Marine Waste
brand audit report
2022 - 2023

By The Pearl Protectors

Marine Waste Brand Audit 2022 – 2023

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An Initiative of The Pearl Protectors
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THE PEARL PROTECTORS

The Pearl Protectors is a volunteer-based and non-profit marine conservation organization in Sri Lanka. Established in 2018, The Pearl Protectors seek to mitigate the impacts of anthropogenic activities on the marine environment, reduce plastic pollution and promote sustainable practices through youth engagement, volunteerism, awareness and advocacy.

Projects undertaken by The Pearl Protectors over the years entail launching of the 'Pearl Protector Approved' Accredited Standardization Certificate to promote a plastic-free dining culture; the annual construction of a Christmas tree out of discarded plastic bottles to highlight single-use plastic pollution; school education programs; eco-brick workshops; coastal cleanups including the Nurdle Free Lanka Initiative; Cleaner Seabed's for Sri Lanka Underwater cleaning expedition; World Oceans Day through Art competition; and social media campaigns to inspire action towards protecting the marine environment.

The purpose of this marine waste brand audit is to highlight the largest companies and product names in Sri Lanka who are responsible for the marine waste. The report also provides viable solutions to responsible companies, government authorities and consumers. The author and the contributors of this report are volunteers.

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The Pearl Protectors

Table of Contents

Summary

The Pearl Protectors, which is a youth led marine conservation organization in Sri Lanka conducted a marine waste brand audit encompassing 16 coastal locations across the island. The purpose of the audit was to identify the major marine polluters in Sri Lanka along with the brands responsible for the larger percentage of litter. The survey was conducted in September 2022 concurrently with inter monsoonal period. 31 volunteers of The Pearl Protectors participated in the surveying process during a span of one week. Surveyed locations include selected coastlines of Western Province, Southern Province and the Eastern Province. The results of the audit pre presented in this report highlighting the need to identify the polluters/brands while providing adequate solutions to mitigate the impact caused by plastic pollution to our coastline.

Definitions

- Brand Owner - A person or an umbrella company that owns trademark license, patents, share/equity, etc. OR A person or company who sells any commodity under a registered brand label
- Product Manufacturer - A person or a registered company/unit that manufactures a product.
- Manufacturer - A person or unit or agency engaged in the production of plastic raw material to be used as raw material by the producer
- Product Name - The name in which a product is sold/marketed
- Product - A single word that describes material sold inside the packing
- Product Category - Classification based on usage of the product
- Packing - The material used for packing the product
- Single Layer - A type of packing that uses one single material for packing
- Single use Plastic – Any type of plastic that is usually used once before disposed or can only be used once prior to disposal
- TBM - Transboundary Marine Litter - waste and debris originating from another country or region which travels across the ocean ending up at a different region or country
- Multi-Layer - A type of packing that uses more than one material for packing OR Any material used or to be used for packaging and having at least one layer of plastic as the main ingredients in combination with one or more layers of materials such as paper, paper board, polymeric materials, metalized layers or aluminum foil, either in the form of a laminate or co-extruded structure
- PET - Polyethylene Terephthalate
- LDPE - Low-Density Polyethylene
- HDPE - High-Density Polyethylene
- PS - Poly Styrene
- PVC – Polyvinyl Chloride
- PP - Polyproylene
- Other Hard Plastics - Hard Polypropylene (PP) and Polyvinyl Chloride (PVC)
- NARA - National Aquatic Resources Research and Development Agency
- Study Area - The area of human interaction where waste generation takes place

Introduction

Sri Lanka has been categorized as one of the leading nations where micro plastic is found in the sea surrounding the island as well as for increasingly disposing plastic waste to the marine environment. Plastic waste which leads to the ocean through garbage dumping, flow through rivers and canals, and disposed waste from fishing and cargo vessels has increased the marine waste found in the sea surrounding Sri Lanka. Additionally, transboundary marine litter has posed a major challenge to the islands marine eco system.

Plastic waste largely single use plastic results in various challenges to marine environment. Separate to the impact caused to the marine environment, the pollution continues to impact the health of humans, impacting various economic industries ex: fishing, tourism, coastal development etc., Some of the direct and immediate impacts caused to the marine environment are as such;

- Formation of micro-plastic which are consumed mistakenly by marine life adversely affecting its health and the sustainability of the marine eco system
- Entrapping reefs, corals, seagrass meadows, mangroves, seabed resulting in restricting space for marine life to regenerate and lessening the quality of such habitats
- Drift along with ocean currents widening the areas of polluted ocean
- Pollutes coastlines resulting in unapproachable beaches hence degrading nesting sites for turtles and habitat of various crustaceans
- Consumed by larger marine life such as turtles, whales, dolphins, dugongs, etc. resulting in suffocation or incurable illnesses
- Toxify the sea with various chemicals released during the breakdown process of plastic in the ocean
- Floating and buoyant plastic waste becoming a substrate for invasive species such as parasitic barnacles to cross ocean boundaries
- Much of the plastic marine litter remains in the marine ecosystems for centuries, hindering their natural flow.

The ocean is considered as a complex ecosystem where 80% of planet's biodiversity is found (World Economic Forum, 2022). While the ocean helps regulates our climate, it

helps absorb a quarter of all the carbon dioxide that humans emit to the atmosphere (Client Earth, 2020). Approximately 70% of the oxygen generated globally originates from oceanic plankton; drifting plants, algae, and some bacteria that can photosynthesize (NOAA, 2021). Sri Lanka which has larger agricultural land receives its rain prominently through monsoonal weather patterns which are dictated in the ocean (National Geographic, 2022).

The health of the ocean is vital for an island nation's continuity and sustainability. The negative impact caused by increasing plastic waste has declined the health of the ocean while negatively impacting the socio economics of Sri Lanka. In 2020, Sri Lanka imported $611 million worth of plastic burdening the economy (Colombo page, 2022). Meanwhile packaging industry is responsible for 90% of the single use plastics around the world and in Sri Lanka (CEJ, 2019). It has already been estimated due to the increased usage and addiction of single use plastic, by 2050, there will be more plastic in the ocean than fish by weight (Washington Post, 2016). According to a survey conducted by NARA, 50% of the sea surrounding Sri Lanka is polluted due to various contaminants including plastic waste. The same survey also has revealed that 80% of the sea in the western Province is densely polluted. The Indian Ocean currently holds the record of being the second most pollute ocean with an estimated of 1.3 trillion pieces of plastic resulting due to many developing nations located at the perimeter of ocean (Clean beach initiative, 2020).

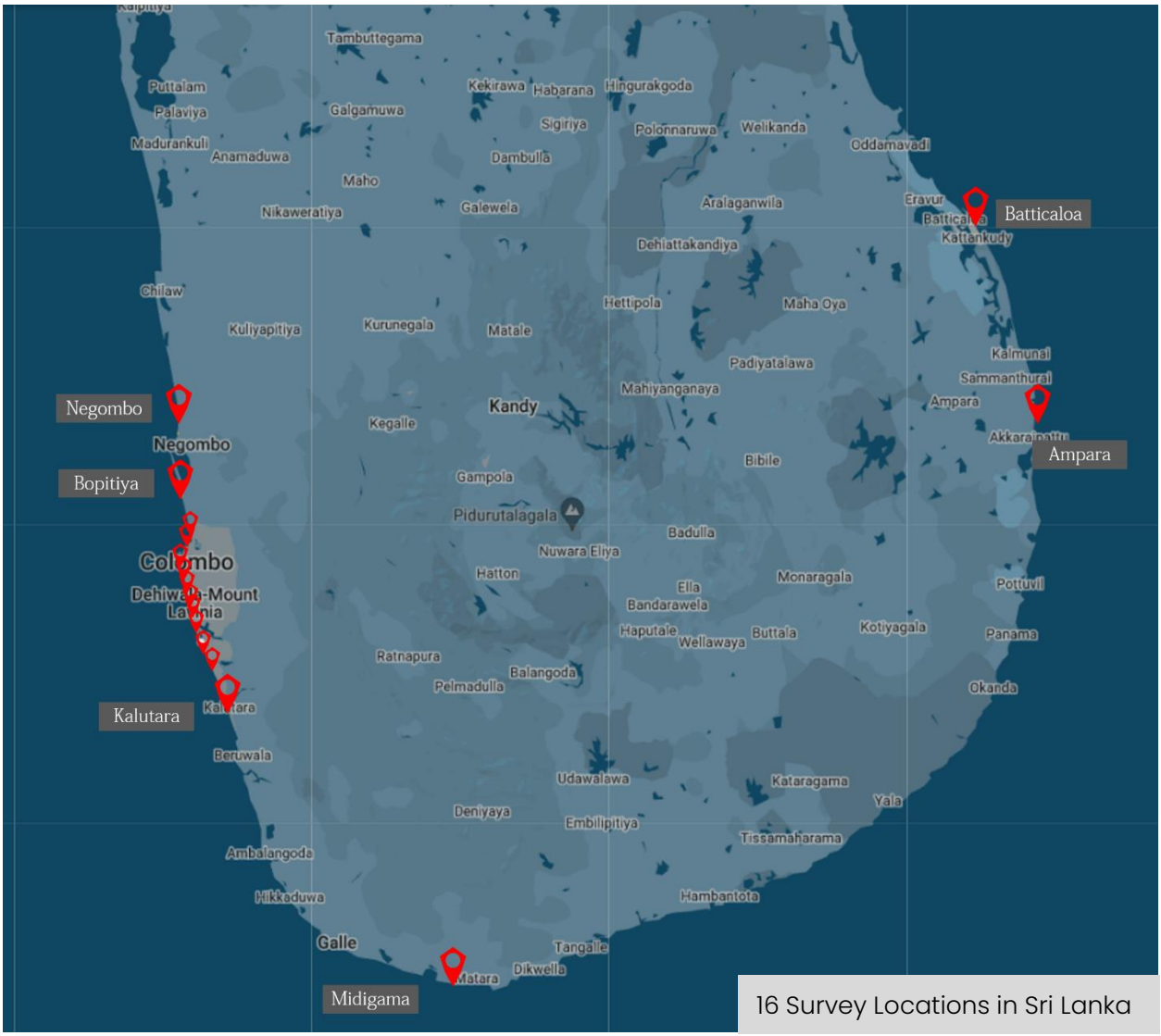
Since the pandemic, plastic usage along with plastic pollution has increased with new pollutants such as surgical face masks made of PP entering the waterways and eventually ending up in the ocean. During beach cleanups conducted throughout the past 3 years in Sri Lanka by The Pearl Protectors has identified plastic bags, food wrappers/packaging, PET bottles/lids, plastic sachets and plastic straws as being the top 5 plastic pollutants (in respective order) found in the shorelines of Sri Lanka. As food wrappers/packaging is hardly recyclable, higher the chance of breaking into micro plastic and difficult to be collected from the environment. This study identifies which manufactures/distributers and products are responsible for the carnage caused to the marine environment of Sri Lanka.

Methodology

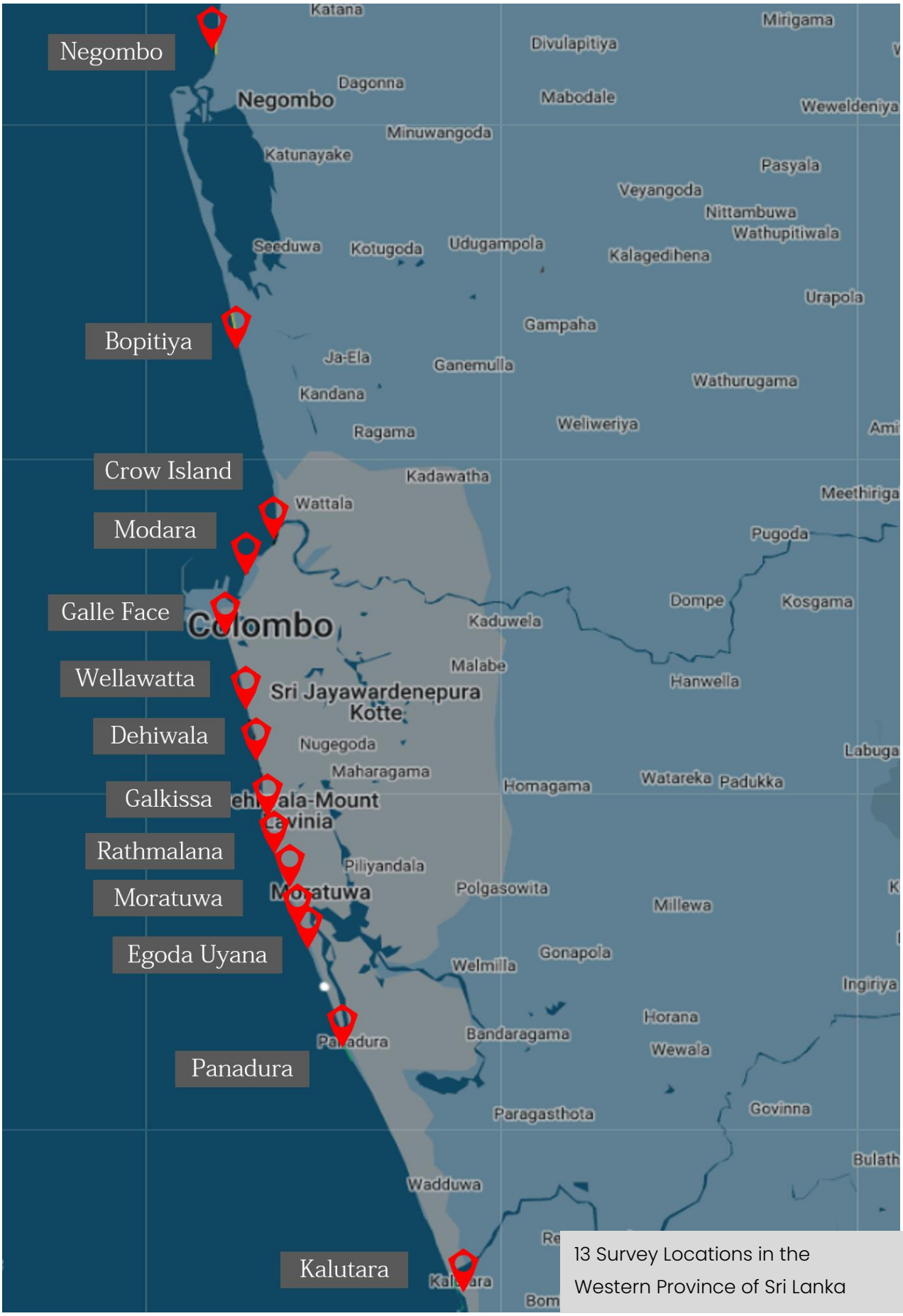
The methods adopted in marine waste brand audit are discussed in terms of time, location, survey area, volunteer teams, surveying, recording and categorization.

Locations

Following are locations of surveying mapped. The locations of Western Province are depicted separately.



16 Survey Locations in Sri Lanka



13 Survey Locations in the Western Province of Sri Lanka

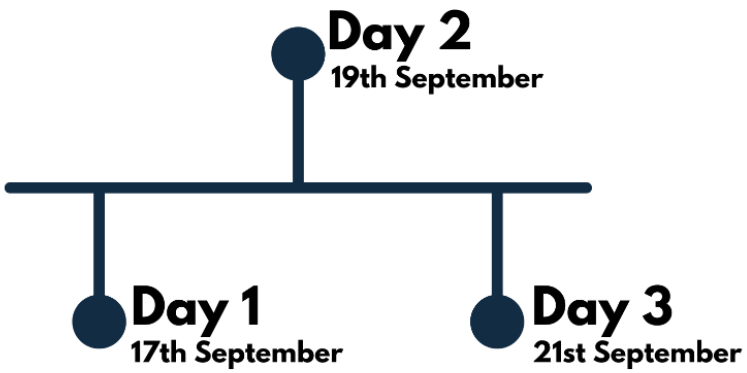
16 locations were identified for the marine waste brand audit encompassing Western, Southern and Eastern Provinces of Sri Lanka. The locations identified are considered to contain moderate to severe levels of marine litter washed up on the coast.

Locations were also determined based on ease of access, safety, and to gather data based on equally distributed locations to minimize any biases. The surveyed locations are in close proximity of urban areas.

Timeline of Survey

In the two monsoons seasons, Sri Lanka witnesses extreme weather patterns which results in rough seas, strong wind patterns, heavy rain and ocean surges. During April - October, South Western monsoons prevail while during November - February, North East monsoons along with possible hurricane weather prevails. The survey was conducted during the initiation stage of inter monsoon time frame in order to record most of the marine litter which washes up along the coast due to heavy ocean currents and strong wind.

Due to the direction of winds and ocean currents, South Western monsoons has a larger impact on the Southern and the Western Provincial coasts, hence for the audit, primary locations were identified based on the bearing of the weather impact.



Time period allocated for conducting the audit were three days. Locations were divided for the three days as follows;

Day 1 – 17th Sept 2022

- Wellawatta beach
- Galkissa beach
- Rathmalana beach
- Moratuwa beach
- Panadura beach
- Midigama beach

Day 2 – 19th Sept 2022

- Dehiwala beach
- Egoda Uyana beach
- Galle Face beach
- Bopitiya beach
- Kalutara beach

Day 3 – 21st Sept 2022

- Modara beach
- Crow Island beach park
- Negombo beach
- Akkaraipattu beach
- Batticaloa beach

Marine Waste Categorization & Auditing

The categorization and auditing process of the marine waste was based on the name of the company of which the marine litter originated from and the name of the product (brand). All surveyed waste was initially categorized under the company of origin and secondarily under the product name under each company. Additional category was included to survey transboundary marine litter which has washed up on the shorelines. Marine waste which did not carry information on either product name, or the manufacturing/distributing company was surveyed under 'Unbranded' category.

85 manufacturing/distributing companies and 188 product names which presumably accounted for marine waste, were surveyed in this audit.

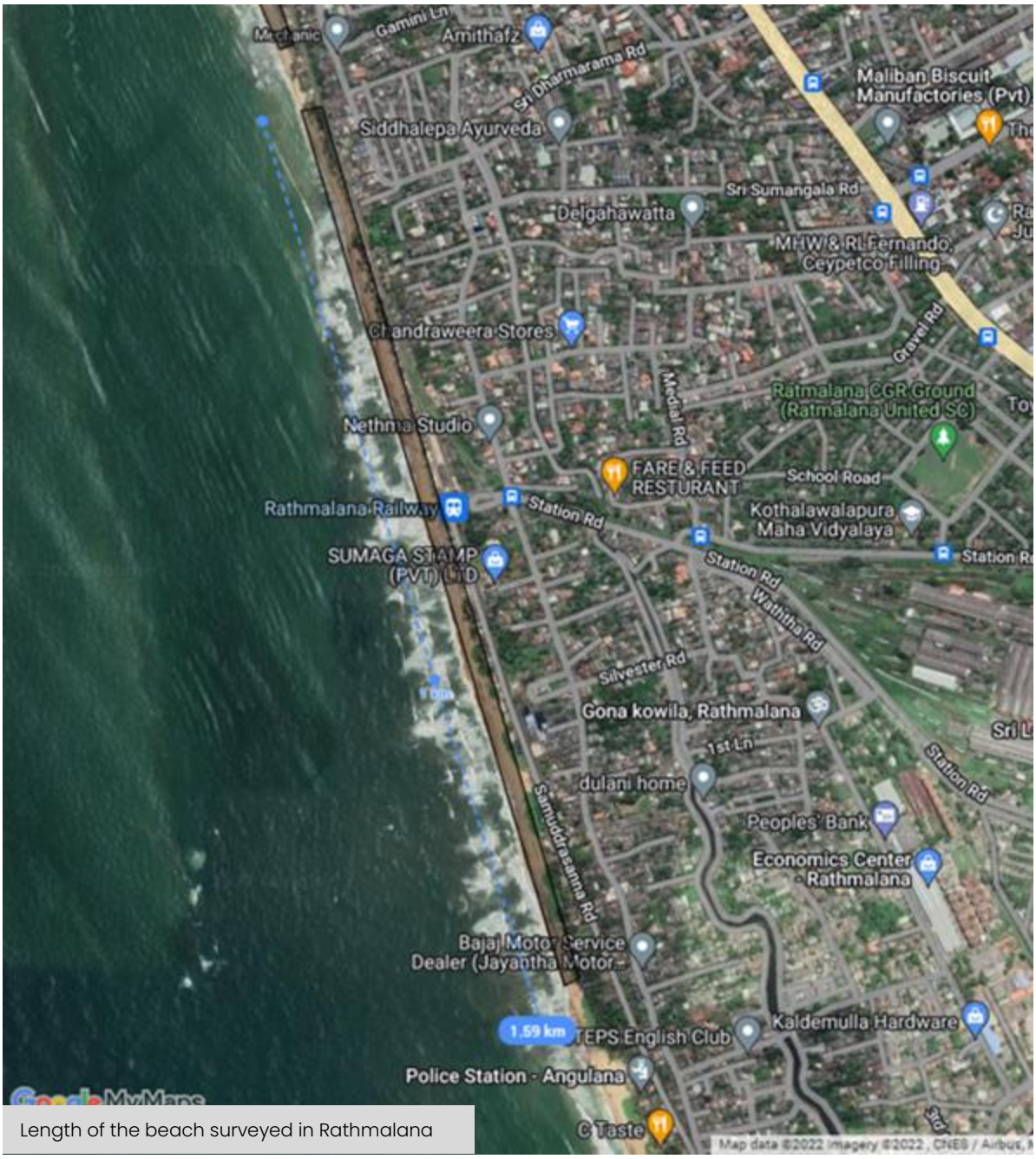
Method of Surveying

An average distance of 700m to 1km of the beach stretch at each location was selected to conduct the marine waste survey. Each location was assigned to a team of 2 to 4 volunteers who were provided with the survey data collection form. Volunteers once arrived at the location engaged in surveying the beach starting from one end to the other end of the selected beach while surveying a width of approximately 10 meters of beach from the high tide. The width was limited to only the area of sand where inland waste did not merge with waste which had washed ashore.

Each team had a designated data entering volunteer and data gatherers. The data gatherers scouted the beach based on the width as to capture all marine waste litter which had washed ashore. All waste which included; plastic waste, glass, metal which was initially produced for retail purposes by a company was surveyed. Marine waste excluded from the survey were as follows; paper, nurdles, Styrofoam, plastic cutlery, plastic straws, cigarette buds, plastic toys, plush toys, rubber product, Polypropylene, micro plastic and biodegradable waste.

Surveying in Galkissa

Surveying in Egoda Uyana



Length of the beach surveyed in Rathmalana

Team member responsible of data logging-in used tally marks to enter quantitative data as reported by the other team members. If the team encounters a new product name or manufacturer/distributer, each of them were entered to the data sheet separately. At the end of surveying, the team evaluated the data gathered prior to signing on the data sheet.

Participating Volunteers

The Pearl Protectors mobilized its Protector of the Pearl volunteers for the task of gathering data. All volunteers received extensive briefing on the process of gathering data and submission. Time schedules were shared with each team where each team was named based on marine animals unique to the location of surveying

Volunteer teams were as follows;

Team Manta	Nidarshi Sivapadam
	Abiru Dharmarathna

Team Sting Ray	Chathuri Samaraweera
	Shamila Nawarathna
	Nadia Swijtink
	Emily Berlage

Team Seal	Samudra De Silva
	Nimthara Senevirathne

Team Sea Horse	Thohara Wijenaike
	Oneli Amarasinghe
	Anupa Satharasinghe
	Praveen De Silva
	Chanuli Hettige

Team Sierra	Anitra Perera
	Sasini Ranathunge
	Chanika Samarakoon
	Evin Handapangoda

Team Olive Ridley	Rafhan Mohammed
	Jeremy Reckerman
	Tania de Silva
	Muditha Katuwawala

Team Shark	Bineth Rajapakse
	Keshan Panditharatne
	Rose Fernando

Team Star Fish	Uresha Rodrigo
	Nimesha Perera
	Anusha Vass

Team Pilot Whale	Asha Ekanayake
	Sara Buddhi

Team Blue Whale	Zeltia Fucinos Mosquera
	Francesca Lucka

Surveying in Rathmalana

Surveying in Galkissa

Surveying in Dehiwala

Surveying in Crow Island

The teams were provided a data collecting sheet which was categorized primarily into plastic packaging companies and secondarily into brands under each company. A team member was assigned to input data while the other team members surveyed. Each input was included as a tally mark for every recognizable brand litter. Once the team had completed the surveying, the data gathering sheets were submitted for evaluation. All data gathering sheets were printed and used along with a clipboard for the ease of data collection.

A total of 8057 individual waste items were surveyed from all 16 locations. The total surveyed was mainly categorized into 3 sub sections which includes; brands, unbranded and transboundary litter.

Brand waste was divided based on companies responsible of a given brand and the brand name itself. This accounted to 188 brands being surveyed under 85 companies. Several surveyed brands carried the company name as the brand name. The survey covered any waste which carried a brand name or company regardless of the type of

material used to produce the waste. This included plastic, aluminum, tetra packs, branded glass bottles and packaging made of foil.

Unbranded plastic waste was defined under the basis that the waste item doesn't carry a label indicating a company nor a brand name. These items were still visibly form of packaging or PET bottles. Unbranded waste may also have been macro plastics which may have weathered, damaged at sea, aged or broken.

Transboundary marine waste is any waste that was not originally manufactured and distributed in Sri Lanka. These types of macro waste included plastic packaging, sachets, PET bottles which originated from a foreign country or region and traveled to the shorelines of Sri Lanka through ocean currents. These types of waste could also have originated from oceanic vessels which may have discarded its waste to the ocean. All TBM waste was categorized as one entity for the purpose of comparing the composition of locally produced waste vs TBM waste.

The survey omitted collecting data of micro plastics, rubber products, toys, broken glass, medical waste, metal, paper material, plastic straws, polythene bags, general polythene material, plastic cutlery, fishing gear, styrofoam, PVC, smaller pieces of plastic which does not categorize as micro plastic but does not indicate a clear item, and biodegradable waste material. For the purpose of clarity, all surveyed unbranded waste items were excluded from the analysis.

Styrofoam used as Buoys

Trails of microplastic

Analysis

The analysis of the data collected is categorized into three areas. They are as following

- Composition of branded waste, unbranded waste and TBM waste from the surveyed data
- Identifying the top polluting companies
- Identifying the brands responsible for the larger percentage of marine waste

The report analyses the above segment based on percentiles and the results are visually depicted using appropriate graphs.

Following are companies responsible for any amount of marine waste which have been recorded in the data collection survey;

1. Access Natural Water (Pvt) Ltd
2. Alli Company (Pvt) Ltd
3. American Premium water
4. Anods Cocoa (Pvt) Ltd
5. Antler Group
6. Asiri Hospital Holdings
7. Atlas Axillia (Pvt) Ltd
8. Bairaha Farms PLC
9. Candy Delights Ltd
10. Capital Maharaja Group
11. Cargills Ceylon PLC
12. Calton Sweet House (Pvt) Ltd
13. CavinKare (Pvt) Ltd
14. Ceylon Biscuits Limited
15. Ceylon Cold Stores PLC
16. Ceylon Tobacco Company PLC
17. Chello Dairy Products (Pvt) Ltd
18. Cherish Biscuits (Pvt) Ltd
19. CIC Holdings (Pvt) Ltd
20. County Style Foods (Pvt) Ltd
21. Darley Butler & Company Ltd
22. Delmage Forsyth & Co
23. Distilleries Company of Sri Lanka PLC
24. Diamond Best Foods
25. Diana Trading Company (Pvt) Ltd
26. Dongkook Pharmaceuticals Co. Ltd
27. Edinborough Products (Pvt) Ltd
28. Edna Cocoa Products (Pvt) Ltd
29. Emami Indo Lanka (Pvt) Ltd
30. Ferrero Lanka (Pvt) Ltd <Ferrero SpA
31. Finagle Lanka (Pvt) Ltd
32. Fonterra Group Ltd
33. Freelan Enterprises (Pvt) Ltd
34. Glaxo Smith Kline PLC
35. Harischandra Mills PLC
36. Hayleys Consumer Products PLC
37. Hemas Holdings PLC
38. Hettigida Industries (Pvt) Ltd

39. International Cosmetics (Pvt) Ltd
40. Johnson and Johnson
41. Kalbe International (Pvt Ltd)
42. Kellogg Company
43. Kelani Valley Canneries Ltd
44. Lalanka Group
45. Lanka Canneries (Pvt) Ltd
46. Lanka Milk Foods (CWE) PLC
47. Lanka Spice (Pvt) Ltd
48. Link Natural Products (Pvt) Ltd
49. Lion Brewery Ceylon PLC
50. Maliban Biscuit Manufacturers (Pvt) Ltd
51. Mars Inc.
52. Maxies & Company (Pvt) Ltd
53. MDK Food Products (Pvt) Ltd
54. Milco (Pvt) Ltd
55. Mount Spring Water (Pvt) Ltd
56. Nature's Beauty Creations Ltd
57. Nelna Farm (Pvt) Ltd
58. Nestle S. A
59. Pearl Natural Water Pvt Ltd
60. Perera & Sons (Pvt) Ltd
61. PepsiCo, Inc.
62. Perfetti Van Melle
63. Population services Lanka (Pvt) Ltd
64. Prima Ceylon (Pvt) Ltd
65. Pyramid Wilmar (Pvt) Ltd
66. Radiant Confectioners (Pvt) Ltd
67. Raigam Marketing Services (Pvt) Ltd
68. Ranscrip Company (Pvt) Ltd
69. Rashika Trading (Pvt) Ltd
70. Rashmika Products Pvt Ltd
71. Rauch Fruchsafte GmbbH & Co OG
72. Reckitt Benckiser Group PLC
73. Renuka Holdings PLC
74. Richard Peiris and Company
75. Sigma Overseas Company (Pvt) Ltd
76. Sunquick Lanka (Pvt) Ltd
77. Sunrich Confectionery (Pvt) Ltd
78. Sunshine Holdings PLC
79. Swadeshi Industrial works PLC
80. The Coca-Cola Company
81. Uniliver
82. Upfield holdings B. V
83. Uswatte Confectionery Works (Pvt) Ltd
84. Wijaya Products (Pvt) Ltd
85. Wilson Sporting Goods Company

Above companies mentioned are all functioning in Sri Lanka and may or may not be under the official name used in the report. Each company is responsible of one or more brands which have been recorded as marine waste.

Categories of Surveyed Waste

Surveyed Waste	Amount
Branded Waste	6865
Unbranded	1038
Transboundary	154
Total	**8057**

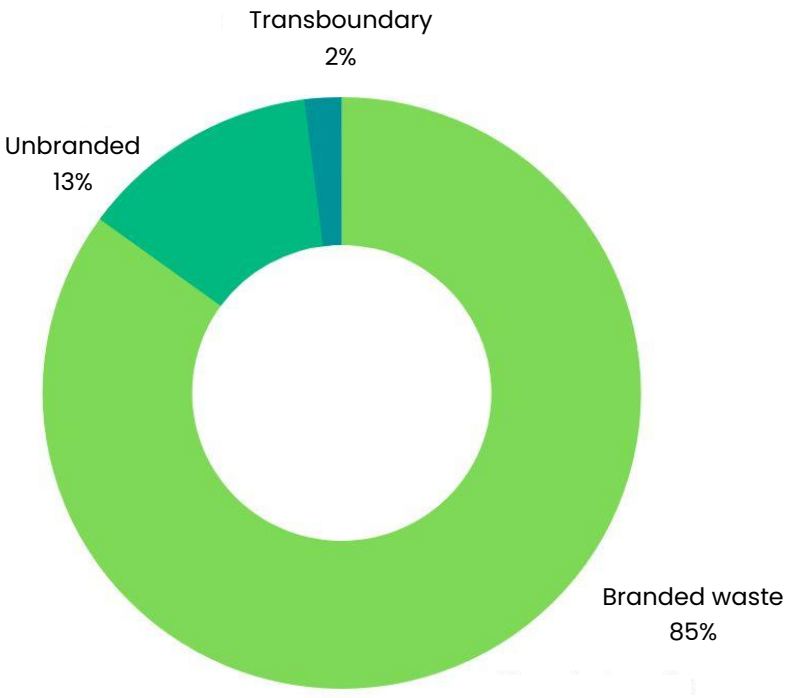


Fig.1- Categories of Marine waste surveyed

While the larger percentage of surveyed marine waste data is of locally distributed product names, 2% of the surveyed data included TBM waste. Majority of the TBM waste visibly carried labels stating manufactured/distributed regions being South Asia such as India and South East Asian regional countries such as China, Malaysia and Vietnam.

An extensive report of TBM litter and its impact on the shorelines of Sri Lanka will be published by The Pearl Protectors subsequently.

While 13% of the surveyed marine waste was unbranded, larger percentage of the unbranded waste could be sourced as TBM waste. During the process of oceanic

movement, many wastes has lost its brand labels. Several additional unbranded bottles had fishing gear attached indicating that the bottles were used as buoys for fishing nets at sea prior to washing up on the shorelines. These can be assumed both local and as TBM litter bottles.

Top Companies Responsible for Marine Waste

The analysis highlights the top 14 companies responsible for majority of marine waste. Companies which accounts for less than 2% of marine waste was categorized under 'Other'.

The top 14 companies responsible for the largest marine waste along with the percentages are as follows;

1. Uniliver (14%)
2. The Coca-Cola company (10%)
3. Ceylon Biscuits Limited (9%)
4. Nestle (7%)
5. Cargills Ceylon PLC (7%)
6. Maliban Biscuit Manufacturers Pvt Ltd (6%)
7. Perfetti Van Melle (6%)
8. Ceylon Cold Stores PLC (5%)
9. Hemas Holdings PLC (4%)
10. Prima Ceylon Pvt Ltd (4%)
11. Fonterra Cooperative Group Ltd (3%)
12. PepsiCo, Inc. (3%)
13. Lanka Milk Foods (CWE) PLC (2%)
14. Milco Pvt Ltd (2%)

All remaining 74 companies accounted for 20% of the surveyed marine waste brands. This analysis indicates how the top 6 companies are responsible for over 50% of the marine waste found in Sri Lanka. The top 14 companies are overall responsible for 80% of all branded marine waste. Almost all of the top surveyed marine waste includes plastic wrapping, PET bottles and sachets (<65ml/g)

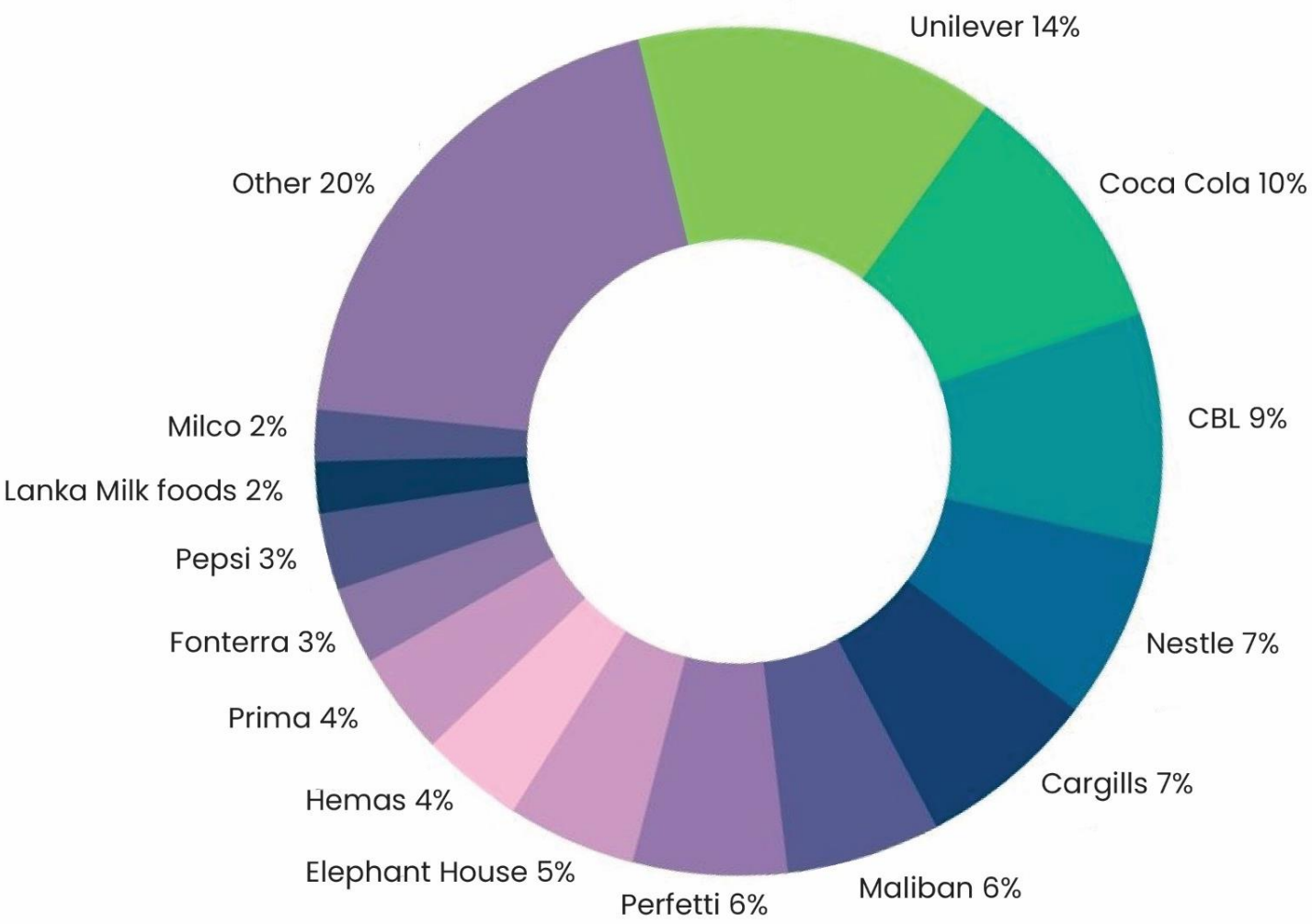


Fig. 2- Top 14 companies Vs other companies

An analysis was also conducted to identify the marine waste percentile of the top 14 companies only. This was analyzed to provide a clear indication of the top 14 companies responsible for the 80% of all branded marine waste surveyed

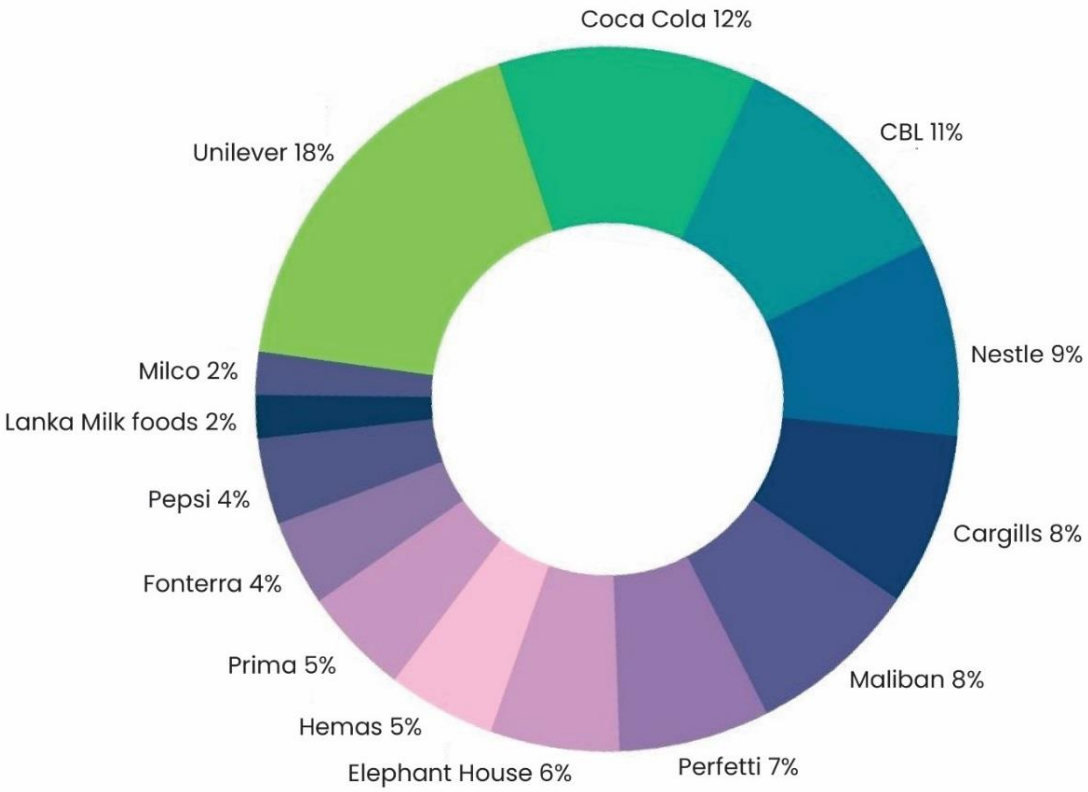


Fig.3- Top 14 marine waste producing companies

Top Brands Responsible for Marine Waste

The analysis highlights the top 18 product names (brands) responsible for the largest percentage of marine waste in Sri Lanka. 53% of all marine waste has been credited to one of the top 18 product names.

The top 18 product names responsible for the largest marine waste along with the surveyed percentage are as follows;

1. Center Fresh - Perfetti Van Melle Lanka (Pvt) Ltd (5%)
2. Munchee - Ceylon Biscuits Limited (5%)
3. Maliban - Maliban Biscuit Manufacturers (Pvt) Ltd (5%)
4. Sunlight – Uniliver Sri Lanka (4%)
5. Sprite - Coca Cola Beverages Sri Lanka Ltd (4%)
6. Prima Kottumee - Prima Ceylon (Pvt) Ltd (4%)
7. Coca-Cola - Coca Cola Beverages Sri Lanka Ltd (3%)
8. Diva - Hemas Holdings PLC (3%)

9. Nestomalt - Nestle Lanka PLC (3%)
10. Magic – Cargills Ceylon PLC (3%)
11. Kothmale – Cargills Ceylon PLC (2%)
12. Milo – Nestle Lanka PLC (2%)
13. Surf Excel – Uniliver Sri Lanka (2%)
14. Anchor – Fonterra Brands Lanka (2%)
15. Signal – Uniliver Sri Lanka (2%)
16. Vim – Uniliver Sri Lanka (2%)
17. Ritzbury – Ceylon Biscuits Limited (2%)
18. Highland - Milco (Pvt) Ltd (1%)

All remaining 170 product names accounted for 47% of the surveyed marine waste brands. This indicates how the top 16 product names are responsible for 50% of the marine waste found in Sri Lanka.

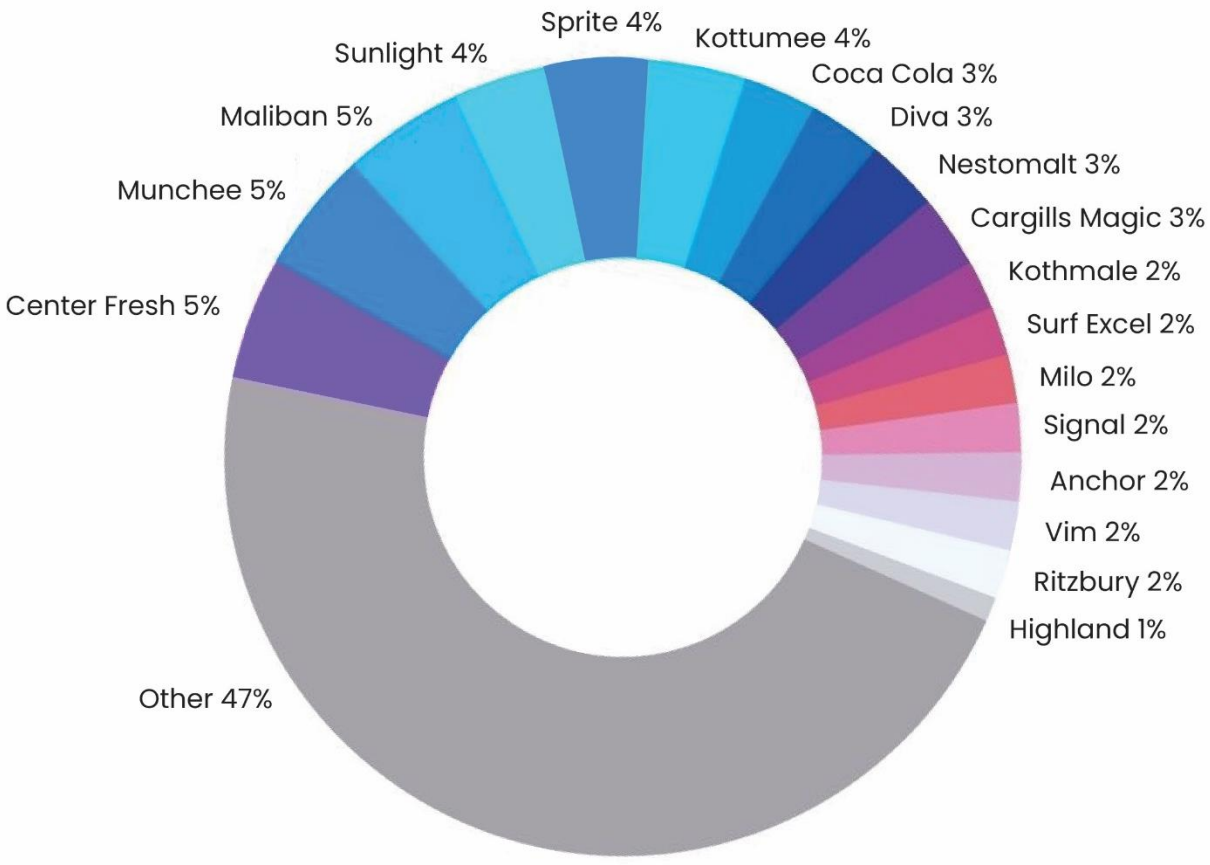


Fig.4- Top 18 Brands Vs other brands

An analysis was also conducted to identify the marine waste percentile of the top 18 product names only. This was analyzed to provide a clear indication of the top 18 product names are responsible for the 53% of all branded marine waste surveyed

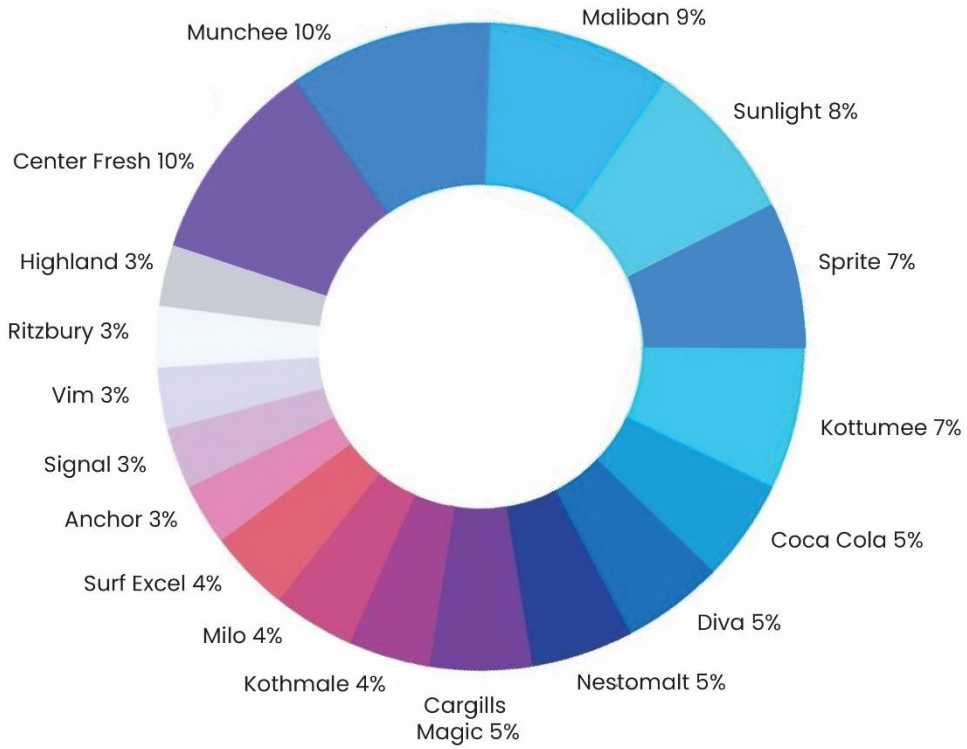


Fig.5- Top 18 marine waste producing brands

Characteristics of Unbranded Waste

13% of all surveyed marine waste was categorized as 'unbranded' due to lack of visible label to identify the Product name or the company name. Based on visual characteristics, many PET bottles had a distinct linkage to few of the top PET bottle manufacturing companies mentioned in the analysis.

Characteristics of unbranded marine waste are as following;

- No visible label indicating product name or company
- Label being damaged beyond recognition
- Torn, broken, damaged marine waste where the label is unrecognizable
- Products which definitely had a label indicating product name at some point

Following are some images indicating unbranded marine waste

Discussion

The marine waste brand audit was conducted by The Pearl Protectors to highlight the largest marine polluters in Sri Lanka after the COVID pandemic. Plastic pollution has significantly increased due to undue advantages taken by many companies responsible for the marine waste during an economic turmoil in the island. Some of the visible advantages adapted includes;

- Reducing the size of packaging to maintain a competitive price which results in increased amounts of marine waste
- Undermining producer responsibility towards the generated marine waste and disregarding collection back strategies
- Reducing the quality of packaging which results in the inability of adequate waste management and many plastic wastes breaking into microplastics

Pollution is also increasing due to several factors of government failure. These failures can be categorized as following;

- Lack of efficient strategy towards management of waste
- Inability to hold polluting companies accountable through effective policies and enforcement
- Lack of resources to collect, segregate, repurpose marine and general waste
- Lack of cohesion between responsible authorities, agencies and implementation bodies

Several site surveys conducted separate to the marine waste survey shows that an estimated 10% - 15% reduction in waste washed out to the ocean through canals in Colombo District through waste strainers. These strainers positioned in several of the polluted canals have trapped floating waste reaching the ocean. Although this has not successfully stopped the movement of buoyant and bottom waste. Meanwhile the pollution washing out from the major rivers has remained the same or have increased. Various macro plastic and other waste material along with chemicals and biodegradable waste enters the ocean.

Government policy to ban sachets which are less than 20ml/g and which contains non edibles substance has significantly reduced pollution caused by such harmful plastic

materials. Although many sachets between 20ml/g and 65ml/g were surveyed. Nevertheless, sachets containing edible material such as sweets, ketchup, biscuits, and detergent were found overwhelmingly during the survey conducted.

The marine waste brand audit was also conducted in celebrating International Coastal Cleanup week in September to create awareness on plastic and marine pollution amongst Sri Lankans. The lack of knowledge and awareness has resulted in many citizens opting for increased amounts of plastic and wasteful material which leads to poor individual and household waste management. Through this report, consumers are provided the opportunity to identify the largest polluters and to opt for eco-conscious and responsible consumer habits.

The Pearl Protectors also provided volunteer opportunity for some of the most passionate and ocean minded individuals. The surveying process provided extensive technical knowledge for young volunteers on data gathering and surveying. The survey also provided the opportunity to visit many of the polluted shorelines to understand the severity of marine pollution while allowing volunteers to excel in traits and skills such as teamwork, leadership, situational awareness, communication and coordination.

Surveying in Negombo

Surveying in Galle Face

Surveying in Crow Island

Surveying in Kaluthara

Surveying in Egoda Uyana

Surveying in Crow Island

Transboundary Marine Litter Overview

The positioning of Sri Lanka in the Indian Ocean allows many marine waste floating in the Indian Ocean to wash up on the shorelines of Sri Lanka. Transboundary marine waste originates from other regions and countries of the world and travels through ocean currents and weather patterns to reach a foreign destination. During the process, Transboundary marine waste could impact marine habitats by;

- Trapping marine life
- Acts as a carrier for invasive species which has a negative impact on native species
- Due to weathering, breaks into microplastics
- Settles in underwater marine habitats forbidding marine life of its habitat
- Adds to the marine litter found in another region other than the original
- Difficulty in removing and recycling due to extensive weathering
- Remains in the environment without biodegrading

Transboundary marine can be located all across the shorelines of Sri Lanka with an extensive number of TBM waste found originating from India, South East Asia and China.

The Pearl Protectors will be publishing an extensive citizen scientist led report on Transboundary marine litter in due course.

TBM litter from Korea

TBM litter from Italy

TBM litter from China

TBM litter from India

Challenges Faced During Surveying

Suring the surveying and analysis process, several challenges were highlighted. Following are areas of challenges;

A day prior to the surveying of a location, a company responsible for marine waste had removed most of its waste from the given shorelines as seen in the images below. This may have had an impact on the analyzed data depending on the amount of waste owning to the company which was removed. While we believe it is important to be responsible for the waste generated by each of the companies, we hope the companies will sustain the collection back or removal of waste rather than being a one-time removal.

Certain surveyed locations contained very large number of wastes which have had overlapped beneath the sand or smaller items of waste not being visible, resulting in the inability of registering the waste. This challenge occurred in locations such as Modara, Moratuwa and Crow Island where significant pollution is present.

Ascertaining the correct company name with which product name is affiliated too was a challenge due to certain companies not visibly publicizing its brands for consumers.

The challenge was overcome to a larger extent through in-depth research and data gathering for all sources.

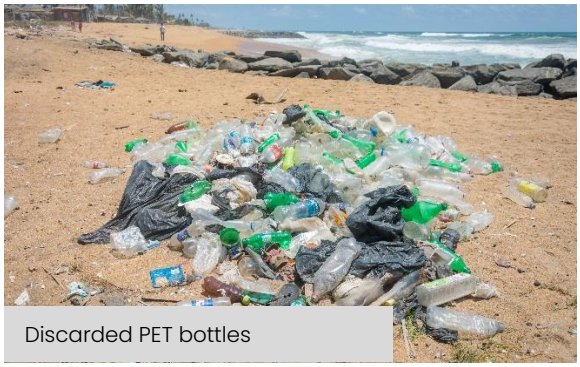
Delegation of volunteers to inaccessible or unsafe locations was a challenge which was overcome by highlighting safety precautions and reallocating to safer locations of surveying. Parallelly, volunteers not participating after signing-up for the surveying was another challenge which was resolved through passionate volunteers taking up multiple survey locations.

Marine waste collected prior to surveying

Marine pollution in Crow Island

Marine pollution in Moratuwa

Sachets of less than 60ml/g



Discarded PET bottles

Conclusion

Sri Lanka is listed globally as a top marine polluting nation with significant number of pollutants released into the ocean. Due to the lack of efficient waste management strategies, various types of waste enter the environment such as the ocean, wetlands, lagoons, forests, and parks. The report has highlighted key polluters responsible for the ever-increasing marine pollution and the goal of the report is to both create awareness and understanding of the polluters while urging the polluters to take immediate and urgent action to take responsibility for its own product waste.

Companies can proactively be responsible for the waste by delving into alternatives to packaging such as bulk packaging, plastic free packaging, reusable glass bottle usage, use of aluminum which has a high value for recycling collection, withdraw from using mixed plastic packaging (resin code 7) which instead use easy to recycle packaging, use of paper packaging, and the use of vending machines. Although proactive solutions can be difficult to implement during an economic crisis, the long-term impact both on the company and the brand will remain to be positive.

Companies responsible for the pollution can implement reactive measures to curb the product waste. Many companies, including many of the top companies mentioned in the report are engaged in 'greenwashing' campaigns to deceive the public through 'green initiative' or 'sustainable' product campaigns which is merely a marketing strategy rather that providing solutions to the ever increasing waste to the marine environment.. Conducting spontaneous beach cleanups or establishing branded waste collection points has failed to provide solutions to the key challenges of pollution. These strategies cannot be considered reactive, rather, these strategies can be considered a 'scam' considered the funds allocated for such 'greenwashing' campaigns compared to the profit generated.

Companies must invest beyond 'voluntarily' agreeing to extended producer responsibility (EPR) and towards 'mandatory' waste collection back strategies through incentivizing, universal collection and safe disposal methods. Companies responsible for larger percentage of marine waste can initiate zero waste goals to achieve social and environmental rewards by setting achievable timeframes and genuinely pursuing

towards achieving the goals. Through these methods, companies can actively engage in boosting Sri Lanka's circular economy.

Although Sri Lanka's recycling and waste management capacity has increased during the past decade, the increase amounts of waste disposed and mismanaged has not effectively been addressed. Companies have reduced sizes of packaging such as PET bottles available at 200ml, increase production of sachets, downgrading the size of snack/biscuit packaging resulting in waste collection becoming a severe challenge.

Companies can initiate simple solutions to increase awareness amongst the citizens by avoiding of advertising plastic bottles, advertising reminding consumers to dispose product waste responsibly, investing in river/canal strainers, investing in long term environmental cleanups which is not used for marketing, highlighting the concepts of reusing, reducing and recycling along with products while actively engaging in supporting the consumer to apply these concepts.

The government of Sri Lanka has a key role in mitigating marine waste and supporting companies to adapt genuine and sustainable practices. Through effectively regulating and monitoring the bottom sizes for packaging such as sachets and PET bottles, the number waste generated can be reduced significantly.

By ensuring the quality of the materials used for packaging, waste collection and the risk of plastic waste breaking down to microplastic can be mitigated.

The government through its mandated agencies and authorities must facilitate waste collection, waste recycling while providing adequate resources. Many municipal councils have failed to allocate resources in removing marine waste due to conflicts in jurisdictions and since shorelines don't fall under their purview. Mandated authorities such as Central Environmental Authority, Consumer Affairs Authority, Coast Conservation Departments, District Secretariats, Municipal Councils, Marine Environment Protection Authority, Ministry of Fisheries, Department of National Planning, Ministry of Finance and Department of Forest Conservation must be responsible for cohesively implementing action strategies towards to curb our marine environment from being destroyed due to the marine waste generated by self-interested companies.

Annex - Brand Audit Data Results

Company	Brand	Total
Cargills	Kothmale	161
	Magic	185
	Kist	79
	Goldi	2
	Sugar	18
	Crescent	1
	Knuckles	3
	KFC	6
Elephant House	EGB	77
	Bottled Water	53
	KIK	4
	Cream Soda	20
	Lemonade	4
	Soda	28
	Necto	26
	Orange Crush	17
	Ice Cream	65
	Fit O	26
	Twistee	2
	Keells	11
Maliban	Biscuits	347
	Milk	60
	Yahaposha	8
	Coconut Powder	2
	Malt	2
	Little Lion	19
	Tea	6
CBL	Munchee	364
	Lanka Soy	55
	Sera	5
	Oreo	1
	Nutriline	3
	Samaposha	63
	Tiarra	36
	Ritzbury	106
Coca Cola	Coca Cola	201
	Sprite	272
	Lion GB	32
	Minute Maid	0
	Kinley	87
	Dasani	1
	Fanta	61
	Portello	22
Pepsi	Pepsi	55
	Mirinda	28
	Mountain Dew	12
	Ole	16
	7Up	37
Uniliver	Surf Excel	144
	Lifebuoy	63
	Lipton	22
	Signal	117
	Sunlight	309

Unilever	Close up	2
	Sunsilk	59
	Lux	13
	Vim	110
	Comfort	28
	Knorr	30
	Horlicks	3
	Viva	17
	Vaseline	2
	Rin	4
	Pears	21
	Ponds	1
	Clear	6
	Marmite	5
	Dove	5
Emami Indo Lanka (Pvt) Ltd	Fair & Handsome	7
Nestle	Milo	155
	Nescafe	47
	Nestea	1
	Maggi	92
	Kit Kat	1
	Nestomalt	190
	Nespray	28
Prima	Kottumee	256
	Chicken	2
	Yoghurt	9
Smak	Juice bottle	45
	Bite pack	16
Uswatte	TipiTip	81
	Biscuit	3
Kalbe International	Diabetasol	2
MD	Juice Bottle	9
	Ketchup	11
Scan	Water Bottle	3
	Jumbo peanuts	35
American	Water Bottle	32
Aquafina -Pepsi	Water Bottle	98
Arpico	Food packaging	20
Flora	Sanex	0
	Napkins	5
Fonterra	Anchor	126
	Ratthi	66
Link	Samahan	13
	Kesha	1
	Sudantha	12
Hemas	Diva	194
	Clogard	42
	Velvet	4
	Dandex	22
	Baby Cheramy	23
	Morrison	1
	Fems	9
	Pro Gel	3
Hayleys	Head & Shoulder	1
	Vicks	8
	Pampers	35

Reckitt	Detol	10
Milco	Highland	103
Diana	Diana	42
Renuka	Rich Life	62
	Mr Pop	35
	Milk Powder	3
Cherish	Cherish	33
Lanka Milk Foods	Ambewela	39
	Daily	68
Siddhalepa	Siddhalepa	12
Perfetti	Center Fresh	381
Edinborough	Ketchup	34
Edna	Edna	1
Eva	Eva	26
Upfield	Astra	29
	Flora	3
Nelna	Nelna	2
DCSL	Arrack	11
Lalanka	Lalanka	2
Wijaya	Wijaya	48
Raigam	Raigam	25
Ceylon Tobacco Company	Dunhill	5
	Bristol	19
	Gold Leaf	32
Capital Maharajah	Capital Maharajah	1
E.B Creasy (Darley Butler)	Denta	1
	BIC Razor	6
	Lion Beer	57
Lion Brewery Ceylon Limited	Ryders Wild Apple	9
	Carlsberg	9
Pure Dale	Pure Dale	11
Candy Delights	Hacks	29
Nature's Beauty Creations	Nature Secret	8
Sigma Overseas	My Orange	2
Sunshine Holdings	Daintee	18
	Watawala	68
P&S	P&S	4
CIC	CIC	30
Matara Freelan	Spice	4
KVC	KVC	1
MDK	MDK	8
Pyramid Wilmar	Fortune	4
Chello	Chello	3
Diamond	Diamond	1
Wilson Tennis	Wilson Tennis	6
Harischandra	Harischandra	8
Mc Curry	Spices	1
Indica	Indica	1
Ranscrips	Ranscrips	6
Meadowland	Meadowland	1
Ferrero	Tic Tac	9
Swadeshi	Kohomba	4
	Rani	0
Delmage	Delmage	1
Rauch	Red Bull	9
Access	Water Bottle	2

Mount Spring	Water Bottle	2
Asiri	Asiri	2
Pearl	Water Bottle	1
Kellogg's	Corn Flakes	1
Rashika	Biscuit	8
	Kottu Noodles	3
Rasmika	Biscuit	3
Maxies	Chicken	2
Sunquick Lanka	Sunquick Lanka	2
Carlton Negombo	Carlton Negombo	3
Johnson and Johnson	Baby Powder/Cream	2
Sunrich	Biscuit	1
Mars	Snickers	5
	Mars Chocolate	6
Alli	Alli	1
Bairaha Foods	Bairaha Foods	5
Finagle	Finagle	30
Preethi	Condoms	10
Sathuta	Condoms	14
Atlas	Pen	22
Britol	Britol	3
Glaxo Smith Kline	Panadol	18
Magna	Magna	16
Unbranded		1038
Transboundary		154
Total		8057