# The Ways To Minimize the Plastic Wastage in Sri Lanka

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**Abstract**— This research paper consists of detailed information with statistical analysis about in which fields the plastic has been used and the global and local consumption of plastic. The future trends of plastic and how the packaging industry contributes to the cumulative of plastic wastage has also analyzed. Along with this, it includes the adverse effects on the environment and the existing law provisions regarding plastic usage in Sri Lanka. In the later part, possible existing solutions available to minimize the plastic wastage has been discussed. As a conclusion of this research, a proposal was prescribed to reduce plastic usage at the supermarkets.

**Index Terms** – Environmental Effects, Minimize Plastic, Plastic wastage, Plastic Reduction at Supermarkets.

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## 1. INTRODUCTION

Plastic occupies significant and unique influence on the Sri Lankan economy and every field of human activities today, such as packaging, transportation, manufacturing of household, agriculture, piping, electronic goods, medical, furniture, heat insulation, and day to day items. Globally 80% of thermoplastics is being consumed. Under this consumption 37 %, 36%, 21 %,1.9 % used in packaging, electrical electronic automobile sectors, building sectors and agriculture sector respectively[1]. The pivotal reasons for its prominent place are due to properties such as safe, hygienic, lightweight, non-breakability, good shelf life, optimum impact resistance, resistance to microbes, ability to penetrate light, low energy consumption, and product loss during transportation. In Sri Lanka, two hundred thousand metric tons of raw plastic is being imported. Among that vast amount, seventy percentage have been utilized, and the rest of them are being exported. Western province solely producing three thousand five hundred metric tons of plastic solid waste. However, the worst part of the scenario is, only two thousand four hundred metric tons are being recollected. Among them, ten percent of plastic is recycled, and another seventy-five percentage has been dumbed [2]. As illustrated in Fig. 1, in future prospectus around 2025, four hundred thousand and thirty thousand tons of plastic expected to be imported, among those three hundred thousand and ten thousand will be consumed. Also, two hundred thousand and twenty thousand tons anticipated being as waste [3].

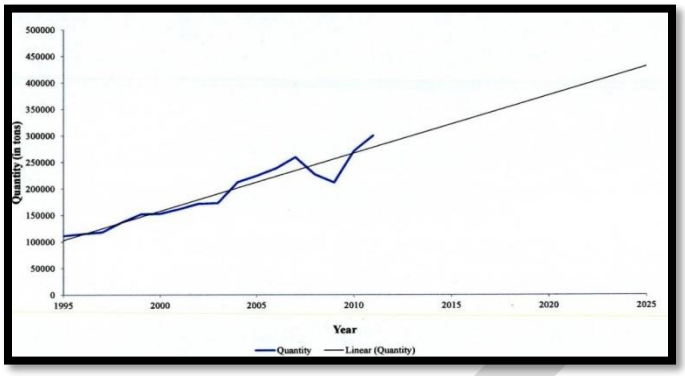


Fig1. Increasing trends of plastic Usage in Sri Lanka

According to the ocean, conservancy reports a hundred and fifty million metric tons of plastic are being circulated in the ocean. Annually eight million metric tons are being added consecutively. South Asia has been declared as a dead zone due to the vast amount of plastic production, which is estimated as twenty-six million tons. Hence, biological oxygen demand increased dramatically. Fig 2 indicates the horrible effect of the plastic residuals on the wild animal.

Fig 2. Harmful effects of plastic residuals on wild animals

Toxic materials may adhere to the surface of the plastic, and it would be accumulated and reach the human body via the food chain, which has the tendency to cause kidney disorders, liver problems, collapse the functions of the endocrine gland and causes cancer. Sri Lankan government took initiation to ban the polythene usage in 1994 and 2006, but it was failed because people strongly refused, and also government not strongly withstand in their enforcement. Again in 2017, the government put a provision in law to ban polystyrene packaging, polyethylene sheet, and the incineration of plastic. However, this has not attained that much success. Apart from these failures, the Sri Lankan government successful in implementing garbage segregation, plastic separation, polythene recycling, a small step towards marine waste management[4]. Plastic occupies more time for the decomposition, which is around One million years. United nations stared a campaign known as Environment`s Cleanses. Their main objective is to eliminate and recycle the plastic wastage accumulated seashore.

Sri Lanka implemented the same sort of campaign in 2018, and its target is to nullify the plastic wastages within twelve years. Sri Lanka has so many law provisions regarding plastic waste management; however, people are not ready to accept them; thus, people usually burn plastic without worrying about future consequences. Harmful toxic substances would be emitted, especially dioxin and furans, by burning PVC, and it will lead to cancer and lung disease. People in developed countries witness plastic as wastage material. Therefore, they have a poor understanding that plastics do not bear any value. So by conducting awareness programs, the value of plastic must be incorporated within society. Most parts of the plastic exposed to the community are from the water and beverage industry. The main reason to consider plastic as a packaging material is because of the flexibility of law in Sri Lanka. Most of the plastic toys imported from foreign contain heavy metals. As a solution, there is a rule in a bill of lading that the importing company must take the responsibility to clean those plastic wastages. Bioplastic was introduced to reduce the plastic wastage, but the problem is it cannot degrade on its own. In order to initiate degradation microbes, have to be sprayed on the surface of the plastic. However, this procedure is inconvenient in seas. According to life cycle impact analysis (LCIA), which is used in the total environmental impact of a product, the impact of plastic is comparatively low in the environment, when compared with other materials.

## 2. EXISTING SOLUTIONS

1. Reduce littering and curtail unwanted consumption of plastic
2. Organize awareness programs within society regarding harmful effects of plastics in a collaboration with school students and university students.
3. Plastic related industries must join with green deal agreement and must take necessary steps to reduce single use packaging, over packaging and littering.
4. Polluter pays principle says that the packaging industry must collect the plastics which they input. For the efficiency of this principle another postulate known as extended producer responsibility executed. The financial support for this program is done by US Aid with the collaboration of Ceylon chamber of commerce
5. CEJ initiated following steps to reduce plastic wastage such as discourage the over production of plastic, ban single use plastic, Enforcing strict laws for production and usage of plastic and suggesting alternatives for plastic
6. Introducing new material which has the similar properties like plastic, and it's manufacturing process also must be convenient.
7. Disposable packaging model must be introduced in cafes, restaurants
8. Using filtered tap water system instead of water bottles
9. Incorporating recycle bins in crowded areas and visualize the necessary instructions
10. Producing bio degradable plastics which can be degraded by ultra violet rays and it should not be long last in the environment
11. Modern methods used in plastic waste management such as Polymer blended bitumen road, Plastic blended with cement which are used in the construction purpose, Plastic waste is subjected to reverse engineering and converted as fuel by the method of using catalyst for the conversion of long molecular chain to small molecules and Plastic waste used as an alternative fuel for generating energy in the cement industry.

12. As per the Act No 26 of 2008, environmental conservation levy was imposed for the sale of certain plastics and services related to those plastics.
13. Production of bio degradable bags, reusable bags, glass bottle and the government must suggest to use these materials instead of plastic
14. Instead of one-time usage of plastic some plastic industries conducting a new system for refilling for the products such as shampoo bottle, soft drinks, cosmetics.
15. Government banned carriage of plastic bottles to the pilgrimage places in Sri Lanka and in emergency purposes Sri lankan military provide cotton bags at the entrance.
16. Prohibition of carrying the plastic materials towards the way from Ukanthamalai to Kataragama
17. Producing plastics which could be recycled in higher frequencies
18. Provide Eco friendly, bio degradable polyethene bag in supermarkets to minimize the polythene usage.
19. Initiate reverse vending machines
20. At supermarkets implementing automatic refilling machines to refill grocery items in Eco friendly bags, so that we can reduce the amount of polythene bags used. Supermarkets must come up with the rule of not providing polythene bags at the counter.
21. Use banana leaf instead of polyethene bags to pack vegetables

## 3. CONCLUSION

According to the above mentioned existing solutions, we would like to propose an innovative idea comprehensively. The amount of packaging cost will be decided on the recycling companies recycling cost. Also, the cumulative of the packaging cost would be uploaded in the system, and at the end of every year, the reward will be given for a person who submitted a maximum amount of plastic packaging. The phone number will be used as the identity of each customer. In addition to this, at the supermarkets, bio-plastics, and paper bags will be provided instead of polyethylene bags. This idea will also encourage people to collect plastics and to minimize the amount of landfill in society.

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