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*Title: An Investigation into the Environmental Impact of
Carnival in Trinidad and Tobago*

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Acknowledgements

“When God ‘cyah’ come, He sends ‘yuh’ mommy.”

Thank you Ma, I couldn’t have done this without you!

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Abstract

Trinidad and Tobago is home to what is described as ‘the Greatest Show on Earth’ and while Carnival may provide significant socio-economic gain for the nation, there are environmental impacts that are often overshadowed. Have our indulgences caused harm to our planet and how can we initiate change to make it eco-friendlier and more sustainable? These questions and more are what we hope to unpack in this research.

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Chapter 1: Introduction

1.1 Context

Trinidad and Tobago is a country that can boast highly of diverse cultural experiences; from various religious festivities like Hosay, Phagwa, Ramleela and many more, to more secular festivals such as Carnival. These festivals all have their roots in the ancient rituals and traditions of our ancestors. For decades these festivals have brought their own rich experiences; whether it is cultural, educational, creative and artistic or simply a human experience. However, we often neglect the impact of the environment from our indulgences. The main focus of this study is understanding the environmental footprint Carnival has on Trinidad and Tobago.

Popularly described as “the greatest show on earth” Carnival has been pinnacle in Trinidad and Tobago’s cultural enrichment, creative extravaganza, social and economic activity. The event creates employment opportunities in various areas such as tourism, food and beverage, the entertainment industry as well as fashion and design. However, while these aspects may experience a boost in activity, the detrimental effect on the environment is often overlooked. Based on this fact and due to the miniscule level of research in this field, it has become necessary to delve deeper to further our understanding and give way to new insight that may help to bring awareness and initiate change in how we celebrate.

1.2 Rationale

It is noted that the subject matter of the environmental impact of Carnival within the context of Trinidad and Tobago and by extension the Caribbean, is not heavily researched and there is minimal documentation concerning it. As such, this void of information is the primary reason for undertaking this dissertation. Additional reasons include the hope that this would help to initiate

some sort of change by creating more sustainable events and making the industry more eco-conscious.

1.3 Data Collection

To gather data for this project a combination of both primary and secondary sources will be used. Primary data collection would involve the creation and distribution of online surveys using a simple random sampling method. In addition to which, face-to-face and virtual interviews will also be conducted with various non-governmental organizations, party promoters and other persons directly involved in Carnival and the aftermath of the festivities (such as sanitation workers and other relevant personnel.) Secondary data collection would involve the extraction and compilation of information from various source articles on the topic, websites and existing literature.

1.4 Thesis Statement

Throughout the years, Trinidad and Tobago's Carnival has had great socio-economic and rich cultural impacts, however due to this its environmental impact is often overshadowed.

1.5 Objectives

Several aims have been outlined in relation to the research. These include the generation of new knowledge to fill the void of information on the topic; along with the idea that that would bring about awareness to the necessary persons involved. Further to that, the research is also aimed at helping to initiate change within the carnival industry by creating and promoting "greener" events and eco-friendly costumes.

Keywords:

Sustainability, Microplastics, Recycle, Pollution, Greening, Eco-friendly, Carnival

Chapter 2: Literature Review

2.1 Chapter Summary: To develop a theoretical framework as well as to create a scope for the research in the grander scheme of academia, this chapter provides a review of the existing literature on Carnival's environmental impact and its relation to sustainability.

It is much more than just the two days of pretty mas parades, feathers, beads and glitters. Its historical significance aside, Carnival involves months of preparation, hundreds of events leading up to those two days, thousands of people gathered at various venues, massive music trucks, spectacular stage setups, tons of food, gallons of alcohol and all-around pure bliss and revelry. While it can be acknowledged that the various forms of Carnival celebrated throughout the Caribbean contributes to the region's tourism industry and is a driver of economic gain, as well as a fantastic form of creative expression, it should also be noted that there is an environmental footprint that is often overlooked.

One must also note that while the Caribbean may indeed rely on Carnival for tourism; the idea of 'a tropical island getaway' or the 'Sun, Sea and Sand' phenomena is also majorly appealing to visitors and as such, more emphasis should be placed on environmental preservation. Research concerning Carnival's environmental impact has been conducted on an international scale, specifically Australia's and the United Kingdom's music festivals. However, as it pertains to specifically addressing the issue in regard to our Caribbean territories, namely Trinidad and Tobago, the research is very limited.

Firstly, it cannot be denied that the islands of the Caribbean are home to some of the greatest Carnival festivals to ever exist in the world. According to writing by Nicholls, she states

that “all festivals have an environmental footprint.”¹ She went on to explain that said festivals make use of finite resources like water, fuel, and electricity for example. She also made mention of the fact that festivals generate greenhouse gas as well as create lots of waste and can also cause noise pollution. Although this article focuses primarily on Crop Over in Barbados, which is a three-month long festival, it can be comparable to Trinidad and Tobago’s Carnival; in that the months prior, there are hundreds of parties and various other related activities. Each of which would generate massive amounts of waste, consume tons of energy, cause noise pollution and even emit tons of carbon dioxide (CO₂).

As the world moves towards environmental sustainability, event organizers, hosts and attendees must all acknowledge the role they play in accomplishing such. Therefore, various organizations have either placed bans or implemented certain initiatives with the aim of reducing their ecological implications. For instance, as a means of decreasing the use of single use plastics during Barbados’s Carnival festivities, a ban has been placed on its use and as such patrons are required to utilize reusable cups and straws. Similarly, according to (Envirotech), Britain's music festivals generate almost twenty-three thousand, five hundred (23,500) tons of waste per annum; with a huge portion of it coming from audiences’ use of plastic bottles. Statistics provided by (Envirotech) state that approximately sixty-eight percent (68%) of the waste generated at these festivals comes from single use plastics such as cups, straws and various other cutlery.

According to Baker other music festivals around the world such as Coachella, “produce one hundred and six (106) tons of waste per day.”² As a means of curbing the use of single-use

¹ See Nicholls, Alicia. “Greening Caribbean Festivals.” *Caribbean Trade Law and Development*, 8 Aug. 2019, <https://caribbeantradelaw.com/2019/08/08/greening-caribbean-festivals>.

² See Baker, Brian. “How Music Festivals Are Destroying the Earth” EDM.com - the Latest Electronic Dance Music News, Reviews & Artists, 4 Nov. 2019, <https://edm.com/opinion/environmental-impact-festivals>

plastics at festivals in the United Kingdom, the Drastic on Plastic initiative was introduced. This gave way to all participating festivals to place bans on the use of plastic straws on-site in 2018 as a minimum initial step because they also pledged to eliminate and eventually phase them out entirely. In Australia, (Waste Sense) also echoes the sentiments of Envirotech and Nicholls stating that “a few changes can make a huge impact when it comes to sustainability.” Simply switching out single-use cups and straws for reusable ones would be a step in making festivals more eco-conscious.

A lot of the waste generated during the Carnival season is not easily broken down as much of it is plastic based; whether it is bottles, cups, straws, utensils, costumes or otherwise, these things are mostly used once and then discarded. The carelessness of our consumption culture is heightened during this period. Amid celebration, the furthest thing from a party goer’s mind would be the preservation of the environment. Hence, litter is often strewn about the streets and all over festival venues, bins may be under-utilized due to the blatant disregard of attendees or in some instances over-utilized due to the lack of sufficient receptacles and therefore there is garbage galore.

Plastic waste seems to be the most prevalent form of waste generated from Carnival however paper waste is also an issue. Promotional flyers, printed tickets, napkins, paper bags and boxes are just a few examples of the sources. Be that as it may, with the advancement of technology in the digital era, patrons are encouraged to purchase E-tickets. In addition to which advertising and promotion of events are done online using digital media and content and via social media platforms. Granted that these alternatives are primarily for the convenience of consumers, it is also a means of reducing paper waste within the Carnival industry.

As previously stated, waste generation is a major and quite possibly the most prominent environmental issue caused by festivals. While single-use plastics such as cups, straws, bottles and utensils account for most of the waste generated, there are also smaller, less distinguishable forms of waste. These are microplastics. National Geographic defines microplastics as “tiny plastic particles, less than five millimeters (5mm) in diameter.”³ It is noted that there are two forms of microplastics: primary and secondary. Primary microplastics are tiny particles designed for commercial use, such as in cosmetics or in the case of carnival costumes, beads and glitters. While secondary microplastics are particles that result from the disintegration of larger plastic items due to exposure to weathering and environmental elements.

In her writing Nicholls mentioned that “microbeads such as glitter is often an overlooked form of microplastics”⁴ Many of our Carnival costumes rely on the use of beads, gems and glitter in their creation and designs and as it stands, plastic of any size is not biodegradable and would take hundreds or even thousands of years to break down; so too would these microplastics. It is already predicted that by 2050 there will be more plastic in the oceans than fish. The major concern when it comes to microplastics is that when it inevitably ends up in our oceans it can be ingested by marine life which can subsequently enter our food chain. As Kanhai mentions in his work, “a lot of seafood, especially shellfish and canned fish, contains some level of microplastics in them.”⁵ In addition to which, research done in China found microplastics in sea, lake and rock salts. Glitter is practically a staple of the industry because of its use in costume design and cosmetics but it is a form of microplastics that is also harmful to the environment.

³ See Microplastics | National Geographic Society
<https://education.nationalgeographic.org/resource/microplastics>.

⁴ Nicholls, Alicia. “Greening Caribbean Festivals.” *Caribbean Trade Law and Development*, 8 Aug. 2019, caribbeantradelaw.com/2019/08/08/greening-caribbean-festivals.

⁵ See Kanhai, Attish. “Twenty Thousand Microplastics in the Sea.” *IMA*, 21 Mar. 2019, www.ima.gov.tt/2019/03/21/twenty-thousand-microplastics-in-the-sea.

One a more eco-conscious note, there are individuals across the globe that are working on or have already produced eco-friendly alternatives to glitter. Two such persons are Frances Sansao of Brazil and Samantha Bongiovanni of New Orleans. Brazil and New Orleans may not be part of the Caribbean region but they too, are home to some of the grandest Carnivals and street festivals in the world. (Premium Beauty News) explains that Sansao, who resides in Rio de Janeiro, drew inspiration from vegan recipes and has produced a biodegradable form of glitter made from mica and algae. Her product is known as Pura Bioglitter and it is her hope that it would replace the conventional plastic fragments used by thousands during the Carnival festivities. Similarly, New Orleans resident, Samantha Bongiovanni developed her biodegradable form of glitter using eucalyptus tree cellulose and she states that “it still has the same pop and shine as glitter but it will not stick around, it will biodegrade in ninety (90) days.”⁶ On a larger scale, companies such as Meadowbrook Inventions and Ronald Britton Ltd. have found a way to create sustainable, biodegradable, and water-soluble glitter for various purposes, be it crafts, cosmetics, carnival or otherwise. These alternatives may not necessarily solve the problem but are a step in the right direction.

What is Carnival without some feathers, wire bras, gems, beads and bikinis? All of these are staple to the construction of costumes but to what end? When the festivities are done and everyone has had the chance to cross the stage bedecked in their amazing Monday and Tuesday wear, what then? Where or how are these costumes disposed of? This is where Carnicycle comes in. Carnicycle is a local enterprise founded by Tobagonians Danii McCletchie and Luke Harris. The non-profit organization aims at bridging the gap between Carnival culture and sustainability through the recycling and repurposing of carnival costumes as well as through education and

⁶ See “Biodegradable Glitter, the New Trend for Carnival in Brazil.” *Premium Beauty News*, 29 May 2020, <https://www.premiumbeautynews.com/en/biodegradable-glitter-the-new,14720>.

awareness. Throughout the region, they would travel and set up collection sites for costumes at various Carnivals, which they would then dismantle into individual parts for donation or re-sale. In an interview with Caribbean UN McLetchie describes their process as being “a circular process”⁷ as opposed to the typical linear process of creating, using, and discarding. As part of their operations, the wire frames and bras are donated to designers and the feathers are collected, decontaminated, and re-sold. The other miscellaneous items they receive such as pants, shoes and t-shirts are also donated to other non-governmental organizations such as homes and orphanages. Based on the interview with Caribbean UN, just prior to the Covid-19 pandemic and the lockdowns that came with it, Carnicycle had begun hosting monthly upcycle markets where they sold some of the sanitized feathers, gems and jewels to local artists and designers at extremely discounted prices. In addition to which, one can also find fete friendly and eco-friendly reusable cups and straws on their online catalog for purchase: all as part of their green Carnival initiatives.

As mentioned before, waste generation may be the most prevalent issue caused by Carnival with paper, plastics and microplastics accounting for most of it. However, one form of waste that is also created is food waste and once again, within the Caribbean context not much is documented as to how this issue is dealt with. Despite the fact certain islands have taken steps towards making their events more eco-conscious in terms of reducing and managing their waste, food waste does not necessarily possess the same precedence. This is largely because festival organizers and party promoters are never fully certain as to how many people would attend their events; this is according to Borofsky who is the owner of Clean Vibes. She states that essentially

⁷ See Caribbean UN. “Carnicycle: Carnival Vibes for Climate Action and Environmental Protection.” *YouTube*, 29 June 2021, www.youtube.com/watch?v=B8wyJrguPfA.

“you have to over-prepare because running out of food while people are trapped on festival grounds would be horrible.” And while there may not be any clear-cut measures of preventing food waste, there are a few means of mitigating the issue.

Borofsky’s organization *Clean Vibes* is a waste management company that works with festivals to help make them more environmentally friendly. For instance Varagur states that one of their major campaigns included spending four days composting almost two hundred and thirty thousand pounds (230,000 lbs) of food after the Bonnaroo Music and Arts Festival in Tennessee 2016. American music festivals are not the only ones taking a more proactive approach when it comes to food waste but countries like Norway and Scotland have also placed emphasis on the issue. For instance, in 2015 alone, at the annual Oya Festival (in Norway), the excess food was donated, and the biodegradable components had been composted and turned into biofuel- almost eight (8) tons according to Varagur. In following years, they even donated leftover coffee grinds to local artisans who would turn it into organic soaps. These are just a few ways in which festivals can deal with the issue of food waste as opposed to it ending up in landfills.

Food waste is the third largest contributor to greenhouse gas emissions- this is because when food ends up in landfills and rots, it releases methane gas; one of the most powerful greenhouse gasses. However, when the waste is composted correctly methane is not released although carbon dioxide is, but this is a less potent pollutant. It should also be noted that the energy used in the production, transportation and handling of food also emits carbon dioxide. The release of these greenhouse gases only exacerbates the issue of climate change.

Another case when food waste is composted would be at the Belladrum Tartan Heart Festival in Scotland; where designated compost corners are set up for both caterers and festivalgoers to deposit their food waste. The composting of food waste can be used for various

things such as the creation of biogas which can be used as a form of energy or even as soil enriching substances that help in food production. Case in point would be the Harvest Farms located in New South Wales, Australia which uses the compostable food waste to create mulch and fertilizers which they use as part of their food production, according to the (Blue Mountain Gazette.) Similar to how the company Carnicycle created what is deemed as a circular process, so too does this farm give way to that idea of a circular course.

As mentioned in the previous paragraphs, climate change is triggered by the emission of greenhouse gases such as methane and carbon dioxide into the atmosphere. The burning of fossil fuels for the purposes of transportation and the powering of sites during major carnival events also release tons of carbon and other gases. Envirotech estimates that five million liters of fuel is used over the course of UK festivals per year, eighty five percent (85%) of which is diesel. While these figures seem drastic, it is because many of the festivals require patrons to camp on-site and as such “glamping” {glamorous camping: a form of camping involving accommodation and facilities more luxurious than those associated with traditional camping eg. electricity} is also a factor that adds to the amount of energy consumed. In contrast, events in the Caribbean are not usually overnight, partygoers attend, eat, drink and dance to their heart’s content and then return to their homes. Thus, as people are arriving to and departing from event venues, the number of vehicles on the road during the carnival period is often increased. Several events hosted in the Caribbean have started offering shuttle services to and from events. In Barbados for example, there is an option presented by the transport board where patrons can “park and ride” to events. Another such example of this service would be Trinidad’s very own EEEmpire offering a shuttle services or discounted fares through partnerships with rideshare services such as TTRS. Whilst we note that this service is mainly for the elimination of traffic congestion and resolves parking

issues, it also serves as a way of reducing carbon emissions as we would see in the following example.

Transportation has the highest carbon footprint and as such careful consideration should be given to how patrons will travel to and from events. The Bonnaroo Music and Arts Festivals in Tennessee implemented a rideshare program which resulted in 397 ride requests, 825 pounds of CO₂ savings with an estimated 44,500 vehicle miles removed from the road. In Trinidad and Tobago there is a similar service offered by the company TT RideShare (TTRS) which partners with fetes and other major event organizers to provide transportation to and from their events at discounted rates. Additionally, in order to facilitate a more sustainable festival experience in Australia, the (Sims) suggested that organizers reward attendees for using low emission options such as carpooling, bike riding/parking and shuttle services. These initiatives all aid in the reduction of carbon emissions thereby reducing air pollution and decreasing the impact it poses on the atmosphere.

The final environmental impact of Carnival is one that while there are laws implemented to deal with it, they are often not enforced and as such have become intolerable. That is noise pollution. The effects of loud music and use of fireworks during events can affect both humans and animals alike. In Trinidad and Tobago, a June 2019 survey conducted by the (Environmental Management Authority) found that one percent from a total of 230 respondents would have utilized fireworks for private parties such as carnival fetes. Whilst this may seem minimal, it should be acknowledged that fireworks have noisy and smokey discharges which have a negative impact on humans, animals and the environment. It is also considered a form of air and plastic pollution. As a result, the EMA had submitted a draft cabinet note to the Ministry of Planning

and Development recommending a ban on importation of traditional fireworks and encouraging the use of noiseless ones that produce sounds that range from 125 to 155 decibels.

The Trinidad and Tobago Guardian Newspaper reported that the EMA conducted a noise monitoring exercise on Carnival Tuesday. This was done in order to determine the decibel level that the public was exposed to for the carnival period. It was found that residents were exposed to peak sound levels of over 116 decibels while spectators were exposed to over 128 decibels and the masqueraders were exposed to over 131 decibels. Research has indicated that damage to one's hearing can occur within only one minute of being exposed to sound levels of 112 decibels. The noise pollution rules are a piece of legislation created under the provision of the Environmental Management Act. These regulations seek to control levels of noise pollution in various environments for the benefit of all. As such it is necessary to enforce the laws in a more rigorous manner in order to curb the problem of noise pollution.

In conclusion, in order to create more environmentally friendly Carnivals throughout the Caribbean, it is necessary that we do more in-depth study and research on its impact on the environment. This can facilitate the creation and implementation of green policies and initiatives for our festivals. As (Nicholls) would have recommended in her work, she stated that “Caribbean countries should have and publish post festival analysis” This brings about public awareness and aid in the creation of policies to mitigate the negative impact of Carnival on the environment.

Chapter 3: Methodology, Data Collection, Analysis and Utilization

3.1 Chapter Summary

This chapter discusses the data collection methods employed in this project as well as an analysis of the data. As would have been previously stated, the topic of this paper is severely under-researched within the context of Trinidad and Tobago. Thus, a combination of both qualitative and quantitative methods was considered in defining the data collection strategy.

3.2 Data Collection Methods

Since the data on this topic is limited, it was necessary to gather primary data. To do this, two main methods were devised and employed: online surveys and interviews.

The online survey was created using google forms, then distributed via WhatsApp and a sample size of 150 persons was generated. The use of this questionnaire was not only to gain insight into the general public's perception of Carnival's environmental footprint but also to help generate public awareness. This was accomplished by including tidbits of information within some of the survey questions, which served as a means of educating people of the various impacts they may have as participants of Carnival and its related events.

The interviews, on the other hand, were done with specific personnel within the industry such as costume designers, mas band leaders and event coordinators. Each of which would have a different impact on the environment. Not only was this done to get a more in-depth understanding of the different perspectives of each stakeholder but also to inform them of the impacts their role may pose. In addition to which, the conversation also led to a way forward as it pertains to creating change for the future of Carnival... a 'greener' Carnival.

3.3 Data Analysis- Surveys

An online survey was created using google forms and was shared via WhatsApp and a total of 150 persons completed it. Even though the survey was generally geared towards individuals who partake in a Carnival, a little less than a quarter stated that they did not as is depicted in the following pie chart.

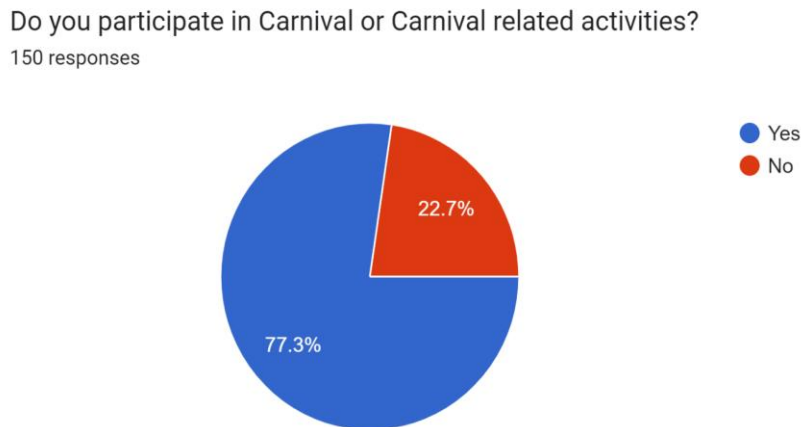


Figure 1: A pie chart showing the percentage of people who participate in Carnival versus those who do not.

It was found that most individuals participated in cooler fetes/all-inclusive fetes, a total of 79 persons out of 150 to be exact. Closely followed by J'ouvert, which garnered 69 participants and finally Monday and Tuesday mas with a total of 34 persons. It should be noted that this question allowed for the selection of multiple choices as well as the option of 'other' which therein allowed them to create their own options. Many of the non-participatory individuals would have selected that option in order to state that they did not partake or that the question was not applicable to them.

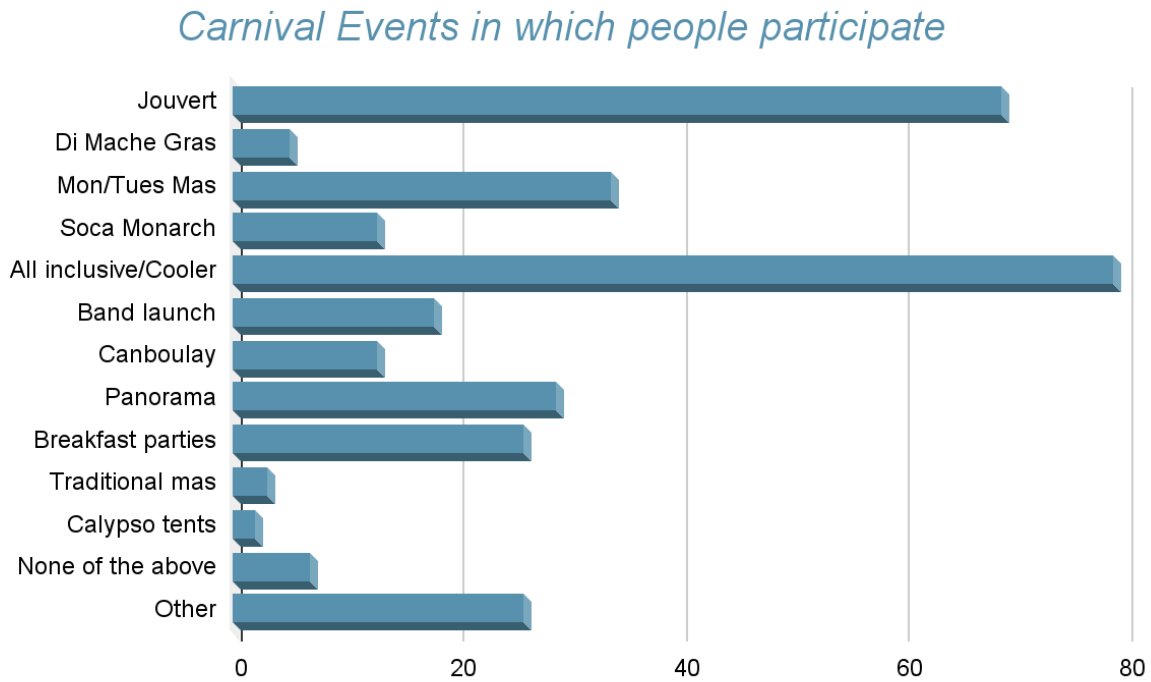


Figure 2: a bar chart depicting the various events in which people partake in during the Carnival season in Trinidad and Tobago

Bearing in mind that often the attire for these events includes glitter and gems, the following question sought to prove whether this is indeed used. Surprisingly the vast majority stated that they did not use face gems or body glitter; both of which are considered a type of microplastics. It was found that a little more than half of the participants were aware of what microplastics are but were not aware of their potential to carry harmful bacteria which can enter our food chain after being ingested by small animals. Now with the invention and usage of biodegradable glitter, it decreases that risk while still providing the bit of glitz and glam that may

be necessary in completing our carnival looks.

Awareness of the harmful nature of microplastics

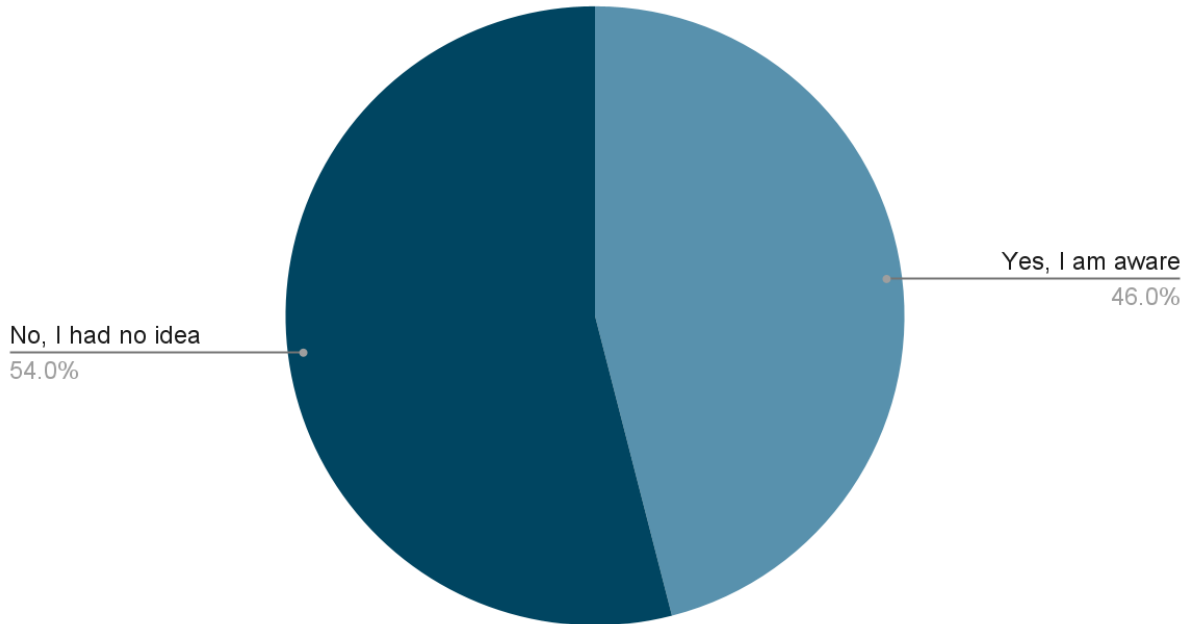


Figure 3: A pie chart used to depict how many people were aware that microplastics can carry harmful bacteria and enter our food chain if ingested by small animals.

The next couple of questions centered around waste and garbage disposal at events. At many of the events listed in figure 2, food and drinks are either served or sold. It was noted by almost half of the sample population that food is often served in styrofoam containers while a little more than one quarter stated plastic containers and one eighth stated paper containers. The remainder gave mixed responses which included five persons selecting ‘all of the above’ and a few added responses such as “I force them to reuse the same cup” or “personalized cups.” This question, in particular, generated a lot of added responses inclusive of persons stating that they do not consume food at these events while others stated that they eat home cooked food after partaking in J’ouvert.

As it pertains to the disposal of trash, an average of 86% of the patrons stated that they would hold onto their garbage until they found a proper garbage receptacle. While 5% stated that they would put it into their bags or pockets. The remaining 9% was divided into various other options such as tossing it on the ground, returning it to the bar and a minimal percentage would have accounted for those who did not participate. However, it can be inferred that this may not be entirely true as the amount of waste generated after events is often massive. Most times when people are at parties, under the influence of alcohol or otherwise, they may not necessarily pay mind to proper waste disposal protocols.

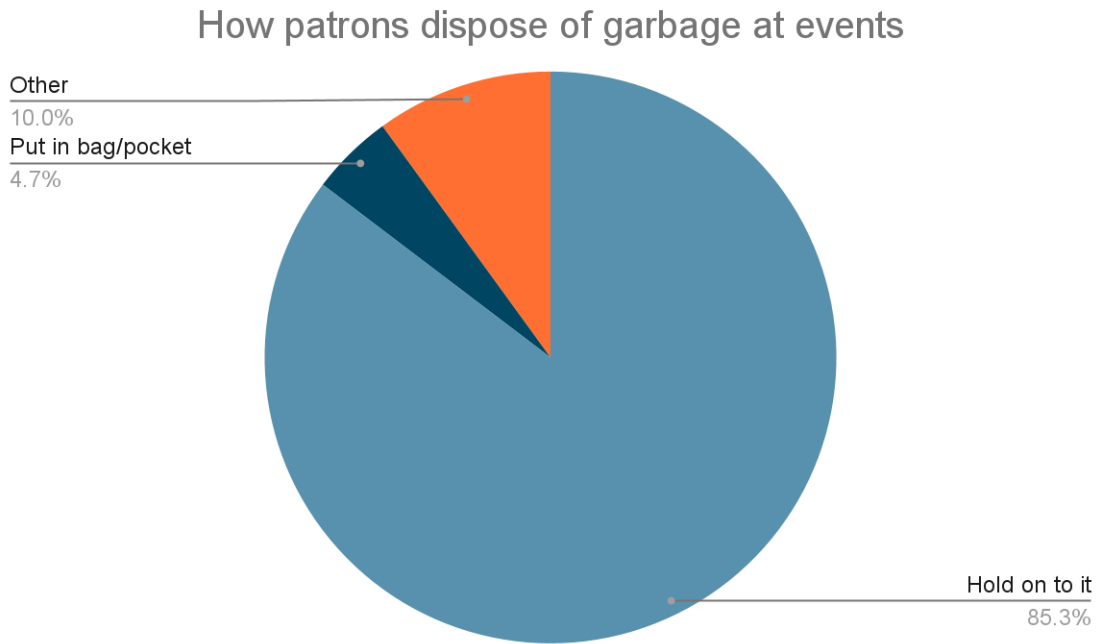


Figure 4: A pie chart showing how patrons chose to dispose of their garbage at events.

It was worth mentioning that many patrons indicated that there were sometimes sufficient and easily accessible trash receptacles at events while the rest of the sample population would

have stated otherwise. This can be verified in the following pie chart

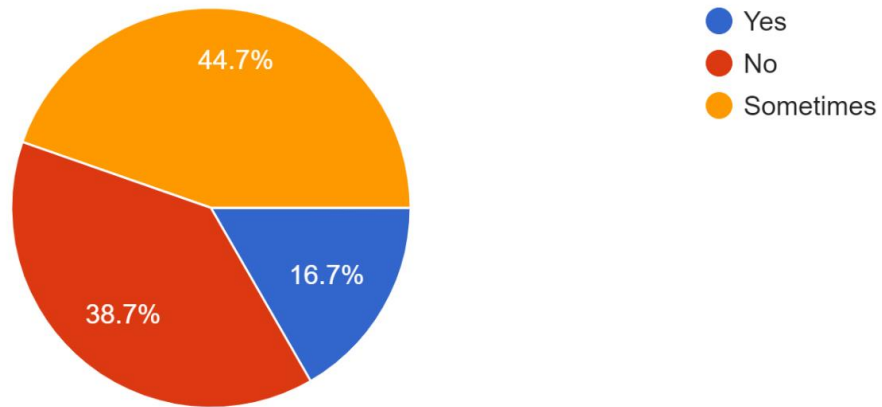


Figure 5: A pie chart depicting whether patrons think there are sufficient and easily accessible trash receptacles at events.

In keeping with the thought process of waste disposal, the idea of having recycling bins at events is not a new one. However, 108 individuals stated that they had never seen one present, while 32 stated that they had and the remaining 10 said they paid no mind to that when they are out enjoying themselves. In asking if events decided to implement more recycling bins; if they would make use of them, the vast majority stated that they would. If that is the case, it would result in a significant reduction of waste generated. The possibility of forming partnerships with environmental organizations can help initiate the change needed for making Carnival more environmentally friendly.

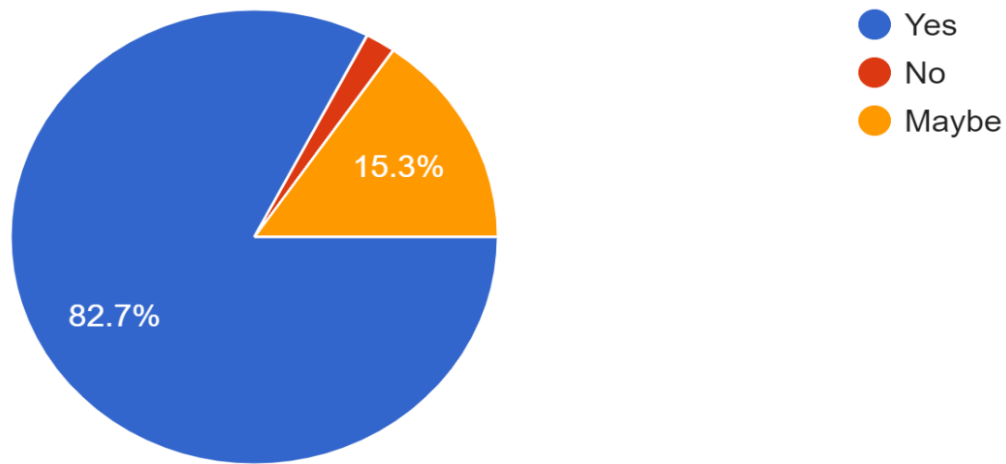


Figure 6: Pie chart showing the percentage of persons that indicated they would or would not make use of recycling bins if events implemented them.

Monday and Tuesday mas is one of the major highlights of Trinidad and Tobago Carnival but in this area, sustainability is hardly ever prioritized. The aftermath of these two days often generates huge amounts of waste, however the focus of the following paragraph will be placed on the disposal of costumes and accessories.

By the end of carnival Tuesday pieces of costumes can be seen discarded on the streets. From the survey, it was found that 15% of masqueraders would have indicated they did such. 30% indicated that they chose to pack it away while 45% kept it and used it for home decoration or as art installations. The remaining 20% would have accounted for those individuals who did not partake in mas. In addition to which, this included those who would have added their own responses such as that they “kept it and reused it for bacchanal road” which is a major post carnival party that allows one to recycle their Monday or Tuesday wear for the season.



Figure 7: Image of discarded costume on the streets of St. Clair, Port of Spain after Carnival 2023. Source: Jabari Bowman, citizen.

As a means of reducing the amount of waste that is created from costumes, the company Carnicycle was born. Although it was found that the vast majority of the sample was completely unaware of their existence, they would have agreed that the public should be better educated

about the organization and its goal of making carnival more sustainable. Herein another tidbit of information was provided, informing persons of this organization and its efforts and how they can make use of their facilities in discarding their costumes. Further details surrounding this organization shall be included later on as an interview was also conducted with one of the co-founders.



Figure 8: Image of Carnicycle's logo, source: company website.

This research aims at understanding many of the aspects of carnival's environmental footprint. While it is acknowledged that waste generation, land pollution and littering are some of the more prominent ones; one that is often overlooked is air pollution. This can be attributed to the fact that there is not an immediate visible effect. The burning of fossil fuels releases greenhouse gases into the atmosphere which eventually leads to global warming, which in turn leads to climate change over the course of time. While greenhouse gasses (GHG) such as carbon dioxide (CO₂) absorb and radiate heat to help maintain earth's natural greenhouse effect and average global temperatures, the surplus of emissions during the Carnival season can have detrimental effects on the environment.

With very little to no statistics pertaining to this, it is difficult to determine how great of an impact CO₂ emissions may be during the Carnival season. However, it is noted that during this period vehicular traffic is heavier as there are a lot more people in the country trying to move around; inclusive of tourists and locals alike who participate in the season's activities as well as vendors, performers, crew members and their equipment, other event staff, music trucks and so forth.

The questions posed in the survey mentioned carpooling and shuttle services being offered not just as a measure of safety and comfort but also as a means of reducing carbon emissions. A total of 123 persons would have agreed that carpooling and shuttle services can aid in the reduction of CO₂, while 7 stated it would not make any significant difference and the remainder (20 persons) claimed that they were more concerned about safety and comfort.

Carpooling- Reduction of Carbon Emissions

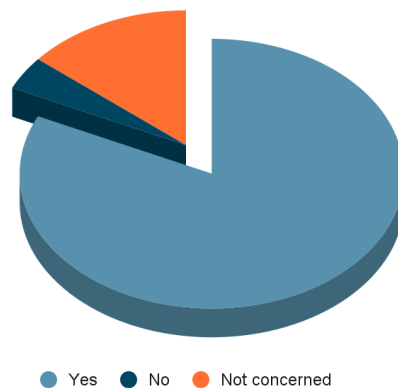


Figure 9: Pie chart showing the results of the survey question surrounding the use of shuttle services or carpooling to and from events as a means of reducing CO₂ emissions.

As a follow-up to this, the question of whether or not event organizers should provide such services arose and the majority of the sample population agreed that they should. It is noted

that many individuals do carpool on their own accord but as it pertains to organizers and promoters, a few events have started partnerships with rideshare services such as Trinidad and Tobago RideShare (TTRS) mainly for the purposes of safety. However, this certainly can be implemented as a means of working towards greener events because of the growing concerns of environmental sustainability.



Figure 10: Image of a discount offered by TTRS under their partnership with the event team,

EEEmpire for one of their Carnival 2023 events, Tropical Luau.

The final impact and by far the least documented or acknowledged is noise pollution, which is caused by music levels that exceed a certain number of decibels and causes disturbances to residents and wildlife. While more than three quarters of the respondents agreed that it is a

major issue during Carnival, hardly ever is there anything being done about it. Despite there being laws in place to help mitigate this, most people would have agreed that these laws are not always properly enforced. Interestingly enough, of the several pieces of legislation concerning noise-related issues in Trinidad and Tobago, the Environmental Management Authority (EMA) is only able to act under one. The Trinidad and Tobago Police Service (TTPS) are the ones who can provide some kind of relief under the summary of offenses act as it pertains to peace preservation. While noise pollution may be temporary, it can have lasting effects on humans and animals alike and more should be done about it.

The last question in the survey asked for any suggestions or input respondents might have had upon completion and there were a range of responses. One individual stated that “Carnival event planners need to look holistically and keep the environmental impact at the forefront of their decision making and planning.” While another said that “I think it might be too costly to integrate eco-friendly elements into the carnival.” One individual even suggested not having a carnival at all. Other responses suggested how the different levels of the industry plays a role and how each can make better choices; from planners and coordinators to law enforcement agencies, suppliers, the EMA and attendees... we all have a part to play in making Carnival more environmentally sustainable.

3.4 Data Analysis- Interviews

Conducting interviews with several persons within the industry led to a deeper understanding of their role in Carnival's eco-footprint.

3.5 Interview with Atiba Borde, Artist and Designer

The first interview was conducted with Mr. Atiba Borde, an artist and designer for The Lost Tribe, Carnival Rogue and Miami Carnival. He has been a part of this industry for approximately 7 years and also teaches biology. In our discussion, one of the most significant changes he mentioned was the fashion. He stated that costumes nowadays are made to be sexier as there is greater emphasis on the idea of it being 'instagramable'⁸ Many of his designs use unconventional materials which is something The Lost Tribe band has become known for. He states that the band is now completely featherless which allows designers to not only become more creative but also more sustainable when sourcing materials. One such material that he uses is acetate which is a man-made, semi-synthetic material made out of cellulose, essentially a biodegradable material.

Borde's background in biology gives him greater awareness about the environmental impact his role as a designer play. His concern for the environment not only lends itself to the use of eco-friendly raw materials but also his maximization of its use and the minimization of waste. He stated that in order to avoid wastage he tries not to purchase more than he needs but also to make use of everything! For instance, he explained that in 2012, the leftover materials from Miami Carnival were used to construct entire costumes for Trinidad and Tobago Carnival. He also focuses on reusability, wherein parts of his costume designs can be used as art

⁸ * instagramable: attractive or interesting enough to be photographed and posted on social media; mainly Instagram

installations because as he stated, he is first and foremost an artist. Additionally, he creates pieces that can be added to one's wardrobe therefore it is not just single-use pieces but can be functional even after carnival is over.

When asked about the challenges he faces in terms of designing "greener" costumes, he explains that there is a lack of eco-friendly raw materials available. However, he mentioned connections with Carnicycle which is a cheaper source of recycled materials that can be used.

In terms of the future of Carnival and sustainability, he does not think that the nation or the economy is ready for a fully green initiative as it stands. However, he has stated that for now we can work towards a happy medium of 60/40 in the sense of the use of both non-biodegradable and biodegradable materials.

3.6 Interview with Karen Cain, Band Leader and Designer

The second interview was done with Ms. Karen Cain, whose portfolio consists of her being a former children's band leader for Cheryl Cain Designs, she is currently an independent designer and producer of adult costumes in addition to working with Tribe's production team. Karen has been a part of this field for more than 13 years, 10 of which was spent designing and producing the children's band which initially started as a school band at Cunapo St. Francis R.C School in Sangre Grande, Trinidad. Eventually branching out into the children's band mentioned above which notably held first place in Sangre Grande for much of its existence.

In our discussion Karen would have mentioned that she tries to incorporate more natural raw materials. For instance, she would have designed a Papa Bois costume using boiscano (bacano) leaves. She stated that she no longer uses papier mache in the construction of her costumes but instead has opted for more eco-friendly options such as acetate, eva foam and tricot laminate which are all biodegradable. Other materials such as cotton, spandex, quiana fabric and tetrex are also utilized. She also steers away from the use of glitter as she is aware that it is microplastic.

For her, in order to be cost effective, she often purchases excess materials which she can store away for future use, especially with rising prices. Karen stated that costumes today are not eco-friendly but certain elements can be and she indicated that we could work towards a greener Carnival, but it is going to take a lot to get there.

3.7 Interview with Valmiki Maharaj, Creative Director of Tribe

The third interview was conducted with Mr. Valmiki Maharaj, the creative director of Tribe, namely The Lost Tribe as well as an event coordinator at Ultimate Events. He considers himself a director of innovation. He initially started off as a designer and worked his way up as he developed his skills and increased his responsibilities.

Although he believes that Carnival is art and is essentially a reflection of society, he agrees that it is not sustainable as he stated that the industry is one of fast fashion. This has a great impact on the environment both in production and disposal. He stated that the fact that Trinidad and Tobago is not a manufacturing nation, coupled with the rise in the cost of raw materials has led to outsourcing. Therefore, importing from manufacturers in India and China has become the next best option but this too adds to global carbon emissions. Like Ms. Cain, Mr. Maharaj states that they often try to cater for a buffer in terms of their materials, which is stored in a warehouse for future use.

While on the topic of storage, he also mentioned the creation of what is known as the *Talent Bank* which is a place where unclaimed costumes and decorations from various events are kept. These items can be accessed for several occasions such as sporting events like CPL, corporate events and other events that may require promo girls or brand ambassadors.

In an effort to reduce waste on the road, Tribe has included reusable cups in their goodie bags; something which most other bands have also adopted. This prevents the use of single use-plastics and decreases the amount of waste generated during the carnival period. He also mentioned the serving of food at their events or as part of their packages; he stated that vendors are encouraged to use biodegradable containers. However, as organizers, they may not entirely have a say in this and as such their guidelines may not be adhered to.

As it pertains to the future of carnival and ‘greening’ initiatives, Mr. Maharaj claims that despite it being nearly impossible, he is of the opinion that it is possible for us to “dream it into the being.”

3.8 Interview with Danii Mcletchie, co-founder of Carnicycle.

The final interview was conducted with the co-founder of Carnicycle, Danii Mcletchie. Founded in 2018, this company is the link between Carnival culture and sustainability; with its primary aim being the reduction of waste through the recycling of costumes, feathers, metals and jouvert apparel.

Mcletchie explains that they have been in operation for 5 years starting with Jamaica Carnival in April 2019 where they would have received a total of 28 costumes for recycling. By the next year, 2020, they got over 100 costumes from Trinbago Carnival. Through the various partnerships they would have formed, Carnicycle is able to work with individuals at each level of the machine of carnival, from the producers to the promoters to the participants.

They can provide designers, crafters, and artisans with discounted but quality recycled materials which not only reduces their procurement costs but also decreases carbon emissions from importation of goods. In addition, they are also able to work with event coordinators and promoters to help instill greener alternatives at their events. Finally, they work with masqueraders, educating them and encouraging them to *upcycle⁹ their costumes or partake in their recycling drives.

She listed some of their significant partnerships which include bands such as Tribe, Ronnie and Caro, Amara Carnival, Miami Carnival as well as Jungle Fever Jouvert. In addition to which they have worked with recycling companies, partnered with hotels, restaurants, mas camps, schools and other non-profit organizations. However, there is still little support from governing bodies such as the Ministry of Tourism and the National Carnival Commission. In this regard, Mcletchie and her team agree that for real change to occur, it must start from the top

⁹ *upcycle: reuse (discarded objects or material) in such a way as to create a product of higher quality or value than the original.

down. She believes that these institutions should have policies and initiatives in place to market a green carnival and sustainable tourism.

It is their hope to continue expanding and be able to have a representative or a brand ambassador in each of the Caribbean Islands' Carnivals. For instance, one year they were able to set things up virtually and with the help of volunteers and the linkages they made previously, they were able to execute their operations in Barbados without even having to set foot on the island.

Besides their efforts to recycle costumes, Mcletchie also states that it is important to invest in eco-friendly options and be innovative to develop a completely green carnival for the future.

Chapter 4: Conclusion

From this research, it can be concluded that there is a small but growing interest in sustainability when it comes to the Carnival sector. Internationally, the issue of the environmental impact of festivals has been raised and various events have already taken an active part in making better choices and implementing sustainable practices. However, locally and regionally, it has not reached the forefront of our celebrations. It was found that while there may be hindrances in the way forward, there are small steps we can take from an individual level to the top of the hierarchy. Whether it comes from having policies in place by governing bodies such as restrictions on single use plastics or the use of natural raw materials in our costume designs or even investing in eco-friendly alternatives. All of these are just some of the ways we can begin to create a greener carnival and preserve our planet. A green Carnival is possible.

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Appendix 1 (Questions)

Questions used in conducting interviews

Designers Questions

1. What is your role in the industry?
2. Can you give me a brief background of your career? (how many years, accomplishments, challenges)
3. How have things changed over the years?
4. What type of raw materials do you use to create and has it changed over the years? (in terms of cost and quality)
5. Are you aware of any effects that your role poses on the environment?
6. What do you think people do with their costumes after mas?
7. What is done with excess materials?
8. What is done with unclaimed costumes?
9. Is there anything in place for masqueraders to discard their costumes?
10. What challenges do you think you'd face in designing more eco-friendly costumes?
11. What is our way forward now? Bearing in mind what was discussed, do you think we can eventually have a completely green carnival?
12. Do you have pictures of your work you'd like to share?

Carnicycle Questions

1. When did you start Carnicycle and why?
2. What type of response have you gotten from the public?
3. What is your process/work flow operation?
4. Have you seen significant changes or like an increase in the use of your services?
5. Do you have anything set up with specific bands?
6. Do you think people are now more aware about Carnival's environmental impact?
7. What does the future look like for carnicycle?
8. Do you have any pictures you would be willing to share to be used in the paper?

Band Leader Questions

1. What is your role?
2. Who makes the decisions as to what is used or done for the band?
3. What is your understanding of environmental sustainability as it pertains to the Carnival industry
4. What would you consider the most significant environmental impact of your band?
5. Is food served as part of your band package? How is it served and would you consider biodegradable food containers (despite the higher cost)?

Event Coordinators

1. What is your role in the industry?
2. Brief background of your career? (how many years, accomplishments, challenges)
3. What significant changes have you seen over years?
4. Do you think if you implemented recycling bins at your events, party goers/attendees would make use of them?
5. Would you consider working with organizations like the EMA or SWMCOL to have recycling bins at your events? (despite the cost it make incur)

Survey questions

1. Do you participate in Carnival or Carnival related activities?
2. If yes, please select those which apply from the list below
3. As part of your attire for any of the aforementioned events, do you use body glitter or gems?
4. Do you know what microplastics are?
5. If yes, are you aware that microplastics can carry harmful bacteria and can be ingested by small animals thus entering our food chain?
6. Do you consume food and drinks at the aforementioned events? How is it served?
7. How would you dispose of any trash at these events?
8. In your opinion are there sufficient and easily accessible trash receptacles at these events?
9. Have you ever seen a recycling bin present at any of these events?
10. If more events introduced recycling bins for paper, plastics, aluminum etc. would you make use of it?
11. If you have ever participated in Monday or Tuesday mas, what did you do with your costume after?
12. Have you ever heard of the company 'Carnicycle'?

13. "Carnicycle" is an organization that recycles all forms of j'ouvert and mas costumes. With this in mind, do you think the public should be better educated about this organization and its effort to make carnival more sustainable?
14. As a measure of safety and comfort, people tend to carpool to and from events (i.e parties, fetes etc), in your opinion do you think this can contribute significantly to the reduction of carbon emissions?
15. Based on the previous scenario, do you think event planners should provide shuttle services to and from their events as a means of reducing air pollution?
16. Do you think we are faced with a major issue of noise pollution during the carnival season?
17. In your opinion, do you think that the law regarding the decibel level of music at events is properly enforced?
18. Do you have any suggestions or points regarding having an eco-friendly carnival?

Appendix 2 (Photographs)



Image of 'Papa Bois' costume designed and constructed by Karen Cain using boiscano (bacano)

leaves. Source Karen Cain, interviewee

The following images are all of Cheryl Cain Designs Kiddies Carnival Band (various years, various themes) in Sangre Grande and Arima, Trinidad. All costumes were designed and constructed by Karen Cain and her team. Source Karen Cain, interviewee, costume designer and band leader



Cheryl Cain Designs Kiddies Carnival Band



Cheryl Cain Designs Kiddies Carnival 2016, Source Karen Cain



Cheryl Cain Designs Kiddies Carnival Band 2018, Arima. Source Karen Cain





Cheryl Cain Designs Kiddies Carnival Band 2019. Source Karen Cain





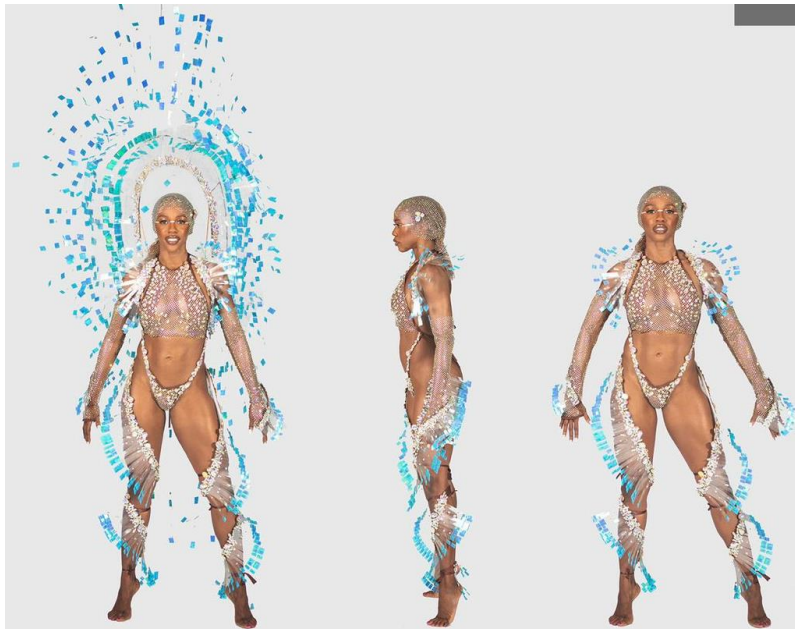
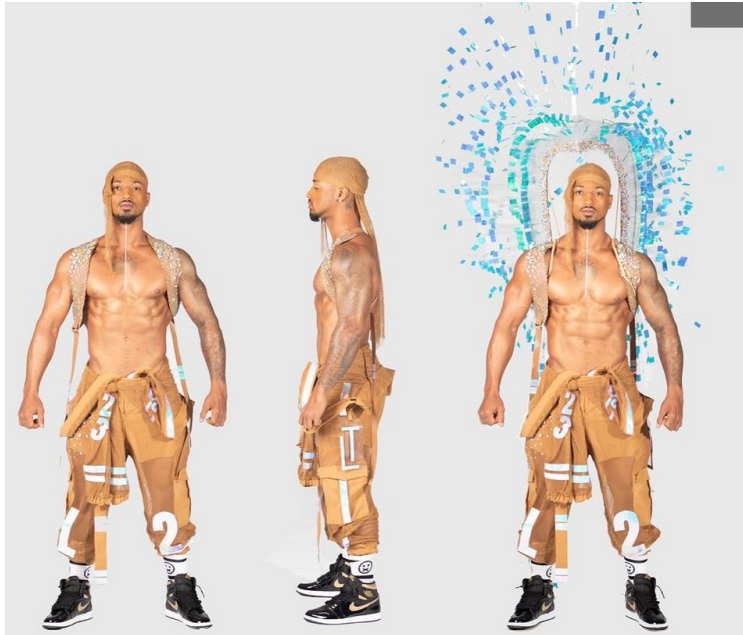




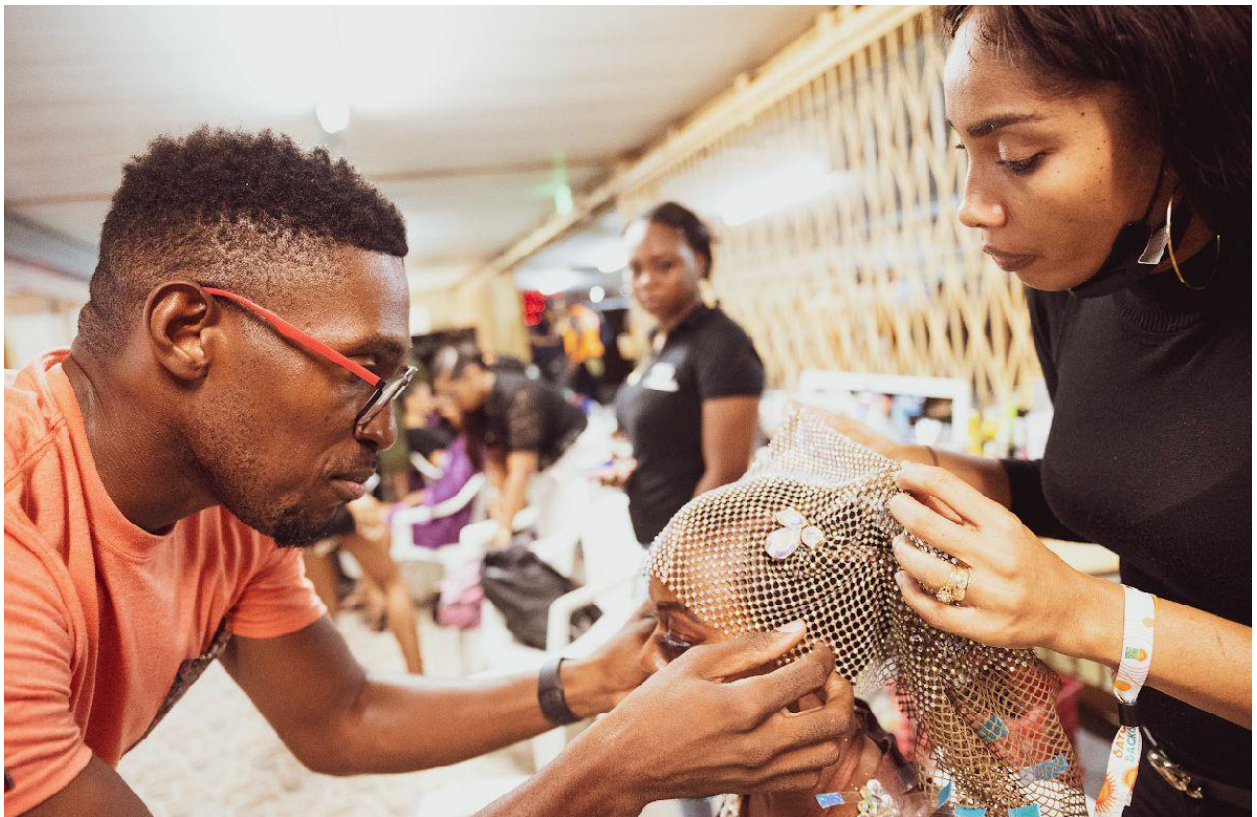


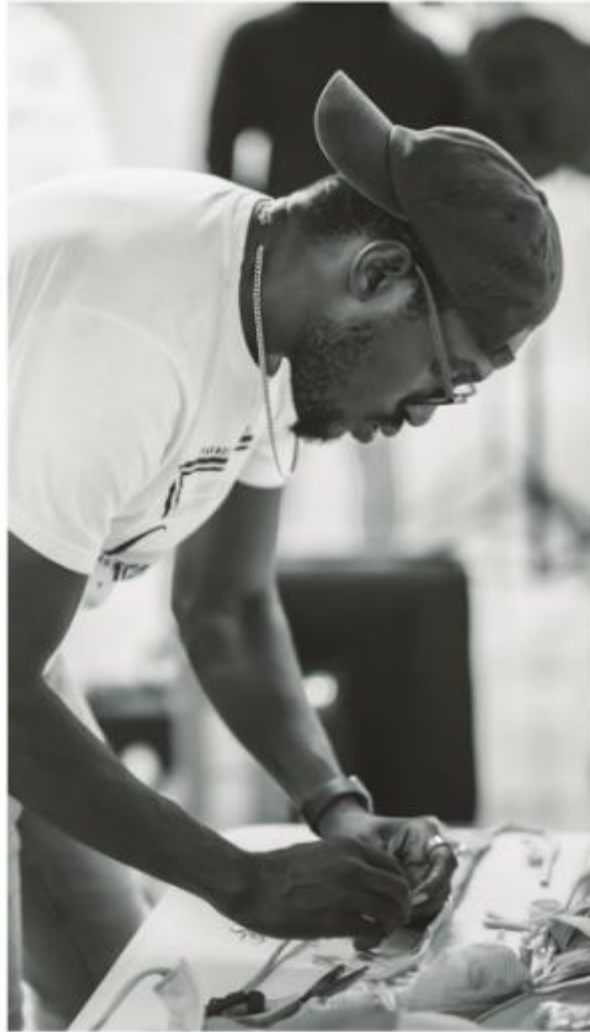
Most notable is the Papa Bois costume that was constructed using natural materials (boiscano leaves) by Karen Cain of Cheryl Cain Designs. Source Karen Cain

The following images are of costumes that were designed and constructed (using acetate) by Atiba Borde, interviewee, artist and costume designer. Source: Atiba Borde.









Atiba Borde, artist and costume designer in his element.



The Lost Tribe female masquerader, Carnival 2023. (Featherless, zero glitter costume-
unconventional materials) Source: losttribecarnival



Valmiki Maharaj, the creative director of The Lost Tribe. a creative, a designer, a genius, an innovator and truly a wonderful soul to have interviewed.

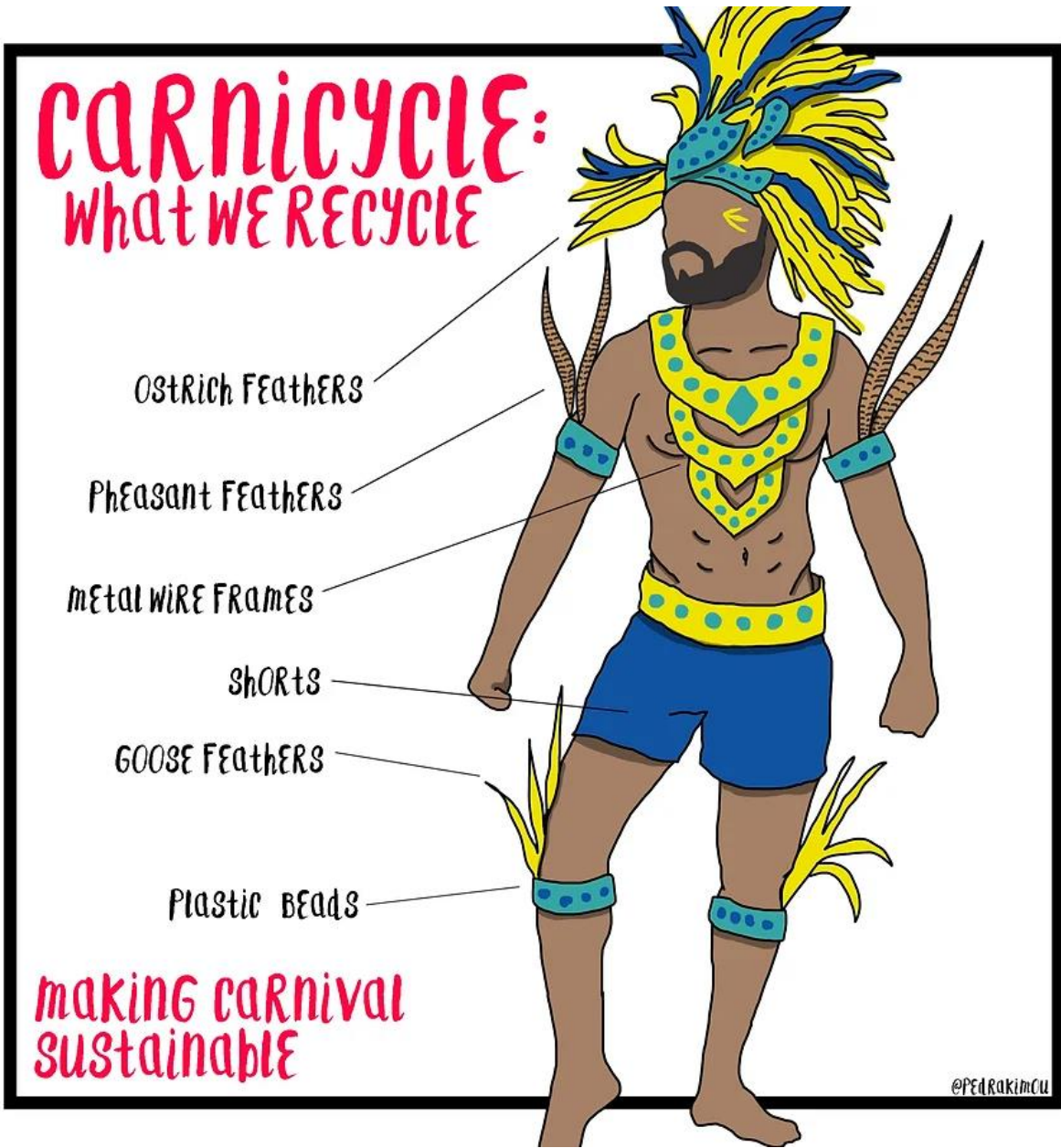


Valmiki Maharaj (left) and Atiba Borde (centre right) along with two other team members
working on designs for Carnival



Danii Mcletchie and Luke Harris, co-founders of Carnicycle





Source: Carnicycle.com