

## Plastic: A Waste or A Resource

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### Abstract

*Within the themes provided, the researcher has chosen Plastic: Waste or Resource as the subject matter to be dealt in the research paper. This research paper would be of importance to academicians and legal scholars to understand that plastic can be waste or resource depending upon the plans and policies that the government take. The central argument of this research paper brings the fact to light that if proper plans and due procedure is followed in relation to innovation, then plastic can also be a blessing. The researcher has supported the central argument primarily by showing how different industries are using plastic in an innovative manner to overcome the problem of plastic disposal. The main objective of this research paper is to request the law authorities to enact an act which makes it compulsorily for industries in the economy to utilize the plastic waste in every manner possible which in turn will help the economy boost.*

**Keywords:** Plastic, resource, waste, innovation, industries, economy boost

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### INTRODUCTION

Plastics are used throughout the world on a daily basis. The word plastic is a common term that is used for many materials of a synthetic or semi-synthetic nature. The term was derived from the Greek word 'plastikos', which means "fit for molding." Plastics are a wide variety of combinations of properties when viewed as a whole. They are used for shellac, cellulose, rubber, and asphalt. It is also synthetically manufacture items such as clothing, packaging, automobiles, electronics, aircrafts, medical supplies, and recreational items. The list could go on and on and it is obvious that much of what we have today would not be possible without plastics. One way in which plastics have changed the world was in cost. It was so much cheaper to manufacture than other materials and the various ways in which it could be used was staggering [1].

### PLASTIC AS A WASTE

The plastic available to us in the modern society has a lot of shortfalls. The manufacturing units prefer to produce plastic over other metals because it's easier to produce and is much cheaper than producing other metals. Also, we as consumers want plastic as it's lighter to carry as compared to other packaging materials. However, its wide

use makes it dangerous to the society.

### Harmful Nature

Disposable plastics used in packaging foodstuff meant for human consumption contain harmful compounds. Improper disposal of these packaging products leads to these harmful compounds finding their way to water bodies, where they dissolve over a long time due to their non-biodegradable nature. Littered plastics are also harmful to animals because they occasionally eat them and die. Additionally, plastics fabrication involves the use of potentially dangerous chemicals, which are added as stabilizers or colorants. Most of these chemicals have not undergone an ecological risk appraisal, and their impact on human well-being and the environment is presently vague. One example is phthalates, which are used in the manufacture of PVC.

### Environmental Degradation

Plastics take centuries to decay as they fall under the ambit of non-biodegradable materials. Plastics constitute intermolecular bond which makes it almost impossible to decompose. Improper disposal of plastics into reservoirs clogs the waterways which in turn pollutes the reservoirs and makes them unsightly [2].

### **Chemical Risk**

Not only that creation and recycling of plastic can cause serious environmental risk, but some of the additives that are infused in plastic can cause permanent harm to our metabolism. Chemicals such as phthalates and BPA are widely used as an additive that prevents degrading of plastic structure, but they also interfere with our natural hormone levels which can cause serious problems to both males and females (lower testosterone levels in men, and premature girl puberty).

### **Choking Hazard**

Plastic is one of the most popular building materials for small items. This is most evident in toy industry, where vast majority of children toys is manufactured with plastic. These toys and small plastic objects of many uses can easily get into children's hands (especially babies and toddlers) that unknowingly put them in their mouth. To prevent these serious accidents, governments have implemented detailed set of rules which force manufacturers to clearly label their plastic products and warn users of the possible choking potential. Another problematic plastic product that can cause serious injuries or death are plastic bags (grocery or trash bags) who can sometimes end up wrapped around children faces, disrupting their breathing [3].

### **Low Melting Point makes it Even Worse**

The low melting point limits its use. Shopping bags that are used to carry hot food add up to the health issues mentioned above. It can easily get mixed if the temperature is not favorable and this may not seem very alarming but if we see it with a long-term perspective, it is just like slow poisoning [4].

## **PLASTIC AS A RESOURCE**

With the help of advance technology, the plastic waste can be used as a resource and not something that we just throw away. Plastic waste has an important economic value and we want to introduce appropriate measures discouraging incineration of recyclable compostable and biodegradable plastics. To give an example, to produce a ton of virgin plastic we spend €1400, the same recycled quantity costs €900. We should privilege the use of recycled products over the virgin ones [5].

The circular economy is all about keeping resources in a constant loop, reusing and recycling them as many times as possible. This helps to minimize waste and reduce the need for brand new resources.

Treating plastic waste as a resource rather than a problem is an important change that needs to happen over the coming decades. This will help to preserve our remaining chemical materials, as well as protect our environment [6].

### **Fashion**

Whatever the designer dreams up, plastics can deliver. What helped put the stretch in skinny jeans and socks, give dress clothes their shimmer and keep outerwear lightweight and water-resistant? Horn-rimmed eyeglasses rose in popularity, only when tortoise shell ones were replaced by molded plastics. In the 1970s, platform shoes went hand in hand with the disco era. Often featuring more than four inches of thick, stacked plastic bases, these shoes were sported on dance floors by both men and women and loved for their appeal. Everything was big in the 1980s, even aerobic fashion. Any aerobic outfit of the 1980s was founded on plastic Spandex. Sneakers, too, were everywhere. The plastic in the thick cushioned soles allowed them to be engineered for sportsmanship as well as style. High-tops burst onto the scene, and athletes like Michael Jordan began endorsing top-of-the-line sneakers. Take the humble hair comb. The famous glitz and glamour of old Art Deco Hollywood poured into 1930s fashion and accessories, most notably the Art Deco hair comb. Some were made of expensive gems and metals, many were made of plastics, making them a classic trend that could be worn by all economic classes [7].

### **Farming and Agriculture**

The ever-growing use of plastics in agriculture—called plasticulture—has helped farmers increase crop production, improve food quality and reduce the ecological footprint of their activity. Not only do plastics allow for vegetables and fruits (even exotic ones, such as broccoli and avocado) to be grown in all seasons, but these products are usually of better quality than those grown in an open field. We forgot to mention exotic,

marketable herbs: wouldn't you like to cultivate parsley, sage, rosemary and thyme? Not to mention oregano! A wide range of plastics are used in agriculture, including polyolefin, polyethylene, polypropylene, ethylene-vinyl acetate copolymer, poly-vinyl chloride and, less so, polycarbonates and poly-methyl-methacrylate. Water can be saved. Crops can even be planted in arid areas. Plastic irrigation pipes prevent waste of water and nutrients, rainwater can be retained in reservoirs lined with plastics, and the use of pesticides can be reduced by keeping crops in a closed space such as a greenhouse or, for mulching, under a plastic film. A silage, made of plastic film and used to store grain and straw in the winter, is a useful application. Silages are time-resistant, and the content can be stored for years. Then there are the walk-in tunnels and low tunnel covers. Terrific, for you can grow asparagus and watermelons anywhere. The raw materials for tunnel covers are usually low-density polyethylene (LDPE) and ethylene-vinyl acetate (EVA) or ethylene-butyl acrylate copolymers. For mulching, linear low-density polyethylene is used. The names really don't matter. Really, the function does. At the end of their life cycle, agricultural plastics such as greenhouse covers can be recycled. Once retrieved from fields, plastics are usually washed to eliminate sand, herbicides and pesticides, before being grinded and extruded into pellets. The material can then be used again [8].

### Construction of Roads

Plastic waste helps increase the strength of the road, reducing road fatigue. These roads have better resistance towards rainwater and cold weather. Since a large amount of plastic waste is required for a small stretch of road, the amount of waste plastic strewn around will definitely reduce.

The entire process is very simple. The plastic waste material is first shredded to a particular size using a shredding machine. The aggregate mix is heated at 165°C and transferred to the mixing chamber, and the bitumen is heated to 160°C to result in good binding. It is important to monitor the temperature during heating. The shredded plastic waste is then added to the aggregate. It gets coated uniformly over the

aggregate within 30 to 60 seconds, giving an oily look. The plastic waste coated aggregate is mixed with hot bitumen and the resulting mix is used for road construction. The road laying temperature is between 110°C to 120°C. The roller used has a capacity of 8 tons [9].

A Government order in November 2015 has made it mandatory for all road developers in the country to use waste plastic, along with bituminous mixes, for road construction. This is to help overcome the growing problem of plastic waste disposal in India. The technology for this was developed by the 'Plastic Man' of India, Prof Rajagopalan Vasudevan, professor of Chemistry at Thiagarajar College of Engineering, Madurai [10].

### Improved Working Conditions

The process of collecting, sorting and selling waste is initiated by waste pickers. There are many recycling companies in Indonesia which recycle used bottles picked up from the streets and beaches of Java. One such company is Namasindo Plas, a leading supplier of gallons, bottles, bottle pre-forms, screw caps and cups. This company operates on a B2B platform. This company has a CSR (Corporate Social Responsibility) program which seeks to improve working conditions and the livelihoods of waste pickers who provide waste plastic bottles for recycling. This CSR initiative is known as WASTE. The aim of the workshop was to give background knowledge about specific issues such as different types of plastic, sorting of waste materials and prevention of child labor.

Namasindo made this CSR a successful initiative by incorporating useful learning methods and educational tools which were used by trainers to more efficiently reach the target audience, i.e., adult waste pickers. The company saw active participation in all sessions and the discussions which took place were fruitful. All this active participation and discussions assured the company of the right path it was taking and this not only improved working conditions of the waste pickers but also improved their living conditions. Namasindo saw an increase in their productivity in the supply chain.

## CONCLUSIONS

Plastic is being used in every nation with them knowing its consequences. Plastic is cheaper to produce, light in weight but also contains compounds which makes it almost impossible to degrade. Keeping the non- biodegradable property of plastic in mind, it is upon the policies and plans that every nation makes which decides that whether plastic is a waste or resource for them. With technology upgrading every day, plastic is being used in different industries. The use of plastic can be seen from fashion industry to healthcare, from agriculture to construction, to automobiles. With upcoming innovation, every nation can make sure that they use the plastic as a resource for building their economy eliminating its shortcomings.

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