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# The Plastic Problem Analysis about its Past, Present and Future

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## ABSTRACT

*The author will explain the plastic problem from the eyes of all creatures living on this planet earth from the smallest to the largest, dead or alive. The author will also try to look into different perspectives around the human timeline. How our lives would have been today if our ancestors, let's say if Columbus has had plastic while he was traveling to the new world and it was in wide use then, how plastic of that period would even after breaking into small molecules still would have been affecting our daily life.*

*The author will look from the eyes of people around the world, from different backgrounds and how their life is being affected by plastic how some are living because of plastic and how others are in a difficult situation due to plastic. A special inclination will be given towards India's plastic problem and how the so-called smart cities of India are dealing with it.*

## I. INTRODUCTION

World War one was the first time in human history where mass production was a key potential in changing the foreseeable future, in that war man fought against each other. Mass production of everything was emphasized upon. After which humans realized how fast our population will grow due to technological advancement and to support mass populations an alternative to traditional items made from cloth was more focused upon and in the end plastic was found to be the most easily available and cheaply producible alternative, however it was not thought then that this miraculous item which has the potential to replace most of our day to day usable could one day have the potential to drown us all, according to a recent research humans have till now from the early 1950s produced almost 8.3 billion metric tons of plastic the weight of nearly 1,600 Great Pyramids of Giza. Much of this plastic ends up as trash.<sup>2</sup> Dividing that quantity into our population as we now will leave every person on this earth from young to old, from rich to poor, owning 1.07792200779 tons of plastic. Which is in-fact

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<sup>2</sup> Fact Sheet: End Plastic Pollution. (2018, March 13). Retrieved from <https://www.earthday.org/2018/03/07/fact-sheet-end-plastic-pollution/>

more than enough to make us all drown. Every piece of the plastic humankind ever made is still on this planet.

The real problem is that people are not understanding that a serious environmental problem exists in the plastic itself. Some people still have no idea that plastic is a non-biodegradable material while those who do continue to recklessly use plastic items, not dispose of them as to how they should be disposed of. People are focusing only on their own little life with little or no concern towards the greater need, some are earning profits from plastics directly or indirectly, some are concerned about the harmful effects of plastic and are therefore trying to raise awareness about it while the rest of the world continues to use plastic recklessly. Those who know the threat that plastic is to earth continues to use it. Though people, organizations and various government bodies on various levels are trying to solve this problem by raising awareness about it and its harmful effects, the plastic problem cannot be solved by them alone and the masses need to unite only then can we even hope to solve this problem.

This paper will look into "The Plastic Problem" analysing it from the very beginnings of plastic to the current situation of 8.3 billion tons of plastic around us, we will look into the plastic problem from various timelines and different ecosystems, we will look into the legislative status on plastic and its harmful effect and in the end we will give a number of solutions which are easily possible and which must be done to end or even temporarily stop the plastic problem.

## **II. HISTORICAL ASPECT**

With growing human population its needs, a huge emphasis was laid on the development of a material that can be easily made, is easily available and is cheap enough to be used by the entire population. Earlier when the world population was limited people did not focus much on this issue of an alternative material however after the World Wars and the destruction caused by it, humanity needed an alternative material to secure its various needs.

It was toward the finish of the nineteenth century when a German researcher, Hans von Pechmann, found a waxy build-up at the base of his test tube. Little did he thought about the material's centrality; he did not realize that at the time the material that he had created would be used today as a daily need of everyone on the planet...<sup>3</sup> He had, totally coincidentally, made polythene, one of the world's most generally utilized and questionable materials.

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<sup>3</sup> "Timeline of Plastic Development." *Wikipedia*, Wikimedia Foundation, 2 Sept. 2019, [en.wikipedia.org/wiki/Timeline\\_of\\_plastic\\_development](https://en.wikipedia.org/wiki/Timeline_of_plastic_development).

People before the 19th century used the cloth as their main thing for various works of their day. During that time cloths were the main fiber that was used for almost everything ranging from their uniforms to shoes to all the major other such activities, however, even then a need for an alternative material to be used for such type of work was felt required. During both the World Wars when humanity fought with all its might against each other, it learned how there is a need of another material for various things such as prosthetics, parachutes, carry bags, shoes, water bottles, packing materials for various goods ranging from food products to all items we can think of, to modern accessories such as computers, laptops, keyboards, speakers, electric switch, even vehicles, etc.

When humanity fought the modern wars which forced humanity to find some other material that could potentially replace everything that humans use, plastic was given more focus. Modern plastic didn't get its start until World War 2 when the militaries realized how versatile it could be. After the war plastic companies needed to find new ways to sell their products and so plastic went from protecting cargo to protecting our leftovers and Nylon went from the sky (parachutes) to our thighs. Since then we have come a long way producing around 8.3 billion tons of plastic of which only about 30% is recycled with the rest lying in our environment from the ocean floors to the jungles to everywhere humanity has reached. People after the Second World War went crazy after plastic from plastic trees, covers, utensils, shoes to plastic decorations. This was where our addiction began. From the beginning of the inexistence of plastic to plastic bags being found in the deepest of ocean floors we have come a long way in the wrong direction and if we don't stop, the world will suffer.<sup>4</sup>

### III. CURRENT SITUATION

Currently, 8.3 billion tons of plastic have been manufactured out of which 70% remain untreated and are polluting our environment. Plastic is proving to be everywhere in the sea. During a dive to the bottom of the Mariana Trench that purportedly reached 35,849 feet, Dallas businessman Victor Vescovo claims to have found a plastic bag, in the rivers around the world plastic can be easily spotted, big beaches around the world conduct regular clean-ups of plastics, approximately in every forest where humanity has marked its presence plastic can be easily found.<sup>5</sup> Even in the most remote place, the Antarctica glaciers where humanity's

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<sup>4</sup> Freinkel, Susan. "A Brief History of Plastic's Conquest of the World." *Scientific American*, 29 May 2011, [www.scientificamerican.com/article/a-brief-history-of-plastic-world-conquest/](http://www.scientificamerican.com/article/a-brief-history-of-plastic-world-conquest/).

<sup>5</sup> Plastic proliferates at the bottom of world's deepest ocean trench. (2019, May 13). Retrieved from <https://www.nationalgeographic.com.au/nature/plastic-proliferates-at-the-bottom-of-worlds-deepest-ocean-trench.aspx>

presence is very close to nil, plastic molecules have been found, which is the most legitimate cause to be worried, to be worried about our future. Due to such a wide presence of plastic and not enough knowledge about its harmful effects on almost everything we know and love, it is a humongous task to even think about some solution. Plastic particles and items made of plastic can be anywhere where human presence has existed or has excited. When one looks around, the person can spot several items made of plastic which is, in the long run, a threat to our very existence. From once a time when plastic was not even present anywhere to a time when plastic is present everywhere around us humanity has done a huge effect on the environment around us thus changing the environmental dynamics so much that some researchers even predict that the plastic problem is going to keep on increasing.

The plastic problem is much bigger than what we see and think it to be. Fishes all around the globe are being reported to be killed due to the consumption of plastic which remains in their stomach till they die, which is a very small period after consumption. Lancet fish are very large oceanic predatory fishes that grow up to 2m (6.6ft) in length. These fishes swim around the dept. of 100m to 1200m and many of these fishes are found dead due to the consumption of plastic waste. The reason this fish should catch our eye more than the others is the fact of the dept. at which this fish swims, 1200m is very deep in the ocean and if these species of fishes are dying due to consumption of plastic at this dept. than we must be worried. This fact should be more than enough to make us imagine how the plastic problem is a deeper problem than what we might have imagined.

The plastic labels of various packaging companies are also found in abundance in the stomach of fishes. The Coca-Cola group, for instance, is a huge source from where the plastic comes, Labels of their bottle, bottles, cans, plastic cans of the group can be easily found in the ocean floating. In fact, companies of Coca-Cola, PepsiCo and Nestle have been identified as among a limited number of businesses that are contributing most to plastic pollution around the whole world. Every year the coca-cola group alone sales 120 Billion bottles of plastic across the globe. That's almost four thousand bottles a second and this mass production is creating devastating mass pollution. In Jan 2018 the multinational brand made a bold announcement that by 2030, the brand is promising a world without waste and its James Quincy Coca-Cola's CEO who is leading the movement. Coca Cola and plastic have a long-standing relationship and one that is full of surprises since the 1960s when plastic was on the rise. Coca Cola admitted recently that it produces almost around 108 billion bottles each

year.<sup>6</sup> This very fact should be our main concern as it is only a single group producing this much plastic and in fact, there are several such groups, the immense quantity of plastic bottles is just so vast. There are no words to explain this and the other fact that this is only the production of bottles, these facts must lead to questioning ourselves as to what are we doing?.

A report from the UN Environment and WRI found that at least 127 countries (of 192 reviewed) have adopted some form of legislation to regulate plastic bags as of July 2018. These policies range from outright bans in the Marshall Islands to progressive phase-outs in places like Moldova and Uzbekistan to laws in Romania and Vietnam that incentivize the use of plastic.

**Some reasons why plastic continues to be used in huge quantities even after many bans and the rising awareness that plastic is harmful could be-**

*1. Most nations neglect to manage plastic through their lifecycle.*

Not very many nations manage the whole lifecycle of plastic sacks—from assembling and generation, use, and appropriation, to exchange and transfer. Just 55 nations completely limit the retail conveyance of plastic sacks, couple with confinements on assembling, generation and imports. The rest incorporates provisos that could neglect to check generally speaking plastic contamination. For instance, China bans plastic pack imports and commands that retailers charge purchasers for plastic shopping sacks, however, it doesn't unequivocally limit their creation or exportation. Ecuador, El Salvador, and Guyana just control the transfer of plastic packs, however not their importation, creation, and retail use.

*2. Countries support fractional bans over full bans.*

Eighty-nine nations which were looked into decided on incomplete bans or confinements on plastic bans rather than full bans. Fractional bans may incorporate prerequisites on sacks' thickness or structure. A scope of thicknesses and biodegradability necessities are managed. For instance, France, India, Italy, Madagascar, and a few different nations don't have an out and out the prohibition on every plastic sack, however, they do boycott or assessment plastic packs that are less than 50 microns in thickness.

*3. Virtually no nations limit plastic manufacturing/production*

Manufacturing limits or complete bans on manufacturing itself, which have the potential to at least stop the future production of plastic are the least utilized regulatory mechanism. Only a single country in the world Cape Verde included an explicit production limit. In 2018 the

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<sup>6</sup> *Coca-Cola's plastic secrets / DW Documentary* [Video file]. (2019, September 19). Retrieved from <https://www.youtube.com/watch?v=qvYZ3sbTaQ0&t=2020s>

country had imposed a percentage production ban of 60% and they increased it to 100% in 2016, when its full ban on plastic bags came into force. Since then, only biodegradable and compostable plastic bags are allowed in the country.

4. *Exemptions are various.*

Twenty-five of the 91 nations that have plastic pack bans incorporate exclusions, and many have various exceptions. Cambodia, for example, excludes from its boycott the importation of little volumes (less than 100 kilograms) of plastic sacks for non-business purposes. Fourteen African nations have unequivocal exceptions in their plastic pack bans. Exclusions may identify with specific exercises or items. The most widely recognized exclusions incorporate dealing with and transport of transient and new nourishment things, conveying little retail things, used for logical or medicinal research, and trash or waste stockpiling and transfer. Different exceptions can incorporate plastic packs for fare, national security (air terminal and obligation-free sacks) or agrarian employments.

5. *Incentives are not offered for choices to single utilize plastic packs.*

Governments in many cases do not give sponsorships to reusable packs. They likewise neglect to require the reused substance to be utilized in plastic or biodegradable sacks. Just 16 nations that were looked into had principles concerning the utilization of reusable packs or plastic options, for example, sacks produced using plant-based materials.

In India- only 14 of the 35 regional pollution boards have sent their reports on plastic waste to the central pollution control board.<sup>7</sup> Thus, the CPCB estimate of plastic waste generated in India in 2017-18--660,787.85 tonnes, enough to fill 66,079 trucks at 10 tonnes a truck which does not reflect the situation in about more than 60 percent of India's states and union territories. India consumes an estimated 16.5 million tonnes, about 1.6 million truck fulls, of plastic annually, as per June 2018 report in Down to Earth that cites data provided by PlastIndia Foundation, a conglomeration of associations and institutions that deal in plastic. Of this, 43 percent is plastic manufactured for single-use packaging material that will mostly find its way into garbage bins, most of the plastic produced will not be recycled but instead will keep on lying almost everywhere the eye can see. The recycling market for plastic products is not that good and even rag pickers get no more than 4 rupees for a kilo. Currently, the country is able only to recycle about 4 million tons of plastic waste. Mostly the rest of the

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<sup>7</sup> Banerjee, Ananda. "India Is Generating Much More Plastic Waste Than It Reports. Here's Why." *BloombergQuint*, Bloomberg Quint, 1 Oct. 2019, [www.bloombergquint.com/global-economics/india-is-generating-much-more-plastic-waste-than-it-reports-heres-why](http://www.bloombergquint.com/global-economics/india-is-generating-much-more-plastic-waste-than-it-reports-heres-why).

plastic ends up choking landfills, drains, rivers contaminating the water or can be seen eaten by animals whenever the plastic items get mixed with the food of different animals. A stray animals in cities which include cows, dogs, donkeys, monkeys, etc. eat these plastic items thinking it to be their food but it ends up with their death.

Indian plastic recycling firms import plastic waste from China, Italy, Japan, Malawi because imported plastic is available at cheap rates and segregated. The recycling industry should use the surplus amount of plastic produced in India itself instead of importing plastic waste from other countries however because the plastic waste available in India is not segregated, Indian firms tend not to import plastic waste from available local markets. Plastic waste imports in India have increased three-fold times since 2016-17 from 12000 tonnes to 48000 tonnes in 2017-18, despite a 2015 plastic ban. This was made possible because of a loophole that allowed plastic waste through special economic zones but on March 6, 2019, the government banned this also. By the time the last ban was imposed, within the first quarter of the current financial year, 25,000 tonnes of plastic waste had already been imported.<sup>8</sup>

This new throwaway culture fell in love with single-use plastic and don't worry about the consequences, during the 1960s global plastic production increased 400% and by 1979 we were producing more plastic than steel, by this time people started to worry about plastic and as the research was stacking up so was the garbage. In 2014 100 billion plastic bags were used that's almost 1 bag for 1 person per day and even after all this we are still consuming plastic at a breakneck case even though we can literally see the toll it takes on our environment and wildlife and so far some 700 marine species have been said to be eaten for entangled in plastic.

The stakeholders in this plastic problem are not just the people and animals living on the earth right now but are also the future generations of all living beings that are about to be born on this earth. Because the effects of plastic are going to affect every one of us.<sup>9</sup>

If we don't stop this huge consumption of plastic which we are doing now then a great many patches like the great pacific garbage patch will emerge The Great Pacific Garbage Patch, otherwise called the Pacific junk vortex, ranges waters from the West Coast of North America to Japan.

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<sup>8</sup> Excell, Carole. "127 Countries Now Regulate Plastic Bags. Why Aren't We Seeing Less Pollution?" *World Resources Institute*, 13 Sept. 2019, [www.wri.org/blog/2019/03/127-countries-now-regulate-plastic-bags-why-arent-we-seeing-less-pollution](http://www.wri.org/blog/2019/03/127-countries-now-regulate-plastic-bags-why-arent-we-seeing-less-pollution).

<sup>9</sup> *A Brief History of How Plastic Has Changed Our World | National Geographic* [Video file]. (2018, May 22). Retrieved from [https://www.youtube.com/watch?v=jQdBag\\_p6kE](https://www.youtube.com/watch?v=jQdBag_p6kE)

#### **IV. A VIEW OF THE PLASTIC PROBLEM FROM DIFFERENT TIMELINES-**

If our ancestors 500 years ago produced plastic we would have been ruined right now, suppose during the times of Columbus when he was sailing to the new world, the people had access to Plastic and knew how to manufacture it, we would have been ruined by now, just imagine even though the people of that time could not mass produce plastic as we can right now, the little plastic that they would have produced at that time would even right now be floating in our oceans in tiny molecules which would remain in the ocean for at least another 500 years, it would have completely ruined our life's, all the sea animals might even have extinct by now and the aerial animals might also be near extinction, which majority of the land animals been already extinct due to inhaling and eating plastic of which they had no idea what it even is. Our environment would also be in a very bad situation as people would not be aware in the same way as we are not and would be burning plastic or using the conventional ways that we are of landfills etc.

But what would the scenario would have been like if we never had in the first plastic invented plastic- our oceans would have been much cleaner, all the animal species affected by plastic would have a much larger chance of survival, we would need not to worry about us contaminating our earth with plastic cup, bags, and other plastic stuff. But on the other hand our daily life would have also been a lot different, our grocery shopping would look a lot different, our liquids would come in glass bottles, our food items would be wrapped with paper only which would decompose very fast, we would have to grow our food products locally as they will not be able to survive with the current productions and storage rates due to which organic waste will become our main environmental concern, our clothing will be limited to natural fibers only-no polyester socks, nylon dresses or acrylic cloths, heat, and water resistant safety wear would not exist either, we will lose access to tea bags as even they have some plastic in them, without the plastic needed for electrical insulation there would be no inexpensive circuits to build your phones and computers- even early electronics in the early 1910s used plastic , to basically put all this in one line we would still have been living in 1870s still using non-durable and hazardous lacquer and rubber to insulate our wires, all the progress we have made with affordable electronics would never have happened. All the advancements in medical fields would also have been just our dreams, the cheap medical items made from plastics such as prosthetics which helps a huge number of humans would also have been impossible to make available, the vast number of medicines which is kept in plastic covers would not have survived so long without plastic. An important role is being played by Synthetic materials in repairing diseased arteries that cannot be helped via vessel

support. After removing the affected section of the aorta, the damaged section is removed and the gap is bridged by a flexible plastic prosthesis. All these achievements which can be in simple words regarded as miracles would simply not have been possible without plastic.<sup>10</sup>

## **V. A VIEW OF THE PLASTIC PROBLEM FROM VARIOUS CHARACTERS OF OUR ECOSYSTEM**

Plastic does not only affects the environment alone or the human species, on the contrary, but it also has a wide effect on all the living beings present on the earth. From the small decomposers who are unable to decompose dead animals and their feces because of the presence of plastic in that to the consumers including omnivores, carnivores, and herbivores who all die due to consumption of plastic. Plastic has already penetrated the deepest points of the earth and right now is affecting aquatic animals, as they too consume all the plastic present in the ocean. Every day we come to know that dead aquatic animals washing up on the shores which do is not limited to any particular place or a particular animal but this destruction of living beings on earth due to plastic is occurring everywhere. From the streets of towns and cities where animals who roam free eat plastic because they don't know the difference to protected wildlife national parks and sanctuaries where animals eat plastic which is recklessly thrown there by a human when they visit these places.

Let take this issue from the viewpoint of a decomposer, his main work in the ecosystem is to decompose the dead remains of animals, however due to presence of plastic in the stomach of the decomposed animals and presence of various plastic particles in the faeces of the animals, decomposers are unable to do their respective work in the environment as they are supposed to do. This lets the animal waste remaining on the surface which pollutes the nearby environment. This is what can be termed as pollution occurring due to pollution.

Primary and Secondary Consumers both consume plastic items because they don't know the difference between their food and plastic which in turn harms their whole-body system affecting their health and thus they die because of that plastic particles remaining in their body their whole life and not decomposing. This is not a problem just limited to the internal body of an animal only but it is also an external problem to the animal bodies as they get wrapped up in plastic which has different effects varying from the type of animal in question.

Externally if plastic gets wrapped around the mouths of dogs, cows, horses, donkeys or such animal which roam around then they die due to lack of knowledge as to how get rid of this

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<sup>10</sup> *What If Plastic Was Never Invented?* [Video file]. (2018, October 22). Retrieved from <https://www.youtube.com/watch?v=-EEMit5sr5s>

plastic, this problem of plastic being wrapped around animals is more seen in the marine species as these species are far away from human contact which makes it impossible for humans to help them in removing these plastic covers. Internal animals who get plastic suffers a pain which is not explainable in simple words, as these animals carry this plastic in their stomach which makes them heavy, they can't eat other food with the efficiency with which they would have done and this plastic when somehow gets to the point when these animals could excrete it, it becomes very painful and in some cases could even lead to the death of these animals.

Marine animals are suffering the disasters of plastic on another whole level, since they are very remote they can't be helped by humans as is the case with animals who are close to humanity and are often cared for by the various government and non-government organization. These marine animals are left on their own which results in them suffering from the harmful effects of plastics and the happening of this only comes to our knowledge when these animals wash up on our shores, whales get tons of plastic inside their stomach and dies, sea turtles or mainly all of the turtles species are also suffering a lot because they are small and they cannot in any way remove the plastic when it attaches to their body in the ocean, Seabirds, fishes, Sea lions, dolphins are just some of those species in whose survival plastic has become a major obstacle. Scientists expect and by 2050 virtually every seabird species will be eating it. People who eat seafood end up consuming up to eleven thousand tiny pieces of plastic per year and that's only the ocean. By 2050 there could be more plastic than fish in the ocean. Ten tons of plastic are produced every second. Sooner or later, a tenth of that will end up in the oceans.

Plant life is also suffering because of plastic as plastic does not decompose which in turn affects the growing roots of young plants effectively stopping them from growing, which opens a whole other Pandora's box for humanity as a species as plants are the main reasons that human life or life for that matter is present on earth is able to survive on earth, without plants it is impossible for humans or any other species to continue to live. The plant is getting affected by plastic as the plastic stored in landfills takes thousands of years to decompose which lets to that particular area becoming hard for plants to grow on. Most of the unused plastic ends up in soil or freshwater. The problem is that these particles are entering our food chain after it decomposes into smaller particles or as science call it micro-plastic, which to be put in simple terms would be disastrous for life on earth. Like it or not we are eating plastic. Our whole environment is suffering due to the negligence of one species alone.

## **VI. HUMAN PSYCHOLOGY ON PLASTIC PROBLEM**

On one hand there are people who are changing all aspects of their lives because they know and believe that the environmental problems that we have created are real and thus they have changed their overall lifestyle, they have become vegans, they use bicycles only, they don't use plastic and they encourage others to do the same but on the other hand there are people who know but don't believe that the environmental problems are real and thus continue this culture of use and throw. I mean the real problem is not that we have created a problem so huge which is very hard to solve but the real problem is that the problem itself is not being recognized by people, they don't care, they don't even know that this problem even exists.

Human psychology must be drastically improved if we are to solve this problem of plastic and people must realise that this is a **PROBLEM** and the activists who are fighting for it, who are raising their voice for this are not terrorist or mad-men or hippies basically people who don't have any work and are just roaming free and doing these activities which they are doing with the only aim of disturbing the normal routine or normal life of others but it is not like that, there are businessman and moms and dads and lawyers and scientists and people who have 9 to 5 job there are people from every walk of life getting involved in this because they really believe that there is a problem. These are people who have understood this problem, people who want others to understand it and people who know what will be the consequences of this reckless behavior.

People don't have time for this, they don't think that this is important, they have no knowledge or let's say idea that this is an important issue and if these problems are not solved then we are going to suffer, according to the geologist, environmentalist present at the Katowice Climate change conference in 2018 if we want to stop climate change then we must stop all the factories around the globe, at this instance otherwise we will pass the point where things cannot be controlled by this so-called superior human race.

When we see a person throwing plastic recklessly we don't mind, when we see mountains been blown up for their natural resources we don't mind, when we see forests been cut for their timber we don't mind, when animals are killed we don't mind, when animals eat plastic and choke on it we don't mind this attitude must change or humanity will be forced into a change which we cannot imagine, in-fact which we don't want to imagine.

One more thing to note here is that this endless pollution by our species is changing the earth. To be simple it is making the earth different from it originally was, the earth has changed and damaged a lot only just in the past 120, not even counting the ten thousand years of human

existence, in the past 120 years we had the so-called modern era ascends on us which directly resulted in a level of pollution which was never seen before. In these past 120 years we have had two world wars, the dawn of the modern era, the rise of mass production, wise in healthcare service and this all inevitably leading to the humongous rise in our population from 1.6 Billion in 1900 we have risen to 7 Billion in 2019. We must, in the end, remember that it was human psychology which started this modern era of pollution, this psychology of use and throws. People need to realize that the world which they have made themselves limited into is a very small world with small issues and that they cannot keep on ignoring the real-world problems, they will come a time when people will need to look for solutions of all of our environmental problems but by that time it will be late, if any solid step is to be taken right now is the best time to do it.<sup>11</sup>

This recklessness by the majority of our population lets activists turn towards radical environmentalism an ideology that has its origins due to the frustration with the co-option of mainstream environmentalism. Thus this sometimes gives rise to violence which the so-called environmental friendly industries whose profit lies in harming the environment itself terms as Eco-terrorism. Violence committed in support of ecological or environmental causes against people or property, but the fact remains that these Eco-terrorist have thus far harmed only the property of the big corporations or government bodies harming the environment and have not killed or injured any person. The thought behind eco-terrorism rises from the belief that capitalism, patriarchal society, and the industrial revolution and its subsequent innovations were responsible for the devastation of nature.

Examples of organizations accused of eco-terrorist organizations are Animal Liberation Front (ALF), the Earth Liberation Front (ELF), The Sea Shepherd Conservation Society, People for the ethical treatment of animals (PETA), and Earth First. The coalition aims to preserve the environment by committing acts against the environmental harmful organizations, however, a mutual understanding between all these organizations is that no person or animals should be harmed in this process. The FBI (United States federal bureau of investigation) credited eco-terrorists with USD\$200 million in property damage between 2009 and 2008. A majority of states have introduced laws in penalizing eco-terrorism.<sup>12</sup>

These organizations follow a leaderless resistance which Stefan Leader describes as "a technique by which terrorist groups can carry out violent acts while reducing the risk of

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<sup>11</sup> Curry, M. and Cullman, S. (2011). *IF A TREE FALLS 2011*. [online] YouTube. Available at: <https://www.youtube.com/watch?v=UmZkNNJqrII>

<sup>12</sup> Eco-terrorism. (2003, August 24). Retrieved from <https://en.wikipedia.org/wiki/Eco-terrorism>

infiltration by law enforcement elements. The basic principle of leaderless resistance is that there is no centralized authority or chain-of-command." These organizations use tactics with the aims of just harming the property of environmental harmful corporations and not the people associated with it. Their tactics involve Tree spiking, Arson, Monkey wrenching and in rare cases bombings. We must also remember that these organizations worked or works because years of paperwork, protest, and rallies by an activist to shut down a particular building or a corporation can be done by these groups in just one single night.

The irony here is that after the movement which originally aimed at protecting the environment turned violent which not even killed or harmed any person was at a time listed as FBI's No. 1 Domestic Terrorism Threat. This is not a group which harmed any person unlike the various sadistic terrorist organizations with the main aim of killing people without any goal but this was a group who wanted to fight for all of us but was regarded as the No. 1 Domestic terrorism threat, my question is "A threat to who ?". I mean how can you call a person a terrorist who sets building on fire while taking the caution to not to harm anybody, it's inappropriate in every way and it's nothing more than an insult. The word terrorism is about killing humans, ending innocent life and should not be given to people whose aim is to save humanity itself by conserving and fighting for the only thing due to which human life is possible for the first place, the environment. The word terrorist in this context is exactly the antithesis of what they do. Life was a very big part of the plan and implementation of these actions and that is why no one was harmed or injured in them. About 1200 incidents have been contributed to the ELF alone in the USA till 2011 and not a single case of injury has been reported, those statistics don't happen by accident.

The real terrorist here is the big timber companies that come to a forest and harvest it, the big oil companies which come for the extraction of oil, you don't see the justice forces raiding the executives homes of these organizations, they aren't being threatened with life imprisonment, all they really do is pay and fine and move on to the next area to harvest or to extract natural resources from. It's just like the old phrase that one man's terrorist is one man's freedom fighter, however, we all must realize that this fight is not against each other or even a fight at all but this is an initiative to protect something larger and bigger than just you and me.

This will be the form of response by environmentalists that has already happened and which is likely to happen if environmental degradation is not stopped. Plastic is what should be seen as the physical form of all these environmental dangers or beginnings to all our environmental problems, as it is only during the period of mass production of plastic that we started to tremendously increase all other harmful work towards environmental degradation. Only then

can we as a species will have the chance to fight in defense of ourselves, whenever we see plastic we must remind ourselves that this is the starting of all this problem and we must remind ourselves that if we can stop using plastic and switch to other materials, then only could start hoping for achieving our other works towards environmental protection.

On the other side of the coin, the plastic producing companies such as Coca Cola are blaming the consumers for all this plastic pollution, not the industries. Coca Cola has partnered with this organization Keep America Beautiful (Kab.org), you hear keep America beautiful you think that this organization sounds like that this is like an organization started by a bunch of bearded environmentalists, but it was founded surprisingly by the beverage brewing and canning and packaging industries. The idea is that let's tell the consumers that they are the ones responsible for all this plastic pollution and not the industries. The consumers are the bad bugs, the littering people and not the industries and industries should not be blamed for all this. This organization started in 1953 in Stamford, Connecticut but this organization still has a wide presence across America. Keep Scotland Beautiful is another example of such an organization, this particular one is partially financed by Coca-Cola. According to the head of an organization which claims to be the head of a fight against pollution, he says that plastic products from MNC such as coca-cola are an excellent example of packaging, a wonder and we should look towards coca-cola for example as to how to dispose of our plastic waste and how to conserve the environment.<sup>13</sup> Coca Cola should instead of doing all this just go back to their original way of serving Coke. In the 50s a bottle of coke was made of glass and there was a deposit system, in which after drinking the coke people would deposit the bottle after which it will go be to the factory where the bottle will be washed and refilled with Coke and thus reused. This creates significantly less waste for the environment the system worked very well but coke decided to put an end to it and use plastic instead. On camera, the Ceo's of these companies shows that they are doing everything in their power to stop pollution but in reality, they aim to make as much money as they can, they don't care about the repercussions which will follow humanity as a whole if such practices continue.<sup>14</sup>

The Plastic problem has the same effect as the majority of humans present on earth that is the majority of humanity either does not understand or does not care about this problem, they are

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<sup>13</sup> Climate change: it is not your fault. (2019, September 23). Retrieved from <http://nique.net/opinions/2019/09/23/climate-change-it-is-not-your-fault/>

<sup>14</sup> Josh Gabbatiss Science Correspondent @josh\_gabbatiss. "Coca-Cola and Nestle among Worst Plastic Polluters Based on Global Clean-Ups." *The Independent*, Independent Digital News and Media, 11 Oct. 2018, [www.independent.co.uk/environment/plastic-pollution-coca-cola-nestle-pepsico-nestle-beach-clean-greenpeace-a8576276.html](http://www.independent.co.uk/environment/plastic-pollution-coca-cola-nestle-pepsico-nestle-beach-clean-greenpeace-a8576276.html).

busy with their own life and using plastic as it comes applicable to them. Some are solely dependent on plastic as their primary source of incomes while others use plastic because they don't have time to think of an alternative. The recent efforts by the GOI towards curbing the menace of plastic pollution have raised awareness among the masses about the effects of plastic on our environment but still, there is a space for a lot to do in this field.

## **VII. ANALYSIS OF PLASTIC AWARENESS IN AN "AVERAGE" TOWN-**

A research was conducted by the author which included around 250 people from different age groups. Different social, economic, cultural and religious backgrounds in and around the city of Gwalior. Which could be rightly termed as an average Indian town. A town where the majority of the population like the country is developing, the town is included in the smart city program of the government of India. This town is among the 100 cities envied by the NDA government to be part of the smart city programs where a special focus was given to convert these cities into smart cities with special care being given to informing the masses about the modern needs of a city. This city was especially focused upon because this city has similar characteristics to most of the Indian cities that are the city is developing, the people are being focused upon by the government to be informed about such problems and the eco-system that this city has does not only represents the mind-set of the state of Madhya Pradesh but since this city is a niche point between the tri-states of Uttar Pradesh, Madhya Pradesh, and Rajasthan the views of the nearby areas are also collected which gave us a bigger base to conduct our research on. Along with that, the area surrounding the city can be correctly termed as an environmental hotspot such as the Palpur-Kuno Wildlife Sanctuary which is located about a 100kms from the old city, the Bharatpur bird sanctuary along with Ranthambore national park near Sawai Madhopur also being very close this puts Gwalior surround by varies environmental hotspots.

The data is divided effectively into 3 age categories- the first being people up to 30 years of age, second being those who are above 30 and below 62 and the third being people of above 62 years of age in the town of Gwalior in Madhya Pradesh.

The data collected reflected that the older age people are less aware of the plastic problem, most of them have very little or no idea about the characterizes of this problem and the fact that plastic is non-biodegradable. It was also noticed that elders were cleaning do not give any special attention to plastic and they consider it to be a biodegradable product. The data collected for the middle age group people had divided opinions some knew about this problem while the majority of them don't have much intellect on this topic they have don't

know that the fact that plastic is a non-biodegradable material. Though some of them were aware of the various facts surrounding plastic, most of them don't have the time or resources to do something thoughtful against the plastic menace. The data collected from the youngest group of people showed that they have knowledge about the plastic problem, they know that plastic is a non-biodegradable material and also was aware of its harmful effect on our environment. The primary reason for this result could be considered the advancement towards awareness of pollution in general made by the state and central government in their educational system.

The above data may at first look like that it shows that people of older age groups are negligent of the plastic problem and only the younger people are more concerned about the plastic issue instead the truth is that the data highlights the mistakes of our society as a whole in its inability to unite all sections of our society to solve this problem. The younger people and people up to the age of thirty are more connected to the outside world than the elders are, the modern education system is being adapted and improved to include modern problems these are the reasons that the younger people are more knowledgeable about this problem. One more fact to be noted is that all the people in the research produce approximately the same amount of plastic in a day. Talking about single-use plastic whereas the younger people's contribution to single-use plastic waste is mostly related to plastic food packaging items the older people have to some extent the same amount of plastic waste generation rate. The older people also use the same amount of single-use plastic items in a day as the younger people do.

### **VIII. ECONOMICS OF PLASTIC-**

The plastic problem should be seen mainly as an environmental problem however we tend to focus more on the economics of plastics and how any strong action against plastic will affect the economics of plastic. Plastic manufacturing has been a major part of the chemical industry, and some of the world's biggest chemical companies have been involved in the plastics business since the earliest days. In 2014, sales of the top fifty companies amounted to US\$961,300,000,000. The firms came from around 18 countries in total, more than half of the companies on the list being headquartered in the U.S. Many of the top fifty plastics companies were concentrated in just 3 countries: the US with 12 companies, Japan with 8 companies and Germany with 6 companies. The global market for plastic products is growing at about 3% a year, according to the business research company in its report *Plastics Product Manufacturing Global Market 2017*. It was worth \$1.1 trillion in 2016 and will grow to \$1.2

trillion by 2020. The packaging industry using the most plastic at 35.9% of the total world plastic produced. The USA and China are necks to neck as markets for plastic products manufacturers, though China is likely to draw ahead of the USA as soon as the market there is growing by 3% year on year, against the USA's 1.6%. The markets in India and Brazil are very small when compared against the markets in the USA and China. The global plastic products markets are highly fragmented – the top five competitors in the market made up only 3.2% of the total in 2016.<sup>15</sup>

The intended useful life of plastic packaging is typically less than a year. The energy and resources spent on producing it becomes a waste after just a single-use. Then it just leaks out of the value chain and remains in the oceans or soil for centuries. This represents annual losses of \$80-120 billion to the world economy. Also, the natural capital cost because of the pollution it causes is valued conservatively by the UN at \$75 billion annually. The conventional plastic economy, thus, is characterized by heavy losses. 3D printing technology in design and production is a major trend in this industry. The speed and flexibility of this technology can promote innovation and reduce time-to-market. Products manufactured through this process have good mechanical properties like strength and rigidity.

The overall situation of the plastic industry though always very good is under the current circumstances looking very gloomy. The All India association of plastic industries was incorporated in 1982, plastic industries association of India is a leading Association of SSI and Medium-scale plastic processing units and medium scale plastic processing units and related interests in the country. Today in India there are about 26000 plastic processing units. The plastic industry in India gives employments to 3.3 million people who are associated with the industry. In India, demand in the past had been growing at 1.5 to 2.0 times the GDP growth. Thus while the India economy was expected to grow more than seven percent the next fiscal, even at the most conservative estimate, a negative growth of demand has made the overall outlook rather dull and gloomy. One of the major factors is a total tax on plastic in India which is over 28 percent most probably the highest in the region. Besides high taxes, legislative flats like compulsory use of jute bags for packing food grains and sugar have stifled demand for plastics. Other factors threatening the viability of the Indian petrochemical industry are high-cost structure, low duty protection and an emerging avalanche of capacity

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<sup>15</sup> Grand View Research, Inc. "Plastics Market Worth \$654.38 Billion By 2020: Grand View Research, Inc." *PR Newswire: Press Release Distribution, Targeting, Monitoring and Marketing*, 28 June 2018, [www.prnewswire.com/news-releases/plastics-market-worth-65438-billion-by-2020-grand-view-research-inc-511720541.html](http://www.prnewswire.com/news-releases/plastics-market-worth-65438-billion-by-2020-grand-view-research-inc-511720541.html).

in the Middle East region based on highly subsidized feedstock.<sup>16</sup> All these factors culminates to the end result that though plastic packaging is in high demand as of now and is likely to remain so, this is therefore high time when the government must shift its policy focus from developing the solving to the problems of the current plastic industry to setting up a whole new industry to provide as an alternative to plastic not just in use of the material itself but also towards settling the economic and social loss which will occur when the current plastic industry will be gradually deconstructed.<sup>17</sup>

## **IX. RECYCLING PLASTIC-**

Plastic recycling is the process of recovering different types of plastic material to reprocess them into varied other products, which may or may not be like their original form. Plastic was supposed to be the wonder product of the 20th century, but the toxic created by it is very dangerous. Recycling of plastic at such times where companies are producing 10 plastic bottles in a second in a production line of a single factory sounds exactly what we need. Therefore it has become imperative to recycle all plastic waste. However, this is neither as exciting as it looks (or the environment protection part) nor is the money in this is enough for the waste collectors to seriously consider plastic recycling as a mode of business. As many people and organizations around the world are focusing on plastic waste recycling but till now in the whole history of mankind, there has always been more production of new plastic than the amount of old plastic recycled.

The prices of waste plastic are very low which makes it immensely difficult for the people belonging to lower economic sections of our society to collect plastic as a clear-cut way to economically support their family or for that matter, just themselves. Too many pieces of plastic and too many people collecting this plastic to make a living for themselves, make it difficult for everyone. The governments around the globe should in furtherance of a good plastic recycling industry fix a minimum price per kilo for a plastic material that these people collect. In this way, it would be beneficial both ways as this would generate growth in the plastic recycling industry and would also support people who are living below or near the poverty line. Recycling is profitable mainly for the owners and partners of a recycling plant and not the other people who are involved in these activities. For the small collectors of plastic, the payment given to them is very low, the workers working in the recycling plant are

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<sup>16</sup> ET Bureau. "Indian Plastic Industry -Challenging Times." *The Economic Times*, Economic Times, 31 Oct. 2008, [economictimes.indiatimes.com/industry/indl-goods/svs/paper/-/wood/-/glass/-plastic/-marbles/indian-plastic-industry-challenging-times/articleshow/3656328.cms?from=mdr](http://economictimes.indiatimes.com/industry/indl-goods/svs/paper/-/wood/-/glass/-plastic/-marbles/indian-plastic-industry-challenging-times/articleshow/3656328.cms?from=mdr).

<sup>17</sup> "Plastic Planet - An Economic and Human Crisis: Economics." [tutor2u, www.tutor2u.net/economics/blog/plastic-planet-an-economic-and-human-crisis](http://www.tutor2u.net/economics/blog/plastic-planet-an-economic-and-human-crisis).

often hired at very low cost in countries whose labor laws are very weak and these workers are often exposed to harmful gases involved in this process. Some of these workers working in the recycling factories live on the factory site itself. Various first world companies sent dumps their plastic into third world countries where this plastic either gets dump or if it is lucky gets recycled. When this plastic gets there is a high chance that this plastic will get burned which in turn destroys the environment around it. The waste which comes from recycling plastic is to be put in simple terms just waste and it ends up mostly getting burned or dumped around. The lives of people living around these plastic recycling plants are also not good as they become victims of the toxic which is released from plastic recycling and then they are also subjected to the toxic chemicals which are released when the waste from the recycling plant is burned. All this toxic generally ends up in the people living nearby getting sick, in a very bad way. The recycling industries settled near rivers not only affect the environment in approximate to them but through the river, it ends up affecting the whole area in which the river passes. People fish in that river, there are farms situated around the river as it passes through more land and this gives us the idea that how bad is the plastic problem and the major fact remains that first all this plastic generally coming from different places, that is that plastic is not even local and the second thing is that the impact is beyond of what we had originally imagined. This made us think that is this what we had in mind when we went to recycle when we segregated our waste.<sup>18</sup>

So, to conclude environmentally recycling is not a good idea. Because every time we recycle some kind of product, it's undergoing some kind of chemical process, which creates its waste. We all grew up hearing the 3Rs- Reduce, Reuse, Recycle but we just directly go to recycling because that the easiest one.

## **X. LAW REGARDING PLASTIC-**

### ***The situation of India-***

One would expect that when everyone is aware about the harms that plastic causes to the environment and that if the current rate of production, manufacture, sale and recycle of plastic will continue then the environment will be damaged beyond repair, so at such high times all the countries around the world must have through some legislature banned plastic in their respective countries, states, counties, districts, etc. No, only a select few numbers of countries have successfully banned plastic production, manufacture, sale and recycle. The UN

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<sup>18</sup> *Tracking your plastic: Exposing recycling myths (Marketplace)* [Video file]. (2019, September 27). Retrieved from <https://www.youtube.com/watch?v=c8aVYb-a7Uwf>

Environmental Programmer's report: Legal Limits on Single-Use Plastics and Microplastics: A Global Review of National Laws and Regulations have a lot to say about how the elected officials of various governments around the world are still neglecting the plastic problem. Though the majority of them have some kind of restriction that restriction has limited scope with numerous exceptions.

On March 15, 2018, the Maharashtra state passed a proposal banning the use of sale and manufacture of all disposable plastic items the state generates close to 500,000 tonnes of plastic waste every year. However, such bans are not new. In 2006, for instance, the Maharashtra government banned plastic bags thinner than 50 microns after it was found that they had clogged the city's storm water drains and compounded the 2005 flood crisis. But the implementation of the rule was shoddy with many people not even aware of its existence. So will this ban be any different? Activists say that this time an important clause has been added which could be the game-changer. In the earlier case, the manufacturer and supplier attracted a penalty for breaking the law. What's different now is that the consumer is also liable to pay if caught using plastic. There are some caveats however the 2016 notification on Plastic waste management rules had put the onus of collecting back the plastic waste generated by its product on the retail brands. The country generates 15,000 tonnes of plastic waste every day of which 6,000 tonnes remain uncollected. Experts also feel that it won't be enough to put in place a ban without providing alternatives to plastic. We talk about jute bags or cloth bags, however, they come at a huge cost which any seller does not want to incur. Behavioral change is another challenge. In Mumbai, for example, the BMC's attempts to segregate waste at source have not proven successful. Then, there's the question of implementation. Even though the bill empowers a range of government officials to enforce the ban it will be difficult to police a city with 18 million residents, leave alone a state or the whole country for that matter.<sup>19</sup> Karnataka, where a similar ban has been in place for the past two years, has only seen a marginal dip in the total plastic waste output. But a blanket ban on plastic bags does work as is the case in countries like Rwanda, the cleanest country in Africa. But the reason there could be stringent enforcement under an authoritarian government. Plastic manufacturers in Maharashtra believe that the ban will give a raw deal to the four lakh workers employed by the industry. So while it will take a lot more than just a ban to fix the problem it is to a large extent a step in the right direction.

These were the various definitions of the goods used in our day-to-day context, specifying the

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<sup>19</sup> Express Web Desk. (2018, June 27). Plastic ban in Maharashtra: What is allowed, what is banned. Retrieved from <https://indianexpress.com/article/india/plastic-ban-in-maharashtra-mumbai-from-june-23-what-is-allowed-what-is-banned-all-you-need-to-know-5228307/>

exact details which are somewhat required to have a better understanding of the terms used in the Environment and protection act 1986. Making sure that the definition and correct knowledge of every aspect of every environmental act is properly conveyed to the citizens should be the main focus of the Indian government if we are to provide a solution to the plastic problem. Regulates the market scenario to an extent of making the retailers aware that the partial ban is applied for a period of six months and after this testing process a complete ban shall be applied, if only; the retailers are concerned and find alternative methods to devise ways to prevent the use of plastic and its consequences on the environment.

The current system of bans lacks this very aspect. The consumers, producers are neither informed about the law nor are they provided with an alternative.

### ***The situation around the world-***

#### **CHINA:**

The Chinese government responded to widespread plastic pollution by banning the distribution of single-use plastic bags in grocery stores and shops around the country. Companies face a strict fine of 10,000 yuan, or roughly 1,593 USD, for illegal plastic bag distribution.

Impact: The NRDC estimates that China has seen a 66% reduction in plastic bag usage since the rollout of the ban. In response to inconsistent enforcement, 600,000 regulators have been sent to grocery stores around the country to make sure that they comply.

#### **CAMBODIA:**

In Cambodia, new activities are rising to battle plastic contamination.

In April, the Ministry of Environment presented new guidelines for the utilization of plastic bags. Significant grocery stores, for example, Age and Fortunate have started to charge 400 riyals (\$0.10) per bag. The Ministry of Environment is likewise considering designs for jute packs as an option, and the school educational plan is being refreshed to help teach future ages on the mischief brought about by plastics. One promising plan to successfully battle plastic contamination is known as the roundabout economy, which spotlights on waste Reduce, Reuse and Reusing (3R). In a circular economy, waste is treated as important materials that ought to be reused or reused, not just to lessen the volume of waste yet besides to produce new monetary chances. As a matter of first importance, this requires polices that effectively urge a 3R way to deal with plastic waste. For instance, the European Association received a Roundabout Economy Activity Plan in 2016, which incorporates focuses for

reusing 75 percent of bundling waste by 2030 and making all plastic bundling recyclable by the same date.

#### CHILE:

In August, Chile became the first country in Latin America to ban stores from handing out free plastic bags to shoppers. Under the new rules, anyone who goes to a store will either have to buy a reusable bag or bring their own. The bill passed unanimously in both chambers of Congress and surveys showed that 95% of Chileans supported it.

Under the new rules, large stores will be allowed to hand out two single-use plastic bags per person and those handing out more will face fines of nearly \$400 (£315) per bag.

#### Bangladesh

Bangladesh is the primary nation on the planet to execute a prohibition on flimsy plastic packs after it was discovered they assumed a key job in stopping up waste frameworks during shocking flooding. Different nations start to go in the same pattern. Overall, one million plastic packs are devoured each moment. Kenya bans plastic sacks, making it one the latest of the more than two dozen nations that have looked to decrease plastic pack use through charges or bans.

## **XI. FUTURE SITUATION**

What about our future? If we continue to use plastic in the way that we are now along with the same recklessness of not recycling it properly or completely, I believe that humanity if it somehow lives will be drowning in plastic made items, the deepest parts of the oceans will be covered with plastic and instead of global warming, plastic will be responsible for the rise in sea levels, our cities will be garbage bins covered with single-use plastic items mostly. The amount in which plastic continues to be produced and the amount in which it is recycled if continues then it would leave our future generations in such a situation where it will look around and see only plastic. Since the 1950s we have produced almost around 8.3 billion tons of plastic and recycled only about 30% of it. If this level continues than the future generations will have to suffer a lot.

Let us instead of focusing on this future situation, look at the present scenario even right now there are people around the world living in regions which are full of plastic only and people are living there normally as if nothing's wrong. Forget that even in India there are people around the country that live in slums that have rivers of the plastic following in their backyard. These places need not be to be looked for far and deep but can be easily found

anywhere in India, even when one travels by train In India slums made of plastic with rivers of plastic can be easily found.

## **XII. SOLUTIONS**

Plastic ban being imposed by the various government on different levels around the world. However, the bans cannot be said to be completely powerful or working as these bans have essentially stopped legal trading of plastic and started illegal plastic trade, let's take the city of Chennai in Tamil Nadu for example here the state government has imposed a citywide on ban non-biodegradable and single-use plastic however the even after 10 months of the ban single-use plastic can still be found in the city at rush markets, shops, etc. It is hard and expensive for the shop owners to shift from plastic to other biodegradable items. Some continue to use the same old plastic, some have changed half of the plastic which they used previously while others who can try to completely move away from the use of plastic by moving towards good-old banana leaves. Some of the shop owners have shifted to bio-degradable products, some keep cloths bags with them and these bags are available for the customers. Mostly the shop owners encourage the customers to carry their bags with them when they shop. In the end, though the ban has not completely eradicated the use of plastic form the city of Chennai people have become aware of the problems with plastic and those who can try to move away from the use of single-use plastic. The ban though has limited success in the eradication of single-use plastics and has at least raised awareness about plastic in the people.<sup>20</sup>

### ***How Japan is solving this problem***

The waste management system in Japan varies from place to place. One percent of all waste here ends up in a landfill. Much of the waste simply gets burned. Dumped, crushed and chucked into an incinerator, such as the one in Toshima incineration plant. It's in northern Tokyo and is one of 21 which burns the millions of chunks of rubbish generated here in the world's biggest metropolis. Now there is only one landfill site left in the central Tokyo area. They reduce the amount of waste thrown in landfills so their future generations can keep using it. Rubbish becomes 1/20th of cubic volume when it is incinerated. The rubbish is burnt at more than 850 degrees and that heat does more than just burn the rubbish. The thermal energy first generated is used as steam and electricity to power the plant itself. All the small size incinerators which were not able to burn at high temperature were shut down as they released dioxins whose emission is stopped by the laws which were bought by the Japanese

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<sup>20</sup> *How Is Chennai Faring 8 Months Since Plastic Ban? | The Quint* [Video file]. (2019, September 24). Retrieved from <https://www.youtube.com/watch?v=QEuf4UXvPmE>

two decades ago. In small towns which had those small incinerators that had to be shut down, it left the village with a big problem, its answer tries not to produce any waste at all. Everything gets smashed, stripped and sorted into 45 different categories. The town doesn't have rubbish collectors so locals have to bring their waste at the collecting station and sort it themselves. That also means that the villagers make sure that everything is thoroughly cleaned and decontaminated. For the villagers, the only solution to the plastic problem is to use less plastic. Some villagers don't know how many types of separations there are, but they just do as they are told. Statistically, there can recycle 80% of the total waste. The remaining 20% can't be recycled, things that have to be burned or put in a landfill. As much as possible the materials get recycled within the town. For the aging villagers who are unable to come to the waste station, the city council workers make the journey up the town's streets to check in and see what's been chucked out. The more the garbage is separated the more can be recycled, if the garbage is not separated it cannot be recycled.

Some local governments in Japan are making residents pay for the unrecyclable waste they produce. It's known as pay as you throw and something experts say could work. The biggest effect of paying for rubbish is it will improve the separation of waste. It only charges for rubbish that needs to be processed.<sup>21</sup>

### ***How San Francisco is solving this problem***

The US only diverts about 34% of its waste to landfills as the average American who produces about 2 KG of waste per day only 0.68 KG is composted or recycled. But thanks to bold public policy San Francisco is leading all of North America in waste reduction it diverts about 80% of the city's waste from landfills, which is about 1.5 million tons a year. The ultimate goal in San Francisco is to be the first city in the United States to reach zero waste and the way they define zero waste in nothing to landfill and nothing to incineration. The city hopes to achieve this goal by 2020 but even if the city doesn't San Francisco is already way ahead of other cities and countries themselves. But how did San Francisco reached the situation in which the city is now? To get to zero waste production the city of San Francisco made recycling and composting mandatory in 2009 and banned certain items like Styrofoam and plastic grocery bag. The city also initially set trash collection rates much higher than composting rates to encourage behavior change. The charging structure in San Francisco is much nuanced. The collection rate for residents and businesses is determined by the volume of waste. The city has also had a penalization system for business if recyclables end up in the

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<sup>21</sup> *Japan's garbage disposal minimisation projects* / ABC News [Video file]. (2018, May 25). Retrieved from <https://www.youtube.com/watch?v=7T2KwNjYisM>

trash. San Francisco has tried to unite the Economy and Environment which people generally tend to separate. This program is evidence of how one helps the other. Another secret to the success of the city is the city's exclusive partnership with waste management Recology Rafael. Working with one company here eases the administrative burden in comparison of waste collection with other American cities such as New York which has a private system for commercial waste which is made up of hundreds of competing waste collection companies making it difficult for the city to collaborate with them in long term goals.

But the sheer scale of its operations. Say you throw a water bottle into recycling a truck will pick it up and bring it to recycle centrally. The bottle will be scooped up by a tractor loaded into a drum feeder and placed on a conveyor belt where workers will weed out contamination, from there a series of high-tech screens magnets and optical sorters will separate the paper, metals, and plastics. The bottle will end up in a bale with other plastics and shipped to a domestic recycling plant. The composting facility is also state-of-the-art all of the city's yard waste and food scraps are brought to it where they're weighed, ground-up and blended. The compost piles are aerated to reduce greenhouse gas emissions and the nutrient-rich product is sold as fertilizer. Believe it or not when you are eating or drinking in San Francisco your food or drink could be made up of San Francisco's trash. The top buyers of this compost are the agriculturists, vineyards, almond growers, walnut growers, etc situated near or around the city. It costs 300 million dollars a year to operate the San Francisco zero waste program and it's funded solely through waste collection fees which are no higher than average for the respective area. A complex recycling operation can also be a complex for job growth, 20 times more jobs are created when you recycle for each ton of material than if you put it in a landfill. Whether San Francisco achieves its 100% target by 2020 or not is not the question of what we should be asking, instead, the question should be can all cities around the world follow the same? Because after all the urban garbage produced from cities around the world is enough to fill a line of garbage trucks stretching more than 3,100 miles every day and things are only expected to get worse.<sup>22</sup>

### ***Other Solutions***

We use single-use plastic whether it is a fork, spoon, knife, etc. are awful for the environment but we choose to use them because humans tend to choose convenience over mild unconvinced. But if one-stop step we can all do to conserve the environment is to stop using single-use plastic, literally just next time you go to a restaurant just drink from the glass, if

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<sup>22</sup> *How San Francisco Is Becoming A Zero Waste City* [Video file]. (2016, June 30). Retrieved from <https://www.youtube.com/watch?v=Cg3OA1s8-SI>

some person who can't drink directly from the glass or a person with disability just use paper straws, silicone straws, or metal straws. It's not a one size fit solution but there are options. Get reusable utensils is one. This stuff will along with saving us a ton of money also help the environment in a very good way and at the very most it will only add a few more minutes of dishwashing.

In 2016 researchers at Utrecht University developed a super fungus that eats plastic once it is treated with some UV light. The mushroom devours the plastic over the course of a few weeks and once it feeds, it's completely edible. It's a lengthy incredible process that, though won't fix our massive plastic problem, it could potentially offset how much waste we dump into landfills.<sup>23</sup> Further research needs to be done before it becomes a commercially viable product that can start changing the world, but it's a really interesting solution. Six-pack rings end up choking marine animals and are generally an inefficient nuisance to the world. Their purpose is not even close to being outweighed by their environmental impact. The team at We Believers in cooperation with the ocean conservancy have created edible six-pack rings. The rings are made out of barley and wheat remnants from the process used brew beers so it's not just positive for sea creatures. It's cost-effective and resources-effective as well. Reducing our dependence on plastic is a team effort.

What we need to create is a circular economy where the plastic which once gets produced is most surely recycled or degraded by small methods, our aim should be to reduce as much plastic as we can from the face of the earth. End the presence of plastic is necessary because unlimited recycling is not the answer as the plastic will always remain on the earth.

### **XIII. CONCLUSION**

Plastic was a Pandora's box whose contents at the staring were found to be terrific for humans, the idea itself of a cheap and easily available alternative for cloth was found to be the best at the time and it would be correct to say that it still is one of the greatest inventions of 20th century however the mass production, improper disposal and the fact that once produced plastic could not be disposed of without producing other harmful content is the single most terrible thing that could have ever happened to humanity. We reap what we sow, we produced plastic at first and now only we must get rid of it.

Only Men have created a huge plastic problem and only men can stop it. The plastic problem is not a problem that can be solved by actions of some as in the case of CFC (Chloro Floro

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<sup>23</sup> Prestigious BraunPrize for converting plastic into food. (2016, February 12). Retrieved from <https://www.uu.nl/en/news/prestigious-braunprize-for-converting-plastic-into-food>

Carbon) where only if the manufactures of the applications stop or change their manufacturing style the issue on a whole can be solved or at least minimized. The Plastic Problem, on the other hand, can only be solved by the combined effects of every person present on earth without such huge effort no result can be achieved.

"The mass extinction we always feared has already begun and plastic is the cause."

Every Human being must be made aware of the environmental harm of plastic which it brings when it is created, every human being should be aware enough not to use this harmful replacement anymore and everyone should unite to find a viable solution to it.

The solutions that have been found must be applied with great haste and more research is to be done on this issue if we are to make sure that our future generations do not bear the price of our mistakes. We have known the effects of plastic on our environment since the 1970s but have not till now implemented any good efforts to solve this problem, we must implements all the solutions we have on our disposal to the plastic problem now because if we don't this problem is only getting to get bigger.

If we want to save our world and ourselves, we have to decide the planet or plastic. If we recycle just to consume more and more plastic each day, we are fooling ourselves.