The Intersection of Environmental Racism and Conservation:
A systematic review of publications affiliated with UCT that deal with race and environmental sustainability

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List of Abbreviations

UCT	University of Cape Town
SDG	Sustainable Development Goals
MDG	Millennium Development Goals
NSA	Neighbourhood Sustainability Assessment
EIA	Environmental Impact Assessment
UN	United Nations

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1.Abstract

The following research explores the intersection of environmental racism and conservation in literature affiliated with the University of Cape Town, through the means of a systematic review. This systematic review is contextualised by not only the socio-economy of Cape Town and the greater South Africa, but also the self-positioning of UCT as an 'anchor institution' that is impactful, though its research, on the wider community. The research sorts a total of 81 publications into nine themes, time-boxed by the past 10 years. This study is limited only to peer-reviewed journal articles published in English, in established journals. The results indicate growth in the number of publications on these topics over the decade, with the most being published in 2018, 2019, and 2020, and uncovered that the publications offer a significant amount of critique on the environmental governance in the global south, and in South Africa specifically. Through a deep analysis, this research identifies trends across publications, from the year of publication, the current events at the time of writing, and the range that the various authors explore. The study shows that there is a lack of publications on the implementation of the proposed solutions or strategies that tackle the deeply complex issue of eradicating racism, and building a sustainable future for everyone, particularly in the developing world. This research provides a comprehensive review of affiliated literature with UCT on these topics, while identifying gaps in the publications. It identifies spaces where, if time and resources became available, UCT could collaborate and help implement strategies and policies, above and beyond research and recommendations.

2.Introduction

At the time of writing, a pandemic is sweeping across the globe, setting developing countries back by decades with economic contraction, rising unemployment, and healthcare systems pushed far past their limits. In this context, 'developing country' is used in accordance with the UN's definition of Least Developed Countries (LDC) which uses three criteria; gross national income, human assets index, and economic vulnerability index, in order to label these countries (United Naitons, 2021). While South Africa does not qualify for the LDC list, the country is nonetheless no exception to these hardships and is designated as an 'upper middle income' country, yet a projected 60% of people live below the poverty line (United Nations, 2021). The term is used as a description throughout this work through this globally accepted lens and is used to indicate the various statuses of different countries. Coupled with the reality of a deep historical divide along racial lines already, during 2020 the nation experienced an economic shrinking of 7%, and an increase in poverty by over 2 million people (World Bank, 2021). South Africa is no stranger to inequality, since its democratic inception in 1994, the country has persistently found itself near the top of the IMF's most unequal countries list. Various indicators including concentrated wealth, which is skewed to the richest 20%, unemployment, and income per capita, were employed by the IMF confirm that the inequality still falls along racial lines (IMF, 2020). Globally, the UN has set in motion the SDGs, which include 17 different goals, each with the overarching purpose a peaceful and sustainable future for all and are mostly grounded by conservation targets.

Through a discussion of white supremacy in South Africa, Rich (1990) explains the conception of segregation and Apartheid; in 1913 the Natives Land Act was passed whereby black people were not only forced to relocate into poorly planned townships as only whites were allowed to occupy 87% of the land, but were exposed to landlessness, economic struggle, and segregationist policies (Rich, 1990, South African Government, 2013). While foreign occupation and segregation (Dutch and English colonial rule) were present in the country prior to 1913, these events marked the turning point for South Africa towards Apartheid and the lingering racial and class struggles that remain in place today. Large portions of the country remain segregated into townships, and despite some country-wide policies, the fact remains that not enough is being done to provide marginalized groups with justice, equality, and fair access to environmental benefits (Rich, 1990). According to the United Nations, marginalized groups, which in the case of South Africa refers mostly to people of colour, face greater exposure to climate change (Islam and Winkl, 2017). Evidence suggests that due to environmental racism and inequality, groups of colour are forced into areas that increase their exposure to environmental hazards. Furthermore, these marginalized groups are systemically disadvantaged, they often are denied the tools they need to cope and recover from damages, and to mobilize to prevent it from happening again (Islam and Winkl, 2017).

Conservation policy in South Africa is largely the legacy of former colonial and Apartheid regimes and methods, that systematically forcefully removed indigenous peoples from their land, continually denying them rights, and disenfranchising them (McDonald, 2002). In response to these injustices, the South African constitution, ratified in 1996, seeks to address the historical inequalities that have, for centuries, plagued the country. Explicitly delivering citizens progressive environmental rights and protection from environmental harm, Section 24 of the constitution states that everyone has:

a) The right to an environment that is not harmful to their health or wellbeing; and
b) To have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that –
    a. Prevent pollution and ecological degradation;
    b. Promote conservation; and
    c. Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development (Section 24, South Africa, 1996)

Despite the fact that these rights are enshrined in the constitution, they have not yet been fully realized. There remains a diverse population within the country that contest the idea that racist policies and practices have continued past 1994, when Apartheid ended (McDonald, 2002). A certain naivety, or willful ignorance enshrouds the discourse around race and racism in the country (Graham, 2015). By citing the existence of a progressive constitution, some argue that the remaining inequality is not continually being worsened, but that it is simply experiencing 'growing pains' while the virus of racism works itself out of the country on its own, therefore requiring no concerted counteraction (Graham, 2015).

Another explanation for a lack of action and long-term policies is introduced by (Ruiters, 2001). The author provides a powerful commentary on the way in which racism is deeply embedded in environmental policy in South Africa: that it is entirely possible that individuals or institutions would not be made aware of the fact that a system that benefits them is simultaneously harming and marginalizing groups of colour. Another reason for such perpetuation is that environmental governance is dictated by treating the symptoms of environmental racism rather than the disease itself. For example, most social justice protests in South Africa have been on the matter of waste and sanitation services, as opposed to the *systems* in place that cause marginalized groups to have inadequate access to waste and sanitation in the first place (Leonard, 2017). Without citing the reason for these issues as environmental racism, the system is only reinforced from the top down as governance is not forced to change at a larger scale, but instead reacts only to address once-off incidents when protests arise.

As previously mentioned, the SDGs are currently dictating conservation and sustainability globally, and every UN country in the global north and south has committed to various goals they feel most important

in their individual state. The overarching goals of the SDGs is to alleviate the world of inequality and poverty and push an agenda of a peaceful and sustainable future for all. Adopted in 2015, all the United Nations ′member states agreed to the ′2030 Agenda for Sustainable Development ′which is characterized by 17 different goals[1] that, for example, aim to rid the world of poverty, foster gender equality, and to have clean air and oceans. The SDGs were adopted after the MDGs failed to alleviate poverty and inequality by 2015, as they had originally set out to do (United Nations, 2015). Each of these goals is tightly linked to the others, and measured by a total of 169 targets, such as goal 12 (responsible consuption and production) and goal 7 (affordable and clean energy), which both need to be achieved in order for the other to succeed.

Both developing and developed countries are working in unison to address the areas where they are falling short, which incentivises multinational collaboration, and acknowledgement of global injustices that have for so long, defined the developing world, and separated it from developed countries. With a huge amount of negative environmental change being displaced from the global north onto the global south, coupled with recovery from colonial rule, issues of environmental justice are taken extremely seriously. This is especially true within the confines of a university such as UCT where real change is taking place to try to rectify colonial and Apartheid-era inequalities.

Higher education institutions can offer a unique space where change can be enacted from the ground up. They are less bound by the complexities of state governance and have the freedom to direct research and resources towards localized issues. Universities that establish themselves to be anchor institutions are uniquely positioned to engage with radical and meaningful change. Anchor institution, as defined by (Birch et al., 2013) is an entity such as a large corporation, a hospital, or in this case, a university, that anchors the surrounding urban community in a fluid but stable geographic manor (Birch et al., 2013). An anchor institution has four components: ″spatial immobility, corporate status, institutional size, and institutional mission" (Harris and Holley, 2016). This framework suggests that geographic setting and surroundings also define an anchor institution, as does the fact that it is fixed in its setting, and its overall goals as an organization.

Local expectations are affixed to anchor institutions. It is assumed that they will operate on a small enough scale to develop effective solutions for pinpointed issues, such as providing graduates with jobs which both stimulates the economy, while keeping the working force young, educated, and engages the university with their surroundings. Other avenues for enacting change are often seen through place-based engagement that is specific to the institution′s setting (Harris and Holley, 2016). Place-based engagement takes place through tailoring research towards context-specific issues, encouraging public participation, and providing opportunities for community involvement where the public is engaged in the shaping of the

[1] https://sdgs.un.org/goals

institution, and in return, the institution branches out into its surrounding areas to foster positive relationships and to listen to the needs of people within the community (Harris and Holley, 2016). This kind of engagement fosters meaningful, long-term, positive relationships between institutions and the cities in which they reside and can provide numerous benefits for all involved in such a relationship. Scholarship on the importance of anchor institutions concurs that they act as a catalyst for continued funding for up-to-date projects and research, can foster a 'good neighbour' mentality, and establish a stable source of economic and social growth (Birch et al., 2013, Harkavy and Zuckerman, 1999, Harris and Holley, 2016).

A significant amount of the existing literature on the topic of anchor institutions is from the perspective of the global north, nevertheless, there are useful descriptions to take note of. For example, the literature asserts that all universities that act as anchor institutions will play an essential role in building resilience strategies for climate change, for the cities to build intellectual capital, and to strengthen economies against decline (Parrillo and De Socio, 2014, Shaffer and Wright, 2010). These concepts are repeated by (Harris and Holley, 2016) where the authors discuss that the above values in anchor institutions are well known, essentially uncontested, and have been within the academic lexicon for over three decades. One case study focused on a Pennsylvania University reported that the institution turned itself into an anchor institution by engaging with the community and committing to disseminating knowledge in a more effective way throughout the area, and was able to experience the benefits of becoming a pillar for its community (Office of University Partnerships, 2013).

Universities as anchor institutions in the global south have an entirely different set of challenges, in addition to contributing to the local economy and surrounding community, they are empowered to direct the flow of knowledge towards more economic development and social justice. UCT can be considered an anchor institution, especially as it positions itself as one via its internal and external communications. Nestled into the side of Table Mountain, the university offers a picturesque campus, but within its walls, the university has positioned itself to address the inequalities and injustices that have been present in South African society for so long.

UCT is the best ranked university in Africa, and depending on the metrics, falls between the top 100-200 universities globally (Rankings, 2021). Employing over four thousand individuals across academic and administrative roles, helping to teach roughly 30 000 students at six different locations across Cape Town, the university is a pillar of the community (UCT, 2021a). Research is a huge component of UCT′s dedication to transforming and transitioning towards a more socially just and sustainable future post-Apartheid. According to the University, UCT students have persistently propelled social change, opposing Apartheid policies since the 1960s, and eventually forcing the institution to accommodate for their socially just ideas (UCT, 2021a). The university adopted a multifaceted response to reflect the decolonial agenda, recognizing that renaming apartheid-era buildings and removing statues is not enough, the university has

simultaneously dedicated itself to directing research towards a more racially just and environmentally sustainable future. This in particular, positions UCT in a powerful space, where despite its history, it is aiming to transform on multiple frontiers, meaning that if those changes take place from a multi-disciplinary perspective, the university will be able to tackle the overt racism that has, for many years, loomed over the institution, and it will be able to build a sustainable future.

The university has positioned itself around the goals of transformation through a decolonial agenda. Thus, various global and local actors – whether international governing bodies, or mobile scholars – continue to engage with the institution on the premise that this is what they are working towards across disciplines and faculties. UCT has positioned itself at the forefront of African universities, publicly indicating its commitment to transformation through campaigns, city partnerships, and continued research in emerging and contested fields. Through putting this vision and idea of itself into the world, UCT sets certain expectations for itself, and this research acts as an assessment of one of those expectations. This is not meant to oversimplify the complex workings of an HEI such as UCT. It is, however, meant to indicate that the research addressed here is linked to UCT, and that there is an opportunity for exploring the significance behind that work – or .

UCT responded to the month-long Rhodes Must Fall protests by committing to remove colonial-era statues, changing the names of buildings, and to changing the university curriculum to uplift the previously disenfranchised histories and voices of exploited and marginalized peoples (Curriculum Change Working Group, 2018). Dedicating itself to eradicating systemic and institutional racism within its walls, the institution aims to create a safe and accessible space for students hailing from all backgrounds and demographics (UCT, 2021b). In a statement released in early July of 2020, the university took a stand in support of the Black Lives Matter movement in response to the murder of George Floyd (Phakeng, 2020). Recognizing the reality of systemic racism, structural inequality, and perpetuation of marginalization, the university referenced the reality of white privilege that is present across the world, and within the university itself. The path forward, according to the university, while complex, is by:

> …educating students and staff about race, oppression, inequity, gender-based and other forms of violence. To become a more inclusive university we must try to understand patterns of exclusion and probe the meaning of unconscious bias…. Dedicated scholarship that provides knowledge on more equitable and just economic and social systems that eliminates systemic racism is already underway at the university, (Phakeng, 2020).

One of the main avenues through which the university is aiming to tackle systemic and institutional racism is through the direction of research towards those issues. UCT is aiming to involve itself in research that pushes a social justice agenda, through acting as the continent's most reputable institution of higher

learning, research directed towards uncovering and dismantling racist systems both domestically, from a global south perspective, and globally.

More specifically, UCT fits the mould of Harris and Holley's (2016) four criteria. Firstly, UCT, because of their location UCT is able to engage with its mission via community involvement and partnerships, such as the close relationship with the City of Cape Town. Second, the nature of the campus, size and reputation as a sprawling, internationally recognized university verify its corporate status. Third, the university has a huge pull in the community and country, with nearly 5000 staff and over 29,000 students (UCT, 2021a). And finally, the university is has a socially driven message, and is publicly aiming to transform itself and the community into a more socially just space, such as the curriculum change in 2018 or dedication to the SDGs (UCT, 2021a, Harris and Holley, 2016).

A safe and inclusive space for students and faculty also includes a culture that is sustainable, and is environmentally conscious on behalf of both current and future students. In conjunction with changing the curriculum and tackling institutional racism, the university has also laid out a sustainability plan, run by the Environmental Management Committee (UCT, 2021b). The pillars of the University's sustainability plan for 2030 are "shared values, net environmental sustainability, and gaining synergistic outcomes," these goals compliment the four components of the plan which are: "learning, operations, governance and research," (Braune, 2020). Under the heading of research at UCT, the 2030 plan details three points to shift the focus of research towards sustainability:

1. Intensify, strengthen and further promote existing environmental sustainability related research;
2. Create a Living Lab experience via research linked to campus facilities and campus property related projects that support on-site real-life environmental sustainability research opportunities;
3. Strengthen links and awareness of environmental sustainability in any research that occurs at UCT, (Braune, 2020, 5).

The sustainability plan ties together the recurring theme that research is paramount to the university when it comes to building a just and sustainable future for all students and faculty. Although there are other components that will certainly need to be employed, such as the continued deconstruction of colonial and neocolonial (Apartheid-era) structures, and development and implementation of eco-friendly solutions, research is where all of these changes begin.

Presently, South Africa′s environmental policy landscape is at a turning point. The state has wholeheartedly committed to achieving the SDGs by 2030 (Hutchings, 2019). In order to do so, systemic racism must be eradicated. UCT has made important progress in dedicating a taskforce to research ways in which the goals can be met, to educating the public on the SDGs, and involving stakeholders and

communities in the process. In addition to those steps, the university has released two separate statements saying that one of the most important steps in the process of addressing and dismantling racism and in fostering a sustainable future is allocating research towards emerging knowledge in those fields. By doing so, the university will achieve two things, they will position themselves as a global leader in introducing the knowledge around environmental racism in post-colonial, developing countries and will be able to continue breaking down formerly racist barriers and setting the stage for an environmentally and socially just future.

3.Problem Statement:

As previously mentioned, South Africa is no stranger to inequality, often finding itself on or near the top of the IMF′s list of most unequal countries every year (IMF, 2020). The University of Cape Town has publicly committed to using its status in the community and global clout to forge the way for developing the global south towards a more sustainable and just future, using research as a fundamental tool in creating these changes, positioning itself as an anchor institution with a clear progressive agenda (UCT, 2021b). For example, to help South Africa achieve the SDGs by 2030, the university began a seminar series which was aimed to bring together the local community and university in a space that would foster communication and innovation towards a common goal. The first was titled *Localizing the SDGs in South Africa* (Smith, 2019) and is planning to host a SDG summit planned for September 2021 to evaluate the work that has been done so far, and to identify ways that the process can be accelerated (Harrison, 2021). In recent years, educational institutions and governing bodies have attempted to shift their focus away from economic growth and, instead, acknowledged the need to foster a socially just and sustainable future. Ranked the best university in the continent, UCT has publicly broadcasted their commitment to a just transformation of the university and its surrounding area especially since the institution came under intense scrutiny during the Rhodes Must Fall[2] protests. This led to a heightened awareness of decolonizing the university through curriculum changes and dismantling the racist infrastructure on campus (UCT, 2021b, Curriculum Change Working Group, 2018, UCT News, 2021). Thus a research opportunity arises where the discourses of environmental racism and conservation intersect, grounded in the context of UCT. Since the university has committed to both a de-colonial and sustainable future and has identified research as one of its key avenues through which to achieve this, this leads to questions of how the university has positioned itself through research to address these critical issues and what kind of progress has been made.

[2] In 2015 the University responded to intense student protests and removed a statue of John Cecil Rhodes from the campus where it stood for decades representing British colonialism, representing white supremacy and perpetuating ideas of institutional and systemic racism at the university (UCT News, 2021).

4.Research Question:

The purpose of this research is to investigate the contents and scope of the University of Cape Town′s contribution to the discourse surrounding environmental racism, environmental justice, and sustainability, in the form of publications resulting from research conducted by the University and/or its staff.

5.Objectives:

In alignment with the above research question, this dissertation engages with four objectives to facilitate a comprehensive contribution to the knowledge on the topics of environmental racism and conservation through the lens of a systematic literature review from publications affiliated with, funded, or sponsored by the University of Cape Town.

1. Define ‘environmental racism’ and ‘environmental justice’, identify the connection between these terms and that of ‘sustainability’;
2. Develop a search-string across two academic databases (*SCOPUS* and *Web of Science)* to gather all relevant sources, within specific search parameters and inclusion criteria;
3. Conduct an in-depth systematic literature review exploring the contents of all included articles, connect them by theme and sub-categories, and identify trends within each category;
4. Discuss the meaning of the findings from the systematic review; elaborate on the remaining components of the research question by offering a meta-analysis on the results.

6.Conceptual Framework

Definitions of environmental racism vary slightly across various contexts, this research engages with two: the first comes from the author who coined the term in 1987, and the other a more updated, broad definition from 2001 (Chavis, 1994; Ruiters, 2001). For example, while one of the definitions is from the United States (Chavis, 1994), the meaning behind it is applicable in both the global discourse or at a much smaller scale. The objective of this section is to unpack why and how the terms environmental racism and environmental injustice are used in this research. It seeks to explore and explain the gravity of the issues, and to substantiate that it manifests differently across the world. It is particularly prevelant in the global south where it is characterized by developing or post-colonial countries, and communities of colour, which disproportionately experience environmental degradation as compared to the global north.

Through an exploration of contested literature over a 20-year timeframe (Mohai et al., 2009) reference a collation of hundreds of studies that have all come to the same conclusion that:

> In general, ethnic minorities, indigenous persons, people of colour, and low-income communities confront a higher burden of environmental exposure from air, water and soil pollution from industrialization, militarization, and consumer practices, (406).

(Mohai et al., 2009) assert that environmental racism is a global phenomenon which takes on various forms and definitions; in doing so it has permeated across every country on the planet. Backed by hundreds of studies, the authors reference the following two definitions of environmental racism that will act as the foundation for this work. The term ‘environmental racism ’was coined in 1987, in a report on the relationship between toxic waste and race in the United States (Chavis, 1987). The term arose as a result of the worsening environmental inequality suffered by people of colour, and brought attention to the way in which marginalized groups are disproportionately negatively affected by environmental hazards, degradation, and spatial planning. Chavis later clarified and expanded upon his previous claims in 1994, offering a more comprehensive albeit context-specific definition:

> Environmental racism is racial discrimination in environmental policy-making and enforcement of regulations and laws, the deliberate targeting of communities of color for toxic waste facilities, the official sanctioning of the presence of life threatening poisons and pollutants for communities of color and the history of excluding people of color from leadership of the environmental movement (Chavis, 1994, xi).

While there are imperfections in Chavis ’definition, such as the use of the word ‘deliberate ’which indicates that the policy must be explicit in some way, which could call in to question the validity of the claim that racism is deeply embedded in society and is not always overt enough to provide physical evidence thereof. The definition serves as a foundation from which environmental justice has progressed from, but is often refined and critiqued within academia, as knowledge continues to grow, and attitudes transform over time.

(Ruiters, 2001) offers a more general definition of the term, describing it as "the inequitable distribution of environmental quality, burdens and dis-utilities that impact on members of subordinate groups," (p.95). This definition is a simplified version of what Chavis used, but the overall sentiment remains the same, that marginalized groups are forced to deal with unequal environmental quality. Ruiters' definition is just one example of a deviation from the original, which draws attention to how much has changed since 1987, but how relevant the issue remains. Both definitions play an important role in situating the discourse around environmental racism and will be used in tandem to ground and validate the concepts and claims this research focuses on.

The environmental justice movement arose shortly after environmental racism entered the academic and public lexicon. Environmental justice is completely context-specific, because it is entirely dependent upon the complex history within a geographic setting, the population that is affected by the environmental change, and how long they have had to endure the unequal treatment. In South Africa specifically, issues of environmental justice are deeply entangled with systemic issues of racism tied to colonialism and Apartheid. (Ziervogel et al., 2017) explore the concept of justice on its own, stating that justice is:

> The fair distribution of social and material advantages; meaningful participation in decision-making processes; acknowledgement of social, cultural and political differences; and the right to minimum levels of capabilities and opportunities to achieve livelihood and wellbeing goals, (124).

This definition establishes that justice should manifest across all aspects of life, not just concrete deliverables. It is vital to include the immeasurable components such as social activity, opportunities and fair treatment in the definition as well.

The concept of justice is relatively uncontested, with challenges mostly arising not from the unequal treatment necessarily, but from the origins of issues, whether they are systemic, institutional, or coincidental. For example, it may not be contested that a community is affected by a nearby toxic waste site, but the reason behind it could cause conflict to arise. Environmental justice asserts that through environmental injustice, people experience the unequal distribution not only of environmental benefits, but degradation and climate change as well (Mohai et al., 2009). The potential avenues for achieving environmental justice are contested, as is the case with handling most social issues. In the South African context, the pre-democratic government established the Environmental Justice Networking Forum (EJNF) to respond to accusations of environmental injustice. The organization, however, quickly deteriorated due to over-complication of communication avenues, power struggles, and under-representation of marginalized communities (Leonard, 2017). Within an academic and theoretical framework, community-driven approaches are often favoured and encouraged as a pathway to achieving environmental justice and

empowering marginalized communities (Cock, 2015). While in theory this sounds like a productive way forward, the reality of community-driven initiatives is that they lack state political backing and funding, all while placing the responsibility on disenfranchised groups and removing the responsibility of the governing bodies.

In summary, the basis of this research is grounded in the above concepts. Working from this foundation, the ideas and terms explained in this section render my search strings relevant and useful for this study. An explanation of the current state of sustainability governance from a global perspective coupled with the defining and examining of environmental racism and environmental justice, with the overarching claim that UCT acts as an anchor institution points towards a research opportunity, where I plan to examine the space where all these concepts and theories intersect.

7.Methods

a. Systematic Review:

This systematic review is designed to summarize the contents of all relevant journal articles published in association with UCT on the topics of environmental racism and conservation. The headings in these methods were derived from Althor and Witt's framework (2020), because the researchers conducted a systematic review on the topic of literature on distributive environmental justice. The framework employed by these authors was considered useful for the purposes of my research because of the similar nature of the topic, and the attention to detail needed per piece of included literature. In order to address the research question, this study provides an exploration of the publications that fall within the following inclusion criteria: all articles included are in English because of my own language restrictions; all articles included were published within the years 2010-2021; all articles included fall within determined categories of affiliation (either the authors are employed by the university, or the university has been called upon to contribute to wider research, or it is self-funded research as part of the institution). Each of these categories fits into the previously referenced commitment by the university to dedicate research and funding to issues of racial and social justice, and a sustainable future.

b. Search String Development

Through a rigorous process of elimination, the following parameters were developed into search strings and employed over the course of a month in order to catch any new publications, and to revise the strings if necessary. New sources were imported into *EndNote Reference Manager.* Beginning in January, 2021, the search strings were employed every week until the end of February, 2021. Two databases were used for the collection of journal articles in this research: *SCOPUS* and *Web of Science*. Both of these followed the same parameters to collect as many relevant articles as possible.

The key areas of concern include: ʻUniversity of Cape Town ʼunder the category of organization or affiliation; ʻenvironmental racism ʼfound in topic / keyword / abstract and ʻconservation ʼalso in topic, keyword, or abstract. Among these core search terms however, other related terms often arise within the research surrounding them. Based on the preliminary search string testing, the following related terms were added in the search strings to broaden the accumulation of relevant articles concerning environmental racism: ʻenvironmental equity,ʻ ʼenvironmental justice,ʻ ʼenvironmental injustice,ʻ ʼenergy justice,ʻ ʼgreen justice, ʼand ʻgreen militarization,ʼ. Regarding conservation: ʻsustainability, ʼclimate adaptation,ʼ ʻconservation, ʼand ʻclimate change adaptationʼ. In regards to the *Web of Science* search string, three separate strings were combined, beginning with the affiliation with UCT, then onto the topic of environmental racism, then to conservation.

SCOPUS

(AFFIL ("University of Cape Town") OR AF-ID ("University of Cape Town") OR AFFILORG ("University of Cape Town")) AND ALL ("energy justice") OR ALL ("green justice") OR ALL ("environmental justice") OR ALL ("environmental injustice") OR ALL ("environmental racism") OR ALL ("green militarization") AND ALL ("climate change adaptation") OR ALL ("climate adaptation") OR ALL ("sustainability") OR ALL ("conservation") AND (LIMIT-TO (PUBYEAR , 2021) OR LIMIT-TO (PUBYEAR , 2020) OR LIMIT-TO (PUBYEAR , 2019) OR LIMIT-TO (PUBYEAR , 2018) OR LIMIT-TO (PUBYEAR , 2017) OR LIMIT-TO (PUBYEAR , 2016) OR LIMIT-TO (PUBYEAR , 2015) OR LIMIT-TO (PUBYEAR , 2014) OR LIMIT-TO (PUBYEAR , 2013) OR LIMIT-TO (PUBYEAR , 2012) OR LIMIT-TO (PUBYEAR , 2011) OR LIMIT-TO (PUBYEAR , 2010))

n=102

Web of Science

OG=University of Cape Town OR OO=University of Cape Town

AND

TS = (environmental racism OR environmental justice OR environmental injustice)

AND

TS = (conservation OR sustainability OR adaptation OR climate change)

n=14

*with the publication constraint of 2010-2021, as a function on the Web of Science platform

c. Database Creation, Inclusion Criteria and Article Screening

Articles were exported into Rayyan Intelligent Systematic Review database, which allowed for a collaborative screening process. Beginning with over 130 articles, I employed the following inclusion and exclusion criteria to eventually refine the number down to 81 publications. Rayyan provided a space for myself and my supervisor to collaborate by marking articles as ‘include,’ ‘exclude,’ or ‘maybe,’ and to offer reasons as to why they should or should not be included in the study. Additionally, the resource collated the sources in such a way that will make this research easily replicable, and attached to the sources will be the reasons for inclusion or exclusion and can be updated with new, relevant sources as they are published.

Inclusion	*Exclusion*
Published between the years 2010-2021	All other years
Academic journal articles	Books, book chapters, reports, government documents. This decision was made because of the difficulty in obtaining books during the Covid-induced closure of the campus libraries, which could make the study difficult to replicate or verify in the future.
Relevant topics: environmental racism, environmental justice, social justice AND conservation, sustainability, sustainable growth	Some articles covered only one aspect of the search string and did not pay enough attention to the other aspects being studied. For example, many of the exclusions were because only sustainability was studied without providing any input to the discourse on environmental or social justice.
Affiliated articles with UCT whether by one or multiple authors, or university led research	Scientific studies were excluded when they were too concentrated on scientific knowledge that they did not address the social aspect that is crucial to this research.
Publications must be in English	Systematic reviews were excluded, since the nature of this research is an independent systematic review, including others on various topics would likely convolute the data and would not accurately portray the discourse around these issues.
	Repeated publications were removed from the study, as well as corrections or statements that were made about articles that were not caught by the search strings.

d. Sorting and Organization

The review itself will be organized first generally by publications per year, and then divided into relevant themes. Each theme will have its own section so as to identify the nuances and trends between the articles. This process will 1) allow for a discussion on the positive correlation between the year and publication frequency, and 2) create a space for a more comprehensive analysis of the trends and dominant ideas that are present in this research.

8.Ethical Considerations

This is a remote study that will not involve participants and not involve direct communication with any individuals, thus participants of any kind were not called upon for this research. Aiming to be objective, this research aligns with the goal of understanding and reviewing the current literature regarding often contested topics, and subsequently discuss and analyze issues that may provoke controversy. This research seeks to investigate and understand the literature produced by UCT and will not conflate the research as the official stance of the university.

9.Limitations

The aim of this research is to remain objective and comprehensive in the pursuit of identifying, evaluating and summarizing the literature on environmental racism and conservation originating from, or affiliated with UCT. The research is limited to journal articles written in English, which excludes dissertations, or non-peer reviewed works, books, book chapters, and publications that are not written in English. Additionally, the association or direct contribution from UCT in any given article will remain unknown unless there are no other authors on the publication. The research is bound only to works affiliated with UCT, which can be viewed as an opportunity for an expanded exploration into this same field, whether by other institutions, regions, or countries. It is also an unavoidable weakness of this research; due to the nature of this thesis, a boundary needed to be drawn, despite the mobile and fluid nature of scholars and the disconnect often found between research institutions and their affiliate authors, the decision was made to examine only works affiliated with UCT. Furthermore, new studies, policies, and relevant information is still being published and thus this research will attempt to be as relevant and up to date as possible by the time of submission. Lastly, the search criteria will remain unchanged throughout the process, which leaves a possibility for new related terms to arise over the course of writing that will not be able to be included in the study.

10.Results: Overall Distribution

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Frequency	1	3	3	8	5	4	8	8	12	12	13	4 *until Feb, 2021

Figure 1, overall distribution of publications per year, beginning in 2010 and ending in February of 2021.

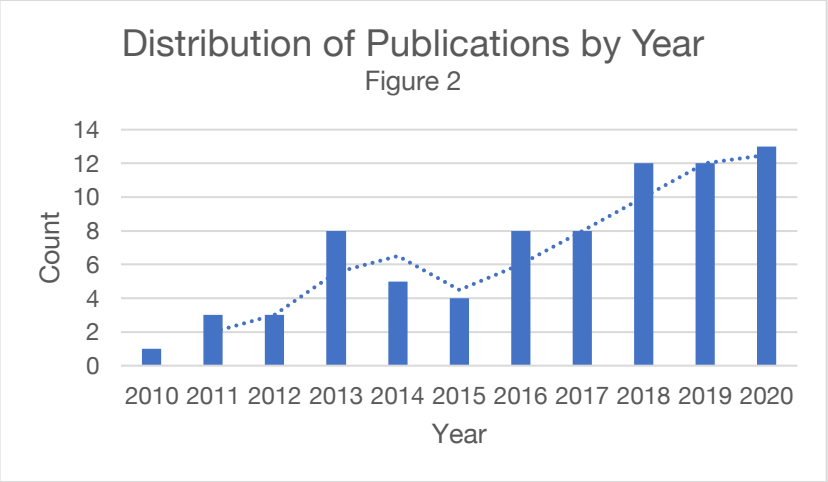
The following chapter details the results of the systematic review, which entailed an investigation focused on the past decade (2010-2021) of literature which is both associated with UCT and that discusses issues of environmental racism, environmental justice, and conservation. Articles were selected using multiple search strings over two databases, *Web of Science* and *Scopus*. These articles were refined and excluded based on the criteria outlined in the methods section. The below sections explore the various years of publication, trends, and themes seen across each of the included pieces.

Included in this research are 81 articles, published by 63 reputable[3] journals. The majority of these journals had no more than one or two relevant publications to their name; there were only two occasions where a journal had published three relevant articles; in both the Journal of Landscape and Urban Development and the Journal of Ecology and Society.

This study is timeboxed within a ten-year period of 2010-2021. Most of the 81 articles fell within the second half of the decade, with four already being published in 2021 – indicating what is most likely a clear upward trend in publication frequency on these topics. The distribution of the publications by year is shown in the table, and complementary graph[4] below. The breakdown of publications per year is as follows; 1in 2010; 3 in 2011; 3 in 2012; 8 in 2013; 5 in 2014; 8 in 2016; 8 in 2017; 12 in 2018; 12 in 2019; 13 in 2020; 4 in 2021. These results show a sharp increase in publications on these topics towards the end of the decade, spiking from 4 publications in 2015 to 13 in 2020, with most publications coming from the years 2020 (13), by 2019 (12) and 2018 (12). This signifies two important pieces of data: first, that the issue of environmental justice in the conservation world is gaining more attention. Secondly, the data suggests that UCT, as an institution, is paying more attention to these issues and is therefore positioning itself to contribute on a larger scale to the overall discourse around these issues.

[3] In this context, reputable refers to academic journals that UCT has paid subscriptions to, are peer-reviewed, and are indexed in bibliographic databases.

[4] For the purpose of an accurate mean line, the publications from 2021 were excluded from figure 2, because the year is not yet over at the time of writing. The four publications are still included in this research. The trend line shown on the graph maps the moving average over the course of the decade.



Distribution by Theme

The 81 articles are distributed across nine different themes. The themes are; 'theories and background information' (14 articles); 'natural parks, protected areas and wildlife conservation' (11 articles); 'plants, urban greening, and the luxury effect' (6 articles); 'energy transitions' (4 articles); 'toxic waste and chemicals' (5 articles); 'informal spaces' (6 articles); 'urbanization, adaptation, and various global/local initiatives (SDG/MDG/NSA/EA)' (23 articles); 'Basic human rights – food and water security' (6 articles); 'ocean, coastal, and fisheries management' (7 articles).

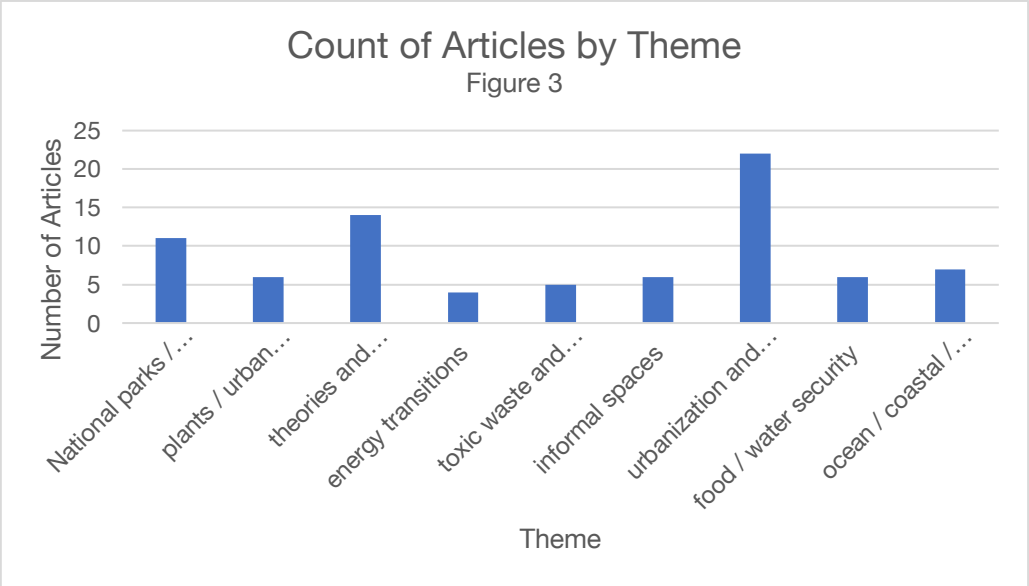
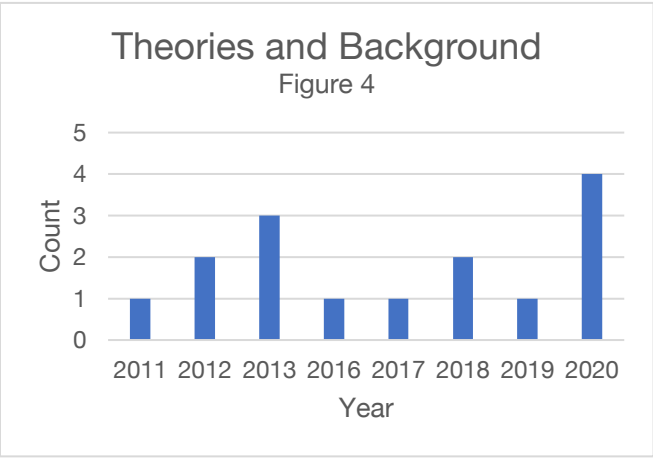


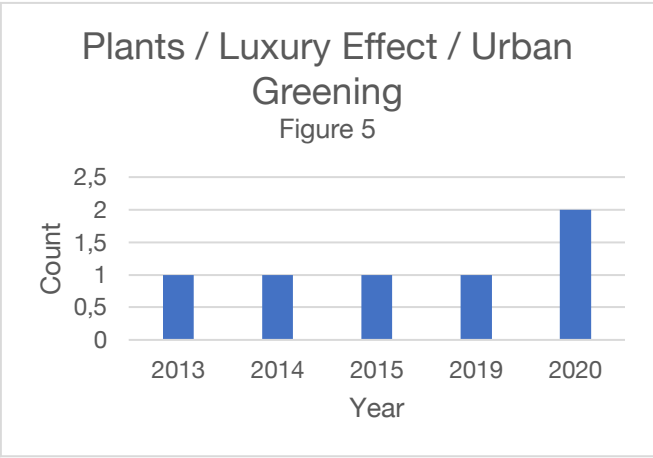
Figure 3 illustrates the distribution of the included articles across the nine themes. As figure 3 suggests, the theme with a plurality (22) of these articles is urbanization and adaptation. These articles range from covering the Sustainable Development Goals, Environmental Assessments,

sustainable housing, and urban resilience. The theme with the second highest prevalence was broader in scope: "theories and background information". This theme contained 14 articles, ranging from topics on distributive justice, climate gating, and transitions in response to climate change. This theme was included because the articles it encompasses offer a more broad, global perspective on environmental justice and adaptation to climate change and did not fit well into any other categories. The themes with the fewest articles are energy transitions with 4, and toxic waste and chemicals with 5.

Theme by Year

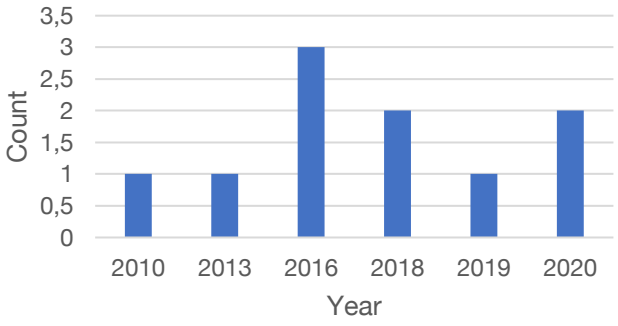
The below figures represent how many articles in each theme were published per year. The variance between years indicates when interests and funding peaked on different issues, and offers a valuable understanding of how opinions surrounding environmental racism, environmental justice, and conservation have changed over the years. For example, there was a spike in articles on the topic of urbanization and adaptation beginning in 2016, only one year after the SDGs were implemented, and steadily increasing until 2021 (United Nations, 2015). Some of these articles are critical evaluations of how the SDGs and other indicators have been performing a few years into their operation. Thus, the inclusion of these figures will help illustrate the way in which interest has not only increased over the past decade, but the manner in which it has been explored over time. Figures 4-12 offer this visual representation below.





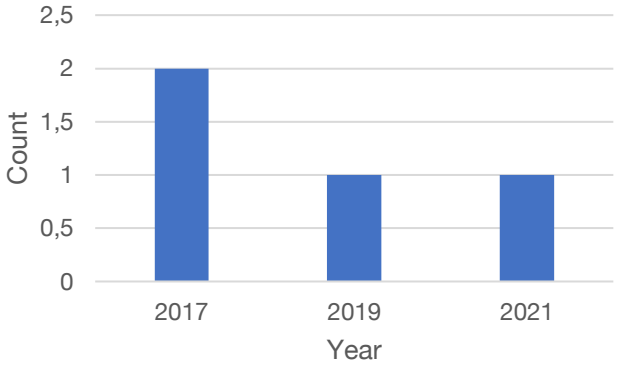
National Parks / Protected Areas / Wildlife Preservation

Figure 6



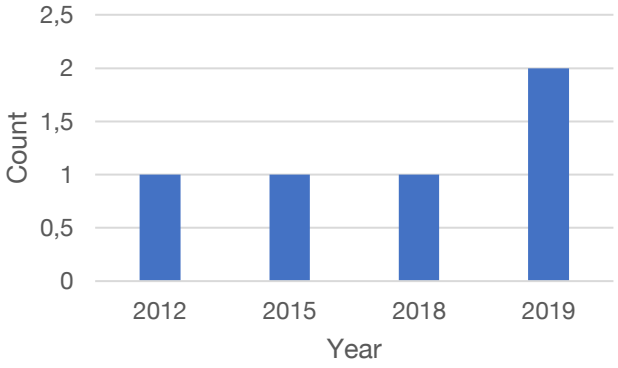
Energy Transitions

Figure 7



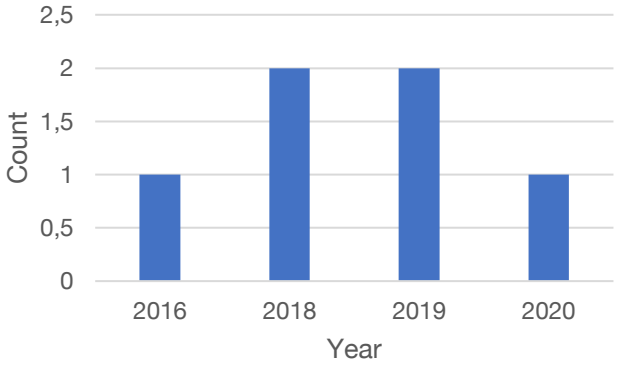
Toxic Waste / Chemicals

Figure 8



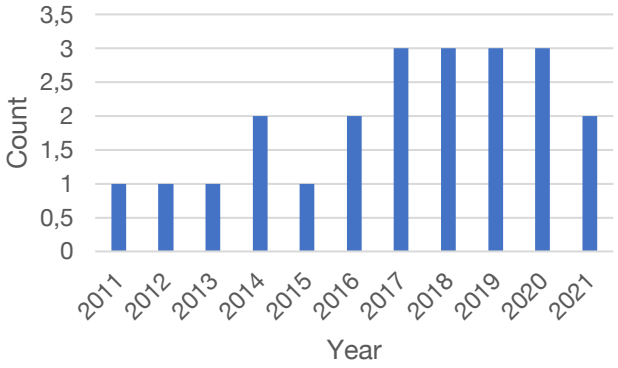
Informal Spaces

Figure 9



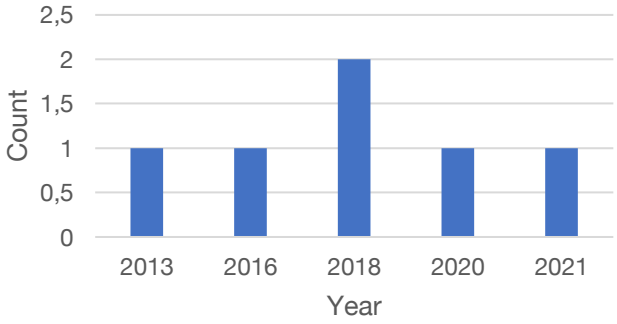
Urbanization and Adaptation

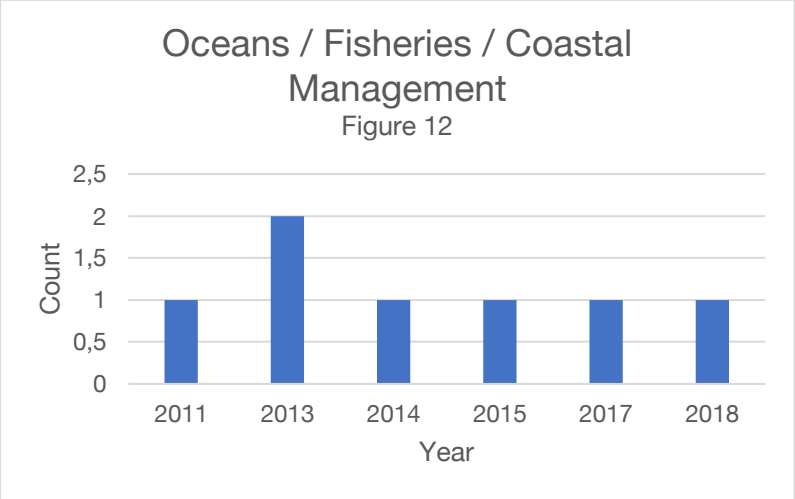
Figure 10



Food Security / Water / Human Rights

Figure 11





The results indicate that there is a wealth of information across the various themes and years. The allocation of these articles was discretionary, and thus while some of them fit perfectly into the categories, others act as a bridge between themes. Most of these were placed into the theory and background category because they offer a different theoretical perspective on the key areas being studied. The following evaluation offers quantitative results per theme, in addition to an analysis of the topics covered across the years with the most publications. This section is included to summarize the key findings across publication years, and to identify the variance in topics within each theme. An in-depth exploration occurs in the following section.

Figures 1-12 are valuable to analyse the compilation of data. Theories and background information are covered in figure 4. In this theme, the most articles were published in 2020 (4). This theme had the largest range of topics and thus a wide variety of conflicting and complementary perspectives. For example, a few articles focused on the increase in climate change-related risks and the endeavour to create a more equitable and sustainable future often from the perspective of the global south. One of these is titled, “Situated, networked environmentalism: a case for environmental theory from the south” (Lawhon, 2013). In 2020, when most articles were published, the themes included issues of justice, equity and transnational geography.

Figure 5, the theme on plants, the luxury effect, and urban greening has the most publications in the year 2020 (2) with the rest of the four articles being spread across four different years. The “luxury effect,” according to (Chamberlain et al., 2019) is the concept that there is a positive relationship between wealth and biodiversity within urban areas (3045). Within this theme are a few papers on community gardens and urban green space, which also have the undertones of wealth discrepancies that most often falls along racial lines, this is especially true in the case studies that are explicitly concerned with South Africa, such as the article titled “Post-Apartheid ecologies in the city of cape town: plant functional traits in relation

to urban gradients" by (Anderson et al., 2020). In this theme is an article titled "Food and Green Spaces in Cities: a resilience lens on gardens and urban environmental movements" by (Barthel et al., 2015), despite the mention of food in the title, the article's substance focuses more on the green space than the delivery of food security. The article covers the history urban gardens and the role they play in the supply chain, focusing on the allotment gardens that were started in Europe and North America during World War II (1325). The attention given to the history of gardens and green spaces thus excludes it from the theme that explicitly deals with food security and basic human rights.

Figure 6 shows that the most papers concerning national parks, protected areas, and wildlife conservation were published in 2016 (3). In 2016, all three articles discussed "green militarization," which is the use of violence in the pursuit of a conservationist agenda. In the case of these papers, it posits the use of violence as the only option to stop illegal poaching. Three of them reference the Kruger National Park specifically in the title, and all of them reference it either through an in-depth case study or by citing statistical evidence of the activity that takes place in the area.

The theme with the fewest publications was energy transitions, containing only four articles, as outlined by figure 7. In 2017, two articles were written about energy transitions from the perspective of environmental justice and conservation, including papers on environmental impacts of oil and gas extraction by (Esterhuyse et al., 2017) and frameworks for energy justice by (Sovacool et al., 2017). There is also an acknowledgement of both the value in the inclusion of communities during energy transitions, and reparations for past injustices. Closely related to energy transitions is the theme of toxic waste and chemicals, as shown in figure 8. These are linked in that both of these by-products result from the production of energy - an example being the pollutants (chemicals) from a factory (energy). Figure 8 shows that in 2019 there were the most papers published on the topic of toxic waste and chemicals (2) with five overall that fit into the category. These topics include the health issues that arise from chemical exposure, as well as the distribution of these issues, the way that it too falls along racial lines as a result of outdated Apartheid policies that have not yet been rectified (Anaf et al., 2019, Andrade-Rivas and Rother, 2015).

Next, figure 9 documents informal spaces and offers a visualization of how in both 2018 and 2019 two articles were published on this topic specifically, with six publications over the course of the ten years being studied. One of these, published in 2019, is a dissertation project, where the author argues in support of situated ethics, and completes research in the informal waste-picking sector (Perez, 2019). Other publications cover the poor governance of informal spaces and what can be done in the future to better deliver human rights and equality. In 2021, one article was published on the subject of how well-being can and should be improved during the Covid-19 pandemic (Corburn et al., 2020).

Figure 10 illustrates "urbanization and adaptation," the theme with the most publications by a large margin (22). Within this contains various initiatives such as the SDGs and the MDGs. Throughout each of

these articles run the common threads of pursuing *sustainable* urban development, how to best involve the relevant and important people whose lives are most affected by urbanization, and how to create an equitable future for those who have been historically disadvantaged. One example of this is titled "Supporting transformative climate adaptation: community-level capacity building and knowledge co-creation in South Africa" by (Ziervogel et al., 2021). This article in particular adds to the discourse surrounding climate change and social justice simultaneously by making the argument that one cannot be achieved without the other (2). 2017, 2018, and 2020 all had three publication per year and 2019 had four publications, making them the highest in the category. During these 4 years, all the papers regarding the SDGs and environmental assessments were written.

Figure 11 visualizes the articles on the issue of basic human rights including water and food security. With six articles, only one year has two publications (2018). Articles in this theme mostly cover the Cape Town drought, such as "Day zero and infrastructures of climate change" by (Millington and Scheba, 2021). Or they address environmental justice through water rights and the role of water in impoverished areas, as well as drivers of water-related climate disasters, such as droughts (Otto et al., 2018, Mahlanza et al., 2016).

Lastly, figure 12 graphs the seven articles included in the theme about oceans, coastal management, and fisheries. In the year 2013, two articles were published, while only one article was released in each of the other years. This theme covers publications that focus on coastal grabbing and affected communities (Bavinck et al., 2017, Wynberg and Hauck, 2014), as well as publications on fishery management from the global south and how to manage small-scale fisheries in the time of climate change with large-scale unsustainable fishing monopolizing the market (Hauck and Gallardo-Fernández, 2013, Menon et al., 2018).

Figures 1-12 help visualize the real-world applications of issues surrounding environmental justice and conservation. Environmental racism and justice branch across theoretical, social, political, economic, and STEM topics. The range of themes shown in the above figures demonstrates how justice is denied at seemingly every turn, and how attention must be shifted towards it for a more equitable and sustainable future. Because of the social science approach from the included articles, many of them include the sentiment that in order for the myriad of global problems to be solved, the injustices must first be completely and meaningfully addressed by those with the power to affect change. For example, in the case of fisheries management, the relevant articles stress the importance of including community members so that their livelihoods are better protected (Bavinck et al., 2017).

12.Systematic Literature Review

The following chapter provides an in-depth analysis of the contents of each of the 81 articles included in this research. Having previously situated the discourse around anchor institutions, environmental racism, environmental justice; conservation, and adaptation, this analysis establishes the patterns and contents of the articles deemed relevant by the meticulous inclusion and exclusion process. This chapter, similar to the "results" section, categorizes the articles by theme and connects them based on their contents, while essentially disregarding the year in which they were published. The themes are kept in the same order as the results and respective figures, and while the order of theme has no significance to the overall analysis, the theoretical and background theme is placed at the beginning, as it was for the results figures, so that a firm foundation is laid.

Theme 1: Theories and Background

As shown in the results (figure 4), theme 1 contains 14 publications, ranging from the year 2011 to 2020. The publications in this theme, as previously stated, offer a range of perspectives and insight into various climate change-related adaptations and strategies as well as a deeper understanding of the equity in the global south. One of the papers is titled "Distributive Justice in the Age of Climate Change," (Babatunde, 2020), and offers a beneficial place from which to begin the review. (Babatunde, 2020) introduces their research with a discussion on the inequitable costs from climate change, discussing how the nations that are causing most of the global degradation are those that are least exposed to it, as they are often wealthy enough to either send away their toxic waste or update infrastructure in such a way that mitigates the effects of climate change. The author argues that because Europe and North America have already developed, it is not reasonable to expect still-developing nations to follow the same restrictions as developed countries, because it implies that they have inflicted the same amount of damage as those nations, which, Babatunde argues, is impossible (266). Thus, the author introduces the concept of neo-colonialism, whereby "the global environmental agenda is being defined by the environmental interests of the North rather than the developmental interests of the South," (266). The deep-seeded distrust of the global north by the global south makes those nations in the south more reluctant to follow environmental guidelines set out by countries and governing bodies that have never had their best interests in mind (266;7).

Justice is crucial in Babatunde's research; it provides a framework and justification for different environmental expectations and regulations. While this research focuses broadly on environmental policy and climate change mitigation from a global perspective, other articles touch on similar ideas, while shifting focus slightly, which fleshes out the discourse on justice in the global south. One such article by (Lawhon, 2013) makes a case for situated environmentalism in the global south. The author first provides a critique of the decades-long environmental policy that has governed the globe, while making a convincing argument

as to why northern policies are not necessarily applicable to the global south (128). The author makes the case for acknowledging that the lived experience is entirely different in the global south, by "developing situated, networked environmentalism which moves beyond the use of Northern theory to examine Southern contexts as well as beyond attempts to universalize the Southern experience," will (129). Using South Africa as the primary area of study, (Lawhon, 2013) critiques the environmentalism in the global south thus far, using the case of South Durban, where a "community of colour"[5] was exposed to intense environmental degradation because of close proximity to a landfill and chemical storage facilities (132). Concurrently, more pressing environmental justice issues were given far less attention. As (Lawhon, 2013) points out, the forced removals are further away from the international spotlight, despite being worse from an environmental justice perspective. This is a lone example of South Africa's environmental justice experiences, yet it provides valuable insight into the disconnect between priorities of policymakers, global stakeholders, and community members.

Lawhon concludes by discussing how important it is to develop policy and relationships that are situated in the specific locations they are addressing, and to have international networked environmentalism (128;135). (Simon, 2016) makes a similar argument to Lawhon (2013) by explaining that environmental issues are more esoteric, while social issues are more tangible (7). This likely explains the case of South Durban shifting the focus of justice to a tangible, smaller-scale issue such as chemical waste than the ongoing, inherently racist policies of land-grabbing. In specific reference to the anchor institution, UCT, Simon states, "at the University of Cape Town, tangible solutions such as the renaming of buildings, the eradication of fee increases and the removal of colonial memorabilia that directly impacted social well-being have, especially since 2015, been implemented," (7). The author argues that pursuing social change is far easier, more tangible, and more in the public eye than seeking environmental change that people may not even be aware of, or if they are, they may not have a vested interest in (7;8).

In keeping with the same premise as the above articles, (Ernstson, 2013) wrote a paper titled, "The social production of ecosystem services: a framework for studying environmental justice and ecological complexity in urbanized landscapes," in which they explore environmental justice in the context of ecology. Through this, the author notes that there is a discrepancy between benefitting from ecosystem services and wealth, which in South Africa largely falls along racial divides (8). The author establishes that ecosystem services can be used to perpetuate inequality and environmental injustice (14). A similar trend is seen in

[5] In this context, "community of colour" aligns with the EJ language employed by the author, though not explicitly defined in the article in question, the commonly accepted definition of it is: a group of people who are the same race, based in the same geographic area. In the context of South Africa, communities of colour are often the result of Apartheid (Lawhon, 2013).

(Zafra-Calvo et al., 2020) and (Few et al., 2017) where they both discuss plural valuation as a means for achieving equity and social justice.

Similar to Ernstson (2013), (Zafra-Calvo et al., 2020) notes that the increasing need to protect biodiversity often leads to worsening social justice and more inequality (2). The author takes a different approach in order to reach the goal of social justice, by focusing their research on plural valuation, which "focuses on eliciting and integrating diverse values of and about nature into decision making and action with a holistic vision," (2). Providing a valuable perspective, Zafra-Calvo echoes the previously recorded sentiments about the need to focus on the global south, affected communities, and marginalized groups by (Babatunde, 2020, Lawhon, 2013) by stating that there is a need to "focus on the global south because of colonial powers, weak institutional structures and continuous power struggles," (3). Similar to the argument made by (Zafra-Calvo et al., 2020), (Few et al., 2017) bridge the gap between conceptual ideas and practice in climate change adaptation. They argue that accepting plurality is key to adaptation, but that tempering expectations is sometimes needed in order to remain realistic about the adaptation that can be done. In this way, Few et al. (2017) agree with Zafra-Calvo et al. (2020), but bring the discussion back to a place where policy can be realized (7;10). Few et al. critique the many definitions that are often associated with terms surrounding climate change responses such as transformation, adaptation and mitigation, and the authors note that it is easy to remain in a theoretical sphere and become bogged down by contested understandings of words instead of pursuing a positive and action-filled agenda (2). Plural valuation is an important tool in including local and diverse forms of knowledge, and can be used as an important avenue for making more equitable and just decisions in environmental and social governance (Zafra-Calvo et al., 2020).

The following articles also address the topic of environmental justice, while being more critical and technical in nature. The first is titled "Climate Gating: a case study of emerging responses to Anthropocene risks" by (Simpson et al., 2019). And the second is "Building equity in: strategies for integrating equity into modelling for a 1.5 degree C world" by (Sonja and Harald, 2018). Firstly, the case study of climate gating references the water crisis in Cape Town, South Africa and was included in this category because of the introduction of the theory of climate gating. Climate-gating is a relatively new phenomena that decentralizes the traditional sources of security, and provides "off-grid" solutions to issues such as water security (2). Similar to the above articles, the authors critique the ever-present inequality in South Africa by stating, "as with so much else in South Africa, water usage in Cape Town was heavily skewed in favour of wealthier denizens with those living in informal housing, conservatively estimated to be 20.5% of the population using very little water in comparison with their wealthier neighbours," (3). Thus, wealthy residents of Cape Town had more access to alternative sources of water, leaving the poor and marginalized groups in the city with far less access to water, while also having been systematically denied those rights in the first place.

The second article referenced above, focuses on fitting equity into a 1.5^{o} world, this bridges the gap of the scientific subject of climate modelling and issues of equity, which is the only direct study included in this research that explicitly ties these two worlds together. Similar to Babatunde's (2020) theories around distributive justice, (Sonja and Harald, 2018) make the argument that context is crucial in determining policies to combat and adapt to climate change (3). As the authors point out, "there is little understanding of how the dynamics of inequality might intersect with climate policy" … and that a large obstacle in the way of prioritizing equity is that "scalar dimensions of global models: analysis divorced from specific contexts will inevitably exclude formal and informal institutions that are essential for local human development," (8). This realization is an important step towards breaking down the barriers between technical and social issues.

Two similar articles are written - (Winkler and Marquard, 2011) discuss the topic of the economic impacts of a carbon tax in South Africa, and (Williams, 2018) writes about stress and mental health on populations of colour. These articles both note that those pollutants that would be lessened and taxed through a carbon tax would disproportionately affect populations of colour. As previously mentioned, however, the effects of climate change are felt much more in populations of colour than in white, wealthy communities. According to (Winkler and Marquard, 2011), the potential of a double dividend for carbon taxes could improve social welfare, by allocating the revenue made from the tax back into the poverty-stricken areas that are still facing many challenges because of lingering Apartheid divisions within South Africa (56). The authors argue that for this reason, South Africa would be a suitable candidate for a carbon tax. According to the SARS website, a carbon tax law was initiated in 2019, but the site offers no information on where the taxed money goes (SARS, 2020).

Straying slightly from the policy side of governance, (Williams, 2018) provides an in-depth study of race-related stressors and their effects on mental health. In addition to being disproportionately affected by pollutants and chemical waste, Williams (2018) provides evidence on the subject that acts of racism and discrimination can have long-term negative health impacts on individuals and families (467;468). According to the research, "incidents of racial discrimination matter so profoundly for mental health because they are experiences of exclusion that trigger feelings of a defilement of self… institutional and structural racism can give rise to…stress proliferation process, in which an initial stressor can initiate or exacerbate stressors in other domains of life," (470). This suggests that racial discrimination from various sources can put people of colour in an acute state of distress, and embed issues of racism into their being, which can lead to mental disorders and increased stress levels. Thus, the authors recommend that "race-related research must be attentive to the changing social context of racial-ethnic status and incorporate emerging threats to mental health as well as opportunities that may arise to promote enhanced mental wellbeing," (479). They conclude with a recommendation that race be factored into future policy. For

example, if viewed through a South African lens, it is important to be aware of the colonial and Apartheid history that still divides the country, and to be conscious of the potential additional stressors that are related to those racial divisions.

Next, transport geography in South Africa is covered by (Pirie, 2013). In this article, the author critiques Apartheid policies of racial division, and cites how new transport infrastructure in a few choice places are deepening the divide "between spaces of transport privilege and deprivation," (312). The author establishes that transport geography is very unequal in South Africa, and like most other things falls along racial and economic lines, leaving poor communities of colour without much-needed access to transportation infrastructure. A very abstract paper concerning colonial ecologies is titled, "What is a river? A transnational meditation on the colonial city, abolition ecologies and the future of geography" by (Kimari and Parish, 2020). In this research, the authors explore the boundaries of geography, the dispossession of land from native peoples, and the ways in which rivers represent a symbol of unmoving geography (644;645). In a metaphorical sense, a river represents stability, while human geographies and urbanization change around it. The authors push for a better understanding of a study of geography that better accounts for the "situated ways of understanding such formations and the multiple histories and political praxes these imply," (645). Through their metaphorical discussion of rivers, the authors place value in these enduring landmarks, citing that they could be useful in achieving an antiracist agenda (645).

The final two papers in the theories and background theme cover Aldo Leopold's land health from a resilience point of view by (Berkes et al., 2012) and a "neo-Gramscian understanding of how to shift development pathways to zero poverty and zero carbon" by (Winkler, 2020). The neo-Gramscian approach is that in order to achieve a 'just transition' cultural and ideological positions and actors are crucial factors (2). They also act as a catalyst for change and can bring about meaningful transitions that help address deep-seeded inequality (1;2). An appreciation for nature is discussed in the article on Aldo Leopold's "land health perspective," where he stresses the need to maintain nature and protect it instead of prioritizing human benefits from it. Similar to Ernstson's (2013) claims on ecosystem services, the importance of biodiversity protection is central to this article. It is a broad, global perspective on nature however, and does not have a specific geographic location. Biodiversity is crucial to ecosystem function, so if these two theories are combined, Aldo Leopold's views from the 1800s remain applicable (4).

The above articles were categorized into the theme of background information and theories. They introduced ideas such as distributive justice, just transitions, ecosystem services and biodiversity preservation. Articles were discretionarily included under this theme; while there are certainly arguments to be made regarding certain articles perhaps having some degree of relevance to other themes, this collection is best represented under the umbrella given. Together, these 14 articles paint a picture of environmental justice particularly in the global south from a wide range of perspectives.

Theme 2: Plants, the Luxury Effect, and Urban Greening

The second theme focuses on plants, the luxury effect, and urban greening. The term urban greening is used here instead of urban green space because the literature often refers to the act of an urban space becoming more green. The literature spans over seven years, as figure 5 shows, beginning in 2013 with the most recent articles being published in 2020. Two of the articles focus on the luxury effect, with a third referencing the concept of the luxury effect without explicitly mentioning it in the title. The remaining three articles discuss food and green spaces, urban greening projects in Cape Town, and ecosystem services.

In 2013, an article was published on how to value nature and ecological complexity, titled "Ecosystem services as technology of globalization: on articulating values in urban nature," (Ernstson and Sörlin, 2013). This article establishes the importance of being intentional in preserving and fostering urban green areas. It argues that ecosystem services can benefit society and human well-being, but that policymakers must be careful not to monetize these areas to the point where they become commodified and exploited which could result in just a privileged few benefitting from urban biodiversity (Ernstson and Sörlin, 2013).

Published in 2015, a literature study examines the role of urban gardens throughout history (Barthel et al., 2015). As has been established, not all articles fit perfectly into each category, this publication for example could have fit into either the background theme, as it provides historical context, or the food security theme as it is largely concerned with allotment gardens during global conflict across North America and Europe. It was included in this theme however because of the discussion on the difference between wealthy areas having the opportunity to grow their own food during these times of conflict, thus tying into the common themes of discrepancies in access to urban green spaces between socioeconomic groups. This article in particular discusses how the wealthy class in Europe in particular, have often been untouched by historical disruptions to the food supply because of their access to gardens, and how their shared knowledge enables the cycle to continue (Barthel et al., 2015).

The luxury effect, as previously mentioned, refers to the positive relationship between biodiversity and socioeconomic status in urban areas (Chamberlain et al., 2020). As one study published in 2020 explains, the luxury effect is tightly tied to environmental justice because access to biodiversity is skewed towards those who have a higher economic status, and that as climates continue to become drier, especially in cities these issues will only continue to worsen (Chamberlain et al., 2020). Similarly, a study conducted one year earlier in 2019, focused specifically on native bird species presence across different levels of urbanization in South Africa (Chamberlain et al., 2019). The authors assert that: "urban biodiversity can provide a means by which the human population, often detached from everyday experiences of nature, can connect with and appreciate the wider benefits of biodiversity, which include cultural and environmental

ecosystem services," (3046). The study determined that there is indeed a disconnect between species richness and socioeconomic status, finding that the less urbanized an area was, the richer the biodiversity. Conversely, the study found that species richness was lowest in wealthy, highly urbanized areas. Importantly however, the authors point out that the study was only concerned with native species, and it does not examine alien or ornamental species, which are most often found in areas of higher socioeconomic status (Chamberlain et al., 2019).

Another study, published in 2020, that for all intents and purposes is on the urban luxury effect ties in the presence of post-Apartheid policies affecting plant traits in relation to urban gradients (Anderson et al., 2020). This case study was based in the city of Cape Town, and supports what the two previous studies have also suggested, that urban spaces in wealthier areas have more access to plant diversity. The findings also situate what Chaimberlain et al. (2020) claim about climate change, and assert that the significant effects of climate change and specifically the prospect of drought in Cape Town will worsen these effects (Anderson et al., 2020).

The final selection in the theme of plants, the luxury effect, and urban greening is a case study on urban greening projects in Cape Town (Anderson et al., 2014). The study determined the role that civil society, helped by experts, can play in greening urban areas. In reference to the worsening state of the climate, especially in Cape Town, the authors argue that focusing on conserving small, bite-sized pieces within communities own sphere will be crucial in the fight against impending climate change. The authors importantly point out that urban ecology is shaped by a myriad of different variables, most often by the humans that interact with and benefit from it.

These six articles are linked together through the topics of plants, the luxury effect, and urban greening. Importantly, each of these publications whether a case study or a literature review, reference the difference in access to urban green space and biodiversity that is felt by less privileged or wealthy citizens. They also discuss that the gap will only grow larger as climate change continues to worsen, and the only urban green spaces that can be protected are those that are owned by the wealthy, and can be maintained despite the preferred conditions changing, such as having a garden full of native and alien species that require large amounts of water, in a climate that is becoming more and more dry (Chamberlain et al., 2020, Chamberlain et al., 2019). Together these articles paint a picture of environmental injustice manifesting in the access that individuals and communities have to plants and urban green spaces.

Theme 3: National Parks, Protected Areas, and Wildlife Preservation

The third category of publications contains all things protected areas, national parks, and the accompanying wildlife in those areas. Containing ten articles, this category is the only one with an article from the beginning of the study in 2010, which indicates where the themes of environmental justice and

conservation were introduced into the field (within the parameters set by this research). Seven of the articles in this category are concerned with poaching, leaving three to cover the topics of land claims, protected areas, and environmental justice in national parks. Of the seven articles on poaching, the research spans over various species and geographies, five of them are based on research conducted in South Africa. The concept of green militarization is discussed at length, and the conflict that arises in the attempt to protect areas and endangered species from harm.

Green militarization, as (Duffy et al., 2019) explains it, is the implementation of "military-style approaches that have been designed to respond to the increase in elephant, rhino, and other wildlife poaching," (1). In Duffy et al. (2019) piece, the authors argue that the underlying reasons for poaching must be examined more deeply so that things like "poverty, inequality, and historical grievances, the continuing effects of colonial or racial discourses," (3) can be understood, unpacked, and addressed from the source instead of employing excessive military force to protect different species. The argument that Duffy et al. (2019) formulates gives a valuable perspective on why poaching happens, and how efforts can be diverted towards addressing the issues that cause it, communities should be given access to parks and wildlife, they should be adequately communicated with and peoples' lives can be better valued by the state.

A similar perspective is offered by (Ramutsindela, 2016) and (Shaw and Rademeyer, 2016) where they discuss the history of poaching activities in South Africa, and how in post-Apartheid South Africa, poaching and communism were conflated, and that there was a need to protect the white minority and their precious species from poachers (Ramutsindela, 2016). The authors argue that the continued use of excessive military force propels the issue towards an international stage and perpetuates the idea of it being a national security issue, when in reality in South Africa specifically it can be treated more easily from the source, as (Duffy et al., 2019) point out. (Shaw and Rademeyer, 2016) discuss the politics in the Kruger National Park, explaining the deep political divide and the historical significance of the area, and draw on the aforementioned arguments to reframe conservation of endangered species in protected areas. (Büscher and Ramutsindela, 2016) focus their research on green violence within South African's Peace Parks. The authors criticize the militarization within the Kruger National Park, and discuss the anxieties and distrust of the white minority that are not adequately acknowledged in the governance of protected areas. This is a common theme among these articles; a concept of distrust being part of the reason that poaching takes place in protected areas such as the Kruger National Park. The interests of the white minority have been represented for so long in South Africa, and the militarization of protected areas is yet another facet of that, whereby communities that have a deep cultural bond to the land and creatures are continually denied access to it, distrust arises from the attempted solutions that do not in fact benefit those largely black communities (Shaw and Rademeyer, 2016, Duffy et al., 2019).

Next, two articles are multi-disciplinary by covering the socioeconomic impacts of poaching, one of which focuses on the individuals and groups who partake in poaching (Hübschle, 2017) and the other focuses on the socioeconomic drivers of illegal hunting in Southern Africa (Rogan et al., 2018). Set in Kruger National Park, (Hübschle, 2017) conducted ethnographic field work to better understand poachers, prisoners, and local people. (Hübschle, 2017) highlights that poaching and land rights are context-specific in South Africa because there is so much contestation surrounding land claims, largely brought on by the racist colonial and Apartheid planning that forcefully removed thousands of people from their land, stating "in the modern context, protected areas continue to present manifestations of colonial dispossession, Apartheid segregation and neoliberal expansion," (440). From an economic standpoint, the author also discovered that the going price of a rhino horn far outweighs the average annual income of those who live in the surrounding areas of the Kruger National Park (Hübschle, 2017). Similarly, (Rogan et al., 2018) discuss the illegal bushmeat hunting that occurs in the Southern African Savanna where trophy hunting is a common practice, and is putting immense strain on the wildlife population there. Because bushmeat hunting is illegal, the ability to collect data is largely impaired, however the authors state that interventions should be designed by the state to decrease the value in trophy-hunted species, and that this issue should not be solved with green militarization (Rogan et al., 2018).

The final article that covers the topic of poaching is a study conducted in Zimbabwe's protected forests, where the authors focus on the physical violence that occurs in the name of conservation (Mushonga and Matose, 2020). This final piece on poaching shares similar themes as the previous publications, the new perspective that this article brings is that 'conservation', or green violence, seems to infiltrate the lives of all those in surrounding areas. Similar to what (Shaw and Rademeyer, 2016) address, the activities of poaching and green militarization reach much further than just the poachers, the violence surrounding protected areas seeps into the everyday lives of the surrounding communities, and (Mushonga and Matose, 2020) point out that "while the violence may not necessarily lead to the death of these people, the corollary effect of the violence leads to the ultimate demise of different spheres of their livelihoods," (222).

Overall, the articles focused on the pitfalls of green violence and the over-militarization that has taken place in protected areas across Africa. They offer different perspectives including those from local communities, poachers, and other affected parties, and all come to the same conclusion that there must be a deeper understanding of the underlying causes of poaching, trust between historically marginalized groups must be fostered, and that governing bodies should place more value in human lives (Mushonga and Matose, 2020, Duffy et al., 2019, Shaw and Rademeyer, 2016).

The remaining three articles cover the geopolitics of protected areas (Ramutsindela et al., 2020), neoliberalism in Kruger National Park (Ramutsindela and Shabangu, 2013) and finally the correlation between national parks and protected areas. The common theme between these three publications is the

discussion and examination of access rights and land claims. Access rights refers to who has physical access to different land and why they might not have access to it, and land claims are the cultural claims that different groups have on land for various reasons. As (Dahlberg et al., 2010) describes, "before European colonization, land in South Africa was managed under customary law and people could generally move through the landscape,"… however as time moved on and as colonizers moved through the country, "conservation regulations gradually became stricter, and African people still remaining within protected areas were removed by force," (212). These groups, despite forced removals and decades of racist planning, have been able to survive and continue to claim the land that they have built their knowledge and practices around. As (Dahlberg et al., 2010) point out, in order to achieve environmental justice in this space, social values and human geographies have to be addressed in any kind of governance or management of these spaces, instead of focusing solely on conservation of biodiversity.

The final two articles in this theme examine the sources of power in protected areas. In (Ramutsindela et al., 2020) writings, they connect different conservation projects to best understand the power relations that occur and how distance and environmental factors play a role in determining these. In regards to protected areas, the authors state that global environmental agendas have a negative effect on weaker, developing states. The authors claim that all environmental governance is shaped by global agendas and processes, which unifies and simplifies it (260). A different angle is taken by (Ramutsindela and Shabangu, 2013), where the authors agree that environmental governance is global, but they credit it to a neoliberal agenda that offers market-based solutions, devalues the land that is to be protected, and commodifies natural resources. This perpetuates environmental injustices by enforcing a capitalist agenda, and does not offer solutions to the racially motivated governance that has continued post-Apartheid (441).

Overall, these articles offer a range of perspectives on the governance of protected areas, whether critiquing it overall such as (Ramutsindela and Shabangu, 2013) or (Ramutsindela et al., 2020) do, or by examining the causes of poaching and illegal activities in protected areas. The publications prove that in order to achieve environmental justice in this sphere, the underlying causes of poaching must be addressed, land rights must be realized by the state, and neoliberal agendas cannot continue to rule the global environmental movement (Ramutsindela and Shabangu, 2013, Hübschle, 2017, Duffy et al., 2019).

Theme 4: Energy Transitions

The theme of energy transitions contains four articles, three of which are more theoretical in nature and focus on the realization of environmental justice and the fourth which encourages the use of vulnerability mapping as a tool to manage environmental impacts. The themes addressed in the first three articles are similar in nature, they discuss the unequal distribution of energy transitions across the globe, and argue that a new perspective should be framed around transitions in the global south where many of

the countries are decades behind the north (Baker et al., 2021, Essex and de Groot, 2019, Sovacool et al., 2017).

Importantly, articles on the topic of energy transitions emphasize energy justice and the unequal distribution of global energy sanctions on developing countries. For example, in South Africa, where Apartheid policies resulted in energy not being delivered to townships, the urgency to provide electricity once Apartheid ended resulted in missing other basic goals that had been set out to achieve environmental justice. Some of those were establishing a baseline for quality of life, and providing individuals with equal opportunities within the country, however jumping to something tangible like energy production resulted in the other initiatives falling by the wayside in the state's agenda (Essex and de Groot, 2019). Thus, this research shows that despite the fact that energy became a priority for the state post-Apartheid, the mission to achieve environmental justice did not and still does not adequately address the social component of the racist policies.

Two more of the articles discuss energy justice, one from a case study conducted in Ghana and the other from a global perspective. In a recent study on community perspective in Ghana, the authors critique the seventh sustainable development goal (SDG) which aims to "expand infrastructure and upgrade technology for supplying modern and sustainable energy services" (2) by asserting that the model outlined by the SDG does not address the characteristics of developing countries, such as the reality in South Africa where much of the infrastructure and social justice have been overlooked (Baker et al., 2021, Essex and de Groot, 2019). The authors offer a solution to this, stating that better communication within communities that are affected by energy transitions is necessary to achieve energy justice (Essex and de Groot, 2019). A similar sentiment is expressed by (Sovacool et al., 2017) in their research on new conceptual frameworks for energy justice. Importantly, the authors point out that there are a myriad of social and environmental burdens that fall upon developing countries when energy policies are swept across the globe. Similar to what other authors have pointed out, the fact that policies are not designed for the global south in particular, makes the countries more vulnerable to deepening inequalities and worsening the effects of climate change (Essex and de Groot, 2019, Sovacool et al., 2017).

The final article in this selection is a scientific study that argues for the use of vulnerability mapping to manage environmental impacts, in this case in terms of oil and gas extraction (Esterhuyse et al., 2017). The research provides a useful example of how vulnerability mapping can be employed to protect areas that face the effects of climate change and exploitation. The mapping, according to the research, shows "surface water, groundwater, vegetation, seismicity, and socio-economic aspects," (2) and can illustrate to stakeholders and policymakers the areas that are most vulnerable. Importantly, the research points out that areas that show little vulnerability do not pose zero risk, but rather that they will suffer less - but *not* zero - damage (Esterhuyse et al., 2017).

The four articles in this theme add value to the overall research by highlighting a very important arena in the discourse around environmental justice. Aided by Apartheid policies, racial divides were created in South Africa, which still remains today. The deliverance of electricity to formerly racially divided areas is still lacking, as are basic rights and social justice (Sovacool et al., 2017). The literature makes clear that energy transitions remain a huge issue in South Africa, despite the fact that the country is aspiring to remain a global player and rapidly transform and keep up with technology, it is falling behind on important issues that only worsen the inequality in the country. If this goes on, the adverse effects will far outweigh the progress that is being made for the wealthy minority.

Theme 5: Toxic waste and chemicals

Figure 8 illustrates the distribution of publications that fit the theme of toxic waste and chemicals. That there are five articles: two were published in 2019, and the remaining three in 2012, 2015 and 2018, respectively. Three of the articles study chemical and e-waste in South Africa specifically, one of them focuses on the perspective of the global south, and the last offers an international perspective on the flow of e-waste.

E-waste is broadly covered by (Ilankoon et al., 2018) from an international context, which according to their research, is growing by up to 5% per year, according to their research. Containing a range of materials such as "plastics, metals and glass, some of which can be systematically recovered," (259). In developing countries there is an industry of informal waste-picking to earn money, however this can be extremely dangerous and can have other adverse effects when waste sites are placed in areas that are desperate for money, putting the surrounding community at risk as well (Ilankoon et al., 2018). Additionally, because it is a wide-spread global network that crosses boundaries and follows various rules and regulations as it crosses those borders, it is difficult to fully understand the scope and negative effects of e-waste, especially on developing countries.

Of the three articles that concentrate on South Africa, two of them are specific case studies, one of which analyses the risks associated with herbicide sprayers, and the availability of personal protective equipment. The study importantly uncovered that due to poor surveillance and communication of risk, women of colour were disproportionately exposed to dangerous chemicals (Andrade-Rivas and Rother, 2015). Workers in South Africa and other low to middle income countries (LMIC) were found to be even more susceptible to damage because of the poor systems of compliance that do not adequately "trickle down" to the workers. The remaining two articles that reference South Africa take a more broad approach to discussing e-waste and chemicals, instead of the case study approach taken by (Andrade-Rivas and Rother, 2015). In one, (Anaf et al., 2019) compare the health impacts the transnational corporation (TNC), Rio Tinto, has on workers and surrounding communities. The study focused on Australia and South Africa,

where Rio Tinto has a large presence. The investigation found that despite there being certain economic benefits through job provision (and, in the case of South Africa, delivering services to HIV-infected miners), there were also a myriad of adverse effects (Anaf et al., 2019). In addition to pollution, deforestation, hazardous waste, increased desertification and coastal erosion, there were a huge number of human-felt effects that were caused by chemical exposure. Thus, even though the company employs a huge amount of indigenous Australians, they are exposed to toxins that can cause cancer, sterility, birth defects to name a few. Regardless of the initiative behind this, the reality is that Rio Tinto exposed an already marginalized group to huge numbers of toxins that the rest of the population did not have to overcome. Overall, the research claims that the corporation ultimately operates to serve its own interests and that social responsibility falls by the wayside.

(Lawhon, 2012) wrote a paper titled, "Relational Power in the Governance of South African E-Waste Transitions" which is tightly tied to the global south perspective offered by (Millington and Lawhon, 2019). In the former, a case study was conducted to determine the relational power among stakeholders, during which they found that the power distribution in South Africa is deeply complex and imbalanced, which often stalls - or even disables - transitions. The latter article provides a better background e-waste as a global phenomenon. E-waste creates a global network by tying together various states, scales, and actors (Millington and Lawhon, 2019). As it stands, e-waste is often transported from the developed, global north to the developing global south. E-waste is a dangerous substance whereby northern governments pay developing countries in need of money to take their e-waste. In doing so, those developing countries are forced to take on the increased environmental burden of e-waste.

The articles in this theme have demonstrated the complexities behind e-waste. While some of the selections focus on the global south or South Africa specifically, the common theme among them is that the movement of e-waste across the globe is complex and oftentimes difficult to navigate properly (Ilankoon et al., 2018, Lawhon, 2012). Data is difficult to rely on because of the trans-boundary nature of e-waste disposal, but it is clear that the practice of informal waste picking that largely takes place in developing countries, is extremely dangerous and hazardous for the individuals that are involved in the industry as well as the surrounding communities (Ilankoon et al., 2018, Andrade-Rivas and Rother, 2015).

Theme 6: Informal Spaces

The distribution of articles on the topic of informal spaces is illustrated in figure 9. The graph depicts that there are six publications that fit into this category, the first one being published in 2016, two being published in both 2018 and 2019 and one being published in 2020. In terms of topics, two of them address flooding, one covers energy, another covers sanitation, covid, and finally a dissertation is included that addresses the stigmatization of waste-pickers in Cape Town. A common theme that is stressed

throughout these publications is that those who live in informal spaces are much more vulnerable to a myriad of risks including flooding, climate change (and even viruses such as Covid-19) than those who do not. In the South African context, informal space often refers to townships, where people of colour were tightly packed and forced into poor living conditions where, as was referenced in theme 4 on energy transitions, electricity as well as basic rights were denied to those marginalized citizens (Sovacool et al., 2017). Despite the end of Apartheid, informal settlements still account for a large portion of South African citizens, according to the world bank, "about half of South African's urban population lives in townships and informal settlements, accounting for 38% of working-age citizens, but home to nearly 60% of its unemployed," (Sandeep, 2014).

Firstly, the two articles on the topic of flooding in informal spaces are both geographically focused on Cape Town's townships. One written in 2016 covers the conditions under which community leaders can become involved in the adaptation and mitigation process (Drivdal, 2016), and the other addresses the governance configuration necessary to transform policy around informal areas and adapt to flood-prone areas (Jordhus-Lier et al., 2019). As (Drivdal, 2016) points out, townships are often located in flood-prone areas and that the already-marginalized groups of people living in those areas are often ill-equipped and left to their own devices to adapt as quickly as the rest of the city. Importantly, people living in informal settlements are exceptionally vulnerable to climate change, and do not have adequate resources to prevent this. While (Drivdal, 2016) claims that community leaders are invaluable in changing policies and helping to push the agenda towards adaptation, (Jordhus-Lier et al., 2019) forms the argument that the process is much more complex than that. (Jordhus-Lier et al., 2019) identifies the urgency of adaptation in townships, but points to the difference between the global north and global south, stating that "a relational understanding of policy implementation is crucial in order to understand the interactions of different actors," (55). Importantly, both authors do not claim that these physical adaptations will achieve equity or justice for the marginalized populations in informal settlements. While infrastructural change may help prevent damage from floods, the facts remain that the areas are predisposed to flooding, that people are still marginalized, and that they do not have the tools to reach environmental justice on their own.

Next, (Pan et al., 2018) broach the subject of improving sanitation in South African informal settlements. The authors point out that in South Africa access to sanitation and free basic services such as water, refuse removal and electricity are not equal or equitable (1). Marginalized communities go without these basic rights, despite the fact that in 1996, South Africa committed to providing those rights to every citizen. The important takeaways from this article is that the distribution of those rights, especially sanitation remains unequal, and that when delivery of those rights is attempted, an equity or justice framework would be beneficial to work from in order to account for the decades of persistent inequality.

Theme four covered energy transitions, specifically in the global south however, (Runsten et al., 2018) specifically explore energy provision in South African urban settlements and thus is a valuable contribution to this theme, rather than theme four. According to the article, electricity is difficult to secure in informal spaces, despite what (Pan et al., 2018) outlined from the South African government, where they committed to providing basic needs such as electricity to all citizens. In many cases, electricity is hazardous, illegal, and often stolen (Runsten et al., 2018). They point out that dealing with a group that has faced so much inequality and injustice that the solutions cannot be one-track, they are deeply complex, and that they can often work in conjunction with each other. For example, informal settlements are not only flood-prone they are often not easily accessible and can be difficult to supply electricity to (Runsten et al., 2018).

The first four inclusions in this theme have illustrated that people living in informal settlements, specifically in South Africa, are more vulnerable to climate related disasters, and have far less access to basic rights. During 2020, the Covid-19 pandemic was no different: (Corburn et al., 2020) discuss how people living in informal settlements are highly vulnerable to the virus, and that this is a struggle shared by much of the global south. Numerous side effects of the pandemic are identified that further divide those individuals from the rest of society, such as increased "racism, xenophobia, and stigma against the poor, migrants and lower classes," (3). With people living in cramped areas without proper sanitation services, the challenge of Covid-19 is increased tenfold, as people have to manage isolation, economic decline, and lack of proper healthcare services, to name a few (Corburn et al., 2020).

Finally, and perhaps with one possible solution to the challenge of data collection in informal spaces, (Perez, 2019) explores the use of situated ethics in informal settings. This PhD project helped illustrate the benefits to selectively sharing the purpose of research and argues that context is vital in terms of being completely ethically compliant[6]. This could be one avenue to help bridge the gap between informal settlements and governing agencies, so that they can build better relationships with those people, and better understand the ways in which they could best be served. Conducting immersive research like Perez (2019) did could be used to better gauge how to adapt flood-prone areas, and how to better provide sanitation and electricity across informal areas, because as (Runsten et al., 2018) points out, "no solution is flawless" (82).

Theme 7: Urbanization and adaptation

Theme seven contains the most articles by a large margin, and also contains a wide range of literature within the umbrella term of urbanization. Thus, due to the much larger contents of this theme, it has been broken down into sub-categories that include sustainability assessment tools, including the SDGs, MDGs, NSA tools, and EIAs which contains six articles. Remaining are sub-categories on community

[6] In this context, ethically compliant refers to the researcher's decision to not procure consent forms from the individuals they collected data from.

efforts (4), justice (4), and an outstanding sub-category containing nine articles that vary from different research agendas in urban planning to cultural heritage. Together these 23 selections paint a picture of urbanization in the context of environmental justice and sustainability. The order of presentation of the subsections is to first illustrate a global, policy-focused introduction to issues of urbanization, to present the social aspects of community and justice, to analyse the remaining articles as they connect to the other categories and to each other, and finally to round out the theme with a deep understanding of how issues of justice are or are not addressed on the pathway to urbanization.

First, the sub-category of sustainability and environmental assessment tools contains six articles. The SDGs were developed to replace the MDGs in 2016, to correct its errors and provide a more grassroots approach instead of the previous top-down governance (Valencia et al., 2019). (Boyle et al., 2018) explore the downside to using neighbourhood assessment tools in urban regeneration. The authors establish that while it is a huge step in the right direction that sustainable development has properly reached the global stage, the lack of local knowledge inclusion and acknowledgement of scale and context make it extremely difficult to achieve urban regeneration (Boyle et al., 2018). According to the authors, neighbourhoods are crucial to driving global sustainability, and that smaller populations decrease complexities that are found on a global level. From a similar perspective (Valencia et al., 2019) point out that the SDGs were designed at an international scale, with national implementation schemes, meaning that the implementation of them was still planned to be largely top-down. The authors point out many pitfalls of the SDGs, such as the enduring priority of economic growth and the lack of trust among citizens and communities for policy buy-in. Overall, the authors present a sound background for how the SDGs have been received, and where they are falling short (Valencia et al., 2019). Overall, the critique shared by (Boyle et al., 2018) and (Valencia et al., 2019) is that the goals are too prescriptive in nature, they are data-reliant, and market-based, which suggest that they will not adequately address the justice aspect of sustainable development.

SDG 11, as (Borie et al., 2019) echo is the progression towards inclusive, safe and sustainable cities. The global south plays an important role in SDG 11 because of the wide range of infrastructure and development within it, the varying contexts and geographies call for entirely unique solutions to sustainable planning. In Cape Town, (Borie et al., 2019) critique SDG 11 for operating within a highly political space, and for reinforcing existing power dynamics. While this goal does not specifically set out to achieve justice, a city cannot be inclusive, resilient, or sustainable without all urban dwellers being valued and having equal access to all the same services that urban areas offer. (Brussel et al., 2019) tackle the transport indicator laid out by the UN for the SDGs. By completing a case study in Bogota, Colombia the authors uncovered that more light is being shed on the inequality that lies within the transport industry, and that there are various injustices associated with access to transport. The authors critique the indicator, however, because

a reframing of the targets could lead to better understanding the needs of the people and be a more constructive pathway towards social justice (Brussel et al., 2019).

The remaining two articles pose solutions to the difficulties of implementing global policies at a local level. In one, the authors prescribe the capability approach in regards to address well-being in environmental impact assessment (Simpson, 2018), and the other also recommends the capability approach from the perspective of a case study conducted in South Africa. Importantly, (Simpson and Basta, 2018) establish that the capability approach would enable disadvantaged stakeholders, and can provide a more meaningful pathway to involvement, letting economic growth take a backseat to the social and political needs of the people. (Simpson, 2018) fleshes out the value of using the capability approach, arguing that it ought to be used as a tool to aid decision makers. By using the capability approach, which means utilizing people's value of basic things such as clean and healthy lives to involve them in the process of environmental planning, environmental and social justice can be brought to the forefront of what has previously been a market-driven field (Simpson, 2018, Simpson and Basta, 2018).

Together these six articles illustrate that while sustainability assessment tools were designed to propel the globe towards a more sustainable future, they often fall short, specifically in the global south where many of the nations are still developing, meaning they have unstable governments, widespread poverty, and lack of access to adequate healthcare and education (HDI, 2021). This oversight of complexity stems from two schools of thought. Firstly, without deep and concentrated ethnographic studies, the global north is incapable of comprehending the umbrella term 'developing' and thus unable to effectively govern these countries. Secondly, due to a history of colonialism and or exploitation of resources and people, the global north is less inclined to recognize the actual damage done during these centuries of conflict (Rich, 1990). Thus, infrastructure is lacking, and issues of social and environmental injustice are at the forefront of society. The authors included in this section presented cases that explain that the top-down approach of the tools, specifically the SDGs, does not work in a southern context, but that these aspirations should be scaled down to the neighbourhood level, people should be deeply included in the process, and that without these two important factors, the world will only continue to become less sustainable and neither socially nor environmentally just (Boyle et al., 2018, Simpson, 2018, Valencia et al., 2019).

The sub-section on community involvement contains four publications. The first discusses community-based approaches to foster environmental justice and engaging young people (King et al., 2021). While this article references environmental justice in the title, the focus of the research is centred around the role that communities can play in that, which is why it has been included in this sub-section. Importantly, the research found that people as young as nine years old can be actively engaged in creating social change, and that if policy can reflect the needs of younger and younger generations, the path towards a more just and sustainable future will be made easier.

(Ziervogel et al., 2021) and (Wlokas et al., 2017) both explore a justice perspective on community involvement in sustainable futures. In the publication by (Ziervogel et al., 2021), the authors site the South African context in order to paint a picture of how useful working with deprived and marginalized communities can be in working towards or even achieving social and environmental justice. They argue that alongside climate risk, issues of social justice are just as important to combat, and are often the cause of the increased risk felt by marginalized communities (Ziervogel et al., 2021). Similarly, (Wlokas et al., 2017) explore the way in which energy solutions can be targeted towards including marginalized communities so as to both amplify their voices and create socially just solutions that are tailored to their often unheard needs. Thus, in the research presented by (Wlokas et al., 2017), the authors outline how renewable energy can come with the benefit of social justice if companies are dedicated to including it in their framework.

The final inclusion of the sub-category of community involvement is by (Cockburn et al., 2019), where again, the authors stress the importance of community involvement and responsibility because in order to achieve a just future, context must be heavily relied upon to steer the direction of policy and interaction among stakeholders. Using a bottom-up approach that includes and situates history, culture, politics and existing power dynamics will allow for people to take ownership of their futures and engage in stewardship over their communities (Cockburn et al., 2019). Together these four articles emphasize the value in involving communities, especially historically marginalized ones, in the process of urbanization. As the literature suggests, by imbedding issues of social and environmental justice into urbanization and transitions, it forces policy makers to devalue market solutions while shifting more towards what historically marginalized groups actually need.

Next, the sub-category of justice also contains four publications which are also tied closely to the topic of community involvement, as it is often noted as one meaningful method for achieving justice. (Patel, 2014) provides a valuable background on the journey towards environmental justice in South Africa specifically. Giving a brief history to situate the issues, Patel (2014) shows that while environmental justice is acknowledged as an important step to restitution for the historically marginalized groups in the country, it has remained an extremely elusive task. At the core of this is that a deep distrust was fostered not only during Apartheid, but also in the years following when sustainable development prioritized conservation instead of social and environmental justice. In doing so, the country painted a negative picture of all those issues in the eyes of the black and coloured community, making it extremely difficult to undo and rectify (Patel, 2014).

Taking one step back, the value of situating environmental and social justice in the context of urbanization of the global south is explained by (Culwick and Patel, 2020). The authors present the claim that since the population of the global south is rapidly growing in tandem with urbanization, it presents an

opportunity to build infrastructure for those in need that is also sustainable. In this example, the authors cite that by making sustainable government housing developments, they can not only raise the living standard of people in informal settlements, they can also provide access to basic human rights (Culwick and Patel, 2020). (Ziervogel et al., 2017) explore the way in which justice can be tied into urbanization and urban resilience. The authors examine how, in the African context specifically, pathways to resilience need to acknowledge context and complexities that have defined urban settings for decades. Infiltrating justice into this mindset is important to indicate a shift in tone towards meaningful participation from formerly marginalized groups in achieving and defining justice for themselves.

The final selection in the subsection of justice is also tied to local involvement in the process of working towards a more sustainable future (Lawhon and Patel, 2013). Interestingly, the authors critique the use of 'local' agendas because they remove the responsibility from larger governing bodies that are often the sources of the ongoing injustices felt by marginalized groups. The authors warn of using local as the scale for most change to occur because a larger shift is needed across the global south (Lawhon and Patel, 2013). This may seem contradictory to the subsection focused on community involvement, but the difference between local and community lies in that studies can be conducted within communities, while local simply scales for national or regional, it has no true boundaries and thus no governance structure that could rival either global policy or community activism.

The final sub-category within the theme of urbanization is the remaining nine articles, some of which are tied together but not enough to create their own sub-category for. About five of them are concerned with policy implementation from various perspectives. All of them are to do with urban sustainability, however, they are not tightly linked enough to merit their own sub-category. The remaining four cover transport in Colombia, urban agriculture, cultural heritage, and media representations of environmental decision making.

To begin, two articles use case studies conducted in Cape Town to examine both the dynamics of the city itself and why implementing meaningful environmental policy in the city has proven to be a wicked problem for policy makers and stakeholders (Davison et al., 2016, Greyling et al., 2017). Both articles explore similar themes: Cape Town being desperate to invest in conservation and sustainable growth but with deeply embedded inequalities having halted that progress and causing severe damage to historically marginalized groups in the city. (Davison et al., 2016) call for organizational learning so that knowledge can be shared in safe spaces, and solutions can be collaboratively reached in order for Cape Town to remain a functional home for the thousands of people who are culturally connected to it, but still so frequently denied full access to its benefits.

(Lawhon et al., 2014) critique urban political ecology; developed and honed by the global north, yet often implemented in the global south without regard to the delicate balance of urban expansion and

deep inequalities that are unique to the respective spaces. Repeating what many articles have stressed already, specifically in the theme of urbanization, the authors claim that when creating policy, it is paramount that context be taken into consideration, especially if that policy was developed in the global north to be implemented in the global south (Lawhon et al., 2014). (Lawhon and Murphy, 2012) more closely examine the issue of political ecology, by referencing insights from its use historically. The authors contribute to the discourse with regard to the global south noting that marginalized communities, often of colour, face the double exposure of climate change and inequality, greatly increasing their vulnerability and decreasing their power over facing those issues. The authors go on to emphasize the importance of deep consideration of existing knowledge, power, geography and historical circumstances to facilitate more meaningful change.

Next, (Smit et al., 2011) dissect the existing urban planning agendas in place in low and middle-income countries and the effect it has on health equity. Interestingly, the authors examine how urban planning has affected health equity, particularly in the global south. It is noted that not along with increased air pollution exist higher rates of obesity, injuries, and mortality. According to the research, in 2011, approximately two million premature deaths worldwide per year disproportionately fall upon urban areas in the global south (878). The authors go on to argue that informal settlements be upgraded so that inhabitants may avoid the double exposure of systemic inequality and the effects of climate change.

The case study conducted by (Teunissen et al., 2015) analyse the global issue of inequality at a more micro level, by examining transport access in Bogota, Colombia. The city implemented new, sustainable methods of transport. Upon assessment, Teunissen et al. found that the poor population has less access to alternative modes of traveling than their wealthier counterparts. Similarly, (Davies et al., 2020) discuss how inequality seeps into the access of urban agriculture. People, especially those living in informal spaces, are less likely to engage with urban agriculture - cited as a useful way of maintaining food security if one has the requisite space and funding. While it is cited as a potentially useful tool to be used in economically disadvantaged areas, a lack of implementation and proper education does not lead to a sustainable or long-term solution to food security.

(Perry et al., 2020) continue exploring this theme, arguing that cultural heritage is not accounted for in the process of urban development and that new ways of thinking, including an acknowledgement of existing cultural practices can lead to meaningful urban development that does not result in gentrification or forced removal from property. The ninth article in this subsection is on the topic of the role of media in environmental policy decision making (Rose et al., 2016). As the authors point out, the media plays two roles in shaping the direction of policy; contributing to the discourse around policy through investigation and reporting, while also creating them through their own agendas and interests. The media has the power

to permeate terms and issues into the public lexicon and shape the direction of opinion that they prescribe (Rose et al., 2016).

The 23 urbanization-themed articles gave an expansive perspective, in the aggregate, of the various ways in which justice has entered the discourse, especially in the context of the global south. In covering the topic of sustainability assessment tools, then to communities and justice, policies, media, and case studies, this theme has illustrated that while the perspectives and research agendas may vary greatly across various sub-topics, the common thread is that there must be a more concerted effort to account for people at the community level. Environmental and social justice cannot be achieved in the process of sustainable development without this accountability, especially those in the global south where social and economic divides are only worsening as urbanization continues to prioritize economic growth instead of equality (Brussel et al., 2019, King et al., 2021, Culwick and Patel, 2020, Greyling et al., 2017).

Theme 8: Human rights; food and water security

The theme of human rights (which includes the issues of food and water security) is included because of the numerous articles that cover the topic of the Cape Town drought in 2017. The connection of this theme to environmental justice is made clear by the research on the effects of the drought, which were felt mostly by marginalized groups in and around the city. As is the case with many other articles included in this systematic review, a few of them bridge between different themes, such as the mention of low-income neighbourhoods and informal spaces in the article written by (Enqvist et al., 2020) where the authors explore water justice in the context of the drought. To begin, three of the six articles in this theme are on the topic of water availability in Cape Town, two of which are concerned specifically with the 2017 drought, and the remaining three foci on food security, water justice, and research questions for South Africa regarding water security moving forward. Together, these six articles paint a picture of access to basic rights, and how climate change and governance are affecting those rights.

Firstly, in a case study focusing on water rights and poverty in Cape Town, (Mahlanza et al., 2016) use an environmental justice approach to examine the governance of water management, and determine where the City of Cape Town is falling short in delivering the human right of water to its citizens. According to the study, the poor population in the city most often bears the brunt of water shortages because the infrastructure is not fairly allocated across the city. Employing an environmental justice approach, involving communities, especially poor households, would enable community engagement and hopefully shift policy and governance towards a more equitable distribution and full realization of the disparity between economic classes (Mahlanza et al., 2016). The study by (Mahlanza et al., 2016) was published before the drought, and thus acts as a premonition for what is to come and how the drought will affect the poor and marginalized communities. These inequalities are pointed out by both (Millington and Scheba, 2021) and (Otto et al.,

2018). From an analytical approach, (Millington and Scheba, 2021) revisit the drought four years on, and assert that the governance of the drought deepened existing inequalities in socio-economic groups, and highlighted the drawbacks of the governance strategies around water management in Cape Town. The authors point out that amidst the drought, the city withdrew the universal provision of 6kl of water, which left marginalized groups without access to this basic right; meanwhile more fortunate groups were less affected by the policy change. The authors call for a reconfiguration of water governance so as to avoid worsening the divide between socio-economic groups in the future as climate disasters increase in frequency and severity (Millington and Scheba, 2021).

Day zero, the day when Cape Town would run out of clean water, was miraculously avoided. Through a huge collective effort, the city mitigated this risk, and gained a huge amount of attention as a global economic actor and central piece of the developing global south. (Otto et al., 2018) discuss how the drought experienced by the Western Cape was the worst seen by the region in over one hundred years. It is posited, however, with increased urbanization and climate change, it will be far less than one hundred years before the next large-scale drought threatens the city. The authors bring up questions of long-term resilience, including whether the agriculture sector can survive, and what will happen to the large informal economy that operates within the country as the threat of disaster becomes more frequent. (Enqvist et al., 2020) explore some of these questions by referencing community perspectives in Cape Town and by employing a *water justice* lens, which "supports water democracy and citizen participation, and questions whether the dominance of a neoliberal approach is able to address differential access to water services particularly for marginalized groups," (4). Narrowing justice to a basic human right such as the provision of water, especially in the case of Cape Town, allows for a concerted effort towards the pragmatic realization of the right for those in need, and does not let the endeavour become lost in legislation or bureaucracy. The authors go on to stress that community participation in reshaping water governance will allow for trust to be rebuilt, context to be accounted for, and resilience to be built, resulting in a safer and more equitable future for everyone (Enqvist et al., 2020).

In 2014, (Siebrits et al., 2014), studied the state of water provision in South Africa and developed priority research questions for the future. This article predates the drought, and thus offers an interesting perspective on the state of water security before the disaster. Acting as an apt example of collaborative effort, the article outlines how community involvement and participation helped shape the understanding of water security across different social and economic barriers and determined that the state should focus on "change, data, ecosystems, governance innovation, and resources" (199). This initiative illustrated that collaborative efforts can shape academic and policy related interests, and could possibly pave the way for future involvement of marginalized groups in this process.

The final selection for this theme breaks away from the matter of water security and the Cape Town drought, and shifts towards another human right of food security (Duminy, 2018). The authors employ a more abstract approach to discuss food security in Southern Africa, they examine the term "territory" and argue that its use is often related to state and colonial powers, and that food can act as a bridge between the dichotomy of territory and the marginalized people that were exploited. The authors present the idea that food bonds together populations, territories, "life and matter, across different scales and dimensions of soil, land, air, plant, body and earth," (5). They assert that food can act as an important player towards a more food secure and social justice future for everyone. If food security is achieved it will play an important role in deconstructing territories, and remaining colonial structures and systems (Duminy, 2018).

The articles included in this theme of human rights, were mostly focused on water scarcity and the 2017 drought in the Western Cape of South Africa. It is important to note here that many of the articles in the informality theme were focused on human rights, as they are tightly linked issues. The topic of water security, especially in South Africa, is tightly linked to the worsening effects of climate change and how poor the governance structure is currently. Poor handling of natural disasters such as droughts will only deepen the socio-economic divide that already defines South Africa as the most unequal country in the world (Millington and Scheba, 2021, Enqvist et al., 2020).

Theme 9: Oceans, fisheries, and coastal management

The final theme in the systematic review covers the topics of oceans, fisheries and coastal management. Figure 12 shows that the seven articles included in the theme are mostly spread evenly across eight years, with two being published in 2013, and zero from 2012. Resulting in somewhat of an even distribution over the better part of the decade. The topics of the articles have some range, but a common thread throughout them is the dependence on fisheries by local communities that are affected by coastal management. For example, some articles focus on rights-based fisheries, others analyse the way in which capitalism has taken over the fishing industry, and the way it has disrupted long-standing traditional and sustainable practices (Menon et al., 2018, Hauck and Gallardo-Fernández, 2013, Raemaekers et al., 2011).

A majority of the articles discuss South Africa, venturing through the topics of abalone fisheries, the impacts of coastal grabbing, coastal risk management, and the capitalist transformation that has overtaken the South African fishing industry. The illegal fishing of abalone has increased in South Africa over recent years for a variety of reasons. The black market for abalone specifically has opened up due to poor governance or small-scale fisheries, overfishing, and a decrease in total allowable catches (TAC), pushing fishers into illegal activity (Raemaekers et al., 2011). Similar to the poor governance surrounding protected areas and the prevalence of rhino poaching, a culture of distrust surrounds the governing body, people are not given the proper tools to fully engage with the management of their own livelihoods, and

they are forced into an illegal rebellion against the state (Hauck and Gallardo-Fernández, 2013). The denial of black and other ethnic groups from equitable access to the land and coast due to colonial and Apartheid regimes has disenfranchised these groups from meaningful participation. As (Hauck and Gallardo-Fernández, 2013) posit, "a sustainable fisheries system, therefore, aims to achieve social, economic, ecological and institutional sustainability for the benefit of both the resource and the people who rely on it," (17). The studies suggest that the pathway towards sustainable fishing is not closing down small-scale fisheries or over-limiting their catches. The negative effects of these options would be twofold; not only would they not replenish the damage that continues from large-scale fisheries, but they would also be denying the cultural heritage of the groups that are tightly tied to the coastal land.

Coastal grabbing has long occurred in South Africa, specifically during colonial and Apartheid rule (Bavinck et al., 2017). It is defined by the systematic exclusion of coastal communities from access to the coast and the marine resources they are dependent on. A case study situated in South Africa illustrates how the threat of coastal grabbing still looms over coastal communities, and how they often require help from outside organizations to help manage the realization of their rights and to situate relevant governance to their specific context (Bavinck et al., 2017).

Posing a solution to the poor fishery management identified in the two former articles, (Sowman et al., 2013) examine the use of social science in the context of South Africa's marine environment. As the authors point out, over-exploitation has dominated the narrative surrounding fisheries over recent years, and poor governance and lingering Apartheid policies have led to the down-scaling and subjugation of small-scale fisheries. The authors recognize that these small-scale fisheries are not adequately protected or recognized by the government, nor are they included in the governance process itself (Sowman et al., 2013). If they were, it is more likely that they would be able to achieve a degree of marine justice and ensure the longevity of their fisheries. The resilience of fisheries in South Africa is illuminated by (Menon et al., 2018), where they note that many small-scale fisheries were able to survive the capitalist, colonial, and Apartheid transformations that the county has seen -meaning that, with the proper attention and governance, they will be able to endure. While South African fisheries are still spaces where both discrimination and unjust governance occur. The solution, according to the literature, is to include local knowledge in the governance process, and to restrict industrial fisheries instead of the small-scale ones that have been sustainable for hundreds of years (Sowman et al., 2013, Raemaekers et al., 2011).

The remaining two selections in this theme examine coastal governance and policies. One highlights coastal risk management in South Africa and the other discusses benefit sharing, which is tied to the previous articles which present potential avenues for more sustainable futures in fishery management and governance. *Benefit sharing* is defined as the equitable distribution of both resources and financial compensation, which is historically skewed in South Africa, and could lead to a more conscious, sustainable

future in fisheries (Wynberg and Hauck, 2014). One example of benefit sharing that has been successful is *fair trade*, which has increased consumer responsibility and compensated formerly exploited workers from developing nations for their labour (Wynberg and Hauck, 2014).

The final selection for the theme of oceans, fisheries, and coastal management is authored by (Colenbrander and Sowman, 2015), The authors explore the value of coastal areas, and list a range of recommendations that should be followed in order to improve upon risk modelling. The authors contend that the context of coastal spaces is often overlooked in risk management, and that in order to better protect the coast and the communities that rely on it for their livelihoods, risk management needs to be approached from a more individualistic angle. The longstanding knowledge and histories present within coastal communities needs to be accounted for so that practical solutions can be reached without further exploitation and a sustainable future that accounts for the increase in climate change disasters, while not exclusively placing the burden of adaptation on marginalized communities (Colenbrander and Sowman, 2015).

The above seven articles have highlighted the priorities of coastal research, and shown that a sustainable future is possible if a few crucial points are taken into consideration. First, it is imperative that the reasons behind illegal fishing habits are understood and that small fisheries are acknowledged in future governance, and that large-scale corporations should be held proportionately accountable, given that small fisheries are not the reason for the shortages of fish (Hauck and Gallardo-Fernández, 2013). Secondly, the articles show how if the cultural heritage is better understood, communities are involved in the process of governance, and value is placed on those continually marginalized groups, South Africa will make progress in becoming increasingly equitable and sustainable (Colenbrander and Sowman, 2015, Wynberg and Hauck, 2014).

12.Discussion

The systematic literature review identified the trends, scope, and contents of publications that met the requirements for this research. The included articles flowed between nine themes, and transcended local, national, and global scales for consideration. Consisting of an in-depth analysis of each article, this research explored the past decade of UCT's history and how it has positioned itself at the intersection of environmental racism and conservation. There remain, however, questions to be answered regarding what the overarching meaning is behind UCT's affiliation with this literature.

Proving meaningful, and the first systematic review covering these topics from UCT, this research has inadvertently validated the claim that UCT acts as an anchor institution for the city of Cape Town, and is highly valued on a global scale, when particular metrics of evaluation are applied. Whether by contributing to studies on the effectiveness of the SDGs, the politics of small-scale fisheries, or the just transformation of informal areas, research affiliated with UCT has explored many issues at the nexus of where social and environmental justice meets sustainability. This aligns with their transformation mission statement, and it has been shown that the university is working towards being:

> …An inclusive and engaged research-intensive African university that inspires creativity through outstanding achievements in learning, discovery and citizenship; enhancing the lives of its students and staff, advancing a more equitable and sustainable social order and influencing the global higher education landscape, (UCT, 2021c).

More specifically, the publications indicate that UCT (here meaning both the institution and the researchers that produced the discussed publications) is deeply involved in the process of working to understand the intricacies and complexities of the many manifestations of racism, especially within the global south and in particular, South Africa. While the goal of 'enhancing the lives of its students and staff' is harder to substantiate, this systematic review suggests no evidence that this was pursued through the 80 articles examined.

As previously mentioned, there are other methods that this research could have been conducted with – it is possible that by changing the boundary of UCT to another geographic or social boundary, the results would have differed. However, due to the nature of this research, a boundary was necessary to draw, and thus it points towards a limitation in this work, but an opportunity for further exploration in other works. There is a large difference between UCT and its research, it has clearly positioned itself around these issues of positive transformation and change, thus signalling to students, scholars, locals and, for all intents and purposes, the rest of the world that this is the idea of itself that it is projecting into the world. It is important to note that neither scholars nor funding are fixed entities part of a university, however during the time that the work included in this research was written, the inclusion of UCT was made clear. Perhaps this points towards a wider, self-fulfilling prophecy, that scholars who align with these ideals are drawn towards UCT

in order to further their own agendas, but the reality remains that these select authors considered in this research have greatly strengthened the discourse around environmental racism and sustainability.

Given the pessimism of the climate projections under current trajectories (Masson-Delmotte et al., 2018) and the devastating impacts of Covid-19 (Mbunge, 2020), it is urgent to address systemic racism in meaningful and sustainable ways that take the intersectionality of the environment, justice and racism into account. It is vital to understand the details of systemic racism, and to comprehend that if practices are not in place to dismantle it, what people perceive as 'normal' activities will continue to perpetuate the disenfranchisement of historically marginalized groups of people across the globe.

The question remains however, of how impactful these findings are in driving the urgent need for change that is identified in all of the articles. The researchers should position and describe the findings in a way that allows the conclusions to be understood between academic and policy-related fields, so that their findings have broader reach and are more meaningful across various scales and use cases. A large portion of the publications hint towards the institution's dedication to contributing across local, national, and global scales, with many of the solutions repeating themselves across themes. For example, the results show that urbanization was the dominant theme, where a sizeable portion of the research from authors such as (King et al., 2021), (Lawhon and Patel, 2013), and (Wlokas et al., 2017) assert that community engagement is paramount in the process of not only dismantling systemic racism, it is also key to tackling wicked problems that arise as a result of rapid urbanization in a place such as South Africa that has a deeply racist past (Davison et al., 2016). While many of the findings were poignant, it is important to note that a significant amount of the research was very critical of environmental policy in South Africa specifically and were often lacking in practical or substantial solutions.

Being deeply committed to contributing to the knowledge on the complex cultural struggles that have shaped the fabric of marginalized groups in South Africa is a key component of the literature. For example, numerous studies were situated along South Africa's highly contested coasts, where communities have managed to survive for hundreds of years, whether via colonialism, Apartheid, capitalism; each regime employing their own form of oppression, particularly land-grabbing. The dedication and continued engagement with those communities highlights UCT's awareness of the inequalities that for so many decades have shaped the makeup of the country. Sadly, the divide between academia and the 'real world' is still present. Despite the fact that UCT has played its part in investigating the relationship between environmental racism and conservation, the findings lack the implementation strategies that are needed to lift the voices of marginalized groups, and to use those voices to develop conservation strategies that simultaneously dismantle environmental and systemic racism.

The results suggest that UCT has positioned itself to be involved across various scales, areas of study and contested topics so as to best understand the deeply complex manifestations of inequality. While

this indicates a wealth of knowledge to be tapped into by policy makers and social and environmental justice stakeholders, the question remains how effective this catalogue of publications is. It is clearly within the University's means to dedicate either time, resources or faculty (or all three), to the continued investigation into social ecological injustice in South Africa. However, if the findings all point to the same proposed solutions, but none of the included publications are on the topic of *implemented* solutions or strategies, will continuing such studies teach us anything new? Despite the fact that the university acts as an anchor institution, and often its faculty advise or support the local government in Cape Town on sustainable development, the university has offered little in the way of self-reflection as an institution, via academic writing (though it does offer a form of this through its own press publications and internal statements). One avenue through which UCT disseminates the work of its academics and faculty is through social media and the university is often reporting on new publications and summarising important findings. However, this positions the university well for stepping into being able to lead change if it is called upon to do that.

A few key recent events have shaped the framework of UCT's outlook on sustainability and environmental and systemic racism. While it is not pertinent to speculate on the cause of the uptick in publications per year since 2015, there is a positive correlation between the university's response to the Rhodes Must Fall protests, the launch of the SDGs and the number of articles included in this study. There were no publications on the topic of the Rhodes Must Fall protests, or on how those events have shaped the university since, this is likely because of the lack of specific environmental consideration in the social justice movement that transpired. It does however point to another gap in the publications stemming from the university: why has environmental racism not yet been considered in the context of de-colonizing the campus, curriculum, and institution? Despite the fact that there is a large number of publications included in this study, there are none that provide a case study of UCT that cover the topics of environmental racism and sustainability, even though the university has publicly committed to both over five years ago, and is positioned in a privileged position with regards to both the community and surrounding ecology of Table Mountain National Park.

UCT provides courses on the subjects of governance from a global south perspective, sustainability, climate change and mitigation, and offers seminars on the topics of race and decolonizing the campus and curriculum (UCT, 2021c). While race is considered through the lens of environmentalism in the global south, the environment is not a consideration within the subject of race, for example there is no mention of the environment, sustainability, or conservation in the lengthy de-colonizing of the curriculum report (Curriculum Change Working Group, 2018). More broadly, the university was affiliated with a substantial number of publications on the effectiveness of the SDGs, and has committed to helping implement them on campus, but has offered little in the way of self-reflection as an institution. While the university is holding lectures (at least one) and hosting summits, it is entirely unclear what progress they have made to

transform the campus in alignment with the SDGs. There are a large number of news publications from UCT that document the commitments, 'increased focus,' and broadening vision however the only progress report on reaching the SDGs was published in March 2021, where a member of the Future Water Institute at UCT reported that South Africa will not meet SDG 6 (clean water and sanitation) (Winter, 2021). It would appear that if the university was truly making meaningful progress towards these goals, whether on campus, or by assisting the immediate community of Cape Town,, then that information would been made publicly available.

In terms of progress towards dismantling the systemic racism on campus, the university has acknowledged the need to include decolonizing the campus in its '2030 agenda' which encompasses the commitment to reaching the SDGs (Bernardo, 2020). Again, either the university is not effectively communicating their successes, nor providing commentary on what needs to be done either on campus, in the community, nationally, or globally without outwardly reporting the successes at any level. While there may have been a shift in attitudes on campus, the tangible aspects such as news articles or academic journal articles are lacking or hidden in this field.

Issues of race and conservation should not be viewed through their respective silos. A likely reason that environmental, systemic or institutional racism are discussed in the systematic literature review is because racism, colonialism, and Apartheid have, for so long, defined race relations in South Africa. It is crucial to discuss the role that race plays in order to ethically complete studies on fisheries, urbanization, national parks, or poaching. In order for an article to be included in this research, the publications needed to have some kind of affiliation with UCT, whether that meant that the university funded the research, or simply lent its faculty to a broader study. The objective of including researchers from the most renowned university in Africa was naturally to include the perspective of a progressive, environmentally and racially conscious institution. Through these studies, the researchers contextualized what much of the global south is subjected to and underscored race in the discussion of environmental issues. Thus, while results show UCT's awareness of the connection between environmental justice and conservation, perhaps the real reason for these considerations lies in the fact that the country is still so dominated by either past or present racist policies, laws, and institutions and it is impossible to open a social justice conversation without considering this reality.

A key reflection in this discussion is that none of the included articles were on the topic of race, with conservation or sustainability as a secondary consideration. All 81 articles included in this study begin with a study on one social issue, whether poaching, urbanization, the luxury effect, or national parks, and mention environmental racism as one reason as to why the governance or communication falls short, and that marginalization is perpetuated. Thus, another gap in the publications is illuminated, there is a wide-open space for UCT to fill with articles that are on the topic of racism, whether systemic, institutional, or

otherwise, that include a discussion on the environment. The university has loudly positioned itself to work on the project of decolonising itself and the country.

As this review has shown, environmental issues, such as increased vulnerability to climate change, or poor governance of protected and coastal areas, are paramount to addressing racism within the country and global south and are a clear research priority for UCT. This research makes it clear that UCT has positioned itself in researching local, national, and global issues which, aligns with their research agendas of growing knowledge on the topics of a just and sustainable future, and is a driving force behind expanding the knowledge and discourses in these subject matters. Additionally, the depth and range of the publications included in this study points to the fact that if the opportunity presented itself (funding and or collaboration), UCT would be able to take a step further into the space of implementing the strategies outlined in the catalogue of research discussed here.

13.Conclusion

Being the first systematic review on the research output of UCT related to environmental racism, conservation and ecological justice, this research has successfully evaluated UCT's claims about its contribution to this field, and has contributed to the field itself with the provided analysis and identification of gaps in the field in general, and UCT outputs specifically. To introduce these ideas and lay the foundation for this research, the concepts of anchor institutions, environmental racism, environmental justice, and conservation were all positioned into the context of South Africa. The purpose of this was to rationalize a systematic review affiliated with UCT specifically, and to lay the foundation for commonly contested terms such as environmental racism and environmental justice that are frequently called upon in this research. Then, to tie these ideas together on the assumption that a significant amount of research affiliated with UCT will pay some kind of attention to South Africa. Grounded by a systematic literature review, the topics covered were found to be diverse and rich, transcending through various scales, contexts, and themes. In order to capture the full scope of the 81 journal articles covered, they were sorted into nine relevant themes, examined by year, and then discussed at length within each category. The purpose of this was to fully understand and evaluate the ways in which UCT has positioned itself around these issues, and to comprehensively examine these ideas holistically.

The themes were: 'background and theory,' 'plants, luxury effect and urban greening,' 'national parks, protected areas, and wildlife preservation,' 'energy transitions,' 'toxic waste and chemicals,' 'informal spaces,' 'urbanization,' 'human rights; food and water security,' 'oceans, fisheries, and coastal management.' Within each of these themes, concepts and theories were often repeated and supported by various authors across different contexts. For example, in the 'oceans, fisheries, and coastal management' theme, authors such as (Sowman et al., 2013), (Raemaekers et al., 2011) and (Wynberg and Hauck, 2014), to name a few, explore the injustices that shape the governance of coastal areas in South Africa. Pointing out that small-scale fisheries (made up of people of colour) along the coast of South Africa are not only *not* the cause of over-fishing, but they are sustainable and have been since their inception. The authors conclude through various studies and perspectives that these groups are marginalized, not communicated with effectively, and governed poorly by the state. Solutions arise where marginalized communities are carefully and meaningfully engaged with, trust is built, respect is given, and there is an acknowledgement and effort put towards dismantling of the systems that are further dividing people along racial lines. Although the studies were spread across the coast and featured various case studies within different communities, the findings were all reminiscent of one another, in order to effectively and justly govern areas that have been systemically oppressed such as these, community voices *must* be uplifted and prioritized from all scales.

A common thread ran through the articles, despite the fact that the positions, perspectives, and study areas varied greatly, was that despite a substantial amount of research, marginalized communities

continually face injustices that make them more vulnerable to the effects of climate change. One key way to uplift those communities is to involve them in the governance processes, to engage with them in meaningful ways, and to provide a platform from which they can play an active, meaningful, and equitable role in society. With infrastructure, outdated laws, and contemporary policies continually disenfranchising the people of colour in South Africa specifically, this research examined the way that UCT has positioned itself around these issues. Having a catalogue of knowledge surrounding these inequalities, the university has played an invaluable role in contributing primarily to the South African discourses on environmental racism and conservation, however, as discussed, the university's role in actively dismantling these systems seems to have halted outside of the campus.

Within the silos of racism and sustainability, the university has publicly dedicated itself to achieve the SDGs by 2030, and to dismantling institutional racism. This research suggests, through a consideration of 81 publications across 63 journals, that the university has played an important part in contributing to the knowledge on social and environmental issues that are underscored by environmental racism. Along with concurring with the general findings of much of the included articles that marginalized communities need to be considered and uplifted in order to combat, mitigate, and adapt to the changing and worsening climate, this research has identified two key gaps in the existing discourse. First, at a small scale, UCT is not publicizing their successes with either the SDGs, or with decolonisation. This does not necessarily mean that there are no successes to report on, but one can assume that with such a large number of commitments, that if the university was making meaningful progress towards these solutions, that they would better known outside the institution.

The other key gap that this research identified is that none of the included articles were on the subject of race, whether institutional, systemic, environmental or otherwise. All of the articles contained social studies, often situated in South Africa or the global south, and referenced environmental racism as a way of explaining the inequalities that play an important role in the study areas. For example, in the theme of energy transitions, the difficulty of providing energy to communities of colour that were formerly segregated by Apartheid regime policies is discussed, not first by discussing race, but by discussing the nature of energy transitions in the developing world (Sovacool et al., 2017, Baker et al., 2021). The gap that arises in this research is not that the issues are not discussed extensively, but that there lacks research into race specifically that references conservation and sustainability. The argument could be made that the search strings caused this hole in the research, if this were the case however, it is unlikely that with search strings such as these, that went through rigorous testing both from broad and narrow inclusions, that *all* publications that concentrated on race would have been missed.

Importantly, this research identified areas from which UCT can continue to grow and shape the discourses around race and conservation, and to continue blending the two together. With such a large body

of literature backing the solutions to the racial and environmental injustice that are present in South Africa and the global south, it is time for UCT to take all this research to the next step, and to allocate resources to either implementing the proposed solutions, or to enabling policymakers and stakeholders to enact the necessary change. This is also an opportunity for UCT to begin reporting on the ways in which the university is changing to be more racially just *and* environmentally sustainable, and making those changes more explicit. Finally, it appears prudent to suggest that UCT positions itself closer to the issue of race and racism in its research ventures, and to emphasize the role that environmental change plays in dismantling unjust systems and institutions.

Overall, this research has proved valuable in identifying trends, key themes, and gaps within a large collection of diverse publications. The publications were sorted into nine different themes, the most dominant of these was urbanization, which included reflections on various global sustainability initiatives, such as the MDGs and SDGs. The results showed an increase in publications over the past ten years, with the most 2018 (12), 2019 (12), and 2020 (13) having the most inclusions. The gaps that were identified point to the common disconnect that is found between the world of academia, and the real world; where the implementation of suggested solutions is often posited by academics and researchers, and the execution falls short. This is a pivotal moment for the planet: on the brink of irreversible climate destruction, coupled with deep racial division; equality, justice, and sustainability should be at the forefront of everyone's mind. Issues of justice and injustice are shown to be inextricably both social and ecological, in their cause, effect and perseverance, and so cannot be meaningfully addressed as separate – in research, implementation, or evaluation. UCT is shown to be in an ideal position, as both a research and anchor institution, to follow the progress of this idea of an inclusive justice in its sphere of influence.

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