

Killing Two Birds with One Stone- With Ocean Plastics Waste Technology

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Abstract: According to the study conducted by the Public Library of Science Journal there are more than 5 trillion pieces of plastics floating in the world's oceans. It is estimated that there would be more plastics than the fishes by 2050. Micro plastics, the degraded components of plastics harm both the marine biodiversity and the other dependants. The growing awareness of clean ocean movement attracted a number of business entrepreneurs and the MNC's to take up sustainable projects in which marine plastic wastes and debris converted in to useful households and fashion stuffs useful green packaging. Dell, Adidas are some of such prominent MNC's who have created variety of fashion stuffs from ocean plastic wastes. From this perspective this study analyses the various innovative practices in effective harnessing of ocean green wastes for packaging process. The main objective of this paper is to identify the innovative practices adopted by the business entrepreneurs and the MNC's in ocean plastic waste recycling for the sustainable development. The scope of the study is restricted to the green packaging and manufacturing different use stuffs with useless waste by different national and international organizations based in Bangalore, Karnataka.

Keywords: Ocean plastic technology, Green packaging, Biodiversity, Sustainable development.

1. Introduction:

Ocean plastic is a global environmental concern as it's micro-fracturing and the subsequent harmful particles have effect on sea life. Approximately 80% of the ocean plastic starts its journey on land with resultant detrimental effects in drainage areas, river in environments and estuaries along the way.

Recent research estimates that an average of 10 million metric tons of plastic materials enter the worlds' oceans annually and it also is estimated that if current trends continue there will be more plastic than fish in the ocean by 2050.

Disposal of plastic now uses nearly 14% of all the world's oil and gas. Plastic production is expected to grow 205 by 2050 by which time the industry's climate emissions could rise to 2.75bn tonnes a year and plastic could be driving half of all oil demand growth.

According to the International Energy Agency, Plastic, could take up to 15% of the remaining annual carbon budget and make the fast-growing industry the equivalent of the world's fifth largest climate heating country, emitting more than Germany or the UK, twice as much as all African countries and nearly as much as shipping and aviation combined.

Despite UN hand-wringing and corporate pledges, demand for plastics grew a further 3.5% in 2019 and up to 16% in much of Asia. Latest figures suggest 359 m tonnes were produced in 2018. Nearly one-third went to single-use packaging and less than 10% was recycled. The rest went to landfills, was burned in incinerators adding to emissions and increasing air pollution, or was left uncollected, with approximately 8m tons making its way to the sea via rivers.

But 2019 was also the year the worldwide revolt against plastic pollution translated into political and corporate action; Great steps were taken by the public to clean up beaches and seas but an event shocked the public in Britain when a whale was found on a Scottish beach, whose stomach was filled with . 100kg ball of plastic rope, fishing nets, cups, shopping bags, gloves, packing straps, tubing, sachets, bottles and all the waste of the global consumer society. Such beaching were common in 2019, with plastic-filled whales and cetaceans washed up in Wales, the Philippines, Indonesia, Italy and the US.

Flustered at the sight of choked animals and soiled coastlines, the packaging industry was forced to respond. Food and drink firms including Unilever, Mars, Danone, Pepsico and Coca-Cola pledged to reduce the amount of virgin plastic they used by 2025 and to increase the amount of recycled plastic. The global commitment on plastic, introduced in late 2018 to get corporations to pledge to use less and recycle more.

Waitrose had removed 90% of the 2,291 tonnes of black plastic. Some initiatives were eye-catching: Tesco pledged to remove 1bn pieces of plastic from products for sale in UK stores by the end of 2020.

Greenpeace and the Environment Investigations Agency showed that more plastic than ever was put on shop shelves in 2019 and only Waitrose, Tesco and Sainsbury's of the 10 biggest chains marginally reduced the amounts they used. Academic researcher, too, claimed that pollution was worse than ever in 2019 and the fishing industry was responsible as more than half came from discarded plastic nets and rope, fish aggregating devices [FADs], buoys, long lines, crates and floats. French researchers showed how plastic litter at the bottom of the Mediterranean had tripled since 1990 and the Ellen MacArthur Foundation estimated that there would be more plastic than fish in the oceans by 2050 if business was allowed to continue as normal. Plastic water bottle sales, indeed, soared.

Wherever researchers looked, they were horrified. One study found an estimated 1.8m pieces of plastic, old tyres and fishing gear on the sea floor of the Bay of Fundy between Nova Scotia and New Brunswick in Canada; the WWF calculated that 570,000 tonnes of plastic went into the Mediterranean each year – the equivalent of 33,800 plastic bottles every minute and plastic was found widely in the food chain and in human bodies.

Big manufacturers such as BASF, Dow, Huhtamaki, Plantic, Mondi, and Amcor unwillingly produce less plastic under governmental pressure and y turned in 2019 to bio plastics, which convert the sugar present in plants and crop residues into plastic. But bio plastics were not the solution. Not only can they take up land needed for food production, but most bio plastics need high temperature industrial composting facilities to break them down and release methane, more potent green house gas than carbon-dioxide.

India and Peru planned to eliminate all single-use plastic by 2022 and there Maldives said it would phase out all its non-biodegradable plastic. By the end of 2019, more than 120 countries had banned plastic bags and 60 more countries said they would impose taxes. Many US states banned or said they were planning to phase out plastic bags.

The industry fought back. Companies may have promised publicly to stop using certain types of plastic, but their trade bodies lobbied strongly in 2019 against new laws and argued to be allowed to continue to produce more. Industry and supermarket trade groups lobbied against proposed deposit return schemes, bans and new recycling targets. The US industry responded with threatening lawsuits against local authorities and cities who tried to introduce bag bans.

Instead of waiting for governments and industry, coalitions of global and local NGOs, international banks, conservation groups and some plastic producers volunteered to clean up rivers and beaches, and help governments collect and recycle waste. The UK-based Common Seas NGO worked with islands and resorts in the Maldives and Greece, and with city authorities in Indonesia to prevent plastic getting to the ocean. Volunteers cleared millions of pieces of plastic from beaches in the Mediterranean, Middle East, Latin America, China and India beaches.

Novel ways to collect plastic from rivers and oceans were introduced. The Ocean Cleanup project launched the Interceptor, a barge-like vessel theoretically able to harvest up to 100,000kg of plastic waste a day from heavily polluted rivers. Waternet, which manages Amsterdam's canals, introduced a "bubble barrier" to catch floating debris. New Naval adapted oil-spill technology to invent a mesh barrier system to collect river plastic; and Mr Trash Wheel scooped rubbish out of the Jones Fall River in Baltimore with waterwheels.

2020 is widely seen to be critically important. In June the UN will host an oceans conference in Portugal at which worldwide progress will be assessed, and countries will pledge to prevent plastic pollution. Many proposed government bans should also come into force and hundreds of smaller initiatives to recycle more and reduce pollution should start to grow and make a difference.

What is certain is that calls for a reduction in plastic use will grow louder and the industry will resist. But unless ways are found to use less, most of the efforts to stem the flood of plastic entering the environment are likely to prove temporary and insufficient.

2 OCEAN PLASTIC AS A WOE FOR MARINE ANIMALS:

Only a fraction of plastic ocean pollution is visible. as Most of it's tiny degraded particles swirling in vast gyres spread across 16 million square kilometers of ocean surface equivalent to the total area of US & AUSTRALIA. Plastic particles in oceans harm marine animals in two different ways.

- Firstly the floating plastic when swallowed by animals get stuck in the digestive systems leading to impairment or death. Fish, turtles, seabirds, sea lions, and whales can all die a horrid death eating or become entangled in plastic. A three fourth of fish in market are found in California and Indonesia contain plastic in their guts, mostly in the form of plastic microfibers.
- Secondly plastic particles can absorb toxins already in the water and spread them through the marine food web, and possibly to humans.

Plastic pollution in the world's oceans has been a serious problem. so it has become utter concern among people when the World Economic Forum declared that, by weight, there will be more plastic in our oceans than fish by 2050

After a little more than a year since the report's publication, we've seen a flurry of activity among consumer packaged goods (CPG) companies involving ocean plastic. CPGs have developed numerous initiatives to source recovered ocean plastic as an input for packaging. And several apparel companies have engineered ways of using ocean plastic in textiles for clothing and shoes.

Both strategies have important challenges worthy of examination, but also show how multinational companies are interpreting circular economy principles in new and more diverse ways.

3 Literature review:

Marine plastic pollution is present in all oceans, including remote oceanic islands. Despite the increasing number of articles on plastic pollution in the last years, there is still a lack of studies in islands, that are biodiversity hotspots when compared to the surrounding ocean, and even other recognized highly bio diverse marine environments. The main focus of most articles was the spatial distribution of plastics associated with variables such as position of the beach in relation to wind and currents. Very few studies have analysed plastics colonization by organisms or the identification of persistent organic pollutants (POPs). Islands of the North/South Atlantic and Caribbean Sea were influenced by different sources of macroplastics, being marine-based sources (i.e., fishing activities) predominant in the Atlantic Ocean basin. On the other hand, in the Caribbean Sea, land-based sources were more common.

But none of the study did not mention the products and green packaging people are making from ocean plastic. How innovatively these ocean plastics are used by some companies. This study will fill the gap and give an overview of the utility of the ocean plastic in packaging industries and some of the leading industries to produce a new product after recycling the waste plastics.

4. Objective: The study consists of a objective to identify how ocean plastic waste are used in green packaging and what are products are made from these ocean waste

5. Innovative plastic packaging

Plastic packaging not only delivers direct economic benefits but can also contribute to increased levels of resource productivity. For instance, plastic packaging can reduce food waste by extending shelf life and can reduce fuel consumption for transportation by bringing packaging weight down. Strong, lightweight plastics enable us to reduce material use and ultimately conserve resources, save energy, lower greenhouse gas emissions, and reduce waste. Plastics' environmental profile can become even stronger when we all work together to recycle or otherwise properly dispose of these efficient materials after use.

The Trucost study also identifies opportunities to help further lower the environmental costs of using plastics in consumer goods and packaging, such as:

- Increasing the use of lower-carbon electricity in plastics production
- Adopting lower-emission transport modes
- Developing even more efficient plastic packaging
- Increasing recycling and energy conversion of post-use plastics to help curb ocean litter and conserve resources

6. International coalition :

An international coalition has been launched of investors to engage publicly traded consumer goods companies on the threat posed by plastic waste and pollution. Twenty-five institutional investors from four countries with a combined \$1 trillion of assets under management have signed a declaration on plastic pollution citing plastic pollution as a clear corporate brand risk and pledging to interact with leading companies to find solutions through new corporate commitments, programs, and policies. Their initial engagements will be with four large consumer goods companies: Nestle, Procter & Gamble, PepsiCo and Unilever.

7. Research methodology:

7.1Population: The world wide companies are taken as a sample .

7.2Data collection: Data is collected based on secondary sources like magazines and different report on ocean plastic packaging technology. different web links related with topic has been accessed to clarify data.

7.3Sampling technique : No specific sampling technique is used.

7.4Research type: Elaborative and Descriptive study based on previous study in this field.

8. Products made from ocean plastic:

Instead of making Adidas isn't limiting recovered ocean plastic as a feedstock material for footwear. The company also worked with Parley to create the first jerseys made of 100% ocean plastic for football teams Real Madrid and Bayern Munich. Munich

player [Xabi Alonso](#) (left, in red) highlighted that, “Wearing a [jersey] that is made from recyclable ocean waste is something I’m very happy about as it’s a fantastic opportunity to raise awareness about the need to protect and preserve our oceans.”

Indeed, raising awareness about sustainability in general and ocean plastic pollution specifically is a chief benefit of using recovered ocean plastic in new products and packaging.

Method, People against Dirty, was one of the first companies to use [recovered ocean plastic](#) in its soap bottles in 2012 and highlighted the importance that social awareness was to the packaging design.

This emphasis on awareness and activism emerges in method founder Adam Lowry’s discussion of the project as well. [He elaborates](#) that, “We know that only a small amount of plastic will be taken out of the ocean through all of these bottles. We know that’s not the solution. But, we also know that we can have a much bigger impact if we start to change people’s mind about their role in protecting our oceans.”



- Much like method’s conventional soap bottles that use 100% post-consumer recycled polyethylene terephthalate (PET), the ocean plastic bottles designed out the need for virgin plastic, reducing the carbon footprint by 70%. Since method first broke ground in sourcing ocean plastic to produce plastic bottles, the industry has been innovating to increase the percent of ocean plastic in a given resin mix.
- Procter & Gamble, for example, is releasing a limited run of Head & Shoulders shampoo bottles in France at Carrefour stores. P&G’s black high-density polyethylene (HDPE) is unique in that, unlike many other ocean plastic packages, other polymers from the beach plastic have been sorted out. In addition, P&G has raised the proportion of ocean plastic in the formulation up to 25%. More generally, the CPG company announced that by the end of 2018, it will have half a billion packages in Europe with at least 25% post-consumer recycled content, among its hair care portfolio, including Head & Shoulders and Pantene.



One downside to packaging that uses recovered ocean plastic is that the plastic's color often results in a dark grey when processed. From this point, many companies will then use dark or black colorants to make the package appear more uniform and provide more juxtaposition with competition on-shelf.

If the material is being collected by volunteers from beaches or waterways already, a second-life as a package or textile is certainly a better outcome than a landfill or incinerator.

Nevertheless, companies using recovered ocean plastic in large quantities, like Adidas, incentivize efforts to continue removing plastic from the ocean as it helps to come together a reliable end market for the material.

- Dell, which is using 25% ocean plastic in its 100% post-consumer recycled content laptop trays, stresses this is a deliberate aspect to its sustainability initiatives. Dell describes the initiative as the “first commercial-scale global ocean plastics supply chain.” Moreover, the computer technology company, “will convene a working group to address ocean plastics at scale.”

9. Challenges of using reclaimed ocean plastic

The interest from packaging companies has ramped up to highly excited state in recent years. Packaging brands across the US's fledgling cannabis market have expressed increased interest in using ocean plastic.

The time and additional cost of using ocean plastic is still a major hurdle to collect, sorting, cleaning and manufacturing procedures to arrange. Companies has to pay extra for the privilege of marketing an environmentally more responsible product. Ianelli says that ‘high-seas ocean plastics’ collected from gyres – large meeting points of circulating currents in the ocean, such as the now infamous Great Pacific Garbage Patch- would not suffice for high-grade applications after weeks or even months of degradation.

Another challenge that P&G's vp for global sustainability Virginia Helias highlights is the limited quantity of beach plastic and much higher expense due to the complex supply chain of its collection and processing. Critics of ocean plastic use in plastic packaging will point out that this elaborate supply chain also likely means that the environmental toll of transport involved negates some of the benefit to the material recovery.

10. Recommended companies used ocean plastic in their business:

HERTI:

- Herti is a leading European manufacturer of aluminium screw caps, plastic and composite closures for a diverse range of bottles used throughout the food processing industry. They provide a range of plastic articles for packaging applications. The versatility of the plastic closure system is applied in huge variety.
- NEWTEC designs and manufactures high-performance machines used to weigh, package and sort fresh foods for a worldwide client-base. printing solutions and films .flexible packaging. shrink sleeves are the applications of Newtec.
- **Norton Point Makes Sunglasses out of Ocean Plastic.** The co-founders of Norton Point, Ryan Schoenike and Rob Inanely launched a campaign to eradicate ocean pollution. They decided to collaborate with ‘The Plastic Bank’, an organization pays locals a living wage in return for plastic collected from beaches and the ocean which reined in on unemployment and contributed to a more sustainable lifestyle
- **Unifi Spins Plastic into Yarn**
- Unifi is another manufacturer that has taken an initiative to reduce plastic waste. They are manufacturers that spin plastic into yarn. And a massive 2.2 million students have worn plastic-recycled graduation gowns over the years.
- **Method Makes Plastic Hand Soap:**
- Method was founded in 2001 and at present is an established cleaning product company that emphasizes on an eco-friendly lifestyle. The company just kept getting better over the years and improved the quality of their products. Today, they have massively reduced the amount of plastic that has covered Hawaii's beaches and continuously strive for a cleaner planet by using wind energy to power production

11. CONCLUSION:

- Plastic usage may not be stopped though its highly restricted , so people should control themselves not to through landfills or their waste plastic whether bio degradable or non bio-degradable into the sea or ocean.
- There should have huge amount of penalty system for them who throw plastic in any kind of waterbody whether it's sea, lake, ocean or river.
- More and more companies should come forward to utilised those ocean plastic into a more creative and innovative Products.

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