

## Article

# Comparing Tourist and Tour Operator Perceptions of Tourists' Impacts on the Environment in Tanzania

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**Abstract:** Tourism accounts for a substantial and increasing portion of the Sub-Saharan African economy. In Tanzania, the number of international tourist arrivals nearly doubled from 2010 to 2018, and many of them participated in nature-based tourism. In addition to the jobs and revenue created by tourism, it has both positive and negative impacts on a place's environment. For example, it can fund conservation efforts, but it can also lead to deforestation from infrastructure development. This paper focuses on the environmental perceptions of tourists who traveled to Tanzania and tour operators working in the country. Environmental perception assesses an individual's ability to recognize how they truly view and react to their environment. This study builds on the existing literature on tourist perceptions to compare three aspects of perceptions. First, it compares tourist perceptions of their personal environmental impact to the impacts of other tourists. Second, it compares tourist perceptions of their personal impacts to the perceptions of tour operators. Third, it compares how tourists perceive their behaviors at home to their behaviors while traveling. Using results from online surveys of 47 tourists and 16 tour operators, this study found that tourists attribute negative environmental impacts to others and positive impacts to themselves. It found similar gaps between tourist and tour operator perceptions, with tourists both over and underestimating their impacts compared to operator perceptions. It found that tourists are more proactive at minimizing their environmental impacts at home than away.

**Keywords:** environmental impacts; perceptions; tourism; Sub-Saharan Africa; Tanzania



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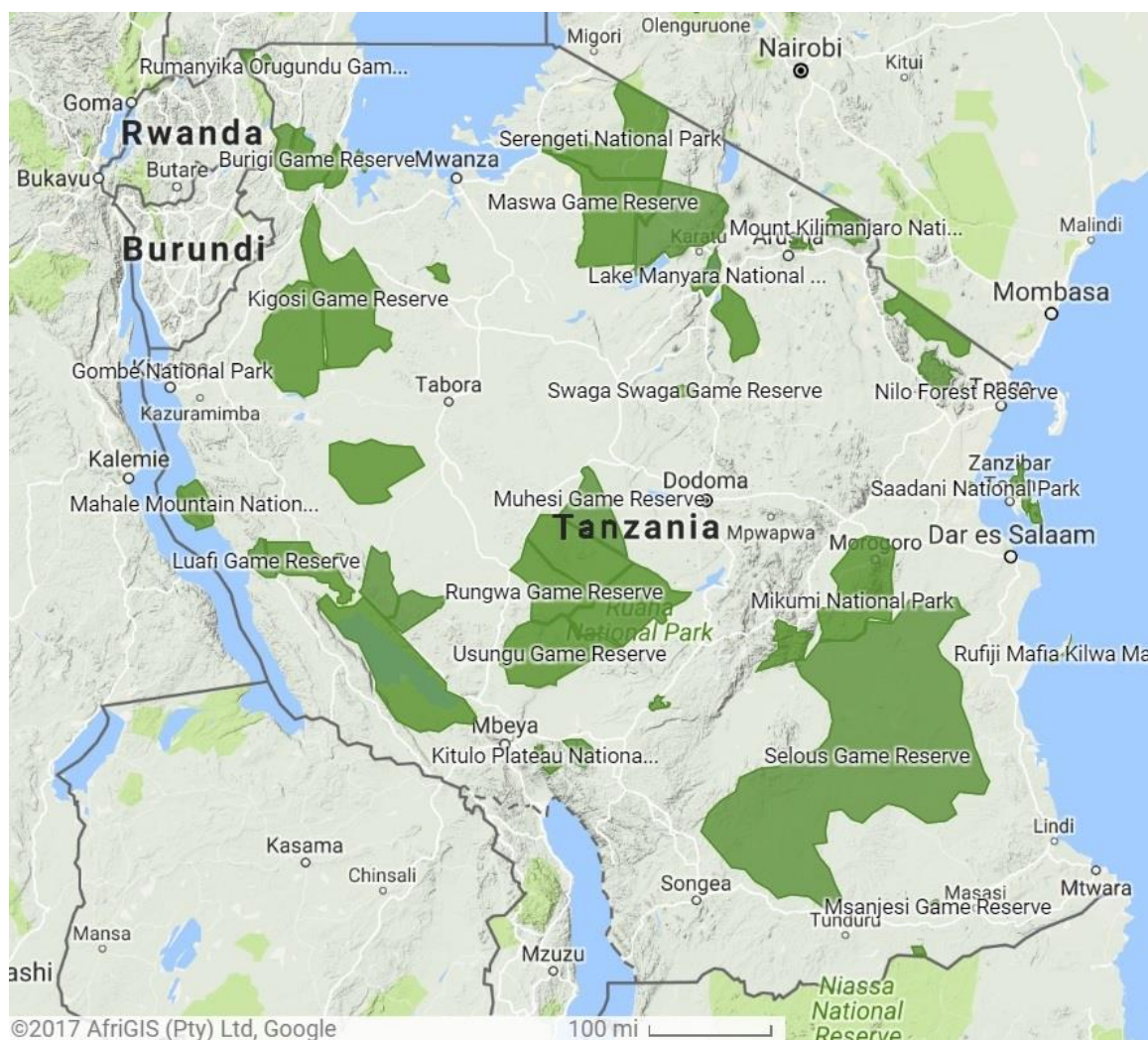
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## 1. Introduction

Prior to the COVID-19 pandemic, Sub-Saharan Africa experienced a substantial increase in international tourist arrivals; between 2010 and 2018, the average annual growth of international tourist arrivals was 6.1% [1]. Although the pandemic resulted in an estimated decrease in international arrivals by at least 60% from 2019 to 2020 [2], it is hoped that the industry will rebound as travel restrictions end and vaccine availability increases.

Tourism has significant social, economic, environmental, and political impacts, and they can be both positive and negative [3,4]. For example, Hoogendoorn et al. [5] highlight the importance of tourism in South Africa for the economic benefit of local farmers who can convert their agricultural farms to private game farms. This conversion creates not only an increase in income for those farmers through tourist dollars, but it also leads to greater biodiversity in the region as farming of the land and animal grazing decreases and other plants and animals are reintroduced. Scholtz and Slabbert [6] examine the social impact of tourism in South Africa and find intangible benefits of community upliftment and pride as well as that community protection and education are especially important to local residents. On the other hand, Melubo and Lovelock [7] find that residents in Tanzania experience mixed impacts from tourism; although it does increase income, it also brings restrictions on land resources and undermines livelihoods.

This paper explores tourist perceptions of environmental impacts in Tanzania. Tanzania contains numerous protected areas, including 16 national parks, 2 marine parks, 28 game reserves, multiple forest reserves, and 1 conservation area [8], totaling approximately 38% of Tanzania's total land area [9]. Figure 1 depicts these areas. Using the results of two online surveys, this paper focuses on three aspects of perceptions: how tourists perceive their own impacts as compared to the impacts of others, how tourists perceive their own impacts compared to the perceptions of tour operators, and how tourists perceive their behavior at home compared to while traveling.



**Figure 1.** Map of Tanzania's protected areas.

### 1.1. Environmental Impacts of Tourism

Tourism has significant environmental impacts, and these vary based on the specific destination. Still, some potential negative impacts include resource overconsumption, land degradation, pollution, and the disruption of wildlife [10,11]. Major positive impacts are natural resource conservation and wildlife protection.

Overconsumption includes the direct consumption of water, energy, food, and fuel and the indirect use of land for food production and infrastructure development such as for roads, hotels, and camps. Although there are economic benefits of increased food security and infrastructure development, they can also present challenges to the resources of residents, wildlife, and the environment [12]. Development also leads to a rise in energy consumption which can have a dramatic impact on global climate change through increased carbon emissions [12,13].

Infrastructure development and the creation of tourist areas can lead to deforestation and habitat loss. Deforestation lessens the availability of wood for fuel and construction. It can decrease wildlife populations, increase carbon dioxide concentrations, decrease water supplies, and contribute to erosion and soil degradation [14–16]. Infrastructure development and the expansion of agriculture around protected areas have negatively affected animals by restricting them into smaller areas and blocking traditional migration routes [16,17].

Tourists can impact the environment through water pollution, air pollution, and litter [18]. Hotels and resorts produce substantial amounts of solid and liquid waste and are often located in areas without adequate sewage systems and landfills [19]. Lack of sanitation is especially dangerous in campsites where drinking water is typically supplied by boreholes [10,12]. Carbon emissions and other forms of air pollution are a global and local concern due to their contributions to climate change. Tourists contribute to these emissions through their transportation getting to and traveling within their destination. Beyond climate change, air pollution also raises concern for air quality affecting the health and quality of life of local residents [10].

Tourism helps promote conservation and preservation of natural resources in order to continue a sustainable tourism industry [10]. In particular, ecotourism and green tourism have tremendous positive impacts through promoting conservation, local development, and sustainability. However, in order for ecotourism and community-based sustainable tourism to benefit all involved, they require positive action from decision-making authorities together with the local community [20–22].

Libosada [23] notes that ecotourism preserves fragile ecosystems and saves threatened animals by providing a tangible economic aspect of conservation. Reimer and Walter [24] found decreases in hunting and logging and increased awareness of environmental issues in Cambodia as a result of an ecotourism project. Nyuapane and Poudel [25] suggest that as residents benefit economically from tourism, they are more likely to preserve the resources that attract tourists.

### *1.2. Tourism, Perception, and Behavior*

Since the late 20th century, there has been an increase in concern with and awareness of environmental issues. The tourism industry has become increasingly aware of its impacts [26], and ecotourism, sustainable tourism, and nature-based tourism have been introduced as options for travelers in light of that awareness. This popularity of environmental awareness has also led to an increase in research surrounding environmental problems caused by tourism and how tourists perceive these impacts that they create [27].

Environmental perception assesses an individual's ability to recognize how they truly view and react to their environment. How a person perceives environmental quality within a destination has been proven to be directly related to their socio-economic status, cultural ties, and past experiences [28,29]. Perception tends to become a process of filling in empty spaces of a situation with previous knowledge.

Research has considered host perceptions of tourism, suggesting that perceptions depend on how much they personally benefit economically and the types of social impacts the tourists have on their communities [30]. Likewise, Andereck et al. [31] explain that hosts who have a personal stake in tourism perceive it as having more positive impacts than those without the stake, but all hosts perceive the negative impacts similarly. Beeharry et al. [32] compare the perceptions of tourists and leisure tour operators toward environmental impacts in Mauritius, finding that operators perceive more harms to the environment and are more environmentally conscious than tourists.

Dube et al. [33] find that tourists are becoming increasingly aware of climate change but perceive ignorance, lack of education, and political leadership as causes rather than their own actions. Lepp et al. [34] show that tourists perceive Uganda as a risky destination despite not knowing much about it, however, their perceptions changed after viewing the country's official tourism website. Gao et al. [35] investigate the relationship between

tourist perceptions of tourism impacts and their perceptions of responsibility; although they perceive negative impacts, they do not attribute the responsibility to tourists themselves.

Studies have shown that tourists are aware of their impacts, whether individual or communal [36]. However, they tend to perceive that they have less impact than they really do [36–38]. Priskin [38] finds that tourists are aware of the impacts their recreation activities had on a coastal area in Australia; in general, tourists perceive less harm than actually caused. Hillery et al. [36] suggest that while tourists perceive environmental impacts on tourist spaces in Australia, they are not able to distinguish between the scope of impact at different sites. Gossling et al. [37] find that although tourists perceive that tourism causes environmental problems, they are most aware of visible and immediate problems such as plastic bag litter; they have less understanding of global problems such as carbon emissions and air pollution. Harriott [39] notes that while the majority of respondents believe tourists and tourism have negative impacts on the Great Barrier Reef, they view it as less negatively impactful than other activities such as commercial fishing and agricultural run-off. Du Plessis et al. [40] surveyed South African tourists on their perceptions of their impacts on national parks. They note that tourists perceive waste management and recycling as inadequate, that parks do not use enough renewable resources or environmentally friendly products (like recycled paper), and that infrastructure development is not environmentally friendly.

Similarly, studies have explored the determinants of environmentally responsible behavior. Su et al. [41] find that the eco-friendly reputation of the destination and tourist satisfaction both positively influence tourists' environmentally responsible behavior. Likewise, Luo et al. [42] highlight the importance of tourists' social responsibility awareness on environmental responsible behavior and recommend more environmental education in tourist destinations. The recreation experience of nature-based tourists specifically influences both their general and site-specific environmentally responsible behavior [43]. In eco-tourism, the higher the value-perception of the destination—whether the value of experiences or the economic value from fees—the more environmentally responsible behavior [44,45].

### 1.3. Tourism in Tanzania

During the late 19th century and early 20th century, Tanzania became a destination for game hunting, and eventually the British colonial administration created game reserves and national parks [46,47]. The tourism industry grew in the 1980s with the introduction of policy reforms during the shift from socialism to capitalism [48]. Since then, both tourism revenues and total numbers of international tourists have increased exponentially. There were approximately 1,506,000 international tourist arrivals in Tanzania in 2018, which was a substantial increase from the 754,000 arrivals in 2010 [8]. Tourism contributed 10.7% of Tanzania's GDP in 2019 and accounted for 11.1% of the country's total employment [8]. Although arrivals and contributions decreased because of the COVID-19 pandemic, they are predicted to rebound.

International tourist arrivals to Tanzania are of particular significance. Although domestic tourists in Tanzania do visit the various protected areas within the country, they pay less money to enter the parks and reserves. For example, the fee to enter Lake Manyara National Park—one of the country's most visited parks—during the peak season is approximately US\$4 for Tanzanian citizens and US\$70 for non-citizens [49]. These fees allow the parks to manage the areas efficiently while also contributing to conservation efforts.

Tanzania has experienced struggles between the need for conservation in its national parks and the needs of the native populations living in and around these protected areas. Conservation is crucial to the expansion of the tourism industry; it benefits the plants and animals in these areas, and it is one way of increasing income, investment, and foreign financial aid to the country. However, since the creation of parks during colonial rule, the Tanzanian government has been expelling indigenous people from these protected areas [50,51]. This conflict continues today, with pastoralist Maasai being forced from their

land so that the protected areas can be sanctioned specifically for wildlife. The Maasai have found themselves in a losing battle with the government for decades due to the increase of tourism within their lands [50,51].

Along with the protection of wildlife, hunting is a major concern within Tanzania's national parks. There is a disconnect between the tourism industry and the potential that hunting has to financially support conservation efforts [51]. Lindsey et al. [52] estimate that trophy hunting generates revenues of at least US\$200 million in Sub-Saharan Africa and that it plays the largest role in conservation in areas where other forms of wildlife tourism are not possible. Tanzania's Wildlife Division, which is part of the Ministry of Natural Resources and Tourism, had over US\$16 million in revenue from trophy hunting in the 2014–2015 fiscal year but less than US\$5 million from photographic tourism [53]. In Botswana, a 2014 safari hunting ban reduced the economic benefits of tourism and led to negative attitudes toward wildlife conservation [54]. Still, the conservation impact of trophy hunting can be limited by its occurrence on private land, corruption, and inadequate regulation [52].

## 2. Materials and Methods

This research received ethical approval from the Kent State University Institutional Research Board (Protocol #16-269). Two online surveys were created with Qualtrics Survey Software. The first was distributed to international tourists who had traveled to Tanzania and the second to tour operators at Tanzanian companies. Participants for the international tourist survey were identified in two ways. First, 70 tour companies based in Tanzania were contacted and provided information about this project. These companies were identified from two online lists of licensed tour operators. These lists are maintained by the Tanzania Tourist Board, the government's official tourism office, and the Tanzania Association of Tour Operators, a lobbying and advocacy organization for member operators. Ultimately six companies agreed to provide information about the survey to their guests. These companies were sent printed information cards with the link to the online survey and a short description; they were asked to provide this information at the completion of their safari. Second, convenience and snowball sampling were used to identify other tourists. All participants were over the age of 18 and self-identified as recent tourists to Tanzania.

47 participants fully completed the international tourist survey. They were from a total of 21 different countries and ranged from 22 to 83 years old. Everyone surveyed had at least some college education and many had a graduate degree. The participants used 14 different tour companies although 12 were unable to name the company they used. An additional eight participants said that they had a self-guided safari.

To understand the perceptions of tourists and the environmental impacts of tourism in Tanzania, 12 potential impacts were identified. These were drawn from the existing literature on tourism in Sub-Saharan Africa [10,14,55,56]. These impacts were deforestation, soil loss/erosion, water pollution, conservation, vegetation loss, disruption of wildlife, water overuse, infrastructure development, air pollution, wildlife protection, energy overuse, and litter. Participants were asked to rate these impacts through Likert scales from positive to negative. They were asked to rate the perceived environmental impact they had on the same 12 environmental issues on Likert scales from no impact to significant impacts. They were also asked rate the impacts of other tourists in Tanzania on Likert scales from no impact to significant impact. In addition, tourists were also asked to indicate if they participate in certain environmentally responsible activities while at home and while traveling.

Participants for the tour operator survey included guides, owners, or consultants currently working for a Tanzanian tour company. Participants were identified during the authors' correspondence with companies. 16 tour operators fully completed the online survey. All except one currently reside in Tanzania, with the exception living in Germany but owning a company based in Tanzania. They ranged in age from 24 to 52 years old. Each participant has some form of education in tourism services and most operators have a bachelor's degree. No two operators worked for the same tour company.

The tour operator survey included similar questions to the international tourist survey. Again, using Likert scales, they were asked to rate the same 12 environmental impacts from positive to negative and to rate how much impact they thought tourists in general have on the environment. They were also asked about their own company's contribution to environmental impacts, such as what actions they do in order to lessen negative environmental impacts, what they wish they were doing to lessen their impacts, and if tourists know about these actions that they take part in.

### 3. Results

Table 1 shows how tourists perceive the 12 environmental impacts. 2 were perceived positively by a majority of participants (conservation and wildlife protection) while 2 were perceived negatively by a majority of participants (water pollution and disruption of wildlife). No other impacts were perceived either way by more than 50% of respondents although several came close; for example, infrastructure development was perceived positively by 49% and negatively by 21%.

**Table 1.** Tourist perception of how tourism impacts the environment.

	Positive %	Neutral %	Negative %	Do Not Know %
Deforestation	17	26	32	26
Soil Loss/Erosion	9	30	38	23
Water Pollution	11	17	53	19
Conservation	58	13	18	11
Vegetation Loss	13	26	47	15
Disruption of Wildlife	4	26	62	9
Water Overuse	2	28	47	23
Infrastructure Development	49	13	21	17
Air Pollution	6	28	49	17
Wildlife Protection	83	7	7	4
Energy Overuse	11	30	43	17
Litter	17	28	43	13

Table 2 presents a comparison between how tourists perceive their personal environmental impact versus how they perceive the impacts of other tourists. Tourists generally perceive that they have a larger impact than others on positive issues such as conservation and wildlife protection and a smaller impact than others on negative issues such as litter and vegetation loss. Likewise, more tourists perceive themselves having no impact as compared to other tourists on these negative issues such as water pollution and water overuse. Of the 12 issues, the largest difference between personal and other impacts is with litter; not only do tourists perceive others as more responsible for litter, they also do not perceive themselves as contributing to the problem.

Similarly, Table 3 compares tourist perceptions of their personal environmental impact and the perception of tour operators of tourists' impacts. For most of the 12 impacts, the perception comparisons were fairly similar to the results presented in Table 2. For disruption of wildlife and water overuse, tour operators perceive tourists as having less impact than tourists believe that they have. For infrastructure development and litter, tour operators perceive tourists as having much more impact than tourists believe that they have. For both of those issues, more tourists see themselves as having no impact at all.

**Table 2.** Comparison of the perception of tourists' own impacts on the environment and their perception of other tourists' impacts.

		Some Impact %	No Impact %	Do Not Know %
Deforestation	Personal	43	43	15
	Other	46	26	28
Soil Loss/Erosion	Personal	43	36	21
	Other	50	24	26
Water Pollution	Personal	66	21	13
	Other	61	11	28
Conservation	Personal	79	13	9
	Other	60	13	27
Vegetation Loss	Personal	47	38	15
	Other	53	22	24
Disruption of Wildlife	Personal	81	9	11
	Other	74	7	20
Water Overuse	Personal	70	19	11
	Other	67	9	24
Infrastructure Development	Personal	60	26	15
	Other	69	9	22
Air Pollution	Personal	66	23	11
	Other	62	17	22
Wildlife Protection	Personal	72	17	11
	Other	67	15	17
Energy Overuse	Personal	66	21	13
	Other	69	9	22
Litter	Personal	43	45	13
	Other	62	18	20

**Table 3.** Comparison of the perception of tourists' own impacts on the environment and the perception of tour operators of tourist impacts.

		Some Impact %	No Impact %	Do Not Know %
Deforestation	Personal	43	43	15
	Operator	38	63	0
Soil Loss/Erosion	Personal	43	36	21
	Operator	51	50	0
Water Pollution	Personal	66	21	13
	Operator	69	31	0
Conservation	Personal	79	13	9
	Operator	82	19	0
Vegetation Loss	Personal	47	38	15
	Operator	50	50	0
Disruption of Wildlife	Personal	81	9	11
	Operator	63	38	0
Water Overuse	Personal	70	19	11
	Operator	56	44	0
Infrastructure Development	Personal	60	26	15
	Operator	88	13	0
Air Pollution	Personal	66	23	11
	Operator	63	31	6

**Table 3.** *Cont.*

		Some Impact %	No Impact %	Do Not Know %
Wildlife Protection	Personal	72	17	11
	Operator	76	19	6
Energy Overuse	Personal	66	21	13
	Operator	69	25	6
Litter	Personal	43	45	13
	Operator	69	31	0

Table 4 compares tourist environmentally responsible behaviors at home and while traveling. Most participants conveyed that they try to lessen their environmental impacts regardless of where they are located. Recycling is the only activity where there is a notable difference between behaviors, with tourists being substantially more likely to recycle at home than while traveling.

**Table 4.** Comparison of tourist behavior while at home and while traveling.

	At Home %	While Traveling %	Never %
Minimize Water Consumption/Use	89	87	4
Turn Off Lights When Not in the Room	100	96	0
Turn Off Fans, Air Conditioning, or Heat When Not in the Room	91	87	0
Put All Trash in a Receptacle	98	91	2
Recycle	89	62	9

## 4. Discussion

### 4.1. Research Limitations

Before discussing the survey results, it is necessary to acknowledge the limitations of this research. Sample sizes are low, for both the tourist and the tour operator surveys. There was also some selection bias from the use of convenience and snowball sampling. Another limitation relates to some of the survey responses. For example, there are some counterintuitive responses for some of the answers concerning whether tourism positively or negatively impacts the environment. For example, 17% of tourists responded that tourism positively impacts deforestation. While deforestation is widely considered a negative issue, it is possible participants believe that tourism decreases deforestation and thus positively impacts it. Still, this project serves as an exploratory study that demonstrates the need for further research on these tourist and tour operator perceptions. Conducting future surveys in person might eliminate some of the counterintuitive answers.

### 4.2. Tourism Impacts

The perceptions of these tourists were likely influenced by the activities they participated in while visiting Tanzania; the most common activities were wildlife watching, photography, and bird watching. Those things that most directly relate to animals were viewed most strongly as positive or negative (such as wildlife protection and disruption of wildlife).

Perceptions related to water (pollution and overuse) may be attributed to broader concerns about water in Tanzania [57]. Guidebooks and even government agencies such as the US Centers for Disease Control and Prevention warn travelers about the dangers of drinking the country's tap water. Likewise, the high season for tourism in Tanzania occurs during its long dry season (May–October) so tourists are likely to see dry vegetation and low surface water levels.

### 4.3. Personal Impacts

Participants generally attribute negative environmental impacts to others and positive impacts to themselves. This follows findings from Moyle et al. [58] from Australia which



found tourists perceived their personal impacts more positively than the impacts of tourism broadly. Specifically, they perceive having much less impact on litter than other tourists have. Previous research has found that tourists are not usually aware of abstract forms of environmental impacts but are able to comprehend most visual pollution such as litter [36,38]. Litter is not only a visual impact which can be seen on the road or in a stream but is also an environmental issue that people are concerned about at home. When considering positive impacts, tourists perceive that they impact conservation much more than other tourists. Since park fees are the major way that tourists contribute to conservation, there is likely no difference in impact if all are paying non-resident rates.

Some environmental impacts are difficult to observe during a short trip; soil loss and erosion are most apparent over a long period of time. Likewise, Harriott [39] found tourists have lower awareness of long-term threats to Australia's Great Barrier Reef. Yet, even for impacts that might not be visible to visitors, participants still attribute them to others. Likewise, deforestation is likely not being carried out by individual tourists; it is more likely done by the local population to provide firewood or to clear space for agriculture or housing [14]. Tourism does contribute to infrastructure development which could increase deforestation.

There are also interesting differences between how tourists perceive their own impacts as compared to how tour operators perceive the impacts of tourists. Again, there is a large gap in litter, with tour operators attributing more impact to tourists. Operators also attribute much more infrastructure development to tourists. This is another example of how time is important; the tour operator participants have worked in Tanzania's tourism industry for an average of nearly 6 years, so they have observed firsthand the development of new hotels and roads.

One solution for closing these gaps in perception is increased visitor education [59]. Increased education can potentially result in fewer negative impacts and create a more sustainable tourism industry. Armstrong and Weiler [60] highlight the important role of tour operators in educating tourists.

#### *4.4. Environmentally Responsible Behavior*

Recycling is the only activity where there is a notable difference between behaviors at home and while traveling. This could be due to a lack of easy access to recycling facilities while traveling. Of the tour operators surveyed, more than half indicate that their company did not recycle. This finding indicates the importance of convenience and accessibility. Juvan and Dolnicar [61] include a lack of infrastructure as part of the attitude-behavior gap for tourists to explain differences in environmentally responsible behavior. If tourists are provided with the resources to dispose of their recyclables, it is possible this rate would increase.

#### *4.5. Linking Perceptions to Conservation*

It is important to understand these perceptions. Tourism will continue to be a source of revenue for Tanzania and other Sub-Saharan African countries, and nature-based tourism is a major component of this industry. Tourists underestimate their negative impacts and overestimate their positive impacts. These gaps in perception could ultimately affect wildlife populations, and fewer animals could lead to fewer tourists and harms to the industry.

A better understanding of tourists' perceptions of their impacts can hopefully lead to increased conservation through increased education. Conservation attempts to protect environmental systems as a whole, rather than isolated areas, and further tries to prevent the unsustainable use of environments and resources. The use and protection of the environment can vary based on the resources being dealt with and the human perception of those resources [62]. Both the tourist survey and the tour operator survey show that participants believe tourism broadly has a positive impact on conservation. Indeed, research demonstrates that there is a link between conservation, development, and tourism; creating protected areas is viewed as one of the best ways to achieve conservation [63].

The interest in studying perceptions is driven by the intent to better the environment. By studying environmental perception, we can better understand not only the actions of people, but their needs and desires when it comes to both the natural and built environment. Such understanding can directly relate to a person's beliefs with respect to the natural and human-made hazards, air pollution, depletion of resources, and other environmental problems [64]. Research from Australia suggests that wildlife tourists are both more aware of and interested in conservation than other people [65]. Furthermore, these wildlife tourists want to learn about conservation, specifically actual ways they can help protect wildlife [65]. When we understand perceptions, we can improve environmental learning for individuals so that education can be applied in future environmental conservation programs [66].

## 5. Conclusions

This study builds upon a substantial literature on tourist perceptions of their environmental, economic, and social impacts, including research that compares tourist, host, and tour operator impacts. It does so by comparing the perceptions of tourists' personal impacts compared to their perceptions of other tourists' impacts and by comparing tour operator perceptions with tourist perceptions. It finds that tourists tend to attribute positive impacts to themselves and negative impacts to other tourists. It also finds gaps between tour operator and tourist perceptions, especially concerning impacts that occur over a long period of time.

Although this study focused on tourists in Tanzania, its findings are generalizable to other Sub-Saharan African countries dependent on nature-based tourism. According to the United Nations World Tourism Organization, 80% of trips to Sub-Saharan Africa are for wildlife watching and visitors to the region are expected to double by 2030 [67]. Kenya, Rwanda, South Africa, and Zimbabwe are the largest destinations, and each attracts over 2 million tourists per year, but other countries could attract more visitors with better marketing [67].

The importance of a sustainable tourism industry will only increase as the number of international arrivals grows. By understanding tourist perceptions, and especially the gaps between perceptions and actual impacts, it will be possible to minimize negative impacts and amplify positive impacts through education and outreach. A policy recommendation from this research is to increase environmental education through the tour operators who have direct and personal relationships with the tourists. A particular need in education surrounds long-term impacts such as soil erosion or infrastructure development; this research found that tourists are less able to perceive these types of impacts so operators could take time to describe the changes they have observed over their careers. A second policy recommendation relates to environmentally responsible behaviors. This research found not all tour companies facilitate certain behaviors such as recycling. Education directed toward companies might help increase environmentally responsible behavior by making participation easier.

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