RESTAURANT APPROACHES TO TACKLING MARINE POLLUTION IN CAPE TOWN, SOUTH AFRICA

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Disclaimer
The report has been produced by a team that takes full responsibility for the report's contents and conclusions.

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List of abbreviations and acronyms

EPA	United States Environmental Protection Agency
Kg	Kilogram
WWF	World Wide Fund for Nature

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Background

Plastic debris is a global marine pollutant that imposes both an environmental and financial cost on society. The environmental cost is that associated with the environmental impact on marine ecosystems and the financial cost is that associated with a loss of the aesthetic appeal of unpolluted marine ecosystems for associated sectors, such as beach tourism and hospitality.

Ryan conducted a comprehensive review of anthropogenic marine debris off the coast of southern Africa in 2009. The study estimates that beaches contribute R2 billion to southern Africa's tourism sector with more than R10 million spent on cleaning beach litter in South Africa alone (Ryan 2009). A grave concern is the adverse effects of marine debris on animal mortality, specifically the dangers posed by entanglement and ingestion. Additional effects that are yet to be determined empirically are the quantum of substratum available on which sessile organisms may settle and the rate of propagule dispersal to islands. The evidence linking marine pollution from plastic debris to marine biodiversity threats is largely anecdotal highlighting the need for more research, particularly long-term monitoring (Ryan 2009). This research may support conservation efforts, motivate a business case for educational campaigns and support policy analysis to develop specific instruments in this regard.

The literature review confirms there are several gaps in the international understanding of the levels of plastic debris in the marine environment and the resultant impacts (Bergman et al. 2015). There is a lack of information about microplastics and a need to establish methods for locating, identifying and quantifying plastic debris in the marine environment. In the absence of government-driven programmes, beach surveys led by scientists and citizen action groups have been valuable in identifying plastic debris sources, types and volumes. For specific economic incentives to be developed more information is required to describe the links between plastic debris sources, types and quantities and the unique impacts of these variations. In addition, not much data exists regarding the quantitative link between beach litter levels and socioeconomic impacts, such as that on tourism.

Plastic debris may be categorised according to size, location and source. Plastic debris is classified as small when less than 10 millimetres in diameter and large when more than 100 millimetres in diameter. A distinction is made between debris that floats and that located on the seabed. There are two main sources of marine plastic debris: waste from ships, which is off-loaded in the oceans, and waste from land, which enters the oceans through rivers, wastewater systems, beaches and winds. For the purposes of this research, harmful and non-essential plastics are considered plastics that have disproportionately large environmental pollution impacts and/or plastics that may be removed or replaced by low-cost alternatives. This includes single-use plastics, polystyrene packaging applications and shopping bags, plastic microbeads and plastic microfibres.

The plastics market in South Africa contributed 1.6% to gross domestic product in 2013 and was estimated to have a value of R50.4 billion employing 60 000 people in 1 800 companies across the supply chain (Steyn 2016). The packaging sector is the largest plastic consumer by end user (53%), followed by the construction (11%) and automotive industry (7%) sectors (Fibre Processing and Manufacturing SETA 2014). Plastics used in the packaging sector are characterised as low value, high volume and price sensitive with 5% growth forecast between 2013 and 2018 (Fibre Processing and Manufacturing SETA 2014).

Plastics contributes highest by value (41.8%) to the packaging sector and is considered the most popular and economical choice (Fibre Processing and Manufacturing SETA 2014). Food packaging has been identified as a key future growth area.

Despite significant efforts to recycle plastics, a 2015 *Science* publication estimated that South Africa was the 11th worst offender in the world when it comes to releasing plastic debris into the sea (Jambeck et al. 2015). South Africa scored higher than heavyweight polluter India because it has a high per capita production of waste (estimated at 2 kilograms (kg) a person a day) and a high proportion of 'mismanaged' wastes that do not enter a formal disposal scheme.

The diversity in size and composition of sources of marine debris makes the control thereof and assessment of culpability problematic (Ryan 2009). Most plastic debris in the marine environment is derived from local land-based sources (Lamprecht 2013). A practical and easy way to identify marine debris sources is through a beach survey as the ones conducted in Muizenberg by The Beach Co-operative.[1]

Different sectors, as consumers of plastic packaging, have a responsibility to reduce the level of plastic debris finding its way into the ocean. Cape Town Tourism represents about 20% of the national restaurant industry, which had an estimated value of R1.2 billion in 2010 (Welter 2012) and is assumed to be significant end-user of food packaging. The restaurant sector, including food service outlets, close to the beach area in Cape Town's southern suburbs potentially has a critical role to play. This location was selected as the focus of this study as the pilot initiative could potentially significantly reduce the levels of plastic debris found on nearby beaches, and benefit these businesses because an unpolluted beach and ocean contributes to a positive eating and recreational experience for patrons.

Research design, objectives and methodology

The rationale behind the focus of the study is that restaurant and food service outlets close to the beach and coastline are more likely to participate in best practice to reduce plastic use and thus decrease the volume of plastic debris that ends up in the ocean.

The study aims to:

- Assess the factors responsible for success and barriers for implementation of retailer reduction initiatives regarding harmful and non-essential plastic pollutants.
- Review the available best practice to support identification and implementation of a pilot in two restaurants and/or food service outlets.

Research methodology

A mixed methods approach was employed including a desktop literature review and semi-structured interviews using quota sampling to gather data representative of restaurants along the coastline of Cape Town with a primary focus on the southern peninsula.

[1] The Beach Co-operative is a citizen action monthly campaign led by Aaniyah Omardien wherein beachgoers and residents are encouraged to participate in a beach clean-up that also serves as a beach survey opportunity.

The literature review relies on peer-reviewed publications in science publications and grey literature sourced from popular media, including company integrated annual reports and popular media articles and reports. All collated secondary data was supplemented with primary data sourced from the semi-structured interviews.

Statistics South Africa publishes a detailed monthly national food and beverage report that enables an understanding of the national sector and an indicative size of the restaurant sector in Cape Town, the focus of this study. Statistics South Africa (2016) categorises the food and beverage sector in three types of enterprises: restaurants and coffee shops, takeaway and fast-food outlets, and catering services. The surveyed respondents included representatives of these three categories.

The literature review informed the questionnaire design, which was designed by Wendy Engel. The questionnaire was tested with Fresch Foods and key learnings were incorporated into the final version. The questionnaire was designed in three components – sustainability, waste management, and packaging, plastics specifically, focusing on the willingness to pay for alternatives to plastic food packaging. Eighteen face-to-face interviews were conducted with restaurants.

Research hypotheses

The three key research hypotheses were:

- Restaurant owners, managers and patrons that operate close to the coast and ocean are more likely to participate in efforts to reduce plastic pollution in the ocean.
- Restaurants that have introduced sustainability practices and allocated resources towards implementing waste management practices are more likely to participate in a marine plastic debris reduction project.
- Larger restaurant groups with well-established packaging procurement systems and rules have more constraints to participate in and implement a plastic pollution pilot than smaller companies, with more evidence needed for the former to implement best practice.

Characteristics of respondents are 35% female and 65% male. Table 5 shows the roles that respondents held: 33% were general managers, 33% were owners, 18% were managers, 8% were environmental managers and 8% were operations managers. Most respondents (64%) have been in their roles for less than 5 years, 27% for more than 10 years and 9% between 5–10 years.

Table 1: Characteristics of restaurant respondents

Characteristics	Gender	% of respondents
Gender	Female	35
	Male	65
Years of experience in role	Less than 5	64
	5–10	9
	More than 10	27
Role	General manager	33
	Environmental manager	8
	Operations manager	8
	Manager	18
	Owner	33

The restaurants surveyed are listed below.

Table 2: List of restaurants that participated in the survey (2017)

List of surveyed restaurants	
Harbour House, V&A Waterfront	Kauai, central business district
Vineyard Hotel, Claremont	Loading Bay, central business district
Tiger's Milk, central business district	Blue Water Café, Kommetjie
Café Caprice, central business district	Hang Ten, Muizenberg
Tiger's Milk, Muizenberg	vida e caffé, Muizenberg
Harbour House, Kalk Bay	Galley, Fish Hoek
Café Roux, Noordhoek	Fresch Foods, Muizenberg
Monkey Valley, Noordhoek	Red Herring, Noordhoek
Foragers, Scarborough	Yoffi Falaffel, Muizenberg
Olympia, Kalk Bay	Mariner's Wharf, Waterfront

Review of international and local best practice

Many studies exist on best practice for packaging reduction, less are focused on plastics. Duke University's case study of five American restaurants and hotels provide insights on waste and packaging reduction strategies, key challenges and recommendations (Su et al. 2015). Key challenges include the high costs of alternatives to plastic packaging materials, inconsistent regulations and difficulty in developing a tracking system on monitoring alternative materials.

Recommendations to reduce plastic usage are (Su et al. 2015):

- Change consumer behaviour to reduce plastic use, improve recycling and reuse of plastic with financial incentives or by providing reusable plastic containers at a lower cost.
- Encourage suppliers to select products with less or no packaging or more sustainably produced packaging and to introduce selection criteria for plastic use.
- Implement staff education and training as well as create positions within the company to coordinate sustainability initiatives or manage the project.

Case studies produced by the United States Environmental Protection Agency (EPA) revealed that there are five key strategies to reduce packaging. These are purchasing in bulk, replacing single-use with reusable packaging, switching to environmentally friendly disposables and implementing initiatives, such as 'bring-your-own' container programmes (United States EPA 2015).

Best practices in the restaurant and hospitality industry include recycling, returnable packaging, reusable bag and container programmes and the introduction of biodegradable takeaway containers and paper bags. In the review of five American restaurants and hotels' plastic reduction initiatives, the biggest challenge cited regarding implementation was how to incorporate the higher cost of reusable alternatives into the business model (Su et al. 2015).

No studies have been done on best practice regarding packaging reduction in South Africa.

Retailer approaches towards sustainability, waste management and packaging

Sustainability

The literature review identified the drivers of introducing a sustainability code of practice as mandatory or legal requirements, cost reduction opportunities, gaining a market advantage as a service or customer niche and resonation with corporate value and ethos.

Sustainability practice code

Most respondents (68%) did not have a sustainability practice code in place. Restaurants with a sustainability code of practice in place cited the motivating factor being value or ethos of restaurant (86%) with the rest citing market advantage. In one case, it was driven by the directors as sustainability is a key ethos, another cited "we do it as it's the right thing to do". Another owner mentioned it as a combination of his personal ethos reflected in his brand as well as demand from customers.

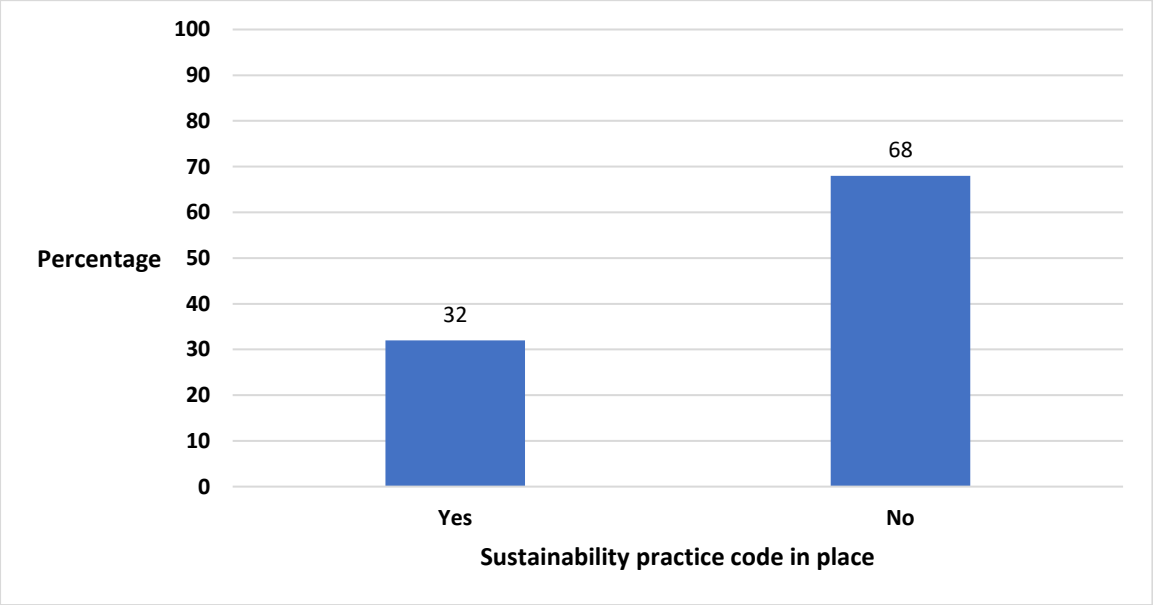

Figure 1: Sustainability practice code

Capacity and resources to implement sustainability practices
Less than half of respondents (45%) have allocated specific resources to implement sustainability practices. The resource allocation is within the current job description of managers, general managers and kitchen scullery leaders. There was only one case where a full-time environmental manager had been appointed to focus on sustainability.

Communication of sustainability practices
Communication of sustainability practices may potentially assist restaurants to connect with existing and potential customers. The literature review identified four commonly used practices: an annual integrated report, largely for listed companies; newsletter or information brochure; online report on internet; or other forms of social media.

The Famous Brands Group, one of South Africa's largest fast-moving consumer goods companies, reports annually on waste recycled at their Gauteng manufacturing facility with 2015 financial year estimates of a total of 165 559 tons including cardboard (89%), plastic (5%) and general waste (6%) (Famous Brands 2015). Given the existing effort by the Famous Brands Group to measure waste, to introduce recycling and report on it, it may be a good partner with which to conduct restaurant surveys with key brands. As part of skills development, their registered skills development facilitator submits plans and reports on their workplace skills plan and organises regular franchisee workshops and training on brand products and the fundamentals of restaurant management.

Survey respondents that affirmed sustainability practices were implemented in their businesses were asked to describe how practices are communicated internally among staff and externally with customers and the wider public, as well as the type and frequency of communication. Few respondents (35%) communicate sustainability practices. Of these, 50% communicate to staff, 40% to patrons, 20% to wider public and 10% to a range of other stakeholders. Only one survey respondent communicated sustainability practices in their annual report and only one via an online medium. Larger and more established brands are cautious on what is communicated to the public as statements or actions may have unintended consequences.

<u>Waste management</u>
Respondents were asked to explain whether generated waste is sorted internally by staff or by patrons and whether training is provided to staff responsible for this function, the type of waste that is sorted, the name of current suppliers responsible for sorting when outsourced and the barriers to sorting waste. The availability of space is a constraining factor for many restaurants as regards waste sorting and recycling, as well as determining for some the frequency of procurement practices of packaging.

Staff training and continued support for introduced practices is vital for the success of sustainability practices in general and waste specifically. There is a correlation between the allocation of specific resources or roles for implementing sustainability practices and the motivation for introducing sustainability practices. Many restaurants cite the unreliability and lack of professionalism of existing recycling businesses as well as the inconsistency of stock available and higher pricing (relative to plastic) of alternative packaging as a constraint to implementing recycling practices and purchasing alternative packaging materials.

Food waste appears to be the easiest to sort for owners, managers and staff. A surprising insight is the number of restaurants that supply food waste to farmers, mostly pig farmers.

Waste sorting

Waste that is sorted is paper, plastic, glass, food scraps or other organic material and batteries. Stores and restaurants that rent space in larger shopping centres rely on waste management facilities provided by shopping centres. Only 42% of respondents sort waste with 91% delegating this task internally to staff and 9% outsourcing to external service providers. By waste type, most respondents (37%) recycle plastic and glass followed by paper (19%); 11% recycle organic waste and batteries.

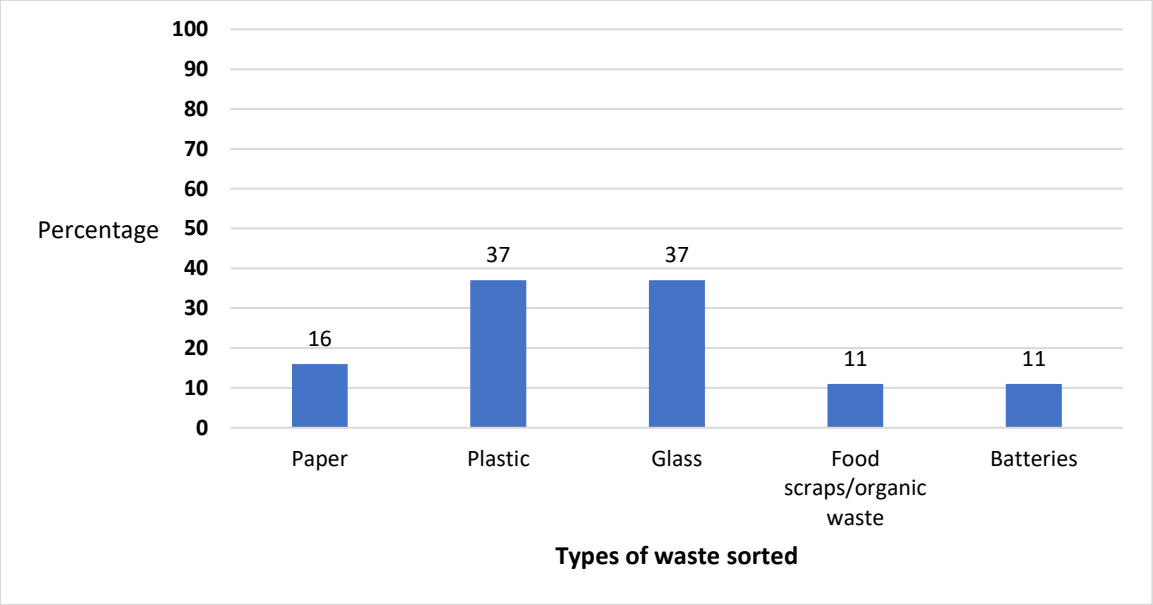

Figure 2: Sorting of waste by type

A few respondents offer water in glass bottles, a service offered by a supplier called Vivreau, to reduce the use of plastic water bottles.

List of suppliers

For the 9% of respondents that outsource waste management to external service providers the main suppliers are Wasteplan, Wasteman, Kool Waste, independent companies and municipality. The loss of metal cutlery because it falls into or is mixed in with trash is a huge concern (25% of respondents).

Packaging

Packaging cost

Only 16% of respondents answered the question on the contribution of packaging cost to total cost. The packaging cost ranges between1–2% and 5–8%.

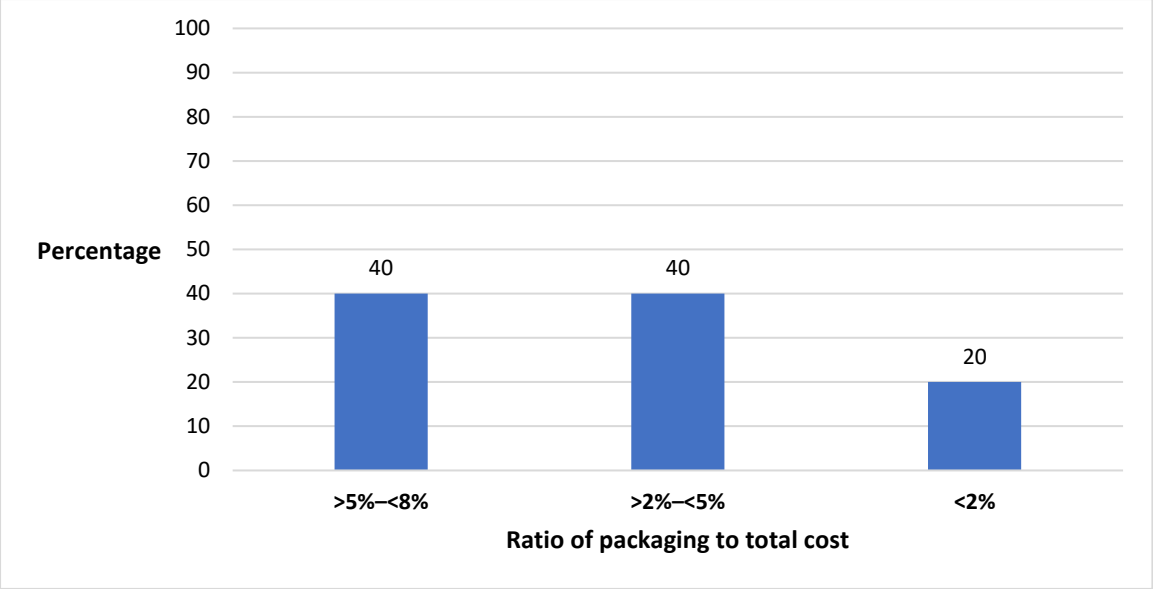

Figure 3: Ratio of packaging to total cost

An understanding of the contribution of packaging cost to total cost will assist with an analysis of the willingness to pay for alternative packaging and development of the business case. The identification of a passionate champion to lead a campaign or a pilot is found to be essential for the successful implementation of plastic reduction initiatives. Often the role for implementing sustainability practices is allocated to someone other than the procurement manager, owner or manager. The categorisation of packaging assists with understanding the purposes for which plastic is used in food and beverage packaging.

Procurement of packaging materials

The decision on type, volume and frequency of procurement of packaging material rests with a range of individuals within the business. Almost half of respondents (47%) indicated who the main decision maker was for procurement of packaging materials. Figure 4 shows that in 50% of the businesses surveyed, the decision is made by the procurement manager, followed by owners (40%) and general managers (10%). This may confirm that any plastic reduction initiative needs buy-in from the procurement managers and owners.

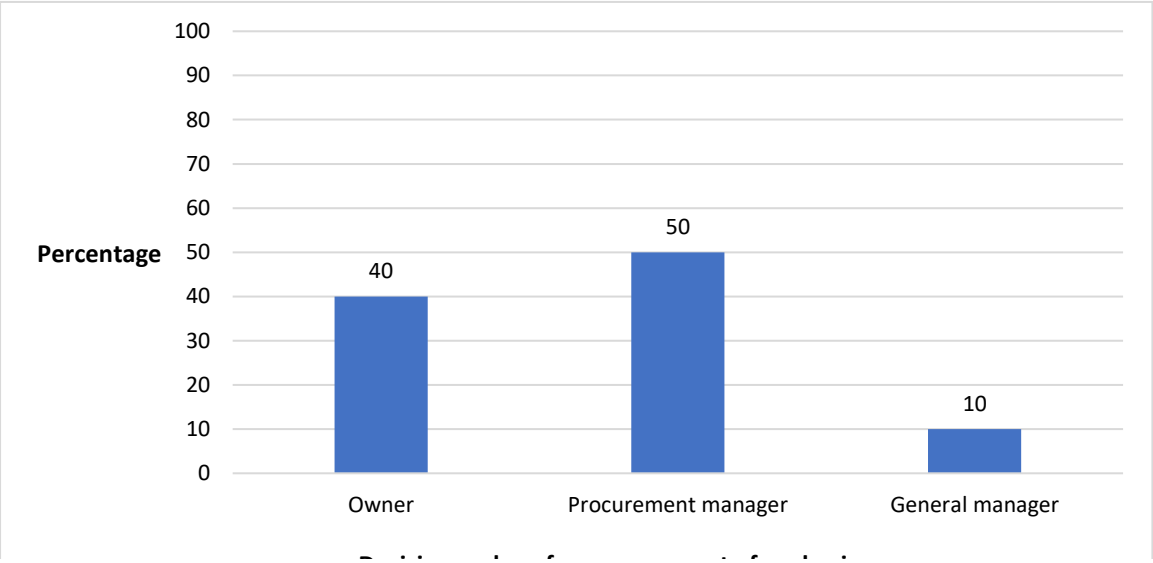

Figure 4: Decision maker for procurement of packaging material

Suppliers of alternatives to traditional packaging materials and plastic
The availability of suppliers that offer a wide range of products at affordable prices is essential for the introduction of new products. As the products and often the suppliers do not have long track records, credibility is often an issue. Using word-of-mouth recommendations is often the best way to confirm reliability of suppliers. The main suppliers of alternative packaging material are GreenHome, Hanco, Vivreau for recycled glass bottles, Eco Pack, Cape Cup, Just Island and Sprint packaging. Most of the products sold by these suppliers are produced in China with little or no products produced in South Africa. This is potentially an area for future investigation for restaurant owners and food service outlets that source locally. It may also be an area for future enterprise development. Single-use plastics include honey, salt and pepper sachets as well as other condiments in the hotels and a few of the restaurants interviewed.

Plastics
South African legislation does to some extent incentivise consumer behavioural change to reduce, reuse or recycle plastic bags with the introduction of the plastic bag levy in 2004.

The following figure shows that a relatively large percentage of respondents (58%) use plastic bags, takeaway cups and lids, takeaway containers, plastic cling wrap and water bottles, with 63% using straws.

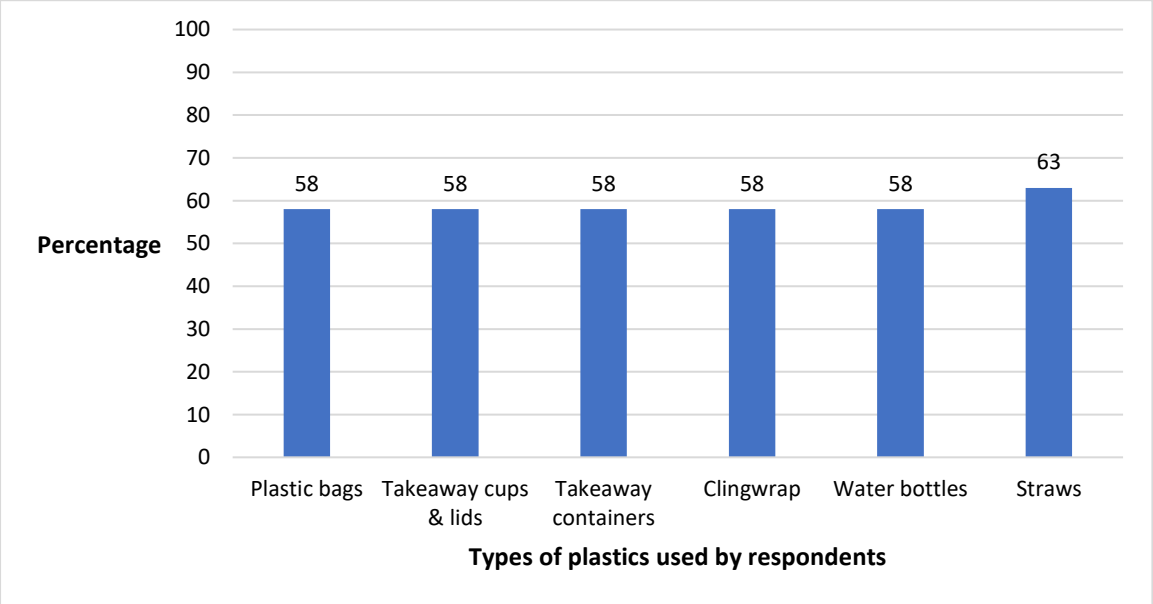

Figure 5: Types of plastic used by respondents

Willingness to pay for alternatives to plastic packaging
Respondents were introduced to the question on willingness to pay by explaining WWF SA's interest in plastic use, reuse and recycling to reduce plastic debris in marine environment and their interest in working with companies that would support this vision.

Understanding the willingness to pay factor provides information on the value attached to the environmental attribute of plastic packaging material. Straws and lids for takeaway coffee cups were selected, as the former is the focus of the pilot and the latter is the product most often used in restaurants that offer patrons a takeaway option. Respondents were provided with price ranges namely 0–5%, 5–10%, 10–15% and more than 15%.

This is not, however, a true reflection because, as mentioned by several participants, the shift from a coffee lid that costs R0.50 to a compostable lid that costs R0.80 seems perceivably more viable for them than to shift from a takeaway container that costs R0.71 to one that costs R1.70. Therefore, the higher the price of the non-biodegradable product the less the willingness to pay for the alternative. Interestingly Cape Cup, Ecopack and Greenhome do not offer biodegradable straw alternatives on their pricelists. The current cost for biodegradable straws is about 8% higher than the traditional product.

Table 3: Common restaurant single-use packaging alternatives priced per unit

Common restaurant packaging alternative	Supplier	Price p/unit
Straw	Cape Cup	R0.44
Coffee cup	Cape Cup	Single wall: R0.80 (250ml), R1.50 (350ml) Double wall: R1.25 (250ml), R1.70 (350ml)
	Green Home	Single wall: R0.81 (250ml), R1.11 (350ml) Double wall: R1.30 (250ml), R1.72 (350ml)
	Ecopack	Single wall: R1.03 (250ml), R1.28 (350ml) Double wall: R1.40 (250ml), R1.74 (350ml)
Coffee lid	Cape Cup	R0.53 (250ml), R0.61 (350ml)
	Green Home	R0.82 (250ml), R0.88 (350ml)
	Ecopack	R0.80 (250ml), R0.85 (350ml)
Hamburger box	Cape Cup	Tub R1.20, lid R1.25 (350ml)
	Green Home	R3.53
	Ecopack	R1.97
Double compartment takeaway box	Cape Cup	Tub R1.40, lid R1.25 (500ml)
	Green Home	R2.93
	Ecopack	R2.98
Knife	Cape Cup	R0.70
	Green Home	R0.91
	Ecopack	R0.83
Fork	Cape Cup	R0.76
	Green Home	R0.91
	Ecopack	R0.83
Spoon	Cape Cup	R0.79
	Green Home	R0.91
	Ecopack	R0.83
Smoothie cup	Cape Cup	R1.40 (250ml), R1.70 (350ml), R1.90 (500ml)
	Green Home	R1.58 (265ml), R2.16 (350ml), R2.91 (500ml)
	Ecopack	R0.67 (200ml), R1.42 (360ml), R1.69 (500ml)
Smoothie lid	Cape Cup	R0.77
	Green Home	Flat lid R0.52 (265ml), Dome lid R0.78 (350ml), Dome lid R0.85 (500ml)
	Ecopack	R0.59 (200ml), R0.69 (360ml), R0.69 (500ml)

Most respondents (58%) answered both willingness to pay questions. Reasons for non-response included that respondents were unwilling to disclose that kind of information.

A limitation of this question is that it did not allow the respondent to first respond yes or no to their willingness to pay before proceeding to indicate the range. Notes from interviews were used to confirm which respondents answered no to this question.

Figure 6 shows the willingness to pay for straws produced from alternative material: 91% of respondents indicating they were willing to pay 0–5% more and 9% were willing to pay more than 15%; for takeaway cups, 99% were willing to pay 0–5% more and 1% were willing to pay 10–15% more. The results confirm that respondents are price sensitive to packaging cost despite it only contributing a small percentage to total cost as shown in figure 3.

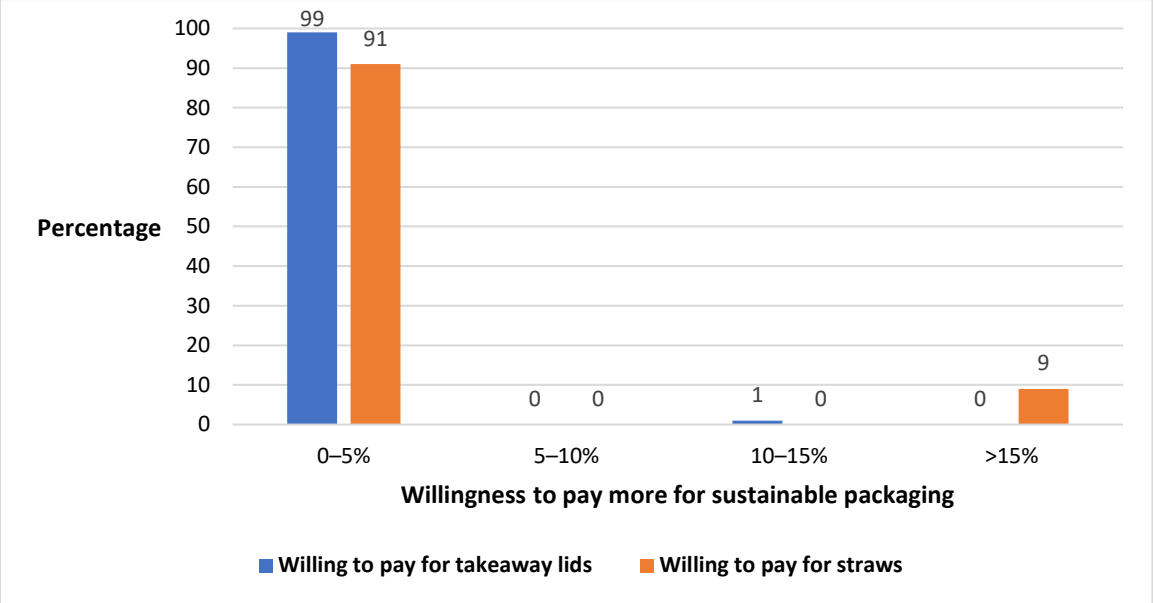

Figure 6: Willingness to pay for alternative packaging

The respondents (5%) that answered that they were not willing to pay any additional cost for alternatives to plastic packaging were also critical of packaging products that claim to be more sustainable in the absence of third party auditing and certification schemes. This criticism is important to note in communication to patrons to simplify and clarify any claims of newly introduced alternative materials that will be tested in the pilot. It is particularly critical given that an online survey in the United Kingdom with 2 046 adults (older than 18 years) confirmed that 63% of consumers interviewed said plastic is the material they are most uncertain about (RECOUP 2016).

An area of further research is to determine the scope and nature of any locally produced biodegradable packaging materials as well as any planned government support for enterprise development.

A plastic bag levy implemented in South Africa in 2004 was successful in reducing short-term plastic consumer demand. Despite the availability of substitute products and the increase in the price of the plastic bag associated with legislation, consumption rose in the long term as the size of the levy was too small relative to consumers' disposable income (Dikgang 2010). The increase in consumption of plastics, after the levy, occurred after an initial decrease in consumption of 90%. This indicates that initial results do not always give an accurate reflection of sustainable long-term results.

A more detailed review of legislation particularly relevant for the African context may be valuable to better understand and support design of policy instruments.

Conclusions

Consumer behavioural change is needed to reduce plastic debris that finds its way to the ocean. Restaurant owners and managers have the potential in their service and product offering to support this behaviour change by offering alternatives and recycling, reducing, reusing and discontinuing use of single-use plastics.
The key insights gained during this research project are outlined below.

Barriers to behavioural change

- Communication alone, whether through in-store displays or online media, is insufficient to result in behavioural change. Respondents echoed sentiments that 'consumers do not like to read' and that many customers ask questions despite answers being displayed on in-store signage. Significant consumer awareness is needed and this perhaps best done through 'nudging' activities; for example, showing consumers how it is possible to drink a smoothie without straw, using video clips and having a campaign.
- The time and cost to collate information on alternative options is a barrier to efficient implementation of waste management and the introduction of alternative plastic packaging materials. A recommendation was made to approach the City of Cape Town to provide an advisory service on implementation of efficient waste management practices and ways to reduce packaging and its costs.
- The consumer will need to pay for the additional cost of packaging material that is less harmful on environment as currently it costs more to use these materials than conventional materials. Businesses will not use the material if consumer is not willing to pay for it. When the demand increases, the supply will increase and potentially decrease prices as it moves away from being a niche product.
- Some of the recycling companies currently offering services are unreliable.

Type of support needed

- More research is needed to build an evidence base linking the threat of plastic debris to marine species to assist conservation efforts, motivate for a business case for educational campaigns and to support policy analysis to develop specific instruments.
- Larger companies with more complex supply chains wherein the procurement manager is responsible for packaging and plastic packaging materials need support to make the business case, which may involve following up with leading packaging companies to better understand their challenges and successes to offer alternatives.

The following recommendations are drawn from the findings above:

- Given the lack of studies and data empirically linking beach litter levels to socioeconomic impacts, such as on the tourism sector, it is proposed that a similar study be conducted with the hospitality and tourism sector.

- Explore collaboration with the restaurant industry and/or associated stakeholders to co-host a platform or find innovative ways to distribute learnings on alternative local packaging materials, including on the cost and functionality. Respondents cited a lack of information on alternatives as a barrier to implementation of plastic reduction initiatives.
- Follow-up research is needed on the business models of existing suppliers that offer alternative packaging materials and how best to support them to offer locally produced materials where possible.
- Given the lack of professionalism and consistency of service offering of recycling companies and the suppliers of alternative packaging materials, it is recommended that this insight be confirmed with the Green Cape Waste sector desk and that they include it in their service offering of market intelligence.
- The identification of the pilot should be based on criteria that include willingness or eagerness of owners or general managers to participate, current level of awareness of waste management in general and packaging specifically, as well as the scale of impact in terms of customer profile and ability to rollout the pilot in several stores.
- Based on the survey and suggested criteria, it is recommended that the pilot takes place at vida e caffé and one of the Harbour House Group restaurants. Restaurants and food service outlets have an opportunity to build upon the work of The Beach Co-operative and be active participants in citizen action campaigns along Cape Town's coastline to build the business case for national campaign in the restaurant and hospitality sector to reduce plastic debris that ends up in our oceans.

This study provides useful information on how informed restaurants are using packaging in general and plastics specifically, and the awareness of, knowledge and willingness to pay for alternatives. These insights may assist policymakers in designing policy instruments and conservation organisations in building business cases and designing pilot initiatives. The next phase of the project will use the findings and insights of this restaurant research together with consumer research to identify and implement the pilot.

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