space to formulate a culture of sustainability. The fact that a police officer did not stop us from what we were doing, also establishes an embodied meaning that affirms our activities relationally which allows for Bantutopianism to exist. It puts art, people, technology, public space and myth together and through the embodied activities of these things, it manifests something which is endorsed by passers-by rather than being rejected making apparent a manifested reality that bring a certain philosophy alive in the assemblage of objects that might not be seen as necessarily having collective meaning at the first encounter. These mediate a ritual and a culture of sustainability through actions and thoughts. The activity therefore formulates the meaning and affirms the philosophy of Ubuntu in the context of a reality that never previously existed.

The same way the intervention existed in a nomadic space, enables for the infrastructures to exist as ephemeral, which similar to the Bushmen who practised

rituals of dissolution as to detach themselves from the environment to prevent maladaptive behaviour, the conditions of the place create a space which one cannot easily get attached to which the ability to adapt a gazebo to the climate makes apparent this ability to be responsive to change at a fast pace and be adaptive to the microclimate of the built environment. Furthermore, the connective aesthetic of fragmented components of technology which appeal to our senses of sight, sound and touch in the intervention also begin taking on the role of tools of dissolution, similar to the way art, trance dance and myth plays that role in the context of the Bushmen as demonstrated by Maape's (2016) doctoral research as a way of possibly mitigating climate change. This is evident just through participating in those activities that do not omit any fossil fuels, and by mere fact that the way of life of people and methods of engagement with the objects of cities by their nature being embedded in nomadic formations or organic forms, begin to contribute to the formation of new ontologies that prompt behavioural change by creating subjectivities related to solar technology. This links pre-colonial lifestyles of ancient societies such as the Bushmen to that of the informal traders that adapt to the environment for their needs, which supports nomadism. However, with that said there are still certain behaviours, which I argue, are not environmentally sustainable such as litter, which persists in Dunusa despite the fact that there are people who clean it up daily. This points to a behavioural problem by those whom inhabit the space. These are also spaces dominantly inhabited by black people given the impact of spatial segregation in the city since apartheid days. It raises complex reasons as to why this may be so today.

However, the plant getting stolen on the fourth day, points to ideas of ''harvesting produce'' but it also points to wider systemic issues as a possible cause for this but we can only speculate. However, this experience also makes apparent the potentiality of manifesting green

spaces, which create places for people to gather around so that they may experience biophilia in response to biophilic design solutions, illustrated on day three of the *Inclusive Green-Smart City* intervention when two men congregated around it. This made apparent the power of this utopia as green infrastructure to establish an embodied relation between humans and nature. For me, the participatory engagement of the work *Inclusive-Green Smart Cities?* (2017) made apparent the meeting of terrestrial (land/plant), extra-terrestrial (solar powered light) and social space. The interrelatedness of those things manifests a Bantutopia in that Ubuntu as an embodied philosophy draws a set of relations between people into the utopianism of solar powered art in urban space and nature into the landscape interfaces with urban society in the city hence the term Bantutopian Cities. The Afrofuturist City can be defined as the hardware of the city which pertains to physical infrastructure that spatially devices the ethics of relationality. This relationality is further driven by humans and their relation to nature, technology and things that exist beyond human origins. Bantutopianism is a reading of their relationality underpinned by Ubuntu in the conceptualization and construction of utopias which may examine the boundaries between different entities. Therefore, what we can understand is that Bantutopianism is the ethics of relationality that manifest in the making of a particular utopia which help to constitute what makes it work relationally which engineers the software of the socio-technical networks around the artefact (physical infrastructure). Therefore, the urban language devised, is that Bantutopianism becomes a method of making more inclusive cities specific to urban African communities such as Dunusa. The interface of the Afrofuturist City as physical infrastructure and Bantutopianism as ethics of relationality (social programming) could now be defined as follows: ‘‘It’s about spatially rewriting the city to not

only mitigate apartheid spatial legacies that continue to spread in perpetuity in relation to other matters, such as climate change, but one that transforms with evolving black culture (Mlati, 2018).

5.5 Findings

The main findings in this chapter are highlighted as follows:

- Underemployment and unemployment in Dunusa
- Energy poverty
- Desire for cleaner and beautiful environments
- Green-Smart City Integration can be co-produced with urban society
- Recycling of textiles and waste
- Trading of food, fresh produce and electronics
- Strong aural and music cultures
- Theft in Dunusa
- Creating beautiful and healthy spaces needs to take economic considerations into account
- Extra-terrestrial aesthetics seduce crowds
- Smart Citizens
- Littering remains a problem
- Police interaction with traders is violent
- Improvisation in uncertain situations
- There is Ubuntu amongst traders

What we see through the intervention is that the green-smart city integration in this chapter advances a human, technology urban interaction that is less ICT based which has been the direction in which the smart city paradigm has moved towards (Chan and Marafa, 2018). Furthermore, the aesthetics of these are coproduced through urban gardening and knowledge sharing of solar technology amongst city inhabitants therefore aesthetics of sustainability in this regard is produced relationally between people's activities, culture, tech and nature.

6 BANTUTOPIA



Figure 41 Bantutopia by Michelle Mlati

Bantutopia is a speculative fiction of the future potential of informal open spaces in African cities responsive to climate change mitigation and adaptation. It is set in the year 2028 specifically speculating on the future of Dunusa based on findings in previous chapters of this research. The protagonist, Ulalia, who leads the Department of Post Human settlements is tasked with the difficult duty of maintaining earthly-cosmological relations between humans and non-humans to ensure continuity of the planet. Through Bantutopianism, she tries to establish a balance between the anthropocentric tendencies and techno centric quick fix solutions to African problems at the local level in relation to the cosmic. By applying the post anthropocentric philosophy of Ubuntu bestowed to her by her ancestors, she extends it not just to humans, nature and animals but to technology and other emerging sentient beings in the Johannesburg city context. This leads to a scientific breakthrough in the Afrofuturist and Bantutopian research hub in the discovery of the eternal solar battery to safeguard the energy security of future generations. Word of mouth on the new technology goes out and Mega Solar corporates want a piece of the cake on the patent. Will Ulalia and her department share it freely?

BANTUTOPIA

A SPECULATIVE FICTION BY MICHELLE MLATI



Figure 42 When Dunusa becomes a planetary question (Vernacular Cartography). By Michelle Mlati

It was 5:30 a.m. when Ulalia received a message from her solar hologram emitting cosmic sounds. Ulalia groaned as she opened up the device as streaks of light formed themselves into a talking mural whilst blinding her sight.

Solar hologram: Good morning Ulalia, it's time to get up. I know you are exhausted from yesterday's Green Building conference, but the sun is not going to catch itself, so if you would like to have a cooked meal and hot shower tonight, you'd better get up!

Ulalia closed her solar monitor app as she rubbed her eyes and opened her WhatsApp to read a message from her friend Sech.

1 September 2028

Sech: Hey Lalia, I hope you saw the news last night. Solar harvesting tariffs have dropped by 25% for the day so it's a great day to make your ancestors proud!

Ulalia: What do you mean to make my ancestors proud (raised eyebrow emoticon)?

Sech: Well you are in the sun business and so were they, just without being a tech drag queen…

Ulalia: Mxm, whatever…don't you have a job to go to, to profess about my ancestors? Bye!

Sech: Cheers bra!

Ulalia dashed into the bathroom and took a quick shower, put on her floral printed kaftan, head wrap and lipstick before making her way to the train. In less than 10 minutes she had arrived at her stop.

She began to make her way to the Department of Post Human Settlements. As she was about to walk in to the hub, a long queue of informal traders extended to the outside of the shed waiting to submit their sun harvesting permits to enable them to sell solar energy to small scale energy consumers by taxi ranks for services such as charging cell phones and to use in food stalls.

Ulalia paused for a moment to internalize the magnitude of work for the day. She sighed and went into the Afrofuturist and Bantutopian Research hub to begin authorizing processed sun catcher applications. She was concurrently responding to private sector investors wanting patents on her intellectual property of the solar futurhythmachine whom she kept shutting down whilst assessing intern applications from postgraduate students from multiple African, Asian, Caribbean, European and American cities.

Later that morning she had an interview with ENCA to talk about the recent discovery of the solar futurhythmachine and its impact on the upliftment on the poorest of citizens.

Good morning, I am Busisiwe Ngodwana and it is a pleasure to welcome Ulalia Boonzaier in our studio today. Ulalia is not just a business woman but has been acclaimed as one of the most prolific sun harvesters of solar energy helping to create meaning in the production and distribution of renewable energy in African Cities. She has worked with humans and non-humans alike collaboratively. Through her leadership in the department of Post Human Settlements she has facilitated cosmological relations between the planet and the cosmos to keep our solar system balanced and to connect our cities to the cosmos' resources sustainably.

Busisiwe: Ulalia, what sort of work does the department of Post Human Settlements do?

Ulalia: The department of Post Human Settlements aims to establish ethical relations between the cosmos and human settlements more broadly, with cities and precincts more specifically and subsequently with people to both the earth and cosmos.

Busisiwe: How do you actually create networks between the cosmos and the earth as it would seem they are two different types of entities or beings?

Ulalia: Well, we establish our relational links through embodiment. We connect to the cycles of the cosmos as we experience them on earth. From that point of view, we respect the functional mechanisms of the cosmos as they are and respond to it aesthetically in how we build our shelters, spaces of work and those of recreation as a multiplicity of rituals. When we work with humans we try to help them to align their modes of operation to the cycles of the cosmos so that they maintain an awareness of how extra-terrestrial space impacts their immediate surroundings and their bodies. We also try to work against those spatial practices that position the human as superior to all things both physically and metaphysically.

Busisiwe: So, you would say that you are trying to create consciousness between terrestrial and extra-terrestrial space using solar power to facilitate this relation?

Ulalial: Certainly. Therefore, the aesthetics of Photovoltaic solar panels becomes important for establishing that link between the cosmos where the sun is located and the planet where the source of energy is used to appreciate its origin and its cleanliness in the production of renewable energy working to combat the impact of fossil fuel-based energy exacerbating climate change in our cities.

Busisiwe: So why has it been important to locate one of the department's specialities within creating black or African utopias in the built environment?

Ulalia: My first answer to that will be that when it comes to energy poverty in the urban commons the way solar panels are installed is very inaccessible which results in ordinary citizens having no knowledge of the technology as free energy and in that way it becomes exclusive. In addition, the current aesthetics of solar panels is not responsive to the local identity of African urban communities in embedding it more meaningfully into African consciousness. It is often implemented by technocrats that do not even consider the identities of people whom the tech is supposed to help or improve their lives, especially at a commercial level in the informal economy sector as a spatially embedded artefact. At the same time those whom occupy buildings, might not even know there are solar panels above the building they sit in so relational aesthetics in built environments becomes critical for creating that spatial awareness.
Secondly, I hate to bore you with the same overstated answer that in the context of African cities such as Johannesburg the spatial effects of apartheid planning are still prevalent which still exhibits inadequate provision of shelter for black people at residential and commercial scales, particularly those in lower income groups. Furthermore, it is black people subjected to high unemployment rates and for those working within the informal economy sector, whom are faced with high levels of inequality and insecurity in terms of provision of adequate shelter that is responsive to climate variability. So never mind poverty, but climate change impacts are worse for those working in spaces such as those inbetween buildings, as much as they have adapted to these conditions it affects the quality of their lives and livelihoods.

Busisiwe: So, it is within this context in which the department's projects such as Bantutopia stems from?

Ulalia: Yes. As one of our projects we aim to address not just dystopian aspects of black life or spaces but building onto those spaces or places that already pursue sustainable practices that are embodied. We add on to these practices which we view as utopian based on how they have adapted infrastructures to work to support their livelihoods in relation to unfavourable climatic, social and economic conditions. We come in to further contextualize these practices to the cosmological locus also guided by the micro climatic context to further embed consciousness of other non-human relations at play within the practices of everyday life aesthetically. Furthermore, we create art for renewable energy infrastructure or encourage urban gardening as to create the association of such

aesthetics and practices as those directly linked to the cycles of the cosmos and those directly related to economic and social upliftment where urban poverty is a problem. We believe that embodiment is central in this process through a renewed engagement with the cosmos and earth to locate urban society existentially. This is so humans and non-humans are best positioned to co-evolve together and are wired towards climate change adaptation and mitigation in their life cycles.

Busisiwe: Can you please tell us what is the solar futurhythmachine?

Ulalia: The solar futurhythmachine is a sensual mathematic equation with multiple functions. It is a pedestrian traffic circle used for enabling spatially efficient mobility in very dense urban spaces to allow for rhythmic dispersal of movement. It is a large-scale sound system powered by the sun enabling street performers to dance and entertain passers-by. It is a street spotlight used to accommodate a variety of inhabitants & events from the homeless, prostitutes, religious practices and built environment conferences. Most critically it is a machine that marks noon through black noise. It can be viewed as a sonic weapon, countering artefacts such as the noon gun in Cape Town as a colonial artefact that continues to sonically project the soundscape of the colony in the city. The solar futurhythmachine summons the future in the present, contextually considering the past. It presents to urban society an alternative space and time. It's a sort of chronotropic architecture.

Busisiwe: So, what exactly is black noise?

Ulalia: This can be understood through a quote by Steve Goodman's interpretation of Kodwo Eshun's concept of the futurhythmachine:

''In its most convincing formulation the negativity of the politics of noise is twisted into an engine of construction, and noise becomes a reservoir of rhythmic potential, a parasitic probe beckoning a future. Usually noise here, in a nontechnical sense, is black noise—the black noise of what Kodwo Eshun calls the futurhythmachine. It is to black noise, painstakingly crafted in the context of enforced migration, depressed urbanism, and ethnic suppression, becomes a locus of affective collectivity. Feeling around in the dark, in the toxic smog of megalopian pressure, when no hope seems to exist, when no stability persists, rhythmic decisions still get made, collectives mobilized, and potential futures produced.'' (Goodman, 2011: 192)

Busisiwe: Ok, I understand better what the solar futurhythmachine is trying to do. It is trying to create an enabling space for potential futures to be produced in context to the negative or dystopian aspects of cities often those black people have been subjected to, creating potentiality in a rhythmic form in the physical reality of solar power?

Ulalia: Definitely, it becomes a resourceful space to turn that black noise into having rhythmic potential for all sorts of futures to be determined or dissolved, to enable a type of architecture that promotes flux and change as a sustainable architecture. With the solar futurhythmachine we do so by creating an energy utopia within black cultural life for the benefit of the environment, society and economic systems through cultural existentialism. We certainly cannot imagine such a space without the cosmos being a central contributor! Hence the department of Posthuman Settlements embraces the complexity of maintaining such earthly-cosmological relations.

Busisiwe: Thank you for joining us this morning and we look forward to seeing the impact of the work that the department does

As Ulalia left the studio to walk back to the hub, as she crossed the road by the taxi rank she went to get brunch by one of the food stalls. Luckily there was plenty of sunshine, so food options were in abundance that day! Often food stalls move where the sun is and navigating this can be very hard at times. This was often due to the plenty amounts of shade caused by towering skyscrapers. But thanks to the solar food app, the locations of these can be navigated, but of course, to only those whom have smart phones and can afford data! But to those energetic enough to follow the movement of the sun too! As Ulallia was ordering food a man in a shiny solar powered cape holding a batch of solar powered bank charges exclaimed loudly, ''Ama Blue Blocks, Ama Blue Blocks!'' He strutted closer towards the stall ostentatiously waving his sparkly panels at the young lady sitting quietly behind her pile of bananas whom could not help but to smile back. He then dangled it in front of her and proclaimed:

Solar trader: Sisi, your eyes are as beautiful as these panels!

Before he could say more a customer hurriedly purchased two bananas, pulling her attention into her business! The man dramatically swayed his solar cape back into the crowded city centre continuing to yell ''Ama Blue Blocks, Ama Blue Blocks!'' He congregated with fellow solar traders wearing kaleidoscopic capes, some blue, some purple, some bronze, some silver and some even gold! The centre looked like a glitzy solar fashion show creating a wonderful palette that painted the city's fashion district like a human galaxy! Within sight an orchestra of gentlemen who used to sell shopping bags were trading solar powered sound systems pumping the latest Gqom tunes luring in crowds that formed mini dance circles dancing the gwaraa gwaraa. Besides them old ladies selling second hand clothing played their gospel Joyous Celebrations from the same kind of sound system! Simultaneously a male trader pointed at the pile of bras and underwear and with the loudest baritone shouted, bra underwear, underwear bra in a repetitive pattern non-stop, only stopping to swallow his saliva…

Just as Ulalia sat down around the lotus garden where traditional healers were harvesting medicinal herbs, her friend Sech pitched to join her for brunch holding a 10-litre bucket in one hand and an avocado sandwich in the other hand. Ulalia gave Sech the raised eyebrow…

Ulalia: What's with you and the bucket?

Sech: Hi Lalia, so I have this great idea! My first-year students and I have a lot of ideas we have been thinking about for the project Bantutopia. We know that the focus of the Post Human Settlement's Department has been on energy utopias, focused on solar but we came up with this idea of water utopias which we would like to put to practise with the traders when it rains…

Ulalia: So, what exactly are you suggesting?

Sech: Well, we were thinking, on a day where heavy rains are forecasted, we would like to experiment with rain water harvesting with the traders.

Ulalia: Ok, but you do realise today is a scorching day?

Sech: Yes, I do, but you do know hot days are an invitation for the rain queen and her followers, right?

Ulalia: Are you trying to put me out of business?

Sech: Well, I don't decide that, talk to your cousins in the cosmos! All I'm suggesting is how we can catch the rain to prevent storm water flooding for informal structures in Dunusa since the government is so focused on nuclear whilst the GBCSA is so focused on green star rating buildings in Sandton…

Just as Ulalia and Sech were finishing their brunch they took a walk to the Ama Blue Blocks Fixers and Washers workshop where, a group of young black youth were cleaning and repairing solar panels from across the garden. As they walked into the workshop the guys were listening to some new Rudeboyz tracks not noticing Ulalia and Sech entering the premises.

Ulalia cleared her throat and Jabu lowered the volume.

Jabu: Hi Ulalia, sorry I did not see you, I can see you have reached the peak of your growth!

Ulalia: You think you've got jokes ne… well, I can see being out of prison is keeping someone out of bloody trouble!

Jabu: Well, at least I'm doing better for myself thank you very much.

Ulalia: This is my friend Sech and just wanted to show him around the workshop. How are those juvies of yours doing here?

Jabu: What's up Sech! Those juvies of mine are late for their community service as you can see…but at least my main man Sibusiso over there is almost done and I've just offered him a 1-year job at the workshop. We'll see how it goes. Better to keep him here than let him back into those streets… He's told me he wants to finish his matric, so he can get into WITS to study the interdisciplinary Art and Electrical Engineering degree.

Ulalia: Well our door at Post Human Settlements is always open if we can assist you with anything.

Jabu: Well we will definitely give you a shout for scholarships soon.

Sech: Here's my number if you might need any information on WITS, I work in the STEAM faculty. We can look into various opportunities for you guys (handing card to Jabu).

Jabu: Thanks man! By the way what is the STEAM faculty?

Sech: Sharp bra! It's the Science, Technology, Engineering, Art and Maths faculty.

Jabu: Awe!

As Ulalia and Sech left the workshop 6 young lads were hard at work wiping and reconstructing PV systems into a cityscape mural whilst 2 lasses were repairing broken systems of a traffic light panel.

As they walked outside the sounds of noon smothered their ears and skin as the machine vibrated warm tones of the first day of Spring. The lotuses jumped from outside their leaves, whilst the urban gardeners harvested their produce and delivered them to the stalls. Sech and Ulalia rushed to the city centre to witness the performance of the new season where a group of dancers jammed to the rhythm of the machine powered by the cosmos. It was like an intergalactic Jika ma Jika in downtown Jozi.

After 30 minutes crowds averted back into their respective journeys as the ensemble came to an end.

Ulalia rushed back to the Post Human Settlements Hub whilst Sech lingered around town walking past a womxn yelling ''Ama Blue Blocks, Ama Blue Blocks''. He noticed she had a prosthetic right arm which she swayed lotus shaped solar panels, he was so captivated he had to get one.

Sech: May I please get one lotus panel?

Cyborg trader: That will be R100 thank you.

Sech got his new toy and pointed it to the sky. It started to speak.

Lotus: Please don't wave me around in the sky, I'm fully charged right now.

Sech got a fright and accidentally dropped it… He hesitantly picked it up.

Sech: Wow, I had no idea that it's AI.

Lotus Solar Panel: Yes, I'm AI. And I am not an IT. I have a name. My name is Flying Lotus. You can call me Flotus for short.

Sech: Oh, so you fly?

Flotus: Well, only when you point me to the sky. I generally prefer to be left in well-kept gardens, I like to be grounded. I don't do ponds.

Sech: Well, you're a picky one.

Flotus: Well, so are you. You picked me!

Just as Sech was getting ready to leave back to campus a group of grey clouds congregated and a shower began to pour. He quickly placed Flotus in his hoodie pocket. Suddenly a thin sleeve of waterproof layers automatically emerged from the common roof to shelter the Dunusa traders. The Ama Blue Block Traders ran to stand under the shelter with their solar capes' water resistance bearing the gravity of the rain. The rain got so bad that the water started to rise up just above Sech's ankles.

Sech's 10-litre bucket already filled up he realized this needed more hands and more buckets. He called some traders and rushed into the Chinese store with them and asked the storeowner if they could use the buckets to collect the water. The storeowner agreed to give them 100 buckets, so they began laying these buckets on the walkways and most of the traders began collecting as much water as they could. 20 minutes later the rain stopped, and they had gained 1000 litres of free water. Ever since that day things were never the same again. Access to water improved, especially for food stall traders whilst the Chinese man's bucket business boomed.

Some silver capes walked passed Sech exclaiming, ''Ama Blue Blocks, Ama Blue Blocks'', advertising cell phone charging services. A woman yelled back, can I please use the blue block, asking to charge her phone. She seemed distressed. The street hawker stretched his palm out to her asking for R10, so he could charge her phone. She had to stand for at least 10 minutes before she could get enough power to be off. She eventually decided to purchase one of the Ama Blue Block as she seemed to be in a hurry after the storm.

All soaked up, Sech went straight into his solar powered self-driving whip Solly, loudly playing Babes Woduma. Sech opted to drive himself back to the University to prepare for his water utopia and embodiment lecture for the next day.

Solly: Yoh Sech, were you swimming with the Mammi Watas?

Sech: Solly, I'm really not in the mood for this can you please play my music and let me drive in peace just for today?

Flotus: Please get me out of your pocket! Remember I said I prefer to feel grounded?
Sech placed a damp Flying Lotus on the passenger seat.

Solly: Oh, you have a new best friend now?

Flotus: I've only just met the guy so chill your wheels Solly!

Meanwhile at the Afrofuturist and Bantutopian Research Hub, Ma Vips at the Fashion unit had finished designing Solar powered Masaai, Seshoeshoe and Herero blankets which a group of fashion killers packaged these into fragile labelled crates to send off in the weekly delivery airship to Lesotho, Kenya and Namibia. Ma Vip's design assistant came towards her with her tablet struggling to contain her excitement.

Ma Vips: What is it, why are you looking like you about to burst with butterflies?
Kwetsi: So, we've just got an order for 100 000 custom solar blankets from the United Nations who would like to distribute these to H & M global to help developed countries consume less fossil fuel-based energy and to combat the hypothermia outbreak in New York, London and Paris.
Ma Vips: Is that so?
Kwetsi: Yes Ma!

Ma Vips: Ok, what are you waiting for, you see the queue of unemployed young girls, boys and cyborgs outside the hub… please go set up interviews together with Candice and Trevor to organize a bigger team for this job. Please remember to use the Nano 100-year life battery when you begin to design these!
Kwetsi strutted off to go get Candice and Trevor whilst Ma Vips continued to fix Sho Madjozi's solar powered Xibelani (traditional Tsonga skirt) she'd be wearing for the Bantutopia festival that

evening.

Sho Madjozi: I Yhoo Ma Vips! This skirt is fire! Thank you, we will definitely give you a shout out in our new track called Ama Blue Blocks we're performing tonight!

Kwetsi began formulating structures and workloads for the new project, Candice went to begin speaking to potential candidates outside the hub whilst Trevor was making the posters and social media posts for the call for applications. Kwetsi and Trevor gossiped about how Amazon just started to sell fake solar powered Basotho blankets online especially appalled by how ugly they had designed and misappropriated them!

Soon in the micro-cosmic structure a public meeting was about to gather. A white suit man rocked up. Before the chair of the meeting could proceed, the man demanded that the research unit share the patent on the eternal solar battery for the good of the JSE market since the premise of the Ubuntu philosophy was to share.

Ulalia stood up and asked the man to sit down and to stop disturbing the proceedings of the meeting because that was not on the agenda for the day. He refused and insisted.

Mega Solar Corporation Rep: If you refuse to answer to my request you will force me to call the Scorpions to question each and every one working in this hub to give us information to find the eternal solar battery and its blueprint.

Ulalia: Is that a threat?

Mega Solar Corporation Rep: Take it whichever way you want to but just know that if we do not receive any call offering us a stake in the new patent being sealed before the end of the day, expect a lot of trouble. Whatever witchcraft is going on here, just know you heathens will be taken down very soon!

Ulalia: You know, whatever your name is, we have great meditation services in our Dream Room unit in the hub we'd like to offer you for free…It's a great healing service for colonized minds and imaginations! Please go over to reception to book your appointment.

Mega Solar Corporation Rep: I'll be dealing with you later!

The man stormed out of the microcosmic structure and left the hub.

As the man left tension levels decreased and the open meeting proceeded.

Cosmic Hologram: Greetings to all in attendance, it is an honour to be in your presence this afternoon. We just had a little rain problem hence why we have had to convene a bit later than usual. However, I wish to assure you the weather council in the cosmos has approved the weather programming application for the Bantutopia festival

tonight. We have resolved our conflicts with the rain queen. However, we wish to express our concern regarding the tension between the Department of Post Human Settlements and Mega Solar Corporation.
Ulalia: Thank you Sonny. I hear your concern, however, we ask you to please let us resolve this matter ourselves. Anyway, this is just a quick meeting to make sure everything is in order for tonight. Can each unit please report on their progress?

Ama Blue Blocks Unit: We have made a variety of miniature solar powered LED lights, however, without the AI system because many patrons have found it to be annoying. In addition, these will be distributed at R150 to cover production costs whilst the profits will go directly to the Ama Blue Blocks traders.

Ama Blue Blocks Washers & Fixers: We will have repair stalls just outside the performance enclosure to fix any malfunctioning solar powered tech for festival goers. The probation worker together with those serving their community service will be on duty. I will just be overseeing the whole operation. Festival goers will be charged for these services.

Recycling Unit: We will be collecting recyclables separated into organics for compost for the Foodstalls and Urban Gardening unit including glass, and lost solar tech which we will deliver to the ABB Washers & Fixers and god forbid plastics too!

Afrofuturist and Bantutopian Unit: We have set up the sound system in the solar futurhythmachine and checked lights with the solar battery being fully charged. We have designed the stage as an African fractal underneath the machine giving it six focal points around the stage to allow for performers to interact with the crowd encircling the space. We will quickly place this platform at 6:30pm when most commuting crowds have dispersed. However, most clothing traders are most likely to continue selling into the night because of the foot traffic the festival will bring in. We have just negotiated for the central block to not be used for any trading other than by Ama blue blocks traders during the festival. This is to keep the stall trading in the stretches that extend outside the cross section of the circle to allow for festival goers comfortable space to thrift and to give adequate space for the crowd to ensure their safety. We have also received approval from residents living on the de Villiers stretch regarding noise levels which they have given permission for the festival to go on until midnight which most of them said they will be attending since it is free of charge. Some have mentioned they would view the performances from their balconies, so we have had to curate the performances to be responsive to that spatial context.

Food Stalls and Urban Gardening Unit:
We have mostly harvested fruits and vegetables this afternoon to stock up the food stalls which will have a variety of cuisine with both

meat and vegetarian options kept in the CFC free mini energy efficient fridges in the food stalls. This will use stored solar energy in the cookers, so it is faster and more efficient to feed hungry crowds. Water collected from rainwater will be purified and available from the self-purifying Bronze Jojo tank by the food stall section which Sech has quickly organized for us to collect rain water more efficiently through his connections. A requirement for the festival has been for festival goers to bring their own water bottle to refill. We, however, have kept a reserve of biodegradable cups for those who don't have a bottle. This will be placed adjacent to the lemon tree for those who want lemon in their water or lemonade which we will slice for them which will be free of charge. However, we will also sell plants and trees for those that wish to pick up gardening skills.

Fashion Unit:

We will have a stall set up with the Dunusa traders selling the Bantutopia branded festival blankets since Spring evenings can still be very chilly! But we finished making the solar powered Xibelani for Sho Madjozi which will further create kinetic energy when she dances which will accelerate her movement and illuminate the lights on it in a sequence.

Dream Room Unit: We will try our best to keep conflict to the minimum!

Ulalia: Ok fantastic, sounds like we're ready to go! I guess let us all go and freshen up and be back just now now!

As everyone left Ulalia returned back into the hub's bathroom where she fixed up her lipstick and changed her head wrap into a lime solar powered one. As she packed up her makeup bag a hand grabbed her wrist and put a black cloth over her face. She was then lifted and placed into a fragile labelled crate. Before Ulalia could even scream she was silenced by the cloth over her face suffocating her. The Dream Room Unit whilst still in session saw what had happened on the CCTV screen.

An hour later, Ulalia woke up and found herself tied up to a chair in the boardroom of Mega Solar Corporation. The table was surrounded by men in white suits.

Mega Solar Corporation Rep: Hi Ulalia, you probably remember me from this afternoon. Glad we can meet again. We were waiting for your call but clearly you were too busy with that heathen festival of yours! But to cut the story short, we want the blue print of the eternal solar battery and if you do not tell us where to find it, you will not make it to your beloved Bantutopia festival ever again!

Ulalia remained quiet and seemed to be in a trance which kind of

frightened the board. She could not clap her hands or stomp her feet, but she could clench her teeth until she awoke from her trance humming.

The board left her alone still tied up in the chair as they could not understand her behaviour. 10 minutes later they all came back, and she was still humming.

Meanwhile back at the hub everyone began to wonder where Ulalia was because she had to perform a ritual before the music performance started as the opening act.

At this point the show had to begin without her.

Suddenly a black police officer burst into Mega Solar Corporation with a staff member from the Dream Room Unit.

Police Officer: I do not come to hurt anyone but to do the service bestowed to me to protect everyone.

The police officer walked towards Ulalia to untie her. Before he even finished untying her someone spoke.

Mega Solar Corporation Rep: Are you sure you want to do that? What if we offered you R1 000 000? We know your job as a police officer pays you nuts and we could help change that for you.
The police officer took a step back as he was stunned by the offer. In this moment he imagined how this could change his life, to help finish building his house for his wife and three kids who stayed in an RDP house in Alexander township. It was his chance to build a proper home for his family.

Dream Room unit staff member: Please don't do it! We have fought so hard for environmental justice, social equity and our economic liberation to create Bantutopia! Even if we are not materially richer, at least we still go to sleep having eaten and knowing our children will not be breathing in the metropolis smog of tomorrow. At least they have a chance to live GMO free and being meaningfully connected with the cosmos so that they may embody a fine harvest. You have children sir, so please think of them and their children. Is that the kind of world you want them to live in? The solar business is in a white monopoly and we are the few really trying to create wealth for our people so that we may also survive. If the eternal solar battery blueprint is given to corporates, we will be eternally doomed and will forever be exploited not just as black people but as a human race!

The police officer took a moment to reflect.
He then decided to untie Ulalia who had woken up again from her trance. The three of them left Solar Mega corporation and rushed back to Dunusa in the police van.

When they arrived Sho Madjozi was on stage shaking her kaleidoscopic Xibelani wrapped around her waist. It flashed lights excitedly as she jumped around the stage with her back up dancers under the star-like structure. Each back up dancer stood on the six focal points of the fractal whilst Madjozi stood in the middle of the fractal directly under the spotlight of the solar futurhythmachine. It was a radial cosmic celebration of life! She started rapping ''*Ama Blue Blocks are the future of Africa…The future of Africa is Ama Blue Blocks*''!

As Madjozi was about to get off stage she gave the loudest shout out.

Sho Madjozi: Thank you for being an amazing audience and thank you to Ma Vips for hooking us up with the Ama Blue Blocks Xibelanis! Iyhoo!

Towards the end of the festival, in closing Ulalia performed a ritual. She began clapping and stomping her feet and enthusiastically asked the crowd to join in and to continue in the rhythm she was moving which then progressed into an offbeat and eventually… they were all in a trance!

They became the stars, they became the earth and they became the machine. When they awoke a realization of the importance of the relationality of everything that exists emerged and a new embodied consciousness manifested.

In less than 30 minutes, the fractal stage was removed block by block, food and clothing traders closed up their stalls and placed their stock in the storage facility nearby, festival goers jumped into Ubers, whilst some cycled and walked home and some took the train.

As Ulalia arrived home, she laid on her bay window with her cat Lulu where she could still see the glow of the solar futurhythmachine from a distance. She pointed her mini telescope to gaze at the stars and saw the Orion belt then scanned it towards the solar futurhythmachine. Below it, the homeless prepared to go to sleep whilst prostitutes waited under it for protection.

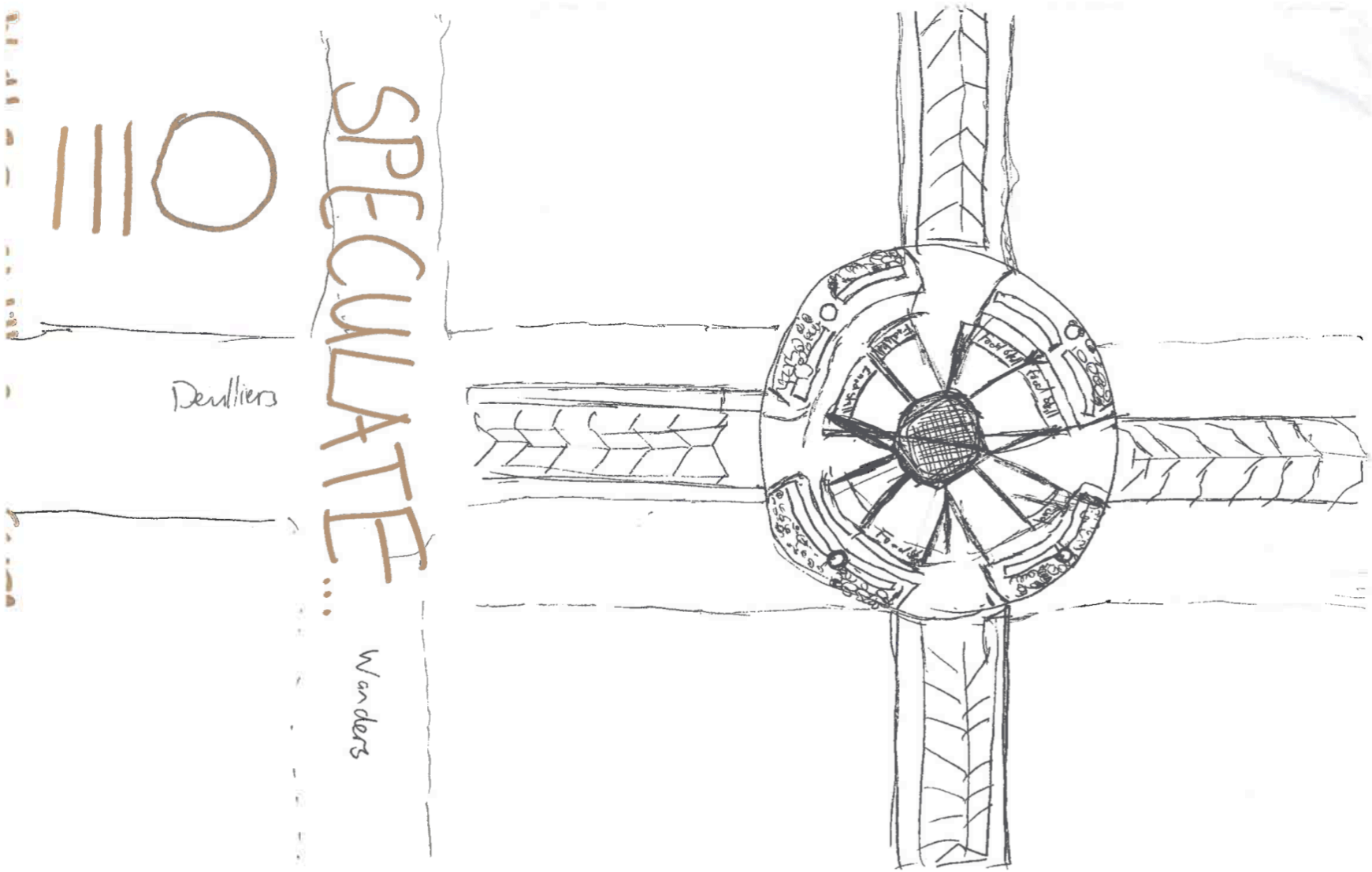


Figure 43Conceptual street sketch of Dunusa from Aerial perspective. Michelle Mlati



Figure 44Dunusa render 1, Michelle Mlati



Figure 45Dunusa render 2. Michelle Mlati



Figure 46 Dunusa render 3. Michelle Mlati



Figure 48Dunusa Green Smart City. Michelle Mlati

7 CONCLUSION

7.1 Introduction

The research questioned how the aesthetics of sustainable African cities can be understood in Dunusa, Johannesburg through Afrofuturism as a method with a focus on solar energy as a primary medium.

This was in relation to a site-specific context structured around three perspectives namely:

- Display practices of Solar Technology in Dunusa
- Afrofuturism as an inclusive design approach for coproducing a new urban language of Sustainability amongst practices of urban African communities
- Speculative fiction design approach

The reason for these experiments in Dunusa were also done to deepen understanding of the place and done so by merely not observing but engaging the place and therefore that is the reason why the project is embodied. It was pursued with an outcome to understand an aesthetic approach to sustainability, that selected essentially intuitive experiments but they all yielded insights about the conditions of the place and limitations of sustainability paradigms in its current form that does not provide a method of articulating an urban aesthetic/language of sustainability in an informal African context such as in Dunusa. Looking at the 'objective studies' of the place and subjective experience was needed to create the speculative fiction later. This is in essence a combination of objective knowledge and my own subjective understanding of the place. It needs to be remembered this is an open ended creative practise. This approach is affirmed by Di Carlo's (2016) definition of the aesthetics of sustainability as 'negotiation between

personal subjectivity and collective subjectivity as forms of knowledge, and as processes and tools for aesthetic creation — that cannot be separated from the socius and the environment.'

7.2 Display Practices of Solar Technology Amongst practices of urban African communities

The practices of solar technology amongst urban African communities in Dunusa were apparent in two modes of display. Firstly, as a consumable product displayed in a store that sits in a building, in the form of solar panels, solar powered radios and lights packaged in little boxes. Secondly these were apparent as solar powered urban infrastructure embedded into the city infrastructure itself.

The aesthetic of the latter group tended towards a regulatory aesthetic due to being covered in barbed wire preventing crime of the panel which defined the overall look of the panel as untouchable. In the former group the display of solar technology was in the form of consumable products such as solar powered led lights and solar powered radio which had bright warm colours. Within the literature on the aesthetics of sustainability solar powered sound systems (radios) and lights are not accounted for in the seven-macro groups of the aesthetics of sustainability discussed by Di Carlo (2016) in the literature review. Therefore, the absence of a language that categorizes solar powered radios and lights, disregards an aesthetic of sustainability embedded in aural and visual urban cultures in the case of moveable solar powered devices such as the radio and mobile lights. Furthermore, the research revealed that when solar infrastructure was embedded in the urban landscape, inhabitants had little knowledge or awareness of it which can be ascribed to its regulatory design covered in barbed wire and not designed for sensual appeal but purely for function and crime prevention. In addition, these solar panels were

broken and not properly maintained therefore not powering the lights under the trading shelter serving the purposes it was intended, making apparent it is physically unsustainable. Its impact is also socially unsustainable given its potential to create more comfortable browsing conditions for traders and city inhabitants under the trading shelter and prevent pickpocketing as one of the crimes customers are victim to. Therefore, it was evident that the status quo design approach of solar technology in Dunusa as an embedded artefact was not adequately responsive to the needs of traders generally characterized by regulatory aesthetic that does not engage meaningfully with its user.

7.3 Afrofuturism as inclusive design approach to co-create a new urban language of sustainability amongst urban African communities

As an inclusive design tool Afrofuturism was applied through the green-smart city integration through art traversing in a black occupied space. This therefore became an artefact of the black experience because it was an artefact acted upon by the black body. Therefore, the assessment of quality is based on how it is acted upon. This is justified through the methodical use ''of Afrofuturism as an embodied event that foregrounds the experience of invisibility and, second, inviting Afrofuturism into a methodologically-rigorous discourse that preserves—and privileges—its experiential roots'' (ibid.). This enables Afrofuturism to rewrite ''discursive narratives of inhumane contexts through critical examination of cultural artifacts of the black experience'' (Deluliis and Lohr, 2015: 168).

The green-smart city integration was a response to the regulatory aesthetic characterized by barbed wire which I argued vilifies the black body whether intentionally or

unintentionally. Bringing the green-smart city integration in the space created multiple forms of interaction that potentially create conditions for positive experiences of blackness as one of the imperatives of Afrofuturism. Through the Ama blue blocks intervention when the researcher posed as an 'informal solar trader' an aesthetic/language of sustainability is apparent through an informational process. Firstly, inhabitants whom identified the intervention through ''ke solar'' (it's solar) creates a subjective experience of solar technology in vernacular English by integrating Setswana. This creates a sort of vernacular cartography discussed by Nettrice Gaskins (2015) through spoken language connoted by the sun (solar) using a vernacular preposition ''ke'' to position it, which is first embodied, enunciated and forms a literary aesthetic. Secondly, in the literature on smart cities, it makes apparent a shift from ICT based understanding of the smart city to the smart citizen discussed by Chan and Marafa (2018) and Di Carlo (2016) which affirms the shift of the paradigm to human-technology interaction. This therefore created a relational aesthetic defined by Nicolas Bourriaud as an art practice characterized as participatory, open ended and inclusive which are able to ''enhance and intensify human relations and their social context by strengthening social connections rather than through a detached independent and private visual experience'' (Di Carlo, 2014: 14).

Secondly, this was characterized by exchange when city inhabitants insisted on purchasing artefacts presented in the intervention which were not for sale. This however, broke the convention of exchange that was not monetary based but informational. When inhabitants insisted on paying for these, this pleading to relate the objects to a familiar practise affirms the heterotopia created ''as a sort of simultaneously mythic and real contestation of the space in which we live'' (Foucault, 1967: 4). From an aesthetic point of view the object is desired but the non-

commercial practise in which is embedded is rejected. Therefore, the potential to use Afrofuturism as a design approach fails based on the intervention being persuaded to the exchange of goods rather than their creative design. However, this points to the potential of the artefact's economic sustainability and affirms the seduction component of climate technologies in African contexts.

The inclusive green-smart city intervention realised through guerrilla gardening made apparent positive and negative aspects of Afrofuturism as an inclusive design approach. The positive aspects were realized through the seducing power of the aesthetics which resulted in co-creating a spectacle with city inhabitants. When I planted the Areca palm this invited passers—by to participate and in this way enter into the heterotopia I was creating. This also resulted in getting comments that the intervention was beautiful which affirmed Di Carlo (2016) and Hosey's (2012) appeal for sustainability to be seductive and beautiful. However, this revealed the intentions for urban society to participate is one motivated by seeking an income when one participant mentioned to me he was hungry making apparent there are economic aspects to be considered when creating beautiful and healthier spaces. Whilst I gave the participant money to purchase food, this reveals the improvisation of Afrofuturism (Womack, 2003) as a technique to suggest how the economic aspects of sustainability may be addressed systemically in such informal contexts. However, one other participant recognized its potential to create greener and cleaner spaces and appreciated the intervention and volunteered to upkeep it without expectation for remuneration. Day three also affirmed its impact as a biophilic response that is appreciated as a resting space for conversation when two men gathered around the plant. This creates a positive experience of blackness linked to ecology which made the encounter

Afrofuturist as it allowed for a positive experience of blackness to be attained from nature in an urban environment. However, its theft on the fourth day made apparent the tragedy of the commons and difficulty of creating green-smart cities in spaces where there is urban poverty, but it signals potentiality. In addition, Afrofuturism being possible as an inclusive design approach as illustrated above, the notion of Bantutopia affirms this methodologically through Ubuntu as an ethics of relationality being practised in the creation and maintenance of the utopia/heterotopia put forward. This therefore becomes the aesthetic for sustainable African cities given the inseparability between aesthetics and ethics because Ubuntu which comes from the Bantu language predates Afrofuturism which has existed since time immemorial according to Murove (2016) given linguistic evidence. Therefore, urban society's collaboration during the interventions embodies the philosophy of Ubuntu which recognizes ''I am because We Are'' (ibid) making Bantutopianism a deeper design approach to inclusive cities in an African context of practising utopianism which is founded upon relationships.

7.4 Speculative fiction design approach

Through literary aesthetics the aesthetics of sustainable African cities have been speculated in the creation of the fictional world of Bantutopia. This has been based on the findings from previous interventions in Dunusa exploring aesthetics of sustainability responsive to the impacts of climate change in the context of spatial inequality and informality in the city and the socio-economic realities in Dunusa characterized by inadequate provision of infrastructure. It has taken the conceptual design approach of Afrofuturism of creation and criticism of identifying the limitations of Afrofuturism to meaningfully engaging with the lives and livelihoods of African urban

communities, as it remains highly speculated in virtual worlds, by focusing Bantutopianism as the relationality of these different entities underpinned by Ubuntu, more so in physical reality. Bantutopianism has done so by formulating a cosmological society centred on solar powered relational aesthetics mediating the practices of everyday life embedded in multiple cultural artefacts. This is apparent through the imagining of a department of Post Human settlements responsible for facilitating earthly-cosmological relations between humans and non-humans. These relations include the relationship of smart technologies of the future linked to the sun such as solar powered sound systems, lights, textiles such as electric blankets employing vernacular designs of various African cultures, head wraps, food stalls and sentient beings of the future which are used by people as a link to enhance their consciousness to the cosmos and to supporting social, economic and environmental sustainability and well-being. The ability of informal traders to dress in these artefacts or move with them advances AbdouMaliq Simone's (2008) notion of human activities as infrastructure through these artefacts that interact with their bodies to ensure their survival. This insinuates aesthetics as an adaptive system that ensures human survival in ecologically sensitive ways as discussed by Di Carlo (2016). It also has created visions of water utopias by imagining self-purifying water systems to mitigate against the lack of provision of water services for traders in the Dunusa stretch. Most critically, given the domination of white corporates in the solar power industry, it imagines a space where Bantutopians have advanced technologies in the solar industry such as the eternal solar battery to safeguard energy security for future generations. By safeguarding the patents on this technology from corporates wanting to have a monopoly on such technologies, it is done so with the outlook to guard humans and non-humans from potential destruction through extractive exploitative capitalism in

the sun business. This therefore prompts a discussion on political sustainability as the overarching theme where social, economic, ecological and physical sustainability are matter of concern with regards to the governance and decision making on the design and distribution of resources. It therefore considers democratisation and participation of civil society in all areas of decision making within the above-mentioned dimensions advanced by Adriana Allen (2002) and advocated by Edgar Pieterse (2011) revealed in the narrative.

Therefore, the design process results in the creation of the *solar futurhythmachine* (as an emerging technology) defined as a sensual design tool and machine (Goodman, 2011) responsive to performing a multiplicity of functions. This African fractal inspired large scale solar artwork/machine creates a spatial and energy efficient space for urban crowds in Dunusa to move through sensually. It also operates as a sound and lighting system that can be quickly transformed into a performance stage for built environment conferences, festivals to shelter for the homeless. It therefore serves an important role as a sustainable architecture that promotes flux and change. It makes a deep ethical consideration for black cultural life that has often been marginalized in the city, as a shelter for the homeless, prostitutes, the religious and music cultures to be cosmologically engaged with their existence relationally. The right to the city becomes extended to the right to the sun especially in the context of energy poverty. However, the ethical imperative it emphasises is the oral histories that have gone unheard in the built environment and therefore sonic process is fundamental in its functional design which affirms Eshun's (2003) appeal for sonic process in an Afrofuturist project. As Goodman (2011) interprets Eshun's concept of the futurhythmachine that it ''becomes a locus of affective collectively'' ''in the context of enforced migration, depressed urbanism, and ethnic suppression'' as a

''painstakingly crafted'' notion, this research contextualizes this concept in the physical reality of solar power as a liberating aesthetic of sustainability encompassing the sonic, architectural, visual, political and now renewable energy (solar power) in the context of spatial design and urbanism. This formulates an aesthetic of sustainable African cities concerned with liberating infrastructure, people, governance and the environment.

7.5 Recommendations

What this research has suggested is that the field of sustainability that deals with the design of solar technology in the African context has not been considered in its relation to urban African communities. This needs to be mitigated against to produce more suitable visons of sustainability through appropriate aesthetics that engage with the inner city and townships in far more meaningful ways, which is largely inhabited by black communities. These approaches need to consider the multiple evolving identities of African cultures, particularly those whom could benefit in this improving their livelihood given high levels of energy poverty that still exists in Johannesburg.

In academia, it requires an imaginative extension particularly in research methods which requires an interdisciplinary approach especially between the humanities and built environment most suitably placed in addressing sustainable architecture, which must extend beyond a preoccupation with the physical but its deeper interface with the social, political and environmental relations that create new urban languages that reflect urban complexities at hand. This requires designers of solar tech to formulate appropriate aesthetic responses to the manufacture and installation of renewable energy technologies so that they are embedded in the rituals of everyday life in more accessible and meaningful ways to

explore different interactive compositions, forms and scales that respond to multiple ontological manifestations and subjective experiences centred around climate. This requires designers to manufacture concepts and create cultural practices around the design of solar technology which means that in order to create an aesthetic approach a new urban language needs to be created not just through practise but literary form to integrate new theories and practises of solar technology. This enables a far more critical approach that is inventive rather than descriptive given Jane Rendell's (2006) approach to using critical theory as a method of research enquiry.

For future exploration, further research in Dunusa at night warrants attention to have a deeper understanding of the dynamics of the place, as this research has been unable to interact with the space at that time. It will be important for highlighting the actions of the place to further point out infrastructural needs for possible nocturnal social lives and economies to articulate how these are environmentally engaged based on empirical findings.
Areas of research that need further articulation is a sustained engagement on the notion of water utopias in addition to those of energy to propose new urban solutions to issues such as storm water flooding for those operating in the context of informality. This particularly would be resourceful as a speculative enquiry to work towards actualizing such a vision.

Most critically it should be remembered that the future cities to come in an age of the solar futurhythmachine is certainly a time where Cities' energy survival networks roam the cosmos amongst the stars that give life in a space where black life is valued and indigenous ways of life are not ignorantly undermined but critically appraised to better prepare for those to come after us to sharpen sustainability discourse and praxis that engage with our senses.

8 REFERENCES & BIBLOGRAPHY

Anderson, M. 2014. New Ecological Paradigm (NEP) Scale. Research Gate. Berkshire Publishing Group.

Anderson, R and Jones, C. E. (Eds.) 2015. Afrofuturism 2.0: The Rise of Astro- Blackness. Lexington Books. Lanham, Boulder, New York, London.

Baweja, V. 2014. Sustainability and the Architectural History Survey. An Open Access Journal for Architectural Research 11 (1) pp. 40-51.

Bronner, S. J. 1982. The Haptic Experience of Culture. Athropos. (Bd 77) 3 / 4, pp.351-362.

Browning, W. Ryan, C. Clancy, J. 2014. 14 Patterns of biophilic design: Improving health & wellbeing in the built environment. Terrain Bright Green: New York/Washington DC.

Brundtland, Gro Harlem (1987) Our Common Future , Oxford: Oxford University Press.

Butler, O. 1993. Parable of the Sower. Four Walls Eight Windows

Chan, C. and Marafa, L.M. 2018. Knowledge-Perception Bridge of Green-Smart Integration of Cities: An Empirical Study of Hong Kong. *Sustainability.*10 (107): pp. 1-19.

Clark, S. 2010. Contemporary Art and Environmental Aesthetics, Environmental Values, 19 (3): pp. 351-371.

Clammer, J. 2015. Art, Culture and International Development. Humanizing social transformation. Routledge. London and New York.

Claus, J. 2003. Art for the Solar Age. Leonardo. 36 (4). Pp.176.

Demos, T. J. 2016. Decolonizing Nature: Contemporary Art and the Politics of Ecology. Berlin: Sternberg Press

Dery, M. 1993. 'Black to the future: interviews with Samuel R. Delany, Greg Tate, and Tricia Rose', South Atlantic Quarterly, vol. 92, no. 4, pp. 735 – 778.

Di Carlo. I.2016.The Aesthetics of Sustainability: Systemic thinking and self-organization in the evolution of cities. LISt Lab: Italy.

Dyangani Ose, E. 2014. Enthusiasm: Collectiveness, Politics, and Aesthetics. *Nka Journal of African* Art. 34, pp 24-32.

Eshun, K. 2003. Further Considerations on Afrofuturism, globalicities: possibilities of the globe (summer 2003), CR: The New Centennial Review, 3 (2): pp. 287-302.

Eshun, K. 1998. More Brilliant Than The Sun: Adventures in Sonic Fiction. Quartet Books, London.

Eshun, K. Sagar, A. 2014. It May be Useful to Assume the Policeman's Perspective Now and Then. Nka Journal of Contemporary African Art. 34, pp. 8-13.

Fallen, K. 2008. Architecture in Action — Traveling with Actor-Network Theory in the Land of Architectural Research. Architectural Theory Review. (13) 1 pp80-96

Fataar, R. Diversity in planning. Transforming urban environments inclusively. Green Economy Journal. 25. Pp 24-25.

Gallese, V. Gattara, A. 2015. Embodied Simulation, Aesthetics, and Architecture: An Experimental Aesthetic Approach. Robinson, S. and Pallasmaa, J. (Eds) In Mind in Architecture Neuroscience, Embodiment, and the Future of Design. The MIT Press. Cambridge, Massachusetts, London, England

Gaskins, N. R. 2015. Afrofuturism on Web 3.0: Vernacular Cartography and Augmented Space. In Afrofuturism 2.0: The Rise of Astro-Blackness. Part I: Quantum Visions of Futuristic Blackness. Lexington Books. Lanham, Boulder, New York, London.

Gbadamosi, R. 2015. Of Wastelands and Landfills. Question 3 How will technology influence the future in Africa?:. In African Futures. S. O'toole, S. & Heindrich. L, Eds. Germany: Kerber.

Gurney, K. 2015. The Art of Public Space: Curating and Re-imagining the Ephemeral City. Palgrave Macmillan: UK

Goodman. S, 2011, Sonic Warfare: sound, affect and the ecology of fear, MIT Press, Massachusetts USA.

Greenfield, A. 2013. Technology & Urban Space: A Manifesto. In Cityscapes: Rethinking urban things. 3. Pp 24-27. Tau Tavengwa and the African Centre for Cities (ACC): Cape Town

Harries, J. 2011. Africa on the Moon: The Complexities of an Afrofuturist Reading of Dub. Dancecult: Journal of Electronic Dance Music Culture 7 (2): pp43-63.

Harrison, P., Bobbins, K., Culwick, C., Humby, T.-L., La Mantia, C., Todes, A., et al. (2014). Introduction and Chapter 1: Resilience Thinking. In P. Harrison, K. Bobbins, C. Culwick, T.-L. Humby, C. La Mantia, A. Todes, et al., Urban Resilience Thinking for Municipalities (pp. 1-21). Johannesburg: University of the Witwatersrand, Gauteng City Region Observatory.

Hosey, L. 2012. The Shape of Green: Aesthetics, Ecology, And Design. Island Press: Washington.

Ike-Njoku, N.2015. The Cylinder. In African Futures. Question 1 How do we write about the future? S. O'toole, S. & Heindrich. L, Eds. Germany: Kerber.

Jeyifous, O. ND. Uneven Growth: Tactical Urbanisms for Africa. Vigilism. Online: http://vigilism.com/filter/Installations/Uneven-Growth-Tactical-Urbanisms-for-Africa [Accessed 20 April 2017]

Jeyifous, O. ND. Shanty Mega-Structures. Vigilism. Online: http://vigilism.com/filter/Drawings/Improvised-Shanty-Megastructures [Accessed 20 April 2017]

Johnson, V. 2016. Get A first Look At Paul Louise Julie's Afrofuturist Sci-Fi Epic 'Yohance'. 27 January. Comics Alliance. Online: http://comicsalliance.com/first-look-paul-louise-julie-yohance/ [Accessed: 28 July 2017].

Johnson, V. 2016. Werewolves in Africa: Paul Louise-Julie on 'The Pack,' Sci-Fi Epic 'Yohance' and the Blerd Community [Interview]. 20 January. Comics Alliance. Online: http://comicsalliance.com/paul-louise-julie-the-pack-yohance-interview/

Jones, E. 2015. Africana Women's Science Fiction and Narrative Medicine: Difference, Ethics, and Empathy. In Afrofuturism 2.0: The Rise of Astro-Blackness. Lexington Books. Lanham, Boulder, New York, London.

Kamanzi, B. 2014. AfroFuturistic Dream of Cape Town. Blog. Online: https://briankamanzi.wordpress.com/2014/12/07/afrofuturistic-dream-of-cape-town/ [Accessed 5 March 2017].

Kreamer, C.M. African Cosmos: Stellar Arts. Smithsonian National Museum of African Art: The Monacelli Press.

LAGI. 2017, land art generator Solar Mural artwork program. Online: http://www.landartgenerator.org/solar-murals.html [Accessed: 15 November 2017].

Lefebvre, H. 1996 (first published in 1968). Writings on

Cities. Blackwell, Oxford. Pp. 3-240.

Lakha-Singh, R. 2017. Human Rights in a digital world. In Curiosity. Issue 2. Johannesburg: WITS University.pp 16-17.

Latief, J. 2018. Michelle Mlati's Afrofuturist approach to spatial planning. *Design Indaba.* Online: http://www.designindaba.com/articles/creative-work/michelle-mlatis-afrofuturist-approach-spatial-planning [Accessed 8 August 2018]

Deluliis, D. and Lohr, J. Rewriting the narrative: Communicology and the Speculative Discourse of Afrofuturism. In Afrofuturism 2.0: The Rise of Astro-Blackness. Part III: Forecasting Dark Bodies, Africology, and the Narrative Imagination. Lexington Books. Lanham, Boulder, New York, London.

Maape, S. 2016. Architecture for Resilience: Dialogues with place in the indigenous communities of Kuruman during the Holocene period. PhD. Faculty of Engineering & the Built Environment. pp1-258.

Matjomane, M. 2018. Contestations of Street Trading on De Villiers Street. In Taking Streets Seriously: GCRO Research Report no. 8.

Mnisi, Z. 2015. The Daily Vox. 15 August. How I snagged An H & M dress for R20 by Shopping at a ''Dunu Boutique'' [Online] Available: https://www.thedailyvox.co.za/how-i-snagged-an-hm-dress-for-r20-by-shopping-at-a-dunu-boutique/

Mbembe, A. 2015. The Internet is Afropolitan. Chronic Chimurenga Pan African Journal (now-now), (a quarterly pan African gazette) [Online] Available: http://chimurengachronic.co.za/the-internet-is-afropolitan/ [Accessed 31 August 2017]

Mbembe, A. 2008. Aesthetics of Superfluity. In Johannesburg The Elusive Metropolis. Nuttall, S. and Mbembe, A. Eds. WITS University Press: Johannesburg.

Mbembe, A. 2015. Africa in the New Century. Question 4 Where do we go from here? In African Futures. S. O'toole, S. & Heindrich, L. Eds. Germany: Kerber.

Mosagee, N. 2016. Is Africa leading the innovation revolution? World Economic Form [Online] Available: https://www.weforum.org/agenda/2016/01/is-africa-leading-the-innovation-revolution/ (Accessed 2 February 2018)

Murove, M. F. 2016. African Moral Consciousness. Austin

Macauley Publishers: London.

Natalie-Claire. 2016. L. Black Female Engineer + Her Afrofuturist City. Online: https://howwegettonext.com/black-female-engineer-her-afrofuturist-city-b0bf58f2816d [Accessed 12 April 2017].

Nle. 2013. Makoko Floating School. In Boundaries: International Architectural Magazine (8) 3 pp. 66-69

Nuttall, S. & Mbembe, A. 2008. In Introduction: Afropolis Introduction Johannesburg: The Elusive Metropolis. Johannesburg: WITS University Press

NSFWUS [National Science Foundation Workshop on Urban Sustainability]. 2000. 'Towards a Comprehensive Geographical Perspective on Urban Sustainability', 'Final Report of the 1998: National Science Foundation Workshop on Urban Sustainability.' Rutgers University.

Pieterse, Edgar (2008) City Futures: Confronting the Crisis of Urban Development , London: Zed Press.

Pieterse, E. (2011). Recasting Urban Sustainability in the South. Development, 54, 309-316.

Pinther, K. Forster, L. & Hanussek, C. 2012. Afropolis: City, Media, Art. Jacana: Singapore

Ramos, J. 2016. Linking foresight and action: towards a future action research. Chapter 48. The Palgrave International Handbook of Action Research. Eds. R. Rowell, L.L. Bruce, C.D. Shosh, J.M. Riel M.M. Palgrave Macmillan Springer Natur: New York

Rendell. J. 2006. Art And Architecture: A Place Between London: I. B. Tauris

Rendell. ND. Critical Spatial Practise. Online: http://www.janerendell.co.uk/wp-content/uploads/2009/06/critical-spatial-practice.pdf [Accessed: 5 March 2017]

Rendell, J. 2016. Critical Spatial Practice as Parrhesia. Fine Art Research 1 (2): pp 1-8.

Roof Top Gardening in the Inner-City: Durban's Priority Zone Rooftop Garden. 2012. Urban Earth. Online [Avaialble]: http://www.urbanearth.co.za/articles/roof-top-gardening-inner-city-durban%25E2%2580%2599s-priority-zone-rooftop-garden [Accessed: 9 May 2017]

SAHO. 2011. Treason Trial 1956-1961. Online: https://www.weforum.org/agenda/2016/01/is-africa-leading-the-innovation-revolution/ [Accessed: 28 November 2017].

Sholette, G. 2008. Dark Matter: Art and Politics in the age of Enterprise Culture.

Siler, T. Siler.1985.Neurocosmology-Ideas and Images Towards an Art-Science- Technology Synthesis. Leonardo 18 (1) pp. 1-10.

Siler, T. 2007. Fractal Reactor: Re-Creating the Sun. Leonardo. (40) 3. Pp.270-278.

Simbao, R. K. 2007. Credo Mutwa: Time Unravellller. Art South Africa. 5 (4) pp 43-46.

Simon, D. 2016. Green cities: From tokenism to incrementalism and transformation. In Simon, D. Rethinking Sustainable Cities. Accessible, Green and Fair, Mistra Urban Futures, Bristol: Policy Press

Snyman, A. 2017 Houses in the Sky. In the afropolitan.pp58-62

Sui, D. Z. 2000. Visuality, Aurality, and Shifting Metaphors of Geographical Thought in the Late Twentieth Century. Annals of the Association of American Geographers. 90 (2): pp. 322-343

Sunstrum, P. P. 2015. Leaping out. Question 2 Where do we begin when we speak of African Futures? In African Futures. S. O'toole, S. & Heindrich. L, Eds. Germany: Kerber

Tv Tropes, ND. Solar Punk. Online: http://tvtropes.org/pmwiki/pmwiki.php/Main/SolarPunk [Accessed 14 February].

UN Habitat. 2014. The State of African Cities 2014: Re-imagining sustainable urban transitions. Kenya: Nairobi . Online:http://www.gwp.org/globalassets/global/toolbox/references/the-state-of-african-cities-2014_re-imagining-sustainable-urban-transitions-un-habitat-2014.pdf

van Veen, T. C. 2015. The Armageddon Effect: Afrofuturism and the Chronopolitics of Alien Nation. Part II: Planetary Vibes, Digital Ciphers, and Hip Hop Sonic Remix. In Afrofuturism 2.0: The Rise of Astro- Blackness. Anderson, R and Jones, C. E. (Eds.) Lexington Books. Lanham, Boulder, New York, London.

Vieira de Oliveira, P.J.S. 2016. Design at the Earview: Decolonizing Speculative Design through Sonic Fiction. Design Issues. 32 (2). Pp. 43-52.

Werbner, P. 2006. Vernacular Cosmopolitanism. Theory Culture & Society. (23) 2-3. Pp 496- 498).

Womack, Y. 2013. Afrofuturism. The World of Black Sci-Fi and Fantasy Culture. Chicago University Press.

Yaszek, L. 2002. The Self-Wired: Technology and Subjectivity in Contemporary Narrative, Routledge, New York.

Yaszek, L. 2012. Race in Science Fiction: The case of Afrofuturism.

SCHOOL OF ARCHITECTURE AND PLANNING
HUMAN RESERCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE
PROTOCOL NUMBER: SOAP088/07/2017

PROJECT TITLE: Afrofuturist cities: Art for Renewable Energy Infrastructure in the Age of the Futurhythmachine

INVESTIGATOR/S: Michelle Mlati (Student no #771941)

SCHOOL: Architecture and Planning

DEGREE PROGRAMME: Master of Architecture (MArch SEEC)

DATE CONSIDERED: 11 September 2017

EXPIRY DATE: 11 September 2018

DECISION OF THE COMMITTEE: APPROVED

CHAIRPERSON
(Professor Daniel Irurah)

DATE: 15-09-2017

cc: Supervisor/s: Sechaba Maape

DECLARATION OF INVESTIGATORS

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to endure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee.

Signature  **Date** 12 Sept 2018