Global Perspectives 0457

Component 02: Individual Report

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Topic: Sustainable living

Research question: What is an efficient and sustainable solution to the issue of plastic pollution caused by (PET) and (HDPE), is it better recycling or switching to alternative products?

Word count: 1968

Introduction

(PET) and (HDPE) are plastics made of cellulose, coal, natural gas, salt and crude oil. Through processing we get polymer pellets.[1] They are widely used in packaging for dinnerware, food and drinks etc.[2] (PET) and (HDPE) "releases harmful chemicals"[3] in our environment when disposed of improperly. Recycling (PET) and (HDPE) reduces the amount of plastic waste getting collected in the landfills and getting burned, which reduces the percentage of toxins getting released in the environment.[4] But only 10% of plastic gets recycled across the world.[5] Conversely, alternative products provide many choices to the consumer which can be more sustainable and efficient and have better characteristics than the (PET) and (HDPE) both environmentally and economically.[6] Like paper packaging can be used for making containers, bottles, etc.

With different perspectives on the topic, this essay will examine which solution is more efficient and sustainable by looking at their pros and cons to address the issue of plastic pollution caused by (PET) and (HDPE). Along with considering perspectives which are global (Europe and USA), and National/Local (India/Mumbai) this essay will also explore and propose courses of action and finally conclude with my viewpoint on the issue.

Recycling as an efficient solution to the problem of plastic waste

Recycling uses a minimal amount of energy and water which makes recycling an efficient way as it is not using "new raw materials"[7] which would have consumed more energy to be manufactured (it takes old products which have already been made and just have to be processed).[8] Recycling (PET) and (HDPE) decreases the toxins which get released in the air during the manufacturing processes and this reduces the pollution level caused by (PET) and (HDPE), as also the amount of waste which ends up in the landfills and sea beds.[9] Moreover, several studies show that switching to an alternative product like aluminium or glass has a

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[1] https://www.bpf.co.uk/
[2] https://airseacontainers.com/
[3] (*Plastic Pollution*, n.d.)
[4](*Public and Environmental Health Effects of Plastic Wastes Disposal*, n.d.)
[5] (*Our Planet Is Choking on Plastic*, n.d.)
[6] (*Plastic Pollution*, n.d.)
[7] (*Https://friendsoftheearth.uk/*, n.d.)
[8] (*Plastic Pollution*, n.d.)
[9] (*Https://www.in.gov/*, n.d.)

higher carbon footprint than plastic as they need more energy to be manufactured and transported all over the world.[10]

Switching to Alternative Products as the key to tackling plastic pollution

Environmentally friendly alternatives to (PET) and (HDPE) packaging can be reusable bottles, biodegradable and disposable water bottles, boxed water, stainless steel containers, paper bottles, silicone bottles, ceramic bottles etc.[11] Switching to an alternative product becomes much more sustainable than recycling as it uses eco-friendly materials.[12] Using (PET) and (HDPE) for packaging is very harmful, as they gradually start losing their mechanical properties, which gets mixed in the product and make it impure[13]. Moreover, a major problem with recycling is only 9% plastic waste gets recycled while 91%[14] is still dumped in the surroundings (environment) and continues polluting the environment.

Global Perspective

Globally, many individuals recycle plastic or are switching to an alternative product. Yet, only 9% of plastic waste gets recycled globally[15] in which only 29.3% of (HDPE) and 29.1% of (PET) products are recycled. In Europe nearly a third of plastic waste gets recycled. One-half of the plastic waste that is gathered for recycling is shipped to be processed in nations outside of the EU.[16] 32.7 million tonnes of trash were exported from the EU to non-EU nations in 2020. Lot of their waste goes to Turkey, India, and Egypt. The waste contains 48% plastic,[17] and other waste.[18] But compared to Europe as a whole, countries like Turkey, India, and Egypt recycle less. India recycles 6.06 million tons of plastic waste.[19] 1.1 million tons of plastic waste gets recycled in Turkey and Egypt recycles only 3% of its plastic waste.[20] These countries also lack technology and finance to deal with plastic waste recycling

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[10] (*ALTERNATIVE PLASTIC WASTE MANAGEMENT APPROACHES*, n.d.)
[11] (*9 Plastic Bottle Alternatives That Are Environmentally Friendly*, n.d.)
[12] (*30 Eco-Friendly Products to Help You Live More Sustainably and Reduce Waste*, n.d.)
[13] (Light Stabilizers and UV Absorbers Help Protect Plastics From Sun Damage, n.d.)
[14] (*Why Is Most Plastic Not Recycled?*, n.d.)
[15] (*Plastic Pollution Is Growing Relentlessly as Waste Management and Recycling Fall Short, Says OECD*, n.d.)
[16] The inability to treat the waste locally due to capacity, technology, or financial constraints is one justification for the export.
[17] https://www.sciencedirect.com/
[18] (*Plastic Waste and Recycling in the EU: Facts and Figures*, n.d.)
[19] (*India Plastic Recycling Market Report 2022: Favourable Government Initiatives Promise to Boost Growth - ResearchAndMarkets.com*, n.d.)
[20] (*Marine-Plastic Pollution Is Growing, and Egypt Is a Major Contributor on a Global Scale*, n.d., #); And the waste which they are not able to process and recycle, the waste ends up in their landfills. At these places when the landfills are overfilled they burn all the waste which emits a lot of toxin and other gases in the air.

and Europe itself collectively recycles 359 million tonnes of plastic waste as per records for 2018.[21]

Countries like Dominica are switching to alternate materials to sustain the environment. They use products[22] made of biodegradable materials like paper and cornflour.[23] China is the global leader in producing paper packaged containers as it produced 68,430,000.00 metric tonnes of it in 2019.[24]

Local Perspective

As per government data India generates 3.5 million tonnes of plastic waste annually.In India, when waste is collected, it is not managed in a particular way.[25] India's system of waste separation and recycling is run by an unofficial chain of labourers[26] About 5.5 million metric tonnes of plastic waste gets recycled in India yearly. In India, poor waste management, such as inappropriate waste collection and recycling, is more of a problem with plastic waste than the volume of waste that is created.[27]

In India only 60% of waste was treated with CPCB[28] regulations in 2019-2020. The remaining 40% waste was mismanaged and was left over in landfills.[29] ITC Limited, one of the biggest companies in India, took the initiative and has started recycling plastic equal to the amount they produce. In 2021-22 they managed to recycle more than 54,000 tonnes of plastic across the nation. As per (CPCB) rules the producer has to ensure that they also recycle their manufactured product.[30]

Reasons For Recycling

Recycling adds in for conserving natural resources. A 60W light bulb can be used for six hours less energy by recycling only one of these PET plastic bottles, according to calculations. The energy saved by recycling 1 PET plastic bottle is 60 Wh.[31] The areas with a

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[21] (*Plastic Waste and Recycling in the EU: Facts and Figures*, n.d.)

[22] straws, plates, food containers, cups, lids, cutlery, and display trays

[23] (*13 Brilliant Ways Other Countries Are Replacing Plastic*, n.d.)

[24] (*Paperboard and Packaging Paper Production*, n.d.); Paper packaging containers reduce the dependance on plastic ones that are used to store things like milk, oil, and juice.; Additionally, the 3487.5 billion plastic containers were used as of 2018, this can be decreased significantly if paper packaging were to be adopted globally #

[25] Rag pickers who sort through debris and give it to dealers who sell the plastic to factories.

[26] (*WASTE-WISE CITIES*, n.d.)

[27] (*THE RISING PROBLEM OF PLASTIC WASTE IN INDIA*, n.d.)

[28] Central Pollution Control Board

[29] (*The Cost of Plastic Waste*, n.d.)

[30] (*Why India Has Not Been Successful at Eliminating Plastic Pollution*, n.d.)

[31] (*How Much Energy Can Recycling Plastic Bottles Conserve ?*, n.d.)

deficit of energy can be supplied with the energy that was saved. It is unnecessary to use more primary material when recycled materials can be used to create new items. This prevents the release of greenhouse gases that would have been produced by mining, or extracting the raw minerals.[32] Recycling reduces 73% of fossil fuel consumption which contributes to air pollution[33] which account for most of the energy produced. Recycling also improves air quality by reducing energy needs.[34]

Also aluminium has a greater carbon footprint while getting manufactured. A 330 ml aluminium bottle can produce 1300 grams of carbon dioxide emissions.[35] On the other hand plastic bottles only give out 330 gm of carbon dioxide[36] during the manufacturing process. In this case switching to an alternative product like stainless steel or aluminium bottles will cost more than a plastic bottle for the consumer, as the raw materials for making aluminium cans cost 25 - 30% higher than plastic bottles having the same volume. Plastics are much cheaper in price which becomes a convenient option for the customer.[37]

Reasons For Switching to Alternative Products

Plastic pollution can be controlled by switching to eco-friendly products, which will help in conserving natural resources.[38] Eco friendly products use less energy while getting manufactured. And at the same time the biodegradable products can be easily disposed of by "using natural way of composting"[39] . Example: Areca leaf plates are made of Areca leaf which are 100% biodegradable.[40] Most of the Areca manufacturing plants are in rural areas. This helps in generating employment depending on the manufacturing unit size. As per reports, women contribute 55 to 78% in this industry.[41] This can be regarded as one of the ways for women empowerment. In Assamese Kamrup rural district 30 women started manufacturing plates using the arecanut. They produce biodegradable and disposable dinnerware as most of the dinnerware is made out of plastic, nearly around 348 million tons

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[32] (*Climate Change, Recycling and Waste Prevention*, n.d.)

[33] such as coal, oil and natural gas

[34] (*How Does Recycling Help Reduce Pollution?*, n.d.); And recycled plastic products are much cheaper than buying a new product which has been made by using new raw materials.

[35] This much amount of carbon dioxide is produced by a car by driving 7 to 8 km.

[36] (*Why Do We Need More Eco Friendly Products*, n.d.)

[37] (*Substitute Products*, n.d.).

[38] (*The Benefits of Switching to Eco-Friendly Products*, n.d.)

[39] (*Why Biodegradable and Non-Biodegradable Wastes Should Be Discarded in Two Separate Dust Bins?*, n.d.)

[40] (*Areca Leaves: A Sustainable Development Of Plastic Free India!*, n.d.)

[41] (*Economic Utilisation of Areca Leaf Sheaths for Rural Livelihood*, n.d.)

of plastic dinnerware was used in 2017 and reports say that this will be doubled by 2040.[42] These women entrepreneurs got engaged when a NGO named Dhriti launched a project named Pragati. Their aim was to engage the rural women to earn themselves and not depend on others. They gave training to the womens to manufacture areca plates which use the waste sheaths of areca palm trees.[43]

And when this is seen in the perspective of recycling of waste plastic, not segregation the waste into landfills and dumping more waste on those lands overfills the dumping ground. Which is very unhygienic for the surroundings. Example: Mumbai there is a dumping ground known as Deonar dumping ground.[44] In 2016 when there was a fire which broke out in Deonar landfill, 74 schools and some corporates near it were shut down for two days as the smoke caused many breathing difficulties.[45] This was because most of the waste was not separated to be recycled therefore all the waste was burned. Harmful gases like "nitrogen oxides, sulphur dioxide, volatile organic chemicals (VOCs) and polycyclic organic matter (POMs) were released. These chemicals boost up the level of pollution level rapidly[46]

Courses of Action

Till now materials like aluminium, copper etc. Have been used which has its own cons. Which made people reluctant to buy that product made of these materials. Economical purpose, durability etc are some cons. But the most effective material to switch with is[47] bioplastic. Europe has been estimated to have the largest consumption of bioplastic in 2021 and the demand of bio-plastic keeps on increasing there because of environmental concerns.[48] Bioplastics demand has increased by 6.83% per year, as it has rigid packaging, flexibility and uses very less amounts of fossil fuels and renewable resources. Most of the bioplastic is produced by using renewable biomass, sugarcane, corn or microbe like yeast.[49] Bioplastics

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[42] (*Single-Use Plastic Tableware and Its Alternatives - Recommendations by the UNEP*, n.d.)

[43] This gives them an opportunity to earn their living and not be dependent on others # .

[44] In Mumbai the most polluted area is this dumping ground.

[45] (*Deonar Dumping Ground*, n.d.)

[46] (*Waste Not: The Heavy Toll of Our Trash*, n.d.); That is why clearing the waste and treating (recycling) it in a manner helps in sustaining the pollution level.

[47] Bioplastics are plastic which are made of biological molecules instead of using petroleum, and many types of substances which are biodegradable.

[48] (*Global Biodegradable Plastics Market (2021 to 2026) - High Potential in Emerging Countries of APAC Presents Opportunities*, n.d.)

[49] (*Bioplastics A Bioplastic Can Be Defined as a Polymer That Is Manufactured Into a Commercial Product From a Natural Source or Renewable Resource.*, n.d.)

only take 3 to 6 months to degrade completely,[50] which is a lot less than (PET) and (HDPE) plastics which take 20 to 500 years to decompose.[51]

But bioplastics are two to three times more expensive than (PET) plastics. This can be avoided by having more manufacturing plants which will benefit the economical scale of bioplastics. "A good example is Braskem's 200,000-tonne bio polyethylene plant (equivalent to about 20% of the world's current bioplastics production)."[52] .

Source Evaluation

Websites like the United States Government Accountability Office gave me ideas for recycling and helped me understand types of recycling like, chemical recycling and mechanical recycling, IN.gov and the European Parliament reports made me understand about the plastics pros and cons which are helping the world by providing job opportunities but the material is polluting the environment. These sites are government sites. Government sites are reliable, but they can be biased in some way[53] as they could be more supportive to their country. The statistical data is reliable because it is from the government. The above websites can be considered as reliable and credible sources for collecting data.

Personal Perspective and Conclusion

When I started my report I thought switching to an alternative product is the best way to tackle plastic pollution. As I thought if the plastic is only the issue why can't we change it but as I started researching. I got to know that recycling and switching to an alternative product both have ups and downs. But these two ways are the fastest way to get the result of reducing plastic pollution.

Through my research, I have gained a much broader and clearer picture of how the plastic pollution system works. The downs of switching to an alternative material is the products durability, cost etc which restricts people from buying those products.

To make recycling more efficient, segregation of waste in the landfill is required, and segregated waste for recycling so that the landfills don't overfill and cause harm in their surroundings. We can avoid all the plastic products instead of using natural and environmentally friendly products. Places where plastic dinnerware is used can have Areca

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[50] (*How Long Does It Take for Plastic to Biodegrade?*, n.d.)

[51] (*How Long It Takes Everyday Items to Decompose*, n.d.); Bioplastics are climate neutral as they release very less amount of carbon dioxide if compared to (PET) and (HDPE) plastic in the atmosphere. And they are easily recyclable. #.

[52] (*Advantages of Bioplastics Vs. Disadvantages: Memo for Product Designers*, n.d.)

[53] These sites have given some information that has been certified by them which is hard to find in other sites.

plates. Manufacturing process can be structured in a way in which every step involved in the process uses renewable energy and devices which use a lesser amount of energy.[54] For packaging we can use bioplastics which have better characteristics than (PET) and (HDPE) plastics. These small changes globally will impact plastic pollution and can reduce the volume of waste collected in the landfills. Personally I think that switching to an alternative product is a better way forward as we need to remove the plastic completely from our living so that it doesn't harm our environment more in any way.

[54] (*Why Do We Need More Eco Friendly Products*, n.d.)