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Ethical Problems with Plastic in the Ocean

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Ethical Problems with Plastic in the Ocean

By

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Abstract

In the year 2018 this paper argues that plastic use and waste is destroying our oceans and that we should address the problem by fully adopting the principle and practices of sustainability. The first section outlines the advent of our plastic disposable culture. The second section gives evidence of how plastic waste is negatively affecting marine life. The third section draws from literature in environmental philosophy to develop the concept of sustainability, and the concluding section outlines several steps we can take as individuals and nations to practice sustainability.

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Introduction

Plastics that were initially created to help humans are now destroying the environment and hurting human and animal health. Our quest for easy packaging is now hurting both the land and sea. Plastic is in virtually every product that we use today, and it is so insidious that it has become a new norm in our lives. In other words, the plastic garbage both on land and in our oceans has become acceptable. We no longer see it for what it is – a dangerous pollutant. Container products (i.e., bottles, bags, and so on) appear to be the bulk of the pollutants in our environment. Many of these products are non-recyclable plastics (one-time use) and are indestructible.

The amount of plastic in our oceans has become so extreme that we have a new term for it: “garbage patch.” The largest, the Great Pacific Garbage Patch, weighs an estimated 87,000 tons, containing more than 1.8 trillion pieces of plastic, and spans across 617,000 square miles of the Pacific Ocean.¹ Far worse for our environment are the little plastic elements that are naked to the human eye but contaminate the ocean like “pepper floating in a bowl of soup” according to the National Oceanic and Atmospheric Administration (NOAA).² These elements are consumed by every form of animal life that relies upon the ocean or other water sources such as lakes and rivers. No living creature is spared – arthropods, amphibians, birds, fish, mammals, and reptiles. Not only are the lives of these animals, and generations to follow, dramatically altered, but equally as bad we and other creatures who consume these animals are also consuming microscopic forms of plastic. The long-term prospects for all living creatures are dim at best.

¹ Nsikan Akpan, “Great Pacific Garbage Patch Weighs More than 43000 Cars and Is Much Larger Than We Thought,” <https://www.pbs.org/newshour/science/the-great-pacific-garbage-patch-weighs-more-than-43000-cars-and-is-way-bigger-than-previously-thought>, (March 22, 2018).

² US Department of Commerce, National Oceanic and Atmospheric Administration. “Great Pacific Garbage Patch.” <<https://oceanservice.noaa.gov/podcast/june14/mw126-garbagepatch.html>>. (Mar 25, 2018).

The ocean, like our air, is a critical element of our lives and yet we knowingly choose to pollute the ocean.

In this paper, I will show that plastic use and waste is destroying our oceans and that we should address the problem by fully adopting the principle and practices of sustainability. In the first section I will outline the advent of our plastic disposable culture. Then I will give evidence of how plastic waste is negatively affecting marine life. To support my claim about our moral responsibility, I will draw from literature in environmental philosophy to develop the concept of sustainability, and I will conclude by outlining several steps we can take as individuals and nations to practice sustainability.

The Advent of a Plastic Disposable Culture

The American military identified the advantage of plastic over more traditional fabrics and elements. They found that plastic had increased durability while reducing weight in such things as parachutes and airplane parts that were used in WWII. The military was the first industrialized user of plastic. In WWII, plastic was incorporated into glass windows to help reduce breakage, and also in the infrastructure of planes to make them lighter and more fuel efficient. Soon after the war began, our industrial sector began incorporating plastic into existing products to reduce the costs of production, and into new products to ostensibly improve our lives. Many of the new products were non-recyclable containers.

Before plastic, ivory was used for many things, ranging from hair combs, to pool balls, to the keys in a piano. However, with so much ivory being used, elephants as a species were headed towards extinction, alternatives were sought out. Celluloid, the first known plastic, is a compound that comes from cellulose which makes up a plant's walls. This plastic was flammable and broke much easier than today's plastics. The next step in the evolution of plastic

was the introduction of petroleum-based plastics, during a period when oil was very inexpensive. These products were cheaper, more durable, and far less flammable than celluloid, making them a more attractive consumer product. The period after the war was a time of significant economic growth and consumer spending, fueling the demand for plastic-based products.

Before plastic became a common consumer item, meat was simply wrapped in pink butcher paper, not pre-packaged in plastic wrap with Styrofoam padding. It was a more costly process, but the impact on our environment was negligible. The paper did not preserve the meat for long periods, but most people consumed the meat soon after they bought it. Candy was wrapped in wax paper and maybe tinfoil. Cereal boxes would have wax paper bags inside. The produce department had brown paper bags instead of plastic. Milk came in jars instead of plastic cartons. The drive for increased profitability at the expense of the environment was about to begin. Short-term profit and efficiency took precedence over the concern for long term consequences.

Today plastic is everywhere from soap dispensers to vehicles bumpers. One widespread use of plastics is the disposable plastic bag for produce and other “loose” items in retail stores. In the 1960s, 'tupperware parties' were a popular method for selling plastic kitchen containers to housewives, replacing glass or metal containers. Marketers began to focus on the advantages of "disposable" products which would no longer require cleaning and storing. These products are still with us today and many of them are not biodegradable. Glaring examples include plastic utensils, Styrofoam cups, and Styrofoam packaging. With so many disposable products, Americans have become lazy and become accustomed to just throwing materials into the environment rather than reusing items or taking the time to fix them.

Since the invention of plastic, about 9.2 billion tons of it has been produced, and 6.3 billion tons of it never made it to a recycling bin. In fact, between 5.3 million to 14 million tons end up in the ocean each year.³ Plastic for a long time was not designed to be recycled and it is virtually indestructible. Once it is in our environment (landfill, oceans, rivers and so on) it remains a pollutant until removed. The idea of manufacturing “recyclable” plastic did not take effect until 1988 when the little triangle with a number that one sees on a plastic container was introduced.⁴

American consumers are generally very materialistic and focused on quick solutions which is the impetus for such products as "throw-away" and single-use products. This attitude will be challenging to change, so instead of changing how much we consume maybe we should change how we consume products. For example, there is the ability to use washable dishware instead of one-use items such as paper plates and paper cups. Consumerism may be at the core of how we got here—and may be a focal point for changing and improving our environment.

Plastic was made originally to help save lives in war time, most likely with good intentions. Unfortunately, the developers of plastic did not foresee the the harm it may cause. Now the world is developed around this idea that more is good, and plastic is better than anything else. In the next section I will show the damage plastic is causing in the oceans and the destruction it brings to marine life.

³ Laura Parker, "WE MADE PLASTIC. WE DEPEND ON IT. NOW WE'RE DROWNING IN IT." <https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/?utm_source=Facebook&utm_medium=Social&utm_content=link_fbp20180516ngm-plasticscovernative&utm_campaign=Content&sf189663944=1>. (May 17, 2018).

⁴ "The History of Recycling Plastic." *Plastics Make It Possible*. <<https://www.plasticsmakeitpossible.com/about-plastics/history-of-plastics/the-history-of-recycling-plastic/>>.

The Perils of Plastic

Prior to plastic, most materials would break down more naturally with little to no harmful environmental effects, like wood and metal. Both of these materials break down over time in a natural way, but the days of the pink butcher paper have been replaced with “zip-lock” plastic bags. There is so much plastic discarded, that “every year, 8 million metric tons of plastic end up in our oceans, equivalent to five grocery bags filled with plastic for every foot of coastline in the world. By 2025, plastic waste is expected to double. The cumulative input for 2025 would be nearly 20 times the 8 million metric tons estimate – 100 bags of plastic per foot of coastline in the world!”⁵ While much of the discarded plastic ends up in landfills, a good portion of it finds its way to the oceans, whether through intentional human action (people just throwing their garbage into the ocean), an act of mother nature (winds sweeping garbage into the ocean), or some of the plastic just falling off of a ship and landing in the oceans.

In the 1990s a gentleman named Charles J Moore stumbled across what has become known as “the Great Pacific Garbage patch”. Garbage accumulates into these “patches” with the ocean currents. The currents, like giant brooms, sweep the plastics and anything else floating in the ocean, to calmer waters where they remain. Each ocean has its own “patch” which is spread out for miles in every direction. The Pacific Patch is estimated to be about 700,000 square kilometers to more than 15 square kilometers containing 100 million tons of plastic.⁶The Great Pacific Garbage patch is north of Hawaii, but it migrates north to south, sometimes dumping garbage on Hawaii’s beaches. It is kept in place by four currents: The North Pacific Current, The California Current, the Kuroshio Current and the North Equatorial Current.⁷

⁵ Claire Le Guern, *Plastic Pollution*. Mar 29, 2018.

⁶ Ibid.

⁷ Ibid.

The sea life that relies upon the ocean for survival are the first victims of ocean pollution. Even whales are affected as big as they are. They are the largest animals on the planet and obtain their nutrients (which are typically very small plankton, jellyfish, and fish) by gulping sea water and retaining whatever nutrients and solids they swallow, including small particles of plastic and garbage. These sea giants are eating plastic at an extremely high rate, resulting in a premature decline in their species. The contributions these giants play in maintaining an oceanic balance extends even to the almost unbelievable, their fecal matter helps offset the carbon in the atmosphere which benefits everyone on land and sea!⁸

Seabirds and sea turtles consume plastics as well, mistaking it for food. There are numerous cases of birds and turtles found dead with plastics in their stomachs. For example, baby sea turtles have been found dead on the beaches of Australia, with half of them having died with plastic in their stomachs. The smaller the turtles are, the more susceptible they are to eating the plastics, but 15 percent of adult sea turtles studied have also been found with plastics in their stomachs.⁹ It is estimated that about two centuries ago there were tens of millions of sea turtles in the Caribbean, while today there are only tens of thousands. Sea turtles are similar to cows on land. The sea turtles eat sea grass. Keeping this grass short and not overgrown is very important in the ocean because the grass is a breeding ground for fish. If the seagrass beds die the ocean ecology would be out of balance and the habitat for the ocean sea life would be endangered.

Another way in which sea turtles are affected by the plastic in the ocean is their primary food source, jellyfish. Jellyfish, unfortunately for the sea turtle, look surprisingly like plastic bags, leading the turtles to eat plastic bags. Turtles keep the jellyfish in check and prevent them

⁸ "Are Sea Turtles Worth Saving?" *Sea Turtle Conservation Bonaire*, www.bonairereturtles.org/wp/explore/are-sea-turtles-worth-saving/.

⁹ Josh Gabbatiss. "Half of dead baby turtles found by Australian scientists have stomachs full of plastic." *The Independent*. (September 13, 2018).

from developing into a “bloom” which is when the population increases very quickly and can lead to a large number of jellyfish in a smaller area than what is normal. This wreaks havoc on fisheries, recreation and much more.¹⁰ The sea turtles help both fisheries and surfers alike. If these sea turtles die off, it could become much less enjoyable to go to the beach for you might be stung by the overgrowing jellyfish.

Another important player in the ocean's ecosystem are seals. The common misunderstanding by the fishing industry is that fishermen and seals are competitors in a “winner takes all” contest for fish. In British Columbia, the diet of the seals in the Georgia Strait contains 43 percent hake and 4 percent salmon.¹¹ Given that the hake fish is a predator of the salmon smolts, the seal is aiding in the survival of the salmon which is in both the seals’ and the fishing industries’ best interest. Without the seals, the salmon would be soon decimated. The survival and even growth of the seal population can be a benefit to the fishing industry as a whole; however, plastic in the ocean poses a threat to the species. These frisky animals are known to frolic with plastic fragments and many times get caught in the nets of fishing lines that collect pieces of plastic, these fishing nets might have even broken off from the fishing boat and floated into the ocean becoming a lethal “playground” for the seals, causing them to become ensnared and ultimately suffocate.

In a study conducted by *The National Geographic*, researchers collected over five hundred fish of ten different species, dissecting and examining the fish for the effects of plastic pollution. They found microplastics in approximately one third of the fish studied. These fish were taken from in the Atlantic Ocean where the plastic in the ocean is less dense than the

¹⁰ “Are Sea Turtles Worth Saving?” *Sea Turtle Conservation Bonaire*, www.bonairereturtles.org/wp/explore/are-sea-turtles-worth-saving/.

¹¹ Andrew W. Trites, "The Role of Pinnipeds in the Ecosystem." 32.

Pacific Ocean.¹² According to marine biologist Claire Le Guern, the beaches of Midway, near the Pacific Garden Patch, are littered with plastic, which when consumed by the native birds results in their death. The plastic remains completely intact after being consumed. Every single one of the 1.5 million Laysan Albatross that are based in the Midway have consumed some form of plastic. One-third of the baby chicks die from plastic consumption. So many have died it is known as the “albatross graveyards.”¹³ Midway is not even in the densest part of the Pacific Garbage patch, but is in the Subtropical Convergence zone, which is located in the middle of the gyres where most of the plastic accumulates.¹⁴ According to National Oceanic and Atmospheric Administration (NOAA) “plastic debris kills an estimated 100,000 marine mammals annually, as well as millions of birds and fishes.”¹⁵ This problem is very wide spread and is reaching across boundaries from being fish to birds as well.

Coral, which is a living, breathing and growing lifeform is also ‘an impact player’ in the ocean life cycle. Corals eat just like fish and whales do. They need food and use photosynthesis to survive. When the plastic breaks down to small enough pieces, the coral eats the plastic as if it were a form of food. The plastic then builds up inside of the coral's stomach and slowly begins to kill the coral because it cannot eliminate the plastic as it would dispose of other waste matter.¹⁶

While the coral reefs occupy only one percent of the ocean, they serve as a host for approximately 4,000 species of fish. The coral reefs have a global economic value of \$375

¹² Laura Parker. "WE MADE PLASTIC. WE DEPEND ON IT. NOW WE'RE DROWNING IN IT," <https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/?utm_source=Facebook&utm_medium=Social&utm_content=link_fbp20180516ngm-plasticscovernative&utm_campaign=Content&sf189663944=1>.

¹³ Claire Le Guern. *Plastic Pollution*. Mar 29, 2018.

¹⁴ US Department of Commerce, National Oceanic and Atmospheric Administration. "Great Pacific Garbage Patch." <<https://oceanservice.noaa.gov/podcast/june14/mw126-garbagepatch.html>>. (Mar 25, 2018)

¹⁵ Claire Le Guern. *Plastic Pollution*.

¹⁶ Hoogenboom, and Dr Mia. "Great Barrier Reef Corals Eat Plastic."

billion a year because they provide food and resources for more than 500 million people in over one hundred countries.¹⁷

Plastic ocean pollution also negatively affects humans. Odds are, many people have unknowingly consumed many of these plastics over recent years. If this bit of information is not alarming, then one must take into consideration what these plastics do to the human body.

According to scientist Gianna Andrews, as plastics break down, they become like sponges and absorb toxins in the water. Some of those toxins include lead, cadmium, and mercury. Andrews writes: "These toxins have also been found in many fish in the ocean, which is very dangerous for humans. Diethylhexyl phthalate (DEHP) contained in some plastics, is a toxic carcinogen. Other toxins in plastics are directly linked to cancers, birth defects, immune system problems, and childhood developmental issues."¹⁸ BPA (bisphenol A.) is also found in many plastics, and when it breaks down, it interferes with the hormones in the human body. If so many of the fish in the ocean are eating plastic from the garbage patches then this problem should be taken very seriously, if not for the environmental effects at least for the potential human damage.

There is a river in the Philippines that has roughly 72,000 tons of plastic flow down the river each year. In 1990 the river was declared "biologically dead."¹⁹ Meaning that nothing can live in the river due to the excessive plastic pollution. The people rely heavily on the fishing industry, but the river pollution forces the fishermen to either fish elsewhere and compete with other fishermen, or buy food which many times comes in plastic and adds to the problem. This

¹⁷ Renee Cho, *Losing our Coral Reefs*. (Sep 19, 2018).

¹⁸ Gianna Andrews. "Plastics in the Ocean Affecting Human Health." *Case Studies*.
<https://serc.carleton.edu/NAGTWorkshops/health/case_studies/plastics.html>.

¹⁹ Laura Parker. "WE MADE PLASTIC. WE DEPEND ON IT. NOW WE'RE DROWNING IN IT,"
<https://www.nationalgeographic.com/magazine/2018/06/plastic-planet-waste-pollution-trash-crisis/?utm_source=Facebook&utm_medium=Social&utm_content=link_fbp20180516ngm-plasticscovernative&utm_campaign=Content&sf189663944=1>.

river is a perfect example of how there is massive amounts of plastic constantly being fed into the ocean and then end up in the garbage patches.

Plastic is in the rivers that lead to the oceans, killing the life that exists there. This will not only kill massive amounts of life in the ocean, but the industries that humans rely on for basic survival. In the next section I will discuss what some environmental philosophers have said about the principle of sustainability.

Sustainability

Sustainability was defined in 1987 by the United Nations as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.”²⁰ Since most natural resources are limited, humans must identify which resources need to be maintained to keep the balance of life. For example, over-fishing would decimate the oceans, and therefore millions could potentially starve because their communities rely on seafood for sustenance. It is important for our generation to live more sustainably so our children and grandchildren can also live. Sustainability is the keystone to environmentalism, according to Bryan Norton. He writes that “each generation has an obligation to protect productive ecological and physical process necessary to support options necessary for human freedom and welfare.”²¹ In the days of settlers arriving in North America, there was no focus on sustainability. At that time people were barely surviving, but as the nation developed, people began to think about how to use nature as a way of making money and increasing their well-being. There was no consideration to the health of the environment itself, let alone future generations. People viewed nature as something to use rather than something to protect.

²⁰Brian G. Henning, *Riders in the Storm: Ethics in an Age of Climate Change*. Winona: Anselm Academic, 2015. Print. 100-101.

²¹ *Ibid.*, 100.

By the late 19th century, some people began to realize a problem with the dominant American ideology that nature was simply for human use and consumption. Forests were being cut down, waterways polluted, and no one was considering whether there would be natural resources left for future generations. Thus, the Conservation Movement emerged. Conservationists still aim to control nature, but they believe in government regulation of natural resources so that there will be sustainable use over a longer period of time. They first focused on forests and the purpose of the newly created federal Forest Service was to produce as much good as possible for as many people over an extended period of time.

A new group of environmentalists emerged in the early 20th century who were critical of the Conservationist belief that nature was simply for human use. They became known as Preservationists because they felt that some nature should be preserved apart from human use. According to Ethicist James Martin-Schramm, “the essence of the preservationist perspective is the protection of ecosystems, species, and individuals of a species from degrading human practices.”²² Preservationists know that humans must use natural resources, but they argue more strongly than the Conservationists that humans must live more sustainably. The creation of the Preservationist Movement came around in 1913 when there was a dispute over the destruction of Hetch Hetchy Dam in Yosemite National Park. John Muir argued against destruction of the dam and protection of the Yosemite Valley. Organizing by preservationist environmentalists resulted in the 1964 Wilderness Act that protects about 110 million acres of land in the United States. John Muir was one of the founders of one of the nation’s most important environmental groups, the Sierra Club. Preservationists view humans as one species among many and believe that all

²² James Martin-Schramm et. al, *Earth Ethics a Case Method Approach*. Maryknoll, NY: Orbis, 2015. Print. 25-28.

lives have intrinsic value. They tend to view new technology skeptically for often new technologies can cause degradation to the environment.

Today, environmentalists have even more radical views on sustainability. Critical Ecology includes Deep Ecologists, Spiritual Ecologists, Social Ecologists, Ecofeminists, Green Political Activists, and Environmental Justice advocates. All of these environmental perspectives view our capitalist system as unsustainable. They all support a sustainable lifestyle and an emphasis on both community and environmental well-being. They tend to be critical of a system that gives preference to personal property rights over community and environmental well-being. They do not believe that humans should dominate nature, but instead advocate working with nature.²³ Critical Ecology environmentalists argue for full sustainability of oceans and call for the ban of plastics, as opposed to others who might ask whether humans can manage the pollution of the ocean, finding an “acceptable” level of pollution that would still allow the marine ecosystem to survive and even grow.

Philosopher Louis P. Pojman notes that the logic of capitalism is continual expansion. He writes: “Business owners and managers generally consider the short term in their operations... Even if the reality of limitation enters their consciousness, it merely speeds up the exploitation of a given resource, which is extracted as rapidly as possible.”²⁴ He also says that capitalism’s sole goal of profit making alienates humans from one another and the environment. Garbage patches will continue to grow under capitalism since the system is not compatible with sustainability. Pojman writes, “. . .today multinational corporations scour the world for renewable resources and opportunities wherever they can find them.”²⁵ Sustainability will require shifting from capitalism

²³ Ibid., 22-30.

²⁴ Louis P. Pojman and Paul Pojman. *Environmental Ethics: Readings in Theory and Application*. Boston, MA: Wadsworth, 2012. Print. 698.

²⁵ Ibid., 698.

to a steady state economy. By minimizing waste and stabilizing growth and population, a steady state economy will not exceed ecological limits. A steady state economy has environmental integrity.

Environmental philosophers urge humans to understand that natural resources are limited and that we must embrace sustainability before it is too late. Pojman writes: “Our most necessary, most rational goals require that we take into account fulfilling basic human needs, and creating just and sustainable conditions on behalf of a present and future generations (which also means being concerned about the preservation of other species).”²⁶ Philosopher Brian Henning mirrors this opinion: “Most natural resources are not unlimited and that they must take care that these resources remain available not only for the present generation but also for future generations.”²⁷ Philosopher Donald VanDeVeer talks about the spaceship metaphor, first introduced by Kenneth Boulding. The Earth is like a spaceship with limited resources and ability to contain pollution.²⁸ This image works very well because it is easy for people to forget how limited Earth’s natural resources are, and nothing should be taken for granted, even the ocean. The ocean is like air to people. Everyone sees it as big and unlimited and therefore we forget to take care of it. The ocean is home to so much life on this planet and destruction of the ocean will have long-term effects.

²⁶ Ibid., 695.

²⁷ Brian G. Henning, *Riders in the Storm: Ethics in an Age of Climate Change*. Winona: Anselm Academic, 2015. Print. 101.

²⁸ Donald VanDeVeer and Christine Pierce. *The Environmental Ethics and Policy Book: Philosophy, Ecology, Economics*. Belmont, CA: Wadsworth Cengage Learning, 2014. Print. 443-4.

Actions to Move Towards Sustainability

There are several actions being taken to address plastic pollution in the oceans. First, are the efforts to lessen our consumption and reduce waste in an effort to prevent pollution. European countries are already actively developing programs for reducing their garbage and increasing the reuse of plastics, glass, and other items that otherwise would be added to the refuse. One of the most critical steps for eliminating plastic pollution is for Americans to change the way we purchase and consume items. For example, we can stop using disposable items like plastic utensils. Americans generate 624,700 metric tons of waste every day.²⁹ In addition to preventing waste, we can also invest in cleaner biodegradable plastics. For example, 'celluloid' is a compound that was made before the plastics we use today, and it was made out of 100 percent of biodegradable materials and can begin to break down just by getting wet.³⁰

The United Kingdom is addressing the plastic problem head-on through policies. It is working very closely with "wrap.org.uk" to help do its part to eliminate the plastic problem. "The UK Plastics Pact is a trailblazing, collaborative initiative that will create a circular economy for plastics. It brings together businesses from across the entire plastics value chain with UK governments and NGOs to tackle the scourge of plastic waste." By 2025, they hope to have 100 percent of the plastic packaging reusable, compostable, or recyclable. In addition to the government in the U.K. addressing the oceans pollution, almost one hundred private companies have partnered with the project.³¹

²⁹ Ann M. Simmons. "The world's trash crisis, and why many Americans are oblivious." *latimes.com*. <<https://www.latimes.com/world/global-development/la-fg-global-trash-20160422-20160421-snap-htmlstory.html>>(Apr 22, 2016).

³⁰ Julie A. Reilly. "CELLULOID OBJECTS: THEIR CHEMISTRY AND PRESERVATION." <http://cool.conservation-us.org/jaic/articles/jaic30-02-003_3.html>, (1991).

³¹ "The UK Plastics Pact | WRAP UK." <<http://www.wrap.org.uk/content/the-uk-plastics-pact>>. (May 25, 2018).

The United States through the Environmental Protection Agency (EPA) has regulations to reduce pollution. One of these regulations addresses waste from ocean-going ships: “The Act to Prevent Pollution from Ships” (APPS).

In 1987, APPS was amended by the Marine Plastic Pollution Research and Control Act. The MPPRCA requires the EPA and the National Oceanic and Atmospheric Administration (NOAA) to study the effects of improper disposal of plastics on the environment and methods to reduce or eliminate such adverse effects. MPPRCA also requires EPA, NOAA, and the U.S. Coast Guard (USCG) to evaluate the use of volunteer groups in monitoring floatable debris.³²

There is also the “Marine Debris Research, Prevention, and Reduction Act” (MDRPRA) that allows NOAA and the United States Coast Guard to identify sources of marine debris, reduce and prevent marine debris;³³ and the “Shore Protection Act” (SPA) that covers transportation of municipal and commercial wastes in coastal waters. The point of these acts is to reduce marine litter from being thrown into the coastal waters due to poor handling procedures by waste transporting vessels.³⁴ The “Marine Protection, Research, and Sanctuaries Act” (MPRSA) prohibits transportation of waste from the United States for the purpose of ocean dumping.³⁵ Finally, the “BEACH Act of 2000” expands the definition of coastal recreation water to cover the great lakes and marine coastal waters, including estuaries.³⁶ One of the acts provides financial grants to organizations whose mission it is to clean up the oceans, but apart from these acts the federal government to date has not taken an active role in addressing ocean pollution.

A significant obstacle, and largely untapped opportunity, is the efficient and effective recycling of plastics. Recycling must become a profitable opportunity in order for it to become a

³² US EPA, O. W. "Laws that Protect Our Oceans." *US EPA*. <<https://www.epa.gov/beach-tech/laws-protect-our-oceans>>. (Sep 12, 2018)

³³ Ibid.

³⁴ Ibid.

³⁵ Ibid.

³⁶ Ibid.

primary solution to prevent pollution. For decades China was receiving about 45 percent of the world's plastics as a source of income; however, they did not recycle or reuse the plastic and it was instead stored in massive dump sites. Many plastics are tough to reuse for they can be contaminated or it is just not possible to break down the plastic and turn it into something new. Many people have had the illusion that most or all of the plastics being sent to the recycling center would be turned into something new, like sunglasses. Unfortunately, that is not the case.

Private corporations are also working on eliminating waste by producing recyclable products. Nestle, Unilever, Evian, McDonalds, and many other companies have committed to ensuring that all packaging, not just plastic, will be 100 percent recyclable by 2025. Volvo announced a significant modification in its use of plastic so that at least 25 percent of the plastic inside their cars will be from recycled materials. One of the biggest producers of plastic, Coca-Cola, has committed to recycling one bottle for every new one sold by 2030. Dell computer already uses recycled plastics from the oceans as well as bamboo, and it promises by 2020 to have all packaging be 100 percent waste free using sustainable sources.³⁷

Second, are efforts to clean up the plastic in the ocean. In their 'The Ocean Clean Up,' The Netherlands launched a massive tube-like device that will help collect plastic in the Pacific Ocean. This tube is 600 meters long and has a skirt on the bottom of it to help collect plastic up to three meters deep. This device will float around the Pacific Ocean initially and collect plastic and once it is full, a ship will come out to clean up all of the plastic it has gathered up. About sixty other systems will join this one. The plan for these systems is to collect 90 percent of all of the oceans plastics by 2040. This system, once in place will be great at helping to clean up the oceans, but that does not stop people from dumping the plastic into the ocean. Erika Träskvik,

³⁷ "What are businesses doing to turn off the plastic tap?" *UN Environment*. <<http://www.unenvironment.org/news-and-stories/story/what-are-businesses-doing-turn-plastic-tap>>.

the manager of 'The Ocean Clean Up' says: "I think it is important to note that we are a non-profit project, and we aim to put ourselves out of business one day by having clean oceans. We aim to do so by causing as little impact as possible, and by using technology to solve this human-made problem."³⁸ They are supported by private companies and the government of the Netherlands.³⁹ While the company is a non-profit that only has the backing of one country, dozens of companies like Microsoft also support it. The company's only goal is to clean up the plastic floating in the oceans.

Another example of clean up is the European Union paying fishermen to fish – but not for fish – but for plastic!⁴⁰ This program will provide financial assistance especially for the smaller subsistence fishermen with the added benefit of helping to cleanse their very source of sustenance and even provide them income. This approach may help mobilize people around the world to take an active part in cleaning up the oceans near them while being compensated.

Third, are efforts to develop our communities more sustainably. The necessary structural changes would require investing in infrastructure to promote sustainable living. For example, setting a standard for increased miles per gallon for all vehicles, increasing mass transit, and reducing long commutes through mixed-use housing and business, would be examples of addressing the cause of air pollution. Such a change would represent a paradigm shift that would help address other forms of pollution as well. Such a shift will require governmental intervention.

³⁸ Erika Träskvik. "RE: Enquiry via website." Received by Brennan Cotter, 9 November. 2018.

³⁹ The Ocean Cleanup. "Partners." *The Ocean Cleanup*. <<https://www.theoceancleanup.com/partners/>>.

⁴⁰ Fiona Harvey. "EU Unveils Plans to Pay Fishermen to Catch Plastic." *The Guardian*. <<https://www.theguardian.com/environment/2011/may/04/eu-fishermen-catch-plastic>> (May 04, 2011).

Plastics pollution is an international problem. The World Economic Forum has proposed the concept of a “global circulatory economy” where nothing goes to waste. They are working with the Ellen Macarthur Foundation to help develop this circular economy. Their three primary objectives are:

1. Develop blended financing models for circular economy projects, in particular in developing and emerging economies.
2. Help create and adjust enabling policy frameworks to address specific barriers to advancing the circulatory economy.
3. Bring the private and public sector into public-private collaborations to scale impact around circular economy initiatives.⁴¹

Underdeveloped economies already follow these principles, but developing and developed economies ought to use them for guidance. If all countries had circulatory economies, we could possibly achieve sustainability and end plastic pollution in oceans

Conclusion

Mother Nature has evolved over the millions of years, and she has continued to do so. Although Mother Nature continues to surprise us with her ability to perform “miracles,” there is a short window of opportunity for us to address the pollution we have spewed on the environment. Plastic has had its uses, but now it is time to move on to different materials. The damage plastic has done so far is disastrous and will only get worse with lack of oversight. Everyone in the world is affected by the oceans and so we all need to take responsibility for plastic pollution. There are ways we can save the oceans that involves changing the type of

⁴¹ "Circular Economy." *World Economic Forum*. <<https://www.weforum.org/projects/circular-economy/>>.

economy we have. It will not be easy for it is changing a way of life, but nothing is impossible. There are some groups around the world that have shown the beginning steps and give us interesting models, but it will be up to all individual and nations to move towards sustainability if we hope to protect our oceans and the life within them.

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