

Biodegradable Cutleries and Tableware as Substitute for Plastic: An Exploratory Study on Green Solutions

Moneswari Boro¹, Rajkumari Jaya Devi², Prof. L.S. Sharma³

^{1,2}Research Scholar, Department of Management, Mizoram University, Aizawl, Mizoram, India

³Professor Department of Management, Mizoram University, Aizawl, Mizoram, India

Abstract: - Indian food has the most varied flavours in the world as there is no homogeneity of flavor found in North and South or East and West. But when the time comes to serve the food, a variety of plastic wares are used, which has become a major concern to the environment. A number of food and beverage outlets are available now a days, whether it's located on roadside or restaurants etc. Street food vendors, food and beverage outlets in different hotels, restaurants and catering units generally prefer disposal plastic cutleries and tableware also known as "single – use plastic" which are used once and then thrown away. The most common reason behind the use of disposal plastic items is to save time from cleaning the utensils. So plastic items have become one of the fastest growing problems for the environment. The study tries to understand the concept of biodegradable cutleries and tableware and its relevance to the environment sustainability. This research paper is exploratory in nature with evidence based on secondary data. The study intended to examine the various types of biodegradable cutleries and tableware that can replace the single use plastics. The conclusion made in the study will bring insight about the advantages and how it is eco-friendly.

Keywords: Biodegradable cutleries and tableware, eco – friendly, sustainability, environment.

I. INTRODUCTION

Plastic pollution is a global problem that is growing exponentially due to both an increase in consumerism and an increase in the number of plastics used to manufacture the things we use on a daily basis. As of 2018, about 380 million tones of plastic is produced worldwide each year. From the 1950s up to 2018, an estimated 6.3 billion tones of plastic has been produced worldwide, of which an estimated 9% has been recycled and another 12% has been incinerated. This large amount of plastic waste enters the environment, with studies suggesting that the bodies of 90% of seabirds contain plastic debris. In some areas there have been significant efforts to reduce the prominence of free range plastic pollution, through reducing plastic consumption, litter cleanup, and promoting plastic recycling. Some researchers suggest that by 2050 there could be more plastic than fish in the oceans by weight. For more than 50 years, global production and consumption of plastics have continued to rise. An estimated 299 million tons of plastics were produced in 2013, representing a 4 percent increase over 2012, and confirming and upward trend over the past years. (*Worldwatch Institute, January 2015*). In 2008, our global plastic consumption worldwide has been estimated at 260 million tons and,

according to a 2012 report by Global Industry Analysts, plastic consumption is to reach 297.5 million tons by the end of 2015. Moreover, as they do not easily biodegrade into the environment and take hundreds or thousands of years to do so, it is limiting the usage of natural resources for the future generations. As a result, reduction of plastics must be one of the top priorities, especially the tools and utensils being used directly for food consumption. There is huge demand for one-time cutleries; United States for instance, consumes annually 40 billion plastic cutleries (Munir, 2016), while India throws away 120 billion pieces of plastic cutleries every year (Reddy, 2016). The global demand is 640 billion per year and the global plastic cutlery market was worth US\$ 2.62 billion in the year 2017, according to the data published by the Digital Journal, and expected to reach around US\$ 3 billion by 2025 (Digital Journal, 2019). In another study published by the National Geographic in 2018, half of the world's plastics being produced come from Asia, while 29 percent of the entire production volume is being contributed by China (Parker, Fast Facts about Plastic Pollution, 2018).

Objective

To explore the different types of biodegradable cutleries and tablewares with its relevance towards environmental sustainability.

II. RESEARCH METHODOLOGY

The study attempts to explore the various types of biodegradable cutleries and tablewares with its relevance with environment sustainability. This paper is exploratory in nature with theoretical evidences based on secondary data. The study intended to examine the various types of biodegradable cutleries and tablewares that can replace the single use plastics.

III. DISCUSSION

Based on the collected data from secondary sources, the followings are the analysis with respect to the objective framed.

Today, people are more inclined towards fast food due to various reasons. The fast food industry are the frequent users of plastic utensils, cutlery etc. The fast food industry may replace the use of plastic cutlery and tableware with the very eco-friendly alternative viz. biodegradable cutleries &

tablewares. The Table no. 1 shows the indicative lists of biodegradable cutleries & tablewares.

Table 1. Indicative lists of Biodegradable Cutleries & Tablewares

Sl. No	Cutlery	Description
1	<i>Areca Leaf Cutlery</i>	The fallen dry sheaths from betelnut trees or areca palm leaves are cleaned and are heat pressed and cut into the required solid shapes. No chemicals are used in the entire process, which leaves minimal carbon footprint. They are a good alternative to food caterers and party-throwers who are concerned about customer convenience and saving the environment at the same time. Eco Palm Leaf Plates, Verterra Dinnerware, The Magnus, Ecovision are some of leading manufacturers in this segment. Areca leaf plates cost in the range of INR 4-10.
2	<i>Edible Cutlery</i>	Bakeys’ edible cutlery is made from different kinds of flours that are highly nutritious and do not cause harm to our body unlike the cheap plastic cutlery. It is prepared by baking at a high temperature and therefore has no moisture in it. It can be eat and also decomposes pretty quickly and acts as a great fertilizer. The biggest positive is that it is fairly cheap, which allows an average Indian household to think of using it regularly (~INR3 per spoon).
3	<i>Rice Husk Tableware</i>	Rice husk tableware is one of the most durable forms of biodegradable cutlery that can withstand temperatures of more than 100 °C without being damaged. This reusable tableware has a smooth glossy covering that is 100% natural and derived from the wax present in rice husks. The entire manufacturing process results in a pure natural extract that is free of toxins and harmful by-products as well. These are strong, smooth, compact and reusable and could be a good substitute for daily usage storage like tiffin boxes etc.
4	<i>Bamboo Tableware/Flatware</i>	A bamboo flatware set is a perfect addition to your camping gear. It is lighter than metal silverware and fits nicely in your backpack. Bamboo spoons, forks, and knives are easy to put in your lunch bag for work. They also look more fashionable than plastic cutlery. Bamboo is an eco-friendly addition to school lunches and a great way to teach your kids to be environmentally conscious.
5	<i>Starch Granule Products</i>	Starch granules are the latest innovation in the packaging industry, which are made out of Potato and Tapioca starch granules along with other biomass. The product is white and looks like plastic, but is actually a 100% biodegradable product. These bags decompose within 180 days but if kept in normal water they dissolve within 24 hours and in 15 seconds if kept in boiling water. Therefore, one can throw away these plastic bags without worrying about any consequences, as they are fully edible and compostable. The bags are sturdy enough to hold good weight but they cannot hold liquids.
6	<i>Wheat Bran Tableware</i>	The Wheat Bran Tableware is edible tableware, consisting of plates, bowls, and cutlery, can be used to serve both hot and cold food. Aside from being edible, the plates and bowls can be used in classic and microwave ovens. Under correct circumstances, the products can be stored for at least 3 years. After use, the tableware decomposes in 30 days. Poland-based company Biotrem is using the fibrous grain to make biodegradable, single-use, wheat bran-based plates, bowls, and cutlery. Biotrem has been around for a few years, but as <i>Inhabitat</i> reported, the company’s products — which are actually edible — made a splash at the Green Living Show in Toronto over the weekend.

Source: <http://www.ecoideaz.com/showcase/biodegradable-cutlery-for-the-eco-sensitive-foodie>

Table 2. Comparison table for various Biodegradable Cutleries and Tablewares

	Plastics	Husk	Edible	Bagasse	Bamboo	Leafs	Starch
Cost	INR 0.3/plate	INR 500/plate	INR 3/spoon	INR 10-15/plate	INR 10-15/plate	INR 15-20/plate	INR 3/bag
Convenience	High	High	High	High	High	High	Moderate
Disposal	Easy but harmful	Reusable, easy disposal	Edible, easy disposal	Easy	Reusable, easy disposal	Easy	Easy
Decomposition	~500 years	4-8 weeks	~30 days	<90 days	90-180 days	30-60 days	<24 hours
Availability	Online and retail	Primarily online	Online and retail	Online and retail	Primarily online	Primarily online	Primarily online
Environmental Effects	Hazardous. Blocks seepages and pollutes water, kills wildlife	Decomposes into fertilizer	Decomposes into fertilizer as it is made out of flour	Decomposes into fertilizer as it is made out of plant biomass	Converts into manure, fast tracks growth of sugarcane	Decomposes into fertilizer as it is made of natural leaves	Decomposes into fertilizer or an edible products for animals

Source: <https://www.ecoideaz.com/showcase/biodegradable-cutlery-for-the-eco-sensitive-foodie>

IV. CONCLUSION

Plastic items take roughly 500 years to decompose and till then, they languish in landfills, choke our drainage systems

and finally seep into the ocean and kill wildlife. Thankfully, biodegradable cutlery has emerged as a better alternative to plastics across the globe and Indians have been early adopters

of biodegradable products. All kinds of plant biomass material such as bagasse, rice husk, coconut coir etc. are being utilized for producing eco-friendly cutlery, tableware and packaging products that could see a surge in usage in the coming decade. In this fast moving world, everyone seems to be relying on the fast food due to time constraints, for fun and many other factors. Every year, lots of plastic cutleries & tableware are produced to meet the demand of fast food. The availability at a reasonable price makes these plastic goods very much in demand and without any hesitation, people use it comfortably. While consuming the fast food and using the plastic cutlery, one never gives a thought that how these plastic cutlery affect our environment and how difficult it is to deal with such huge volume of plastic waste. It is very important to save and protect our Mother Nature and earth as a whole. One way or other we are destroying the nature by our ignorance and greed. The pressure of the plastic on the environment is very high yet with the usage of such eco-friendly products will reduce the pressure to some extent. The effort could be made and initiative should be taken to promote and encourage the use of biodegradable cutleries and tablewares so that the penetration of these environment friendly products would maximize. The edible cutlery may create the demand for raw material i.e. jowar and bajra which may further lead to the demand for the cultivation of such raw material and may benefit by the farmer across the nation.

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