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NCBar Environment, Energy, & Natural Resources Section Sustainability Essay Contest

May 29, 2020

Plastic Planet

Although the mass production of plastic began less than a century ago, its effects on the environment, and us, have been astronomical. Using plastic has become a necessity for all of us, and we often fall blind to its looming and unintended effects. Plastic is directly sourced from fossil fuels in its production stage, poses potential risks to human health and, despite the notion of recycling, often spends the eternity of its afterlife in landfills, the ocean, and in the stomachs of animals. In recent years, the adverse environmental effects of plastic have gained more awareness, as seen in the plastic straw movement and some state government initiatives to curb the production and use of plastic. Despite these efforts, plastic production continues to increase at an exponential rate and remains the norm. Therefore, it is essential for consumers and governments to raise awareness and take action towards disrupting this status quo and aiming for ideal, sustainable practices.

Air and Chemical Pollution

From the very start, plastic is destined to be detrimental to the environment. Using data from the Environmental Protection Agency's (EPA) Toxics Release Inventory, the Oakland Recycling Association analyzed the environmental impact of toxic chemicals used in plastic production. They found that the plastic industry contributed 14% to the United States' release of toxins into the air. In fact, seven out of ten of the manufacturers with the most toxins emitted

produced plastic foam, demonstrating the strong correlation between plastic production and toxic chemical pollution (“PTF: ENVIRONMENTAL IMPACTS” 2020). Chemicals such as benzene and various sulfur oxides that are used or produced in plastic production are either ozone-depleting chemicals, soil contaminants, or classified by the EPA as human carcinogens (“Plastic Is Forever” 2020). Clearly, the production of plastic is problematic due to its contribution to toxic pollution in our air and soil.

Even more concerning is the strong correlation between the fossil fuel and plastic industries. In fact, a startling 99% of plastic is created using chemicals sourced from fossil fuels, one of the primary contributors to global climate change. Fossil fuel and plastic-producing companies are often within close proximity to each other for transportation purposes. This results in vertically integrated companies such as ExxonMobil and Shell, where oil producers own plastic producers and vice versa (Center for International Environmental Law 2017). The inherent tie between fossil fuel and plastic production and the high numbers of resulting toxic emissions shows that the continued production of plastic is unsustainable, especially with climate change becoming an increasingly prominent issue for newer generations.

Human Health Impacts of Plastic Bottles

Plastic not only harms the environment because of the toxic pollutants it emits; it also drastically affects human health. Bisphenol A (BPA) is a chemical often used in making polycarbonate plastic such as food containers, water bottles, and package lining. When BPA seeps from the plastic container into the food or beverage, studies have shown that it can act as an endocrine disruptor and interact with our estrogen receptors (Takayanagi et al. 2006). The US Food and Drug Administration (FDA) classifies BPA as safe because it is only found in obscure

amounts of food and beverage products, but research continues and the use of BPA remains controversial (“What Is BPA-Free?: Coca-Cola Product Facts” 2020). In fact, research shows that human exposure to BPA in plastic is linked to health issues including, and not limited to, cancer, diabetes, infertility, brain development, and behavioral issues such as anxiety and memory damage (Almeida et al. 2018). Though many plastic bottle companies now use BPA-free plastic, one of the world’s largest soda companies, Coca-Cola, still uses BPA in small amounts for the linings on their cans to protect the condition of the beverage (“What Is BPA-Free?: Coca-Cola Product Facts” 2020). Additionally, in the Centers for Disease Control and Prevention’s National Health and Nutrition Examination Survey, 93% of the people’s urine had discernible levels of BPA, demonstrating that unnatural chemicals are present in our systems because of daily plastic usage and consumption (Wei-Haas 2018).

Along with BPA, microplastics also pose potential harm to our health. Microplastics are created when plastic breaks down into microscopic particles over time. A study conducted in 2018 investigated the presence of microplastics in everyday foods and beverages, including tap water, beer, and sea salt. The results were astonishing: of 159 global tap water samples, 81% contained various levels of synthetic microplastics, and of the 12 US beer brand and 12 salt brands sampled, 100% contained synthetic microplastics (Kosuth, Mason, Wattenberg 2018). Microplastics in our body can lead to increased exposure to harmful chemicals including BPA and polychlorinated biphenyls and the accompanying health effects such as cancer and reproductive issues (Reports 2019).

With the probable health effects stemming from using and reusing plastic water bottles, having a reusable water bottle is not only a safer option, but also a more sustainable alternative.

Additionally, harmful microplastics found in our food, water, and bodies demonstrate the need for plastic production and consumption to halt before more harmful effects magnify.

Disposal of Plastic

Despite popular belief, the plastic in our recycling bins does not always get recycled. In fact, according to the EPA, only 8.4% of the plastic waste created in 2017 was recycled. The rest of the plastic is sent to landfills, burned, and unfortunately, dumped into our oceans (Whitcomb 2020). In fact, plastic is burned six times more than it is recycled in the US (Dell 2019). An astounding 5.25 trillion pieces of plastic are in our ocean, and the numbers continue to grow—in 2020, over 5 million tons of plastic waste have been dumped in our oceans, and the Great Pacific Garbage Patch is rapidly growing over 2 million square kilometers (“Ocean Trash: 5.25 Trillion Pieces and Counting, but Big Questions Remain” 2019; “Plastic Is Forever.” 2020).

So, why does so much of our plastic not get recycled? One reason is that most plastic is not recyclable. Plastic that has a “1” in the recycling symbol on the bottle, such as clear plastic bottles, and those that have a “2,” such as opaque milk jugs, are mostly recyclable. However, plastic with numbers 3-7, known as “mixed plastic,” require more money and energy to recycle. For this reason, US recycling facilities in the past have shipped mixed plastic to China to be recycled, and sometimes, contaminated plastic was thrown into the ocean or landfills. In fact, there was no way of knowing whether the plastic the US shipped to China was even getting recycled at all. Now that China has banned foreign waste imports, recycling facilities in the US lack a market for plastic waste and as a result, usually do not recycle plastic with numbers above two, despite mixed plastic making up 69% of the plastic we use (Whitcomb 2020).

Clearly, recycling is not solving our massive plastic problem. The US lacks the proper infrastructure to process and recycle most types of plastic, and current recycling facilities are strained by the enormous influx of plastic waste. Additionally, companies are more inclined to use new, cheaper plastic rather than more expensive recycled plastic. The US recycling system is far from sustainable, and it is clear that the US government needs to take massive action to minimize plastic production rather than depend solely on recycling.

What Has North Carolina Done?

While 8 states and some major cities, such as Los Angeles and New York, have banned or placed fees on single-use plastic bags, North Carolina (NC) has unfortunately implemented minimal legislation to help mitigate unnecessary plastic consumption. In 2009, NC passed its first and only plastic bag ban in the Outer Banks. Customers were encouraged to bring reusable bags, and if they did not have one, they were provided a 100% recycled paper bag (Shultz 2020). Unfortunately, after 8 years, the NC General Assembly repealed the ban with strong support from the NC Retail Merchants Association (“Plastic Bag Ban Repealed after Override of Governor's Veto” 2017). There is yet to be another plastic bag ban or fee on the county, city, or statewide level in NC despite growing dependence on plastic products.

In NC’s fiscal year 2016-2017, 9.7 million tons of waste were added to our landfills, while only 1.7 million tons were recovered. NC’s recycling rate has since declined, in part due to East Asian countries restricting foreign plastic imports, which then causes local recycling programs to cut back on what they will accept and recycle (Truelove and Katan 2019). Consequently, while plastic waste is increasing, governmental efforts to recycle are decreasing.

Despite such bleak statistics, NC's environmental advocacy groups and non-profit organizations are involved in grassroots movements to address the plastic issue. For example, Environment North Carolina is an advocacy group that launches campaigns backed by research to advocate for solutions to environmental issues, and have decreased single-use plastics in many states through their national network ("Action for a Greener, Healthier North Carolina" 2020). It is through the passion and dedication of such organizations that civilians can become more involved in environmental activism and begin to have an impact.

What Can We Do on a Local Community Level? State Level?

The plastic problem is overwhelming, but NC is capable of making significant changes. However, it will take substantial effort and collaboration among consumers, economic sectors, and various levels of government. Such efforts have succeeded in California, where plastic bags are banned in retail stores and consumers are charged 10 cents for recycled bags. Hawaii, New York, Connecticut, Delaware, Maine, Oregon, Vermont, and multiple large cities have similar bans and fees (Shultz 2020). NC can join the plastic-free movement with these states by creating similar laws and learning from those states on how to make the most effective legislation.

Although consumers are powerless in terms of legislation and the amount of plastic available to them, they are nevertheless responsible for their own choices and holding themselves to a higher standard. It may be unrealistic to pledge on an individual level to abstain from plastic completely, but there are other ways to cause ripple effects in our community. By supporting local organizations that address plastic pollution and by spreading awareness on a personal level, environmental change can become a grassroots movement. Although we should hold our government and corporations to a higher standard of environmental ethics, it is the consumer's

responsibility to educate themselves and the community by learning about local recycling rules and processes, as well as seeking to minimize daily plastic usage and disposal. Rather than unconsciously consuming colossal amounts of plastic, consumers should rethink the products they purchase and the companies they support, and start meaningful conversations in their community about plastic pollution. Although plastic products can be more convenient and cheaper than a more sustainable alternative, the consequences will end up being more severe in the near future. Now is the time to choose: planet, or plastic?

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