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The relationship between the COVID-19 pandemic and environmental attitudes and what this means for environmental justice

Abstract

Government, policy, intervention campaigns, and communication strategies tend to separate social environmental issues from green environmental issues, and more recently, placing emphasis on responding to the pandemic. Interventions with an individualistic focus has also received criticism. Isolating issues from each other makes them deceptively simpler to deal in the short term, but at the cost of their interconnectedness impacting how future disasters might be managed. This myopic approach is of particular concern considering how climate change is increasingly impacting South Africans. This paper proposes two central questions: given evidence of the likely zoonotic source of COVID-19, how have relative rankings of the green environment changed between 2016 (pre COVID-19) and 2021 (COVID-19), and what does this mean for the study of environmental justice? A study conducted with 721 South Africans in 2016 aimed to establish where green environmental issues ranked compared to social and economic concerns. Subsequently, the pandemic provided an opportunity to conduct a follow up study with 665 South Africans to determine whether issues of concern are different during a pandemic. The results show that in the face of evidence of the zoonotic origins of COVID-19, there were little to no shifts in the ranking of green environmental issues in 2021 compared to 2016 among a sample of South Africans. The findings from this study suggest that red and brown issues could be powerfully leveraged to mobilise a range of movements for environmental justice in South Africa.

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Keywords

Social justice, Environmental justice, Climate change, Pandemic, COVID-19, Climate justice, Environmental attitudes

Introduction

The COVID-19 pandemic has personally affected every human being (Courtney et al, 2020) with the potential to change the existential path of individuals (Tomaszek & Muchacka-Cymerman, 2020), perception of risk (Cori et al, 2020), and degrees of concern about environmental issues (Schiller et al, 2022). COVID-19 has also had a psychological impact on individuals (Pillay & Barnes, 2020; Posel et al, 2021) including fear of contracting the virus, lack of access to basic needs (food, water, clothes, accommodation), financial loss, stigma (Brooks et al, 2020), and isolation (Pancani et al, 2021). At the same time South Africa is experiencing the impacts of climate change including on biodiversity (Xi et al, 2021), agriculture (Talanow et al, 2021), household vulnerability (Jimoh et al, 2021), and droughts (Baudoin et al, 2017). The sixth Intergovernmental Panel on Climate Change report (2021) pointed to additional disastrous impacts of climate change: a 'Day zero' drought in Gauteng, collapse of the maize crop and cattle industry, prolonged and unprecedented heatwaves, and landfalls following intense tropical cyclones at Richards Bay or Limpopo River valley. Climate change is also likely to negatively impact the psychological well-being of South Africans (Barnwell, 2021).

There are several similarities between climate change and COVID-19. They are both complex systemic issues with positive feedback loops leading to exponential growth and there is a degree of uncertainty as to how these markers will change the outcome and required mitigation and adaptation. Both phenomena affect all humans in some way (Bradley et al, 2020). Both require decisive, drastic measures on the public and private industry, and deeply impact vulnerable communities. They are also both backed as scientific truths by a significant majority of the global scientific community. The pandemic is inherently linked to green environmental issues since it is a consequence of a collapsing earth system, where growing populations put humans in closer competition with wildlife (Williams, 2021). This increases the risk of zoonotic diseases jumping across species causing pandemics (Reese et al, 2020). However, the key differences relate to degree of concern and perceived risk. COVID-19 poses more of an immediate risk such as collapsing/recovering economic systems, job loss, experiences of death, physically-manifested ill health, contagious spread, and immediate healthcare system pressures, whereas climate change risks are perceived as happening distally and far into the future such as sea level rises, ice caps melting, and extinction of species. Climate change requires individuals to permanently adjust their lifestyles whereas COVID-19 is perceived as requiring temporary changes in behaviour (Reese et al, 2020).

The consequences of disasters potentially increase willingness to promote pro-environmental behaviours (Zhang et al, 2014). There is a possibility that the current

pandemic has made some people consider their impact on the natural environment; i.e. lockdowns (and work-from-home) arguably making affluent people question the need to burn fossil fuels to travel to work, and spending more time in gardens or leafy suburbs. However, while the natural environmental gains are likely to be short-lived, they do provide lessons for how attitudinal and behavioural changes might positively impact the biosphere (El Zowalaty et al, 2020).

A German study investigated mental health, natural environmental concern, and prejudice against asylum-seekers just before and during the nationwide lockdown in Germany in Spring 2020 (Schiller et al, 2022). They found that concern for the natural environment increased due to perceived environmental vulnerability. Participants viewed nature as more fragile, with a higher likelihood of an ecological crisis, and were more concerned about natural environmental issues. Vimal (2022) found that the pandemic had a positive impact on the human experience of nature especially relationships with pets, farm animals, home plants and with birds, especially for people with better access to nature. However, a study conducted in Greece (Tilikidou & Delistravrou, 2021) found that the pandemic had no impact on pro-environmental attitudes or pro-environmental behaviour. Similarly, a study conducted across Cameroon, Egypt, Italy, India, and The Netherlands found that generally the pandemic did not change natural environmental perceptions (Awuh et al, 2021). When comparing the countries, they found that the least change in environmental attitudes emerged from high-income countries and the most change was observed in low-middle-income countries (Awuh et al, 2021).

Attempts to understand the underpinning relationship between the pandemic and pro-environmental behaviour had inconsistent findings. Pensini and McMullen (2022) found that feelings of connectedness to nature during the pandemic predicted support for travel restrictions in Australia. In Iran the pandemic increased environmental knowledge, perceived control over environmental actions, and positively impacted individual's intentions towards pro-environmental behaviour (Zebardast & Radaei, 2022). Daryanto et al, (2022) found that when Chinese adults believed that the pandemic was caused by negative human impacts on nature, there was a positive impact on their natural environmental awareness and that they were more likely to adopt pro-environmental behaviours. However, Lucarelli et al (2020) found no variations in pro-environmental behaviour pre-and post-COVID-19 amongst a sample of Italian university students. Ipsos MORI (2020) reported that across 16 countries South Africa had the highest support (84%) for government prioritising the protection of the environment while planning for recovery from the pandemic. Sixty percent of South African participants agreed that protecting the environment was a priority. Ninety-one percent of South African participants felt that their generation was responsible

for providing a healthy planet for the next generation. These results suggest a high degree of natural environmental concern amongst South Africans, but few studies have focused on how environmental attitudes might have shifted over time, particularly in the Global South.

The pandemic provided an opportunity to explore how attitudes might have changed concerns about the natural environment (e.g., biodiversity, global warming, and climate change) and relationships with other living beings (e.g., animal cruelty, protection of animals, and biodiversity extinction) in South Africa. Climate change remains a serious societal risk issue and it is important to understand how the pandemic might have shifted environmental concerns (Manzanedo & Manning, 2020; Van Lange & Huckelba, 2021) and whether it served as an existential trigger (Tomaszek & Muchacka-Cymerman, 2020) in a country with complex social and economic issues. It further provides an opportunity to understand what this means for environmental justice.

Psychology and environmental justice

Environmental justice considers various interacting and complex domains that draw on both natural environmental and social environmental concerns (Agyeman et al, 2002; Evert et al, 2022) suggesting a need to think beyond binary conceptualisations (Connors & Trites, 2021). Schlosberg (2007) extends justice towards our relations with the non-human world, and Agyeman et al (2002) links justice to sustainability suggesting a convergence of issues. This convergence is not new. Haughton (1999) argued for an interdependency of social justice, economic well-being, and environmental protection because an unjust society is unlikely to be sustainable. This nexus of sustainability and environmental justice has also been proposed in a socio-ecological justice model where social justice is placed ontologically in a relational space between human and non-human worlds. This approach frames justice as including both humans and non-humans equally (Yaka, 2019). The principles of environmental justice affirms "the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction" (Bullard, 2004: 23).

Cock (2004) argued for inclusivity by conceptualising environmental issues as brown issues (water, sanitation, and pollution), red issues (social justice and social movements), and green issues (biotic and abiotic elements of the earth). The synchrony between issues suggests a need for a coalition between social, environmental, and rights-based issues when addressing environmental issues such as climate change (Breysse et al, 2021; Westman & Broto, 2021). However, some challenges need to be recognised when arguing for synergy. The green agenda tends to focus on: ecosystem health (not human health); delayed timing (not immediate),

regional and global scale (not a local scale); future generations (not only lower income groups); nature needs to be protected (not manipulated to serve human needs); to use less (not to provide more); to protect resources from overuse (not providing more at a higher quality); and environmentalism (not urbanism) (du Plessis, 2015).

Therefore, environmental work in South Africa (and other highly unequal societies) remains complex and multifaceted, potentially impacting the implementation and efficacy of climate change mitigation, adaptation, and community resilience. South Africa is one of the world's most unequal societies (Cook, 2020) and has one of the world's highest per capita rates of gender-based violence and rape that has been called South Africa's secondary pandemic (Minisini, 2021). The ubiquitous inequality has been intensified by COVID-19 further impacting anemic economic growth that has led to increased poverty (Orkin et al, 2020). There was also a surge in gender-based violence during COVID-19 due to economic insecurity, alcohol use, and patriarchy that exposed women's poly-violence exposure (Mittal & Singh, 2020; Nduna & Tshona, 2021). The same ideology based on oppression, power, exploitation, control, and commodification that has caused violence and explicit inequities amongst people is responsible for the destruction of the biosphere. These issues are mutually reinforcing consequences of the same dysfunctional systems and therefore to address environmental degradation, and climate change, systems of oppression and power need to be challenged (Solomonian & Ruggiero, 2021).

Multiple environmental stressors impact Southern Africa, causing human suffering (Jackson et al, 2016; Mupedziswa & Kubanga, 2017). South Africa has the third highest level of biological diversity in the world with the Cape Floristic region being a hotspot with ~9000 plant species found in just 90 000 km^2, but is being negatively impacted by human activities (Tassone et al, 2021). Unfortunately, high extinction rates in the region threaten the well-being and biological viability of ecological systems with anthropogenic impacts being primarily responsible for ecological decline (Rebelo, 2018).

South Africa was previously ranked as one of the countries with the least environmental concern (ranked number 26 from most to least concerned) in a study of 33 countries (Franzen & Vogl, 2013). The 2005 South African Social Attitudes Survey showed that 49.3 per cent of South Africans felt that economic growth needed more emphasis than environmental issues (Struwig, 2010). Higher-income participants agreed with economic prioritisation, whereas people in rural areas were more concerned with the biosphere because of their investment in ecological assets such as crops and livestock (Struwig, 2010). Research with university students showed that the majority were neutral on whether they perceived a positive future for the environment in Gauteng with the authors ascribing this result to either indifference or ambivalence

(Dlamini et al, 2021). Another study conducted with undergraduate students at a university in the North-West found that participants did not perceive the environment to be under threat, and endorsed conservation for human utilisation (Evert et al, 2022).

Psychology has begun to consider environmental and climate justice issues (as seen in the special issues in the journals Psychology in Society and South African Journal of Psychology) where the interconnectedness between psychological, the natural environment, and social issues are being explored. Studies of attitudes over time could be a useful way to understand the natural environment and social justice issues in a post-pandemic South Africa. This paper asks two central questions: given the evidence of the likely zoonotic origins of COVID-19, how have relative rankings of the green, red, and brown environment changed between 2016 (pre COVID) and 2021 (COVID), and what does this mean for the study of environmental justice? The results explored in this paper formed part of two larger studies conducted in 2016 (Marais-Potgieter & Thatcher, 2020) and another in 2021 that broadly explored the human-nature nexus in South Africa.

Methods

Participants and procedures

Ethical clearance (number H15/11/15 and H21/03/14) was granted unconditionally by the university's Human Research Ethics Committee (non-medical). For both study periods social media advertising (an electronic banner) was used to randomly invite individuals to participate in the study. Invitations were made through an advertising banner placed on Facebook. They could either scroll past, or if they were interested in participating they would click on the banner to be directed to the participant information sheet. An online survey tool (Alida) was used to deploy the participant information sheet and survey. Only once they were happy with the information provided could they choose to proceed to the survey where they were first screened to identify as South African, with English competence, and at least 18 years old. They were then directed to the online survey battery. A lucky draw, as a separate survey option, was offered as compensation for their time.

Maximum variation purposive sampling was used (Teddlie & Yu, 2007). Due to the online data gathering method, the sample included mainly urban, literate individuals with Internet access, and was likely to include individuals with higher carbon footprints, but potentially excluded those living in remote rural areas or informal urban settlements where internet access might be limited. No criteria were set regarding participation to obtain the maximum variation possible. The 2021 fieldwork took place between 21 May and 10 June and the 2016 fieldwork took place between 26 February and 31 May. Due to anonymity, matching between 2016 and 2021 was not possible. Table 1 shows the sample demographics for the two study periods.

Table 1: Sample demographics for 2016 and 2021

DEMOGRAPHICS	2016	2021
Sample	*n = 721*	*n = 665*
GENDER		
Male	39%	33%
Female	61%	67%
POPULATION GROUP		
Black	39%	35%
Mixed race /coloured	11%	12%
Asian / Indian	6%	5%
White	41%	47%
Other	2%	1%
Refuse	2%	1%
AGE GROUP		
18-25	27%	24%
26-35	30%	27%
36-45	20%	22%
46-55	19%	18%
56-65	4%	4%
66+	1%	4%
CITY		
Gauteng	52%	40%
Western Cape	22%	18%
KwaZulu-Natal	14%	10%
Other (Free State, Eastern Cape, Limpopo, Mpumalanga, Norther Cape, North West)	12%	32%
EMPLOYMENT STATUS		
High School student	1%	0%
College / University student	21%	9%
Full time employed	57%	43%
Part time employed (not a student)	6%	6%
Part time employed (a student)	4%	3%
Unemployed	5%	19%
Stay-at-home parent (not working and not looking for work)	1%	3%
In employment but not currently working (e.g. sick leave, maternity)	0%	1%
Volunteer work only	1%	1%

Table 1 …*Continued*

Retired	1%	4%
Self-Employed	5%	9%
Other	0%	1%
PERSONAL INCOME		
R1 - R4 999	20%	25%
R5 000 - R9 999	15%	18%
R10 000 - R19 999	21%	20%
R20 000 - R29 999	14%	9%
R30 000 - R39 999	6%	5%
R40 000 - R49 999	3%	3%
R50 000 - R59 999	2%	1%
R60 000 - R69 999	1%	1%
R70 000 or more	2%	1%
No income	14%	13%
I do not know	1%	1%
I refuse to say	2%	3%

Overall, there were no significant differences between the two study periods for personal income. However, there was a significant, moderate association between occupation and survey period ($p<0.0001$; Cramer's $V = 0.37$) where 2021 had a greater proportion of unemployed and self-employed, and a lower proportion of student and full-time employed participants compared to 2016. The sample from 2021 was post-weighted by age, gender, and ethnicity to match the demographic profile of 2016 to compare the two study periods.

Measures

The Environmental Issues and Attitudes Questionnaire (EIAQ) was a self-developed questionnaire that aimed to understand issues that individuals prioritise. In 2016, the EIAQ aimed to understand aspects participants felt were more or less important in their lives. Participants were requested to be as honest as possible as there was no wrong or right answer and their answers should reflect how they felt personally. The General Issues section of the survey asked participants to rank the three issues of greatest importance to them, in order of importance. The issues listed were: international tensions (e.g. terrorism, war), economic concerns (e.g. unemployment, cost of goods, value of the Rand), political concerns (e.g. government inadequacy, xenophobia), natural environmental concerns (e.g. loss of biodiversity, global warming), health

concerns (e.g. cancer, AIDS, TB), social issues (e.g. poverty, discrimination, inequity, education, abuse), personal safety (e.g. crime, theft, lack of freedom), religious concerns (e.g. sinning, offending, relationship with higher power), and animal rights concerns (e.g. sentience of animals, cruelty, laws that protect animals).

In 2021, the General Issues section was rephrased as an Overall Concerns section in the EIAQ. The aim of the question remained unchanged. Participants were asked how concerned they were about the issues on a scale where 0=no opinion, 1=not at all concerned, 2=slightly concerned, 3=somewhat concerned, 4=moderately concerned, 5=extremely concerned. All items from 2016 remained unchanged, but two items were added in 2021: Coronavirus/COVID-19, and future pandemics.

Analysis

The 2016 rankings data were calculated by awarding a top ranking three points, second place two points, and third place one point. The points for each issue were then summed. The issue with the most points was given a relative score of 1.00, and the other issues were ranked relative to this, according to the sum of the points they had achieved. For 2021, the percentage of respondents who were "moderately/extremely concerned" was calculated and then based on these results a relative ranking was given. Age was classified as younger being <35 and older >=35 years old. Race was grouped as Black, White, and Other (due to smaller sample size).

Data analysis was carried out using STATISTICA version 12. Sample group sizes with n<30 were excluded from the analysis and results because they are too small to draw meaningful conclusions. The quantitative results over the two periods could not be compared statistically to each other due to the nature of the questions asked. Therefore the quantitative results from the two study periods were analysed descriptively by exploring whether high scores (2021) or rankings (2016) have changed over time looking at the items in relation to each other.

Results

The remainder of the results are presented descriptively for relative comparison across the two study periods, and across items of green, red, and brown environmental concern. Table 2 shows a relative ranking system using the same items over the two study periods, with pandemics and COVID-19 added for 2021. The results are not a statistical ranking, but a relative comparison using a nominal scale between groups, and an ordinal scale within groups.

Table 2: Ranking of environmental concerns between 2016-2021

	Overall		Black Male		Black Female		White Male		White Female		Other Male		Other Female		Younger Male		Younger Female		Older Male		Older Female		Black Younger		Black Older		White Younger		White Older		Other Younger		Other Older	
	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021	2016	2021
Personal safety	1	1	3	4	2	1	1	1	1	1	4	2	1	1	3	3	1	1	3	1	1	1	3	2	3	2	1	1	1	1	1	1	1	1
Economic concerns	2	2	1	2	3	4	2	2	2	2	2	1	3	2	1	2	3	3	1	2	2	2	2	3	1	5	2	2	2	2	3	2	2	3
Social issues	3	3	2	1	1	2	3	3	3	4	3	5	2	3	2	1	2	2	2	4	3	3	1	1	2	3	4	4	3	4	2	4	3	2
Religious concerns	4	11	5	11	4	11	6	11	8	11	1	11	5	11	4	11	5	11	4	11	6	11	5	11	5	11	7	11	7	11	4	11	5	11
Health concerns	5	9	4	5	5	3	8	10	7	9	6	8	4	9	6	8	4	5	7	7	7	9	4	5	4	4	6	9	8	10	6	9	4	6
Environmental concerns	6	5	7	6	6	6	4	6	5	5	5	6	6	8	5	4	6	6	6	9	4	7	6	6	6	8	3	5	4	6	5	5	6	10
Political concerns	7	6	6	7	7	8	5	5	6	6	7	3	8	6	7	6	8	9	5	3	8	6	7	8	7	7	7	6	6	5	7	6	8	5
Animal rights concerns	8	7	8	10	8	10	7	4	4	3	9	10	7	5	8	9	7	7	8	6	5	4	8	10	8	10	5	3	5	3	8	8	7	9
International tensions	9	10	9	9	9	9	9	8	9	10	8	9	9	10	9	10	9	10	9	8	9	10	9	9	9	9	9	10	9	9	9	10	9	8
Coronavirus/COVID-19		4		3		5		7		7		4		4		5		4		5		5		4		1		7		7		3		4
Future pandemics		8		8		7		9		8		7		7		7		8		10		8		7		6		8		8		7		7
Base	721	665	147	116	132	142	80	85	216	188	54	58	92	76	128	146	235	240	99	113	205	166	228	189	51	69	103	121	193	152	86	75	60	59

ORANGE Top three issues (1-3)

YELLOW Middle issues (4-6)

GREY Issues of less concern (7+)

Overall Table 2 shows that in the face of evidence of the zoonotic origins of COVID-19, there were little to no shifts in the ranking of the environment in 2021 compared to 2016 among a sample of South Africans. However, there was a marginal shift where animal rights were more of a concern in 2021 compared to 2016. It is notable that even during a pandemic, COVID-19 was rated as less of a concern in 2021 than personal safety, economic concerns, and social issues, although the pandemic has exacerbated these pressures indicating that disasters (pandemics or climate change) might increase inequity, social justice pressures, and other societal problems. Even general health concerns were lower in relative priority in 2021, suggesting that individuals were not able to focus on broader health issues during a pandemic. Interestingly, concern regarding future pandemics was rated very low indicating a tendency to focus on more immediate threats.

Discussion

By comparing data from 2016 to data in 2021, we aimed to explore how issues of concern might have shifted in relation to each other with the COVID-19 pandemic as a disruptor. The results were marked by their consistency. It showed that green environmental concerns continued to remain less of a concern in South Africa during the pandemic.

These results confirm environmental justice conceptualisations such as those proposed by Cock (2004) and Agyeman, Bullard and Evans (2002) that green, red, and brown movements would be more effective when combining efforts for social, political, and legal change. According to Cordeiro-Rodrigues (2020), including racial justice concerns in campaigns, could benefit movements like animal advocacy. Therefore, treating social justice as a natural environment and animal rights issue, and vice versa could increase the efficacy of climate change communication and policy (Agyeman et al, 2016; Leonard, 2018). The results confirmed that the climate crisis is likely to add to an already complex threat that consists of numerous reinforcing societal ethical dilemmas (Solomonian & Ruggiero, 2021), and therefore requires coalitions (Attfield & Reed, 2021) to be resolved simultaneously. Communities are increasingly mobilising against climate change in other countries like in Puerto Rico, Haiti, and Brazil (Fernandes-Jesus, 2020) where the synergy between green, red, and brown environmental issues are apparent.

This synergistic approach is gaining momentum in South Africa for example in the halting of seismic surveys (Balcomb, 2021), stopping the mining of titanium dioxide (Green, 2020) and coal mining (Yeld, 2021), protecting an aquifer (Centre for Environmental Rights, 2020), and building on ancestral indigenous land while destroying a floodplain (Kwet, 2022). Practically, how might this synergy be achieved in South Africa? From these emergent examples in South Africa, it is evident that taking

a unidimensional approach will only meet with a narrow focus of attention, when what is needed is a broader coalition of stakeholders. Since environmental, social, and economic issues are often intertwined in complex relationships, there is a need to draw on this interconnectedness in a wholistic manner. In South Africa, this means making connections with burning social and economic issues such as unemployment, lack of service delivery, and access to land. Many of the environmental concerns raise serious social and economic challenges. For example, the seismic surveys will potentially collapse the tourism industry along the Wild Coast, putting thousands of jobs at risk while providing no additional service delivery. If environmental concerns are to achieve critical mass, they will need to sensibly leverage off the social and economic issues.

The pandemic has been positioned as an existential trigger (Tomaszek & Muchacka-Cymerman, 2020) said to have positively re-adjusted the human-nature nexus. Previous studies have found increased pro-environmental behaviour (Pensini & McMullen, 2022), increased environmental knowledge and pro-environmental intentions (Zebardast & Radaei, 2022), and increased environmental awareness and behaviours (Daryanto et al, 2022) during the COVID-19 pandemic. This study deviates from these findings that indicated shifts in natural environment awareness, intentions, and behaviour showing consistency between green, red, and brown environmental issues before and during the pandemic. This study's results were more in line with Lucarelli et al (2020) who found no shifts pre-and during-COVID-19. The findings from this study suggest that red and brown issues could be powerfully leveraged to mobilise a range of movements for social and environmental change in the South African context that is complex and multifaceted.

Limitations of the study were that the survey data did not specifically collect information from lower income South Africans and due to the need to access the survey through the internet, there was potentially a middle to high income bias in the sample. Furthermore, although the items of concern remained comparable across the two study periods the questions on future pandemics were introduced as options in the 2021 survey. Although a relative comparison was possible based on rankings versus degree of concern, the results only provide a comparative benchmark for further analysis. There is an opportunity for further research to be conducted looking at significant differences and how concerns impact psychological wellbeing and climate change perceptions. As with the 2016 study, it is recommended that follow-up in-depth interviews are held with a sub-sample of the 2021 participants. This would allow the researchers to gain a deeper, qualitative understanding of the reasons for their perceptions and attitudes during Covid-19. There is also a need for further studies to practically understand what strategies to adopt to connect the red, brown, and green aspects of environmental justice.

Conclusion

Even with evidence of the zoonotic origins of COVID-19 and possible increased nature experiences (Soga et al, 2020; Vimal, 2022) there was little to no shifts in the ranking of the environment between 2016 and 2021 in South Africa. This confirms that green, red, and brown issues need to be resolved synchronously.

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