

May 2017

THE ECOSYSTEM OF WASTE: EXPLORING THE CONNECTIONS BETWEEN CONSUMERISM, STREET VENDING, AND WASTE MANAGEMENT DURING CARNAVAL IN SALVADOR DA BAHIA, BRAZIL

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Abstract

During Carnival in the Barra neighborhood of Salvador, Brazil, largely recognized for its scenic beauty and tourism infrastructure, there are unique structures governing the management of waste. Informal waste pickers, street vendors, and municipal actors, largely facilitate the recycling and waste disposal process, which also requires the engagement of consumers for the protection of the surrounding beach and community environment.

Carnaval is a Lent-centered festival celebrated around the world, often symbolized by vibrant colors and sounds in its different iterations.¹ The event has largely evolved from its earliest origins in Egypt and the Roman Empire to the present celebrations occurring throughout the Americas and has been largely documented within academic literature and creative media, contributing to the grand imagery brought to mind when imagining Mardi Gras in New Orleans, Louisiana or Carnaval in Brazil.

Although there is a tremendous literature base documenting the music, costumes, and cultural origins of Carnaval, there is limited information available on the frameworks guiding the success of the event. This paper is the result of a case study on the management of waste during Carnaval in Salvador da Bahia, Brazil within the Barra-Ondina neighborhood.

Importance of Carnaval in Brazil

Carnaval is celebrated throughout Brazil, with event characteristics differing from region to region, largely influenced by the cultural makeup of the city and state in which it occurs. Although Rio de Janeiro is often cited as possessing the world's biggest street party, Carnaval in Salvador da Bahia has often rivaled this claim due to its welcoming as many as 700,000 attendees per day for this weeklong series of parades covering nearly 15 miles of the city.^{2, 3}

Structure of Carnaval in Salvador da Bahia

Some scholars have identified the success of Salvador's Carnaval to relate to the complex interworking of collaboration between state and municipal governments, associations, and firms, venturing beyond the barriers that normally plague the policy-making process.⁴ Different

¹ Hufferd, Marlene Lima, "Carnaval in Brazil, samba schools and African culture: a study of samba schools through their African heritage" (2007). *Retrospective Theses and Dissertations. Paper 15406*. Page 1.

² Sandy, Matt, "These 12 Facts Explain Why Rio's Carnival is the World's Biggest Party" (2016). *Time Magazine*.

³ Withnall, Adam, "Rio Carnival 2014 in numbers: Brazil kicks off the greatest party on earth [...]" (2014). *The Independent*.

⁴ Cabral, Sandro, et al. "Carnival in Salvador, Brazil: A Case Study of Inter-organizational Collaboration" (2011). *2011 JCPA/ICPA-Forum Paper*. Page 2.

public and private entities come together to make Carnival function and the city benefits greatly from the ticket revenues, sponsorships, and advertising surrounding the proceedings. Official records have indicated that Carnival generates between US\$200 million and US\$250 million in business for the city, emphasizing why so many stakeholders are engaged in its management.⁵ The city's events take place in two core areas, Campo Grande and Barra-Ondina. While these zones have similarities in their structures, both supporting large crowds of people following *trios elétricos* (large trucks carrying powerful sound systems and performers), this study will focus on the event as it occurs in Barra-Ondina.



Figure 1 – Trio Elétrico on the Barra-Ondina Circuit.

Structure of Carnival within Barra-Ondina

Barra-Ondina describes the coastal route of the parade from Barra, a popular tourist destination and residential community, to Ondina, one of the most expensive neighborhoods in Salvador. This party route provides an interesting glimpse into the efficiency of the event, as a result of the party's daily run from 5:00pm to 5:00am throughout the Carnival period and the simultaneous function of Barra and Ondina as popular beach areas.

The intensive nature of Carnival within the Barra-Ondina circuit requires a fast turn-around from the events of the party to return this region to normal, enabling seamless support of the economic generation activities during the daylight hours before the festivities each day during the week. As a result of this interesting component of functionality during the event, I became interested in understanding the way the city manages waste during Carnival.

Limited information surrounding waste generation during Carnival

While there is existing literature relating to the management of waste during large festivals, I was unable to find any peer-reviewed articles specifically related to the operation of Carnival in Salvador da Bahia, nor the events within the Barra-Ondina section of the party.

Current research has focused on the environmental consequences resulting from tourist-related land use within large festivals supporting more than 50,000 visitors, however, the 14-fold increase in scale of Carnival, in comparison to usual festivals, illustrated the merit of completing a study about the waste management profile of the event.⁶ Many of the important solid waste indicators of these studies appear to have been ignored within the management of Carnival. A study by Cierjacks et al. (2012) comments on the data obtained from three

⁵ Cabral, et al. Page 14.

⁶ Cierjacks, Arne, et al. "Operational performance indicators for litter management at festivals in semi-natural landscapes." *Ecological Indicators* 13 (2012): Page 328.

German festivals in 2009, all supporting $\leq 170,000$ visitors, and the structure of the events to support the collection of consumer-generated waste. Although this study provides a comprehensive insight into the role of participatory litter collection in protecting sensitive landscapes during events occurring in valuable habitats, it only considers events within closed festival areas, offering camping zones or delineated rest zones.⁷ Carnival in Barra-Ondina does not support the complete closure of the street where it occurs, which functions as a high-traffic commuter zone from 5:00am to 5:00pm outside of the daily event timeframe.

Explanation of the research topic

Due to the unique nature of Carnival in the Barra-Ondina circuit and my desire to greater understand the structure of the waste management system, I developed an ethnographic case study approach to documenting the event. The study aimed to gain an understanding of the relationship between the municipal and informal waste system during Carnival and how consumers contribute to the success of this waste management scheme.

Hypothesis

I hypothesized that the waste management of Carnival in Barra, Salvador was largely facilitated by interactions between municipal waste managers and waste pickers. However, I did not have an understanding of the formality of this relationship or how the municipal government of Salvador organized both contracted and ambulant waste pickers to fulfill the waste management demands of this event.

Additionally, I suspected that the process required the collaboration of Carnival attendees within the Barra-Ondina circuit, but wanted to explore to what degree these participants contributed to the organization of the collection system during the event.

Methodology of the research study

To develop an understanding of the structure of the waste collection system during the event, the original methodology of the study was organized in two parts: direct observation during the main Carnival activity period and subsequent interviews with individuals engaged within the management process, both from a consumer and waste manager perspective. The project also aimed to provide a map of the physical infrastructure governing waste collection during the event, through the development of a survey of recycling and non-recyclable solid waste bins within the core event areas in Barra.

The project study period was structured around the end of the Carnival period in Salvador da Bahia, with the initial observation period occurring on February 28th and interviews occurring within the second half of March 2017.

Research contacts for the project were derived from existing collaborations within the informal waste picking sector and local community, and through interviews on the street.

Commentary on methodology based on ethnographic case study

My observations on the waste management structure of the event were participant-observation based, facilitated by video recordings of the event. I attended the last night of Carnival in

⁷ Cierjacks et al. Pages 328-330.

Barra-Ondina on February 28, 2017 from approximately 7:00pm until 5:30am to develop an understanding of the interactions between waste managers and consumers. This initial phase did not require the completion of interviews and aimed to understand the organization of the event and how individuals facilitated its success.

Following the direct observation period during Carnaval, I completed interviews with consumers and actors supporting the management of the event. These interviews were designed to provide insight on personal experiences with Carnaval, and were conducted with Institutional Review Board Exemption Approval from the Yale Human Subjects Committee.

As a result of the limited observational period of the study, I centered my project's focus on experiences within the Barra section of the Barra-Ondina circuit. This limited focus is related to the scale of the event and the feasibility of capturing perspectives from consumers and managers, also supported by the structure of the Barra neighborhood as more tourist-friendly.

Study observations

Observations recorded during Carnaval in Barra

The primary observational period (February 28, 2017) of the management system during Carnaval in Barra resulted in a successful concept of the engagement of waste managers to clean the party areas, while also contributing to a new direction for the study's focus.



Figure 2 – Image depicting the climate of the event in Barra.

Physical structures supporting waste management during Carnaval

One of the immediate observations from the night was the limited physical infrastructure available to support the engagement of consumers within the waste management scheme of Carnaval on the Barra-Ondina circuit. Previous visits to the Barra boardwalk area made me familiar with the availability of blue bins allowing tourists and city residents to dispose of waste. However, during Carnaval, all of these bins were removed from the boardwalk area (Figure 3). The only structures that remained were the permanently installed waste bins (Figure 4) that were both too small and infrequent to support the disposal of waste during the event.

Although these bins are unsorted and lead to the depositing of both biodegradable and recyclable materials together, often contributing to the inadvertent contamination of products (e.g. cardboard, paper products), the complete absence of any formal structure for the collection of waste was surprising, especially considering the current literature within large-scale festivals suggesting the integration of consumers within the management of waste.



Figure 3 – Waste bins available on the Barra boardwalk that were absent during Carnaval.



Figure 4 – Permanently installed waste bins available on the Barra boardwalk.

Unexpected facilitation of the waste management process

Despite the absence of physical bins supporting the collection of waste during the event, surprisingly, many beverage vendors collected cans from consumers. Although the bags they used were not provided by the city, with some utilizing small plastic bags leftover from beverage packaging and others using large, stable bags, these vendors facilitated the management of waste during the event by providing convenient locations where consumers could deposit their waste (as shown in Figure 5).



Figure 5 – Examples of licensed vendors who voluntarily collected recyclables.

It could be inferred that the collection of cans and other recyclable materials served a variety of functions for the vendors, namely providing an opportunity to generate additional income from the event and a measure of making their stands more visually appealing to attendees to promote increased sales by removing haphazardly scattered cans from walkways. However, from a merely logistical perspective, these vendors' collection of cans humanized the importance of waste collection during the event and appeared to influence consumers' engagement with the proper disposal of waste. Thus, these vendors appeared to facilitate the

citizen-oriented waste management process described within literature about large-scale festivals and events, by offering consistent locations for waste disposal.

Other physical structures collecting waste during the event

In addition to the informal collection of solid waste during the event, the municipality provided portable toilets for Carnaval attendees' use in Barra. Consumers frequently utilized these bathrooms during the event, however, the distance between different portable toilet areas and the volume of attendees encouraged many to use the bathroom openly or below the boardwalk in the beach area. Licensed beverage vendors were also camped in front of these bathrooms during the event, despite these areas being plagued with a strong odor and the surrounding walkways being covered in urine and other liquids (as shown in Figure 6).



Figure 6 – Shared portable toilet and vendor area.

Observation of the “ecosystem” governing consumption and waste disposal

While the initial focus of this study aimed to consider the management of waste as facilitated between consumers and waste managers, it became apparent that vendors also played a role within this system, serving as facilitators of the waste disposal process, and competition.

Vendors provided the resources to consumers that eventually became waste to be collected by waste managers and informal waste pickers throughout the event. The dearth of formalized waste management infrastructure also contributed to vendors' providing a nearly inexhaustible source of consumable materials due to the intense competition between vendors during the event. Additionally, informal waste pickers relied on the continued flow of materials from consumption to provide opportunities for income generation. However, vendors' apparently passive collection of materials through their placement of bags on their stands led to a level of competition between them and waste pickers.

Differentiation between formalized and ambulant vendors

The varying levels of product vending were another component of the event's structure influencing the constant consumption and availability of recyclable materials. There was a corridor created by formalized vendors that functioned as a flexible barrier for the movement of consumers during the event (as shown in Figure 7). These vendors were highly marked with the logo and bright yellow color of the 2017 Carnaval sponsor, SKOL, one of the major beer companies within the country. As a result of their formalization, these vendors were able to stay in fixed locations throughout the event and the week's parties.



Figure 7 – Functional corridor of product vendors.

However, in addition to the prevalence of formalized vendors, there was an abundance of informal, street vendors working during the event. These workers were limited in their capacity to stay in a fixed location as a result of the high risk of being penalized due to the control of police officers and threat of being caught by the "fiscalization" police, which often confiscate the merchandise of unregistered vendors. Due to the highly congested nature of the event, it appears that there was limited control of these unregistered vendors, lending them a less risky opportunity to benefit from the base of consumers at the event.

While many of the formalized workers appeared to operate with a fixed price due to their affiliation with SKOL, unregistered vendors offered more competitive prices and were more vocal in their pursuit of sales frequently moving through crowds communicating with attendees. While it was challenging to distinguish between unregistered and registered vendors at times, movement and the lack of the SKOL-branded beverage cooler appeared to be more characteristic of ambulant vendors (as demonstrated in Figure 8).



Figure 8 – Ambulant vendors immersed within the party landscape.

Waste pickers engagement during the event

In contrast from the apparent spectrum of street vendors during the event, there was some difficulty in perceiving different types of waste pickers. The majority of waste pickers during the event appeared to be ambulant and unaffiliated with cooperatives. However, the nature of this work makes it challenging to visually discern the level of formality of these workers.

Throughout the event, waste pickers were distributed within the party area and collected cans and other recyclable materials. Their efforts seem to be regulated by one component: the size and portability of their given receptacle. While the majority of waste pickers I observed appeared to carry durable, plastic bags to collect waste (as shown in Figure 9), some utilized weaker, plastic bags and a smaller population utilized carts.



Figure 9 – A waste picker carrying two plastic bags of collected materials.

Procession of cleaning immediately following Carnaval

There were several environments within the Boardwalk area that facilitated the distribution of people and the party's phases. Although there were floats throughout the event, there was also a fixed stage where performances took place throughout the evening. Close to 2:00am, the floats and stage performances ended, and a short show took place at an elevated stage over the main boardwalk area. Upon the conclusion of this show, a DJ played music until exactly 3:00am, allowing attendees the opportunity to reunite with friends and family, and informally signaling the end of Carnaval. The second party, however, was the cleaning process.

The sequence of cleaning events at the conclusion of the party (as depicted in Figure 10):

- 1) Municipal waste managers entered the cleaning landscape for the first time following the conclusion of the night's festivities, utilizing brooms to create piles of the waste that was scattered throughout the party area;
- 2) Waste pickers sorted through these piles, freely collecting recyclable items of value;
- 3) A procession of municipal garbage trucks then entered the party area and municipal waste managers swept the scattered, large piles of waste closer to these vehicles;
- 4) Waste pickers continued sorting through these piles for items of value and once their interest dissipated, municipal waste managers proceeded to deposit all of the remaining waste (both non-recyclable and recyclable materials) into the garbage trucks; and
- 5) Finally, once all of the waste was collected into the trucks, several water trucks entered the party area and municipal waste managers hosed down the boardwalk area.



Figure 10 – Procession of cleaning events following the end of the party.

Limitations to waste management

Despite the intensive, coordinated effort of the municipal waste managers and waste pickers during the event, there appeared to be a variety of limitations preventing their complete removal of waste from the party area, largely influenced by the Barra boardwalk circuit being located above a beach area. Upon the conclusion of the event, it was apparent that many recyclable and non-recyclable items were cast onto the beach area. In addition to these solid wastes, there were a number of wet areas on the beach, potentially having been polluted by the depositing of liquid wastes from vendors or other entities during the party (Figure 11).



Figure 11 – Solid and liquid waste pollution on the beach following the event.

Continued cleaning in the weeks following Carnaval

Camarotes are ticketed VIP areas located throughout the Barra-Ondina circuit offering exclusive experiences to attendees willing to pay for closer access to performers, clean bathrooms, more diverse drink offerings, and heightened security during the event.

However, one component of these party venues is the immense quantity of metal, wood, and other structural elements that go into their construction. Upon the conclusion of the event and within the weeks following Carnaval, these structures were disassembled, resulting in massive piles of materials. While some appeared to be saved for subsequent parties, much of the wood used to construct the superficies of these structures were in too poor condition to be reused. An example of active VIP areas and their deconstruction after Carnaval is shown in Figure 12.



Figure 12 – Camarote VIP party areas during and following Carnaval.

Purpose of interviews within the project

In addition to the direct observations conducted throughout the primary party period and subsequent monitoring of the post-Carnaval cleaning process, this study utilized interviews as a measure of providing stronger commentary on the unique experiences of consumers, waste pickers, and vendors engaged within the Carnaval environment in Barra.

Perspectives from waste pickers

I conducted an interview with a waste picker who has been largely engaged within the Carnaval circuit in Salvador for the past 15 years. Jeane dos Santos is a representative of the Cooper Brava cooperative and serves as the Bahia Regional President of the National Movement of Waste Pickers (MNCR). She is also a member of the CataBahia Network, which is a regional association of waste picker cooperatives within Salvador and local cities in Bahia.

Although Jeane is a cooperative-based waste picker and leader, she has great familiarity with ambulant pickers who may have collected more opportunistically during Carnaval. Therefore,

she emphasized some of the challenges impacting these pickers within the circuit. I excluded ambulant pickers from my interviews as a result of limited access to these individuals and the challenging nature of their work.

Within the Carnaval environment and subsequent cleaning period, I refused to disturb any of the actions of waste managers, although the roles of these informal and formal workers were more obvious at that time. While formal waste managers from the municipality have an intensive workload immediately following the event, they are employed by the city and paid a wage. However, most waste pickers are not provided with wages and are paid, instead, based on the volume/tonnage of recyclables collected. Therefore, it was not ethical to interrupt ambulant waste pickers from their work to complete interviews about their experiences.

Jeane commented on the success of this year's Carnaval for waste pickers, as influenced by the CataBahia Network and MNCR's negotiation with the municipality for a daily salary for waste pickers. Under this structure, waste pickers gained R\$60 each day, throughout the seven days of the party, in addition to the profit earned from the amount of materials collected.

The local political system was also engaged within efforts addressing status of waste pickers during Carnaval through the implanting of showers within the party areas, to be utilized by informal workers (vendors and waste pickers) during the event. Many waste pickers resorted to living outside, within camps, during the entire Carnaval period as a result of the congestion of the city, difficulty in carrying their collected materials to and from cooperatives, and the intensity of the work. This year, the city's provision of showers enabled waste pickers to remain outside more comfortably; however, Jeane commented on the necessity for further investment to provide waste pickers with their own shower area located near their main camp.

“When I put my hand down, there were five more hands reaching for a can. This is because of unemployment which has increased greatly.”

– Jeane dos Santos, MNCR

Carnaval represents a window of opportunity for many workers. This year's activities provided individuals with a chance to gain money and temporarily be relieved from the economic crisis impacting Salvador and Brazil. However, due to the changing nature of Carnaval within the city as influenced by the relative elimination of Carnaval-specific jobs, like *cordeiros* (shown in Figure 13), or cord-holders that separate the different zones of the party, many residents capitalized on opportunity during Carnaval by waste picking. Jeane commented she saw more waste pickers than ever before within this year's circuit, and this was largely representative of the wide availability of materials during the event and the ease of engaging within the activities.



Figure 13 – A small group of *Cordeiros* (cord-holders) surrounding a performance vehicle.

Commentary on the experiences of street vendors

Within the weeks following Carnaval, I conducted four interviews with ambulant street vendors to learn about their experiences and challenges during the event, and within the Barra neighborhood. Although similar questions arose related to determining the formality of different vendors and ethical considerations for conducting interviews due to the intensity of their work, I conducted interviews by walking along the Barra boardwalk and speaking with different vendors. I requested their participation in my study, expressing my interest in learning about their experiences for purely educational purposes, rather than utilizing this information for any formal or supervisory reporting. To show appreciation for their time (2-10 minute interviews), I purchased products from all of the participating vendors.

All of these participants asked to be anonymous within the final report, with one vendor also providing consent to be interviewed only using audio. Many of these security concerns were attributed to the vulnerabilities they face as street vendors in Barra.

All of the vendors acknowledged the lack of support provided to them from the municipality and the most challenging aspect of the experience being the “*rapa*” or fiscalization/inspection process. During normal periods, and on an especially heightened basis during Carnaval, unlicensed street vendors are susceptible to being pursued by inspection police within their normal working areas. These municipal officers travel on large trucks and confiscate all of the merchandise and equipment of vendors who are not licensed by the municipality of Salvador, requiring these vendors to pay by weight and attend a court hearing to retrieve their items.

Within the Carnaval circuit, the inspection control process was much more intensive, presenting a challenge to those who visited from distant cities within the Bahian interior and other vendors who were unable to receive a license for the event.

The sponsorship of Carnaval by SKOL was an additional challenge complicating the success of vendors’ engagement within the circuit. As a result of SKOL’s sponsoring of the event, all vendors were prohibited from selling any of the other beer brands commonly served within Salvador, or other products that were not associated with SKOL (e.g. water products). This caused vendors to have to repurchase all of their merchandise, often being unable to utilize their existing reserves of other brands’ products. In addition to the expense of repurchasing appropriately branded products, vendors who received licenses to sell within the boardwalk area of the Barra-Ondina circuit were also responsible for furnishing the ice within their SKOL-provided beer coolers. Vendors commented that these containers were poorly structured and did not yield well to any further movement once they were placed in the party area.

As a result of the challenge of movement with their merchandise, licensed and ambulant vendors commonly remained in the party area for 7-10 days within the Carnaval period, often sleeping outside and facing various environmental challenges during the event (including safety risks, vulnerability to rain events, limited space for hygiene and privacy, isolation from children and families, etc.). These vendors were not afforded much space to facilitate their stays within the party areas, often being forced to sleep unsheltered on cardboard boxes and small blankets on the ground near their items (as demonstrated within Figure 14).



Figure 14 – Licensed vendors sleeping on the ground immediately following Carnaval.

“The only thing that we, ambulant vendors, want is to be recognized and have a place to sell. We only want to be legalized.”

– Street Vendor in Barra

Although sponsorship influenced the employment protection for many vendors during the Carnaval period, few were able to receive licenses, especially those who specialized in food preparation. Concerns about appropriate food preparation methods and physical safety, as a result of the gas stoves used for cooking, led to many vendors’ failure to receive licenses, and limited financial resources to support the purchase of beer and more licensable merchandise caused vendors to simply sell items with the risk of being stopped by inspection police.

Some ambulant vendors commented that their opportunities were greatly hindered by this year’s Carnaval. Many failed to gain a sufficient profit from their efforts, caused by: a perceived reduction in attendance due to factors like the relative elimination of *cordeiros*, which some attendees viewed as a heightened security risk; the cost of purchasing ice and sponsored beverages for the party, and SKOL’s lowering of the price of their products to increase profits; and, the economic crisis in Brazil which reduced travel to Salvador’s Carnaval decreasing the presence of Brazilians from neighboring states and cities, and vendors’ consumer base.

Ultimately, a myriad of challenges impacting both temporarily licensed and ambulant workers led to many commenting that they hoped for more support from the municipal government and Salvador’s mayor. One vendor noted that the only thing she sought from the city was to be recognized as a worker and given license to work in order to provide for her family.

Commentary from consumers about Carnaval in Barra

I conducted interviews with residents and business owners of Barra (*Sol* and *Gabriela Ventura*), and a waste specialist (*Dr. Sonia Maria Dias*) to understand some specific aspects of the consumer experience during Carnaval.

Gabriela Ventura, coordinator of the SIT Study Abroad Program in Salvador and Barra resident, commented on many difficulties she experiences while navigating her personal and professional life during the Carnaval period. Gabriela noted that a majority of Barra residents choose to leave the city during the party as a result of the difficulty in travel caused by the blockage of many public roads and intensive security check points imposed by the military police. Although many of these stoppages were designed to afford greater safety, they have led to residents' facing challenges in leaving their neighborhoods during the week and in emergency situations, some residents' inability to reach hospitals within reasonable timeframes. Considering the difficulty in travel, many residents travel to the interior towns of Bahia, escaping the events of the city. However, departing the city is not void of its challenges.

“After the party ends, people remove their costumes, outsiders leave and don’t remain to view the city naked and mistreated...”

– *Gabriela Ventura*

As a result of the influx of Salvador residents and tourists into the Barra neighborhood for the daily circuit within the Carnaval period, the main boardwalk area and nearby streets are full of attendees and vendors throughout the 7-10 day period. Some residents may find vendors camped in front of their garages and properties, complicating their perceived safety and ease in accessing their homes. The limited prevalence of bathroom facilities and adequate waste management infrastructure within neighboring streets during the event, also leads to many property owners' placement of wooden boards to protect the glass and walls of their homes (as shown in Figure 15). This superficial protection limits the smell of urine, property destruction, and vandalism that may result from Carnaval, however property owners have to undertake these protections on their own, failing to receive any subsidies or assistance from the city and remaining responsible for any damages resulting from the event.

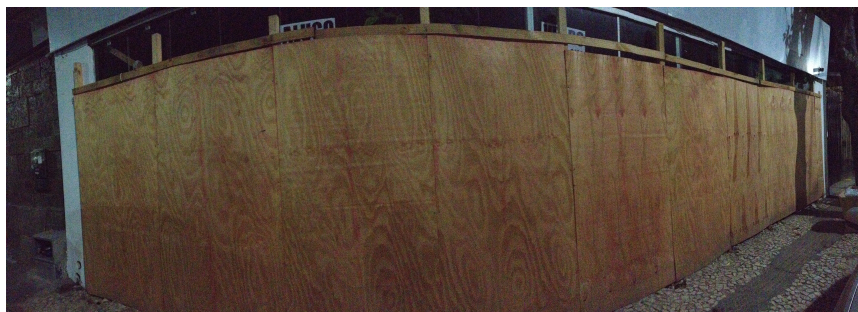


Figure 15 – Example of the boards used to protect Barra residents’ homes during Carnaval.

Another important aspect of Barra residents’ perspectives on the structure of Carnaval was the maintenance of the environment following the party. Sol, a hostel owner and Barra resident, commented on the pollution of the beach during Carnaval and other challenges impacting the community as a result of the event. She noted that many residents and guests fail to take

accountability for the protection of the beach, at times leading to the inadvertent disposal of trash into the Bay of All Saints, which separates the city from the Atlantic Ocean.

There is limited infrastructure for the collection of waste on the beach, leading many visitors to merely leave their trash where they are sitting instead of traveling up to the boardwalk areas to deposit their waste. While this often provides an opportunity for ambulant waste pickers to travel along the beach to collect cans and other recyclables (as shown in Figure 16), biodegradable waste, like coconuts, and other trash from food and refreshments are often abandoned on the beach. The municipality infrequently deploys waste managers to retrieve waste, but the intensity of the pollution cannot often be mitigated by these efforts (Figure 17).



Figure 16 – A young boy collecting cans on the beach in Barra.



Figure 17 – A municipal waste manager collecting leftover beach litter.

The challenge of managing the beach and the resulting environmental pollution has shaped some residents' relationships with the beachfront area that Barra is often defined by. Sol commented that she and other residents avoid the beach during Carnaval as a result of its polluted status and the use of the beach by many guests as a secondary bathroom. The precipitation events also lead to the washing of waste, residues, and chemicals from street cleaning into the water throughout the period, also influencing residents' decision to frequent more distant beaches during Carnaval.

Although there are challenges shaping the health of the beach, some Barra residents have taken initiative to protect their community. "AMA-Barra" is a group dedicated to the preservation of Barra that leads a post-Carnaval diving effort to retrieve plastics and waste deposited in the Bay. Despite many challenges facing impacting their relationship with Carnaval, Barra residents have demonstrated their commitment to protecting their community.

Since Barra's residents have a different investment in the operation of Carnaval in their community, I sought the perspective of Dr. Sonia Maria Dias, a waste sector specialist with Women in Informal Employment: Globalizing and Organizing (WIEGO), to understand consumers' interaction with the party landscape.

Sonia cautioned that consumers during Carnaval should not necessarily be perceived as they would in a normal setting, as a result of the event's unique nature. She noted that Carnaval is a period of "catharsis" that enables individuals to drift out of their normal roles, similar to the structure of other large festivals around the world. Instead of focusing on how residents and consumers should behave exclusively within the context of Carnaval, Sonia encouraged the

consideration of how individuals can be more conscious in their day-to-day lives, leading to a more significant shift within the culture of consumer participation in the logistics of the waste management system.

Conclusions

I completed this study largely influenced by previous experiences related to informal waste picking in Brazil, but little familiarity with the organizational structure of Carnaval in Brazil. One of the primary insights I gleaned from this experience is the rapid pace of this period. As a result of the timing of this project, I did not include perspectives from the municipal government and largely focused on informal workers and consumers' experiences. While I believe this focus did not limit the findings of the study, inclusion of perspectives from the municipal government would have offered further context on the formal structure of the waste management system during Carnaval in Barra.

Lessons and areas for further research from study findings

The role of waste infrastructure

Physical structures, and the lack thereof, served a significant role in the organization of waste during Carnaval in Barra. Since the municipal government removed a majority of the bins usually present on the Barra boardwalk during the party, I considered how the maintenance of these receptacles would have influenced consumers' waste disposal behaviors. However, there may have been inadvertently harmful impacts of further solid waste infrastructure on the opportunities made available to waste pickers and other informal workers.

The presence of bins during Carnaval could potentially hinder waste pickers' access to materials, leading to increased competition between workers. These structures may also be incapable of proper management due to quick overflow and the lack of municipal solid waste managers to retrieve full bags and replace them during the event. It could also be hypothesized that additional bins would contribute to the increased contamination of recyclable materials due to indiscriminate depositing of items. Finally, the engagement of informal vendors in the collection of recyclables within this event, in concert with increased bins, could also be expected to increase challenges with access.

Inefficiency and excess materials

As a result of the limited time for cleaning during the event, it became apparent that although municipal cleaners successfully gathered consumer waste, there were not enough waste pickers or engaged street vendors to collect recyclables, leading to an abundance of these materials being thrown into garbage trucks. This was one of the difficulties related to the restrictive timetable of the cleaning process following Carnaval.

Additionally, waste pickers and street vendors were limited in their potential to collect materials not solely by interest, but also as a result of available supplies. I observed few waste pickers who were utilizing gloves and other personal protective equipment (PPE), and suppose that in addition to safety concerns, the lack of such protection may also contribute to operational inconveniences within the waste collection process. The majority of waste pickers and vendors that I observed during the event relied on plastic bags to collect recyclables. Few possessed reinforced bags or carts and their ability to profit from the event appeared to be inhibited by a lack of adequate containers.

Considering these difficulties, one area for further research would be the merit of the municipality's provision of sturdier bags to facilitate waste collection. While this could further enhance competition, perhaps there could be a measure of pre-registration to gain access to the bags while assuring fairness in the accessibility of these resources. Ultimately, beyond further financial resources, there are operational limitations that could be addressed within the waste management circuit and improve experiences for informal workers.

Street vendors as facilitators of the recycling process

A surprising finding from the study was the direct engagement of street vendors within waste collection during Carnaval. Further investigation could provide an understanding of the factors influencing vendors' involvement in this process. Is this merely a question of opportunity, as a result of the economic challenges impacting many individuals, or a new role within the recycling management structure of the event? Also, while questioning the potential of the government and other entities to support vendors' engagement within recycling, careful consideration should be made of the implications of increasing competition and potentially complicating the availability of resources for waste pickers. In addition, further investigation should consider the disparate potential of ambulant and licensed street vendors to participate within the simultaneous collection of recyclables and sale of products during Carnaval.

Recognition of vendors

The interviews I conducted for this study revealed that more engagement has taken place between the municipal government and waste pickers, than for ambulant vendors. Several study participants emphasized that their primary goal is to be recognized as official workers, who are merely looking for secure spaces for work.

Considering the economic crisis impacting Brazil and the difficulty many ambulant vendors face in their daily work environment, it could be concluded that further research should demonstrate which strategies can best support these workers' opportunities while maintaining a balanced concern for appropriate food preparation techniques and vending licenses.

Humanizing litter and influencing behavior change

This study caused my consideration of the role of infrastructure and education as vehicles for "humanizing" waste management. While many individuals may be removed from the structure of the waste system governing a large-scale festival, if they understood the value that these items had for the people collecting them, it could be assumed that this awareness may influence the culture of environmental stewardship.

However, consideration of changes in conscientiousness surrounding waste also requires a realistic perspective of consumer desires. How can Carnaval maintain its cathartic qualities while still encouraging individuals to take an active role in the waste collection process?

Continued assessment of the multifactorial nature of Carnaval's waste scheme

Ultimately, this study was a demonstration of the importance of balancing concerns of efficiency with the consideration of the people who make a system successful.

As further research assesses how to improve the organization of large-scale festivals, continued assessment of available protections for different actors within the consumption and disposal process will enhance our ability to support communities while promoting equity within the waste management system.

Acknowledgements

I would like to thank the Hixon Center for Urban Ecology, the Carpenter-Sperry Fund, and Joshua Galperin for their support of this study.

Additionally, I would like to thank Jonathan Krones for his patience, guidance, and support while advising me through this process, as well as John Wargo for his encouragement.

Finally, I send my appreciation to the project's interview participants for their honesty and generosity with their time.