

“The Impact of plastic ban on the Restaurants in Pune”

Dr. Sameer Diwanji

Mr. Rajan Ambadkar

Introduction on Topic:

The ban on plastic came into effect from 23rd June 2018 in the state of Maharashtra. The state government, in a notification on March 23, had clamped down on the use of plastic in a bid to fight pollution caused due to its extensive use.

The notification banned manufacturing, use, sale, distribution and storage of plastic materials such as bags, spoons, plates and other disposable items. The ban also includes packaging material and thermocol.

The items that were not banned were plastic used for packaging medicines and drugs. Food grade virgin plastic used for packaging milk. Compostable packaging bags used for horticulture and agriculture purposes. Plastic bags used for exporting goods. Plastic used at the manufacturing stage. Plastic used for handling of solid waste.

Pune restaurants and hoteliers' association (Praha) have asked all their members to start providing home delivery orders in steel tiffin instead of plastic containers.

Ganesh Shetty, president of Praha, said, “Responding positively to the plastic ban, our association has decided not to use plastic items of any kind for food delivery either for packing or for home delivery. We will use stainless steel tiffin for home delivery of food items. As far as my Kalinga restaurant is concerned, I have started using stainless steel vessels from day one of the plastic ban, and it shows positive results. Restaurants are facing problems like food losses, leakage while using plastic and hence, when people come for takeaways or call us for orders, we give them the option to bring tiffin boxes along.”

Restaurant owners in the city have very limited options to pack or deliver food items following the plastic ban, hence, they have taken this move.

Rajesh Shetty, owner of Naivedyam Restaurant in Swargate, agreed that since the plastic ban, restaurant owners have been facing difficulties finding an alternative to plastic items. “We are supporting the plastic ban and hence, when we get calls from customers for home delivery, we ask them if they could get their own steel vessels or tiffin boxes.”

Some customers preferred to use apps to order food after the plastic ban instead of picking it from a restaurant. “In such cases for dry order, we use paper foil and for items with gravy, we are using foil containers,” Ganesh Shetty said.

On March 23, the state government had issued the Maharashtra Plastic and Thermocol Products (Manufacture, Usage, Sale, Transport, Handling and Storage) notification banning plastic items. On June 23, civic bodies started strict implementation of the ban by charging a fine of ₹5,000 for the first offence and ₹10,000 for the second offence. One who violates the plastic ban for the third time, will have to pay a fine of ₹25,000 and may also face imprisonment for a period of three months.

By June 23, Maharashtra – the state in which the nation’s economic capital is located- along with other states had begun to officially enforce the ban, after a fragmented roll out. Out of the 29 states and seven union territories of India, 25 now have either a partial or complete ban on plastic.

The Maharashtra ban covers the manufacturing, usage, distribution, wholesale and retail sale and import of plastic bags, especially single use polyethylene bags with thickness of less than 50 microns.

Objectives:

1. To understand the role of plastic in restaurants.
2. To learn the reason behind the ban on plastic.
3. Impact of this decision.
4. Comparing advantages and disadvantages of plastic ban.

Industry pushback:

Beverage firms, plastic industry have called for the softening of rules as well as extensions.

Some firms like Pepsi, Coca-Cola met state officials to urge the government to implement the regulations in stages and relax certain rules. The e commerce companies got an extension of the deadline and were allowed to use plastic packaging for three more months.

The All India Plastic Manufacturers Association (AIPMA) said, "Despite efforts from AIPMA and plastic manufacturers association the, the plastic industry is still suffering from the ban."

The plastic industry is devastated ever since the implementation of plastic ban in Maharashtra. According to AIPMA, the Indian plastic industry is worth Rs.5000 crores. It is said that a total of 2,150 'Plastic Industrial Units' have been shut due to the ban. This has resulted in a large scale unemployment in the state. It is estimated that directly 3 lakh individuals will lose their jobs and indirectly a total of 4 lakh individuals connected to the plastic industry will lose their jobs according to AIPMA.

Littering is the real issue

Furthermore, AIPMA said that plastic manufacturers in Maharashtra have been trying hard to solve littering, which it claims is the real problem. Plastic serves, littering pollutes it stated.

Moreover, plastic packaging accounts for nearly half of all plastic waste globally, and much of it is thrown away within just a few minutes of its first use.

Plastic pollution is a major problem in India. Plastic bags are often carelessly thrown away on the streets and eventually make their way to block sewers and storm drains.

The Central Pollution Control Board (CPBC) under the ministry of environment and forests stated in 2015 that Indian cities produced more than 15,000 tonnes of plastic waste each day. Of this amount 9000 tonnes of plastic waste was collected and

processed, while the rest were left littered on the streets and in drains, or dumped in the landfills.

AIPMA along with other associations had initiated the 'mobile plastic waste bank', in which plastic waste can be deposited. The collection bins were placed at railway stations, bus depots, market, temples and public places. Supported by various associations, AIPMA also supplied and installed PET bottle crushing machines at various locations in Maharashtra.

The CPBC has commented that in the states that had imposed a complete ban on the use and sale of plastic bags and plastic carry bags were still being stocked, sold and used indiscriminately. Other rules and regulations were also being violated across the state.

While municipal authorities are responsible for the setting up, operations and co-ordination of waste management system and "performing the associated functions", it had been observed that most of the states had not established proper waste management system.

Therefore, this resulted in the widespread littering of plastic waste in cities and towns across the country.

History

Plastic is a word that originally meant "pliable and easily shaped." It only recently became a name for a category of materials called polymers. The word Polymer means "of many parts," and polymers are made of long chains of molecules. Polymers abound in nature. Cellulose, the material that makes up the cell walls of plants, is a very common natural polymer.

Over the last century and a half humans have learned how to make synthetic polymers, sometimes using natural substances like cellulose, but more often using the plentiful carbon atoms provided by petroleum and other fossil fuels. Synthetic polymers are made up of long chains of atoms, arranged in repeating units, often much longer than those found in nature. It is the length of these chains, and the

patterns in which they are arrayed, that make polymers strong, lightweight, and flexible. In other words, it's what makes them so plastic.

These properties make synthetic polymers exceptionally useful, and since we learned how to create and manipulate them, polymers have become an essential part of our lives. Especially over the last 50 years' plastics have saturated our world and changed the way that we live.

The first synthetic polymer was invented in 1869 by John Wesley Hyatt, who was inspired by a New York firm's offer of \$10,000 for anyone who could provide a substitute for ivory. The growing popularity of billiards had put a strain on the supply of natural ivory, obtained through the slaughter of wild elephants. By treating cellulose, derived from cotton fibre, with camphor, Hyatt discovered a plastic that could be crafted into a variety of shapes and made to imitate natural substances like tortoiseshell, horn, linen, and ivory.

This discovery was revolutionary. For the first time human manufacturing was not constrained by the limits of nature. Nature only supplied so much wood, metal, stone, bone, tusk, and horn. But now humans could create new materials. This development helped not only people but also the environment. Advertisements praised celluloid as the saviour of the elephant and the tortoise. Plastics could protect the natural world from the destructive forces of human need.

The creation of new materials also helped free people from the social and economic constraints imposed by the scarcity of natural resources. Inexpensive celluloid made material wealth more widespread and obtainable. And the plastics revolution was only getting started.

World War II necessitated a great expansion of the plastics industry in the United States, as industrial might prove as important to victory as military success. The need to preserve scarce natural resources made the production of synthetic alternatives a priority. Plastics provided those substitutes. Nylon, invented by Wallace Carothers in 1935 as a synthetic silk, was used during the war for parachutes, ropes, body armour, helmet liners, and more. Plexiglas provided an alternative to glass for aircraft windows. A Time magazine article noted that because

of the war, “plastics have been turned to new uses and the adaptability of plastics demonstrated all over again.” During World War II plastic production in the United States increased by 300%.

The surge in plastic production continued after the war ended. After experiencing the Great Depression and then World War II, Americans were ready to spend again, and much of what they bought was made of plastic. According to author Susan Freinkel, “In product after product, market after market, plastics challenged traditional materials and won, taking the place of steel in cars, paper and glass in packaging, and wood in furniture.” The possibilities of plastics gave some observers an almost utopian vision of a future with abundant material wealth thanks to an inexpensive, safe, sanitary substance that could be shaped by humans to their every whim.

The early days of paper cups

The first paper plates and cups were invented in the early 1900s, according to historians. In 1907, a lawyer in Boston developed the single use paper cups, after scientists realized that diseases such as cholera and diphtheria were spreading because people were sharing communal cups at public water fountains. The lawyer, Lawrence Luellen, and his brother-in-law moved to New York in 1910 and produced their product, the Health Kup. Their company eventually became Dixie Cup; a brand many recognize today.

Paper cups continued to grow in popularity. The market for U.S. paper cups and paper plates reached \$20.5 billion in 2017 and is expected to grow to \$21.7 billion in 2023, according to a report from IMARC Group, a market research firm. Though many paper cups are made from renewable resources like wood or bamboo, they're not necessarily an eco-friendly choice. Some are coated with substances that make them impossible to recycle, so they end up at the landfill.

Some companies, such as coffee retailers and doughnut shops, sell their products in disposable cups. A 2011 book estimated that a chain of doughnut shops used one billion disposable coffee cups in a year, enough to circle the Earth twice. A 2012 article in ON Earth said that Starbucks used over four billion disposable coffee cups in 2011. The Cup Noodles brand of instant noodles uses expanded polystyrene foam

cups to contain the product. Hot or boiling water is added to the dried noodles in the container, which cooks the product in a few minutes. Nissin Foods began marketing the product in foam cups in the early 1970s.

The manufacturing of paper cups contributes to water pollution when chemicals such as chlorine, chlorine dioxide and reduced sulphides enter waterways. The manufacturing of foam cups contributes to air pollution when pentane is released into the air. The plastic content in plastic-coated paper cups contributes to the plastic pollution problem, when cups are disposed as litter.

Most plastic cups are designed for single uses and then disposal or recycling. A lifecycle inventory of a comparison of paper and plastic shows environmental effects of both with no clear winner.

Production of 1 tonne (0.98 long tons; 1.1 short tons) of plastic cup emits 135 pounds (61 kg) of greenhouse gases.

The choice between paper cups and plastic cups has to do with the life of the item after use. A paper cup may biodegrade faster than a Styrofoam cup or a plastic cup. In general cardboard or paper takes one to three months for biodegradation, as the majority of the content, up to 95%, is made with wood chips. A plastic cup can take up to 90 years to biodegrade, depending on the type of plastic.

Plastic cups are made with oil, which is not a renewable source. On the other hand, paper cups can be sourced from forests which fall under sustainable management.

Plastic cups, especially those made with polystyrene, are also a possible health hazard as chemicals may leach into the beverage. This is more likely to happen with warm drinks (hot chocolate, tea and coffee) than with cold drinks.

Plastic bags

A plastic bag, polybag, or pouch is a type of container made of thin, flexible, plastic film, nonwoven fabric, or plastic textile. Plastic bags are used for containing and transporting goods such as foods, produce, powders, ice, magazines, chemicals, and waste. It is a common form of packaging.

American and European patent applications relating to the production of plastic shopping bags can be found dating back to the early 1950s, but these refer to composite constructions with handles fixed to the bag in a secondary manufacturing process. The modern lightweight shopping bag is the invention of Swedish engineer StenGustafThulin. In the early 1960s, Thulin developed a method of forming a simple one-piece bag by folding, welding and die-cutting a flat tube of plastic for the packaging company Celloplast of Norrköping, Sweden. Thulin's design produced a simple, strong bag with a high load-carrying capacity, and was patented worldwide by Celloplast in 1965.

From the mid-1980s onwards, plastic bags became common for carrying daily groceries from the store to vehicles and homes throughout the developed world. As plastic bags increasingly replaced paper bags, and as other plastic materials and products replaced glass, metal, stone, timber and other materials, a packaging materials war erupted, with plastic shopping bags at the centre of highly publicized disputes.

In 1992, Sonoco Products Company of Hartsville, SC patented the "self-opening polyethylene bag stack". The main innovation of this redesign is that the removal of a bag from the rack opens the next bag in the stack.

In the early 21st century, there has been a global movement towards the phase-out of lightweight plastic bags. Single-use plastic shopping bags, commonly made from low-density polyethylene (LDPE) plastic, have traditionally been given for free to customers by stores when purchasing goods: the bags have long been considered a convenient, cheap, and hygienic way of transporting items. Problems associated with plastic bags include use of non-renewable resources (such as crude oil, gas and coal), difficulties during disposal, and environmental impacts. Concurrently with the reduction in lightweight plastic bags, shops have introduced reusable shopping bags.

Governments all over the world have taken action to ban the sale of lightweight bags, charge customers for lightweight bags, or generate taxes from the stores that sell them. The Bangladesh government was the first to do so in 2002, imposing a total ban on lightweight plastic bags. As of 1 February 2019, such bans have been introduced in 55 countries, with varying degrees of enforcement, and 31 countries

instead impose a charge per bag. Bans and charges have been enacted by some local jurisdictions such as states, counties, territories and cities.

Plastic bags cause many minor and major ecological and environmental issues. The most general issue with plastic bags is the amount of waste produced. Many plastic bags end up on streets and subsequently pollute major water sources, rivers, and streams.

Even when disposed of properly, they take many years to decompose and break down, generating large amounts of garbage over long periods of time. Improperly discarded bags have polluted waterways, clogged sewers and been found in oceans, affecting the habitat of marine creatures.

Two primary kinds of direct damage to wildlife are entanglement and ingestion. Animals can become entangled and drown. Plastic bags are often ingested by animals that cannot distinguish them from food. As a result, they clog their intestines which results in death by starvation. Plastic bags can block drains, trap birds and kill livestock. The World Wide Fund for Nature has estimated that over 100,000 whales, seals, and turtles die every year as a result of eating or being trapped by plastic bags. In India, an estimated number of 20 cows die per day as a result of ingesting plastic bags and having their digestive systems clogged by the bags. It is also very common across Africa to have sewers and drain systems clogged by bags which cause severe cases of malaria due to the increased population of mosquitoes that live on the flooded sewers. The term "white pollution" has been coined in China to describe the local and global effects of discarded plastic bags upon the environment.

Lightweight plastic bags are also blown into trees and other plants and can be mistaken for food. Plastic bags break down, but they never biodegrade. As a result, any toxic additives they contain including flame retardants, antimicrobials, and plasticizer will be released into the environment. Many of those toxins directly affect the endocrine systems of organisms, which control almost every cell in the body. Research shows the average operating "lifespan" of a plastic bag to be approximately 20 minutes. Plastic bags can last in landfill an anaerobic environment for up to 1000 years.

Plastic bags dumped in the Pacific Ocean can end up in the Great Pacific garbage patch. 80% of the plastic waste comes from land; the rest comes from oil platforms and ships. This can be eaten by marine animals, and block their breathing passages and digestive systems. Plastic bags not only add to the Great Pacific garbage patch; they can be washed ashore around the world.

Plastic ware

After World War II, plastic was being used more regularly in the home. By the 60's, plastic had replaced other materials in the kitchen like wood, metal, and glass. Families saw the benefits of plastic tableware. Several companies began to make kitchen products that didn't break easily, were easy to clean, came in beautiful colours, and at an affordable cost. Companies like Lustro Ware and Melmac began making spoons, scoops, forks, bowls, and other kitchenware with plastic. In fact, modern kitchens that are said to have the "retro" look of the 1960's are frequently associated with brightly coloured plastic.

Disposable Utensils

Manufacturers soon began making plastic spoons, forks, and knives that were meant to be thrown away after one use. This eliminated the need to use water, electricity, and manpower to wash them. For this reason, these disposable utensils became very popular with fast food restaurants and airlines. Today, disposable utensils can be found at restaurants as well as on grocery store shelves.

Styles of Plastic Utensils

Disposable plasticware comes in a variety of styles. The iconic look of plastic forks, knives, and spoons is a solid white colour. However, there are many more options to choose from. You can buy other solid colours to match the theme of decorations for a party. They may have different textures or uniquely-shaped handles. For occasions that are semiformal, plastic ware is available that resembles metal tableware. It may even come in clear or iridescent colours.

Children's Plasticware

Plastic makes many complicated shapes possible. For manufacturers of children's tableware, this makes it the perfect material to use. Spoons, forks, and knives come in a variety of shapes including their favourite cartoons characters. Plastic tends to be gentler on children's delicate mouths and more comfortable for them to grip.

Spork

Combining a spoon and a fork was not a new concept when the spork, a combination of a spoon and fork, was registered with the patent office in the 1970's. Before that, people used stainless steel and other materials to make the hybrid utensil. Plastics made sporks quicker and easier to make. There are many benefits of sporks. Prisons use sporks because they are not easily made into weapons by the inmates. Outdoor enthusiasts use sporks so they can save space by carrying around only one utensil rather than two. The way the spork combines cutlery to form a new, more useful eating tool has inspired others to do the same. A splayed is a utensil that combines a knife, a fork, and a spoon.

When it was first widely used, consumers loved the benefits plastic brought to the kitchen. Plastic makes many things possible for tableware. Pieces can be made that have more complicated designs at a much faster and more profitable rate.

Disposable food packaging

Disposable food packaging comprises disposable items often found in fast food restaurants, takeout restaurants and kiosks, and catering establishments. Food serving items for picnics and parties are very similar. Typical disposable foodservice products are foam food containers, plates, bowls, cups, utensils, doilies and tray papers. These products can be made from a number of materials including plastics, paper, bio resins, wood and bamboo.

Packaging of fast food and take-out food involves a significant amount of material that ends up in landfill, recycling, composting, or litter.

In recent times there has been a backlash against the huge amount of waste produced from disposable food packaging especially plastic packing with consumers demanding a switch to paper and card etc.

After World War II, foodservice packaging materials like plastic and polystyrene foam were developed. The unique properties of these materials (insulation and weight reduction) and their ability to be made into a variety of shapes and sizes, provided foodservice operators, and consumers, with a wider variety of packaging choices.

A major development in disposable foodservice packaging happened in 1948 when the newly founded McDonald's restaurant closed to revamp its menu. Along with changing their menu items, the restaurant wanted to change the way it handled dishwashing and dishwashers, car hops and wait staff, and storage, breakage and (customer) theft of table ware. When the McDonald's re-opened six months later, its meals were no longer served with the use of glasses, plates or cutlery, and were taken away from the restaurant by the customers.

Literature review

1. Jennie Reilly Romer, Golden gate U. Env'tl. LJ 1, 439, (2007) in their paper The evolution of San Francisco's plastic bag ban discussed about the ubiquity of single use plastic bag, which has led to a collective dependency on their free availability that, until recently, has allowed the significant environmental costs incurred in the bags' production and disposal to go unchallenged. In march 2007, the San Francisco 2 Board of Supervisors approved an ordinance largely banning local retailers from providing plastic bags to customers, triggering a deluge of similar ordinances across the nation.
2. Qunfang Zhu, energy Procedia 5,2516-2521, (2011) in their paper An appraisal and analysis of the law of Plastic bag ban(PBB) and points out that the law is necessary, feasible and effective. The success of the PBB policy is represented by the fact that the policy is consistent with public opinion, and has definite control target. PBB has been properly carried out in super markets, and has reduced the usage of plastic bags by two thirds. However, the public understanding of PBB needs to be further deepened. The paper analyses the cause of illegal use and wholesaling of ultra-thin plastic bags.

3. Amy L Brooks, Shunli Wang, Jenna R Jambeck, Science Advances 4 (6), eaat0131, (2018) in their paper The Chinese import ban and its impact on global plastic waste trade have stated that the rapid growth of use and disposal of plastic materials has proved to be a challenge for solid waste management systems with impacts on our environment and oceans. While recycling and the circular economy have been touted as potential solutions, upward of half of the plastic waste intended for recycling has been exported to hundreds of countries around the world. China, which has imported a 45% of plastic waste since 1992, recently implemented a new policy banning the importation of most plastic waste, begging the question of where the plastic waste will go now. We use commodity trade data for mass and value, region and income level to illustrate that higher income countries in the Organization for economic co-operation have been exporting plastic waste (70% in 2016) to lower income countries in the East Asia and Pacific for decades. An estimated 111 million metric tons of plastic waste will be displaced with the new Chinese by 2030. As 89% of historical exports consists of polymer groups often used in single use plastic food packaging (polyethylene, polypropylene, and polyethylene terephthalate), bold global ideas and reactions for reducing quantities of nonrecyclable materials, redesigning products, and funding domestic plastic waste management are needed.
4. Alfroz Shah, Environmentalist, 22/1 B, (2018), In June, one of the world's strictest plastic bans came into effect in the western Indian state of Maharashtra, of which Mumbai — population 18.4 million — is the capital. Plastic bags had been banned here before, to little effect. This time, however, thanks to a strong push from a prominent young local politician, the restrictions are far more sweeping. They included bans on the manufacture, sale, and use of throwaway plastic items such as bags, plates, cutlery, straws, and small bottles, as well as new regulations governing retail packaging and Styrofoam. And penalties for manufacturing and selling these items were now higher than ever, including fines of up to \$350 and jail terms of up to three months. The first week of the ban was marked by drama and confusion. More than 300 plastic bag manufacturers reportedly had to close, throwing thousands of people out of work. Restaurants began using aluminium takeout containers. Residents weren't sure if they could even use plastic bags for their

garbage. Then came the backlash. Within a week — after pleas from plastic manufacturers, milk suppliers, small traders, consumer giants like Pepsi and Coca-Cola, and e-commerce companies like Amazon — the government relaxed the rules, exempting small traders and granting more time for bigger players to come up with solutions for retail packaging, including alternative materials and recycling schemes. For now, only plastic bags, takeout containers, plates, and Styrofoam remain forbidden.

5. Mohammed Rafiq, Project manager, 3/46 BKC (2012), in their paper Plastic waste is silent threat to the environment stated that plastic waste and their disposal is a serious issue for waste managers. Now a day society does not have any alternative to plastic products like plastic bags, plastic bottles, and plastic sheets etc. In spite of all efforts made to limit its use but unfortunately its utility is increasing day by day. To circumvent this, issue many efforts were made in the past to reuse the plastic waste but no significant results were achieved. On contrary concrete being the widely used construction material is facing problem due to unavailability of construction material (Cement, sand and coarse aggregate). Various attempts were made through experimentation to check the feasibility of plastic waste to be use partially in concrete with respect to various properties of strength, workability, durability and ductility of concrete. This paper includes review of various studies conducted on utility of waste plastic material used in the concrete. Moreover, this paper will draw our focus toward the impingement on the various properties of concrete when partially replacing with waste plastic.
6. Travis P Wagner, waste management 70, 3-12, (2017), in their paper Reducing single use plastic shopping bags in the USA discussed that in the USA, local governments have the primary responsibility to manage MSW. However, local governments lack the authority to explicitly shift cost of responsibility back onto the producer for specific problem wastes. A particularly problematic waste for the local governments is the single use plastic bag. In 2014, in the USA, 103.456 billion single use plastic shopping bags were consumed. Because of their extremely low recyclability rate, plastic

Sr.no	Type of Restaurant	No. of respondents	Percentage
1	Fine dine	10	20%
2	Café & Bistro	17	34%
3	Fast food chains	23	46%
Total		50	100%

bags remain a significant source of land based litter and marine debris and impair storm water management.

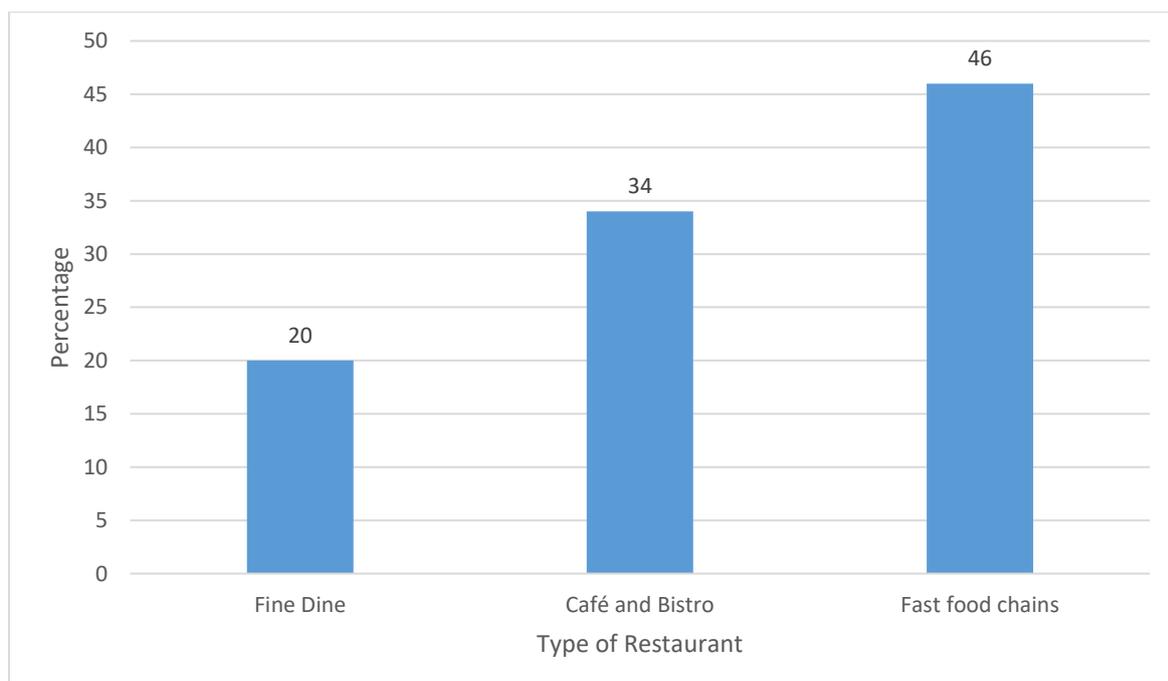
7.

Research Methodology

I visited the restaurants and presented my pre-set questionnaire to the managers of the restaurants and discussed about the topic with them. This was my Primary data.

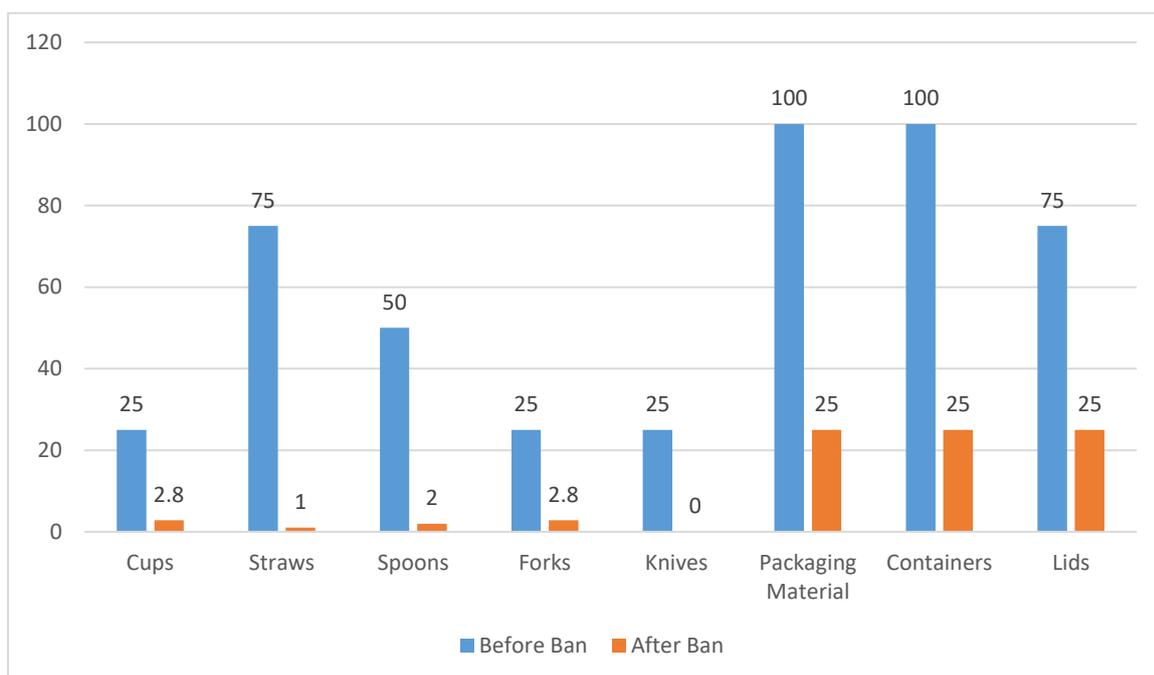
Research papers, journals and mainly the internet were all the sources from where I collected my secondary data.

Data Analysis and Data Interpretation



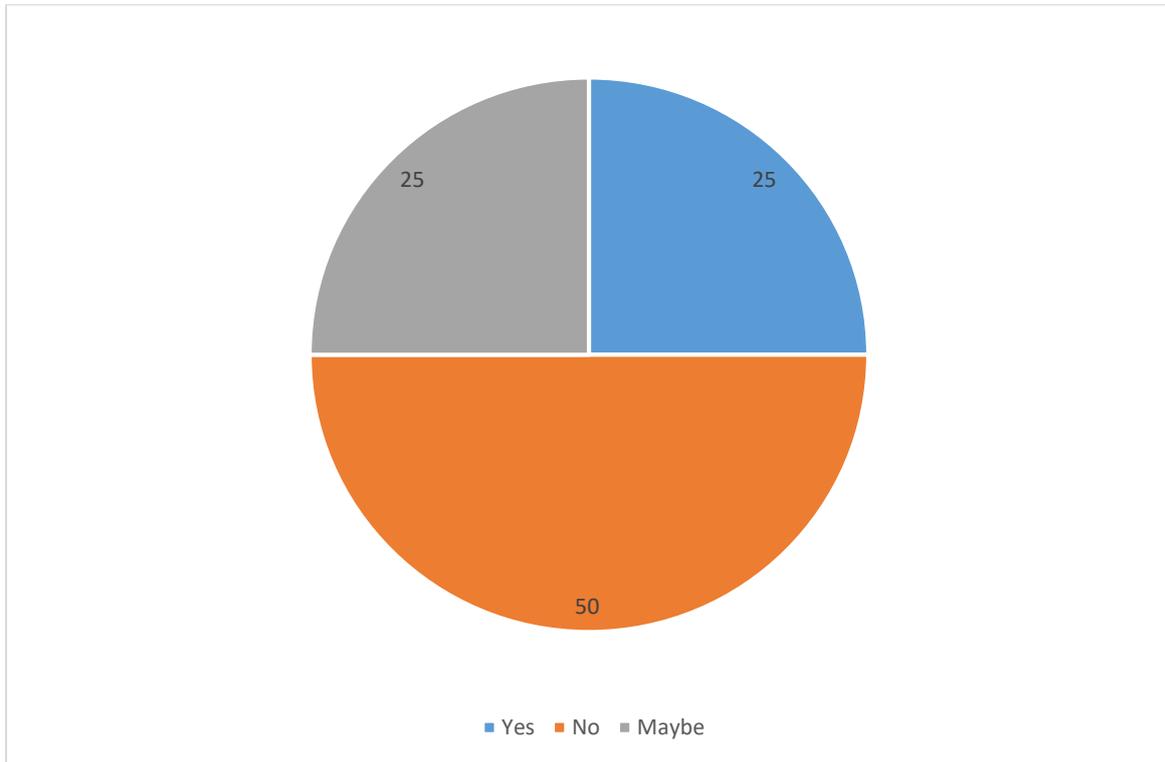
During the survey, 20% of the responses were taken from Fine dine restaurants, 34% from Café's and bistro's and the remaining 46% from Fast food chains.

What things made up of plastic were being used in the restaurants and are now discarded after the ban on plastic?



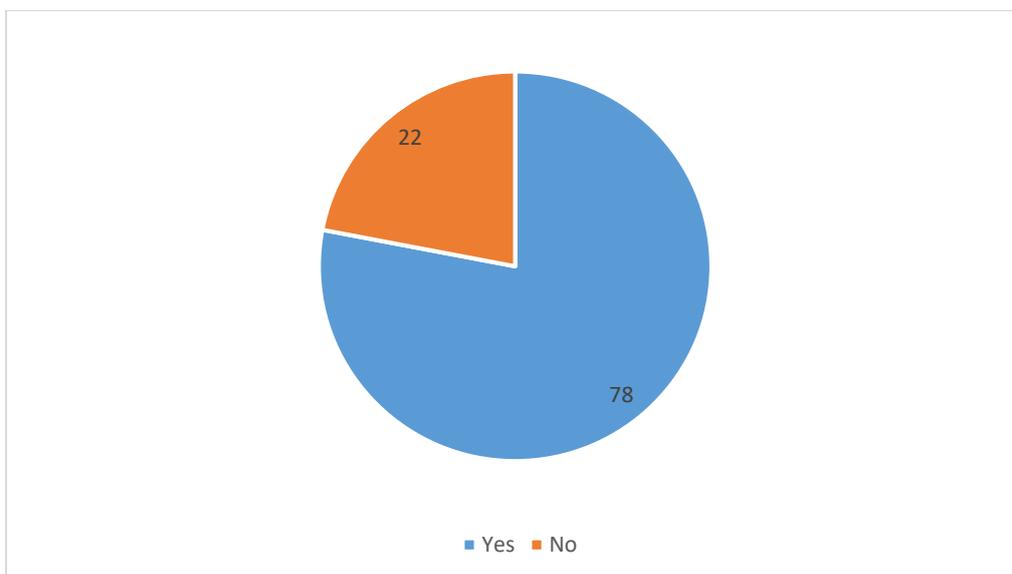
According to the survey it was found that 25% restaurants were using plastic cups before the ban and the use came down to 2.8% after the ban. Straws were used almost in 75% of the restaurants which later came down to 1%, Spoons which were used by 50% later came down to 2% or were replaced by some other material. Forks and knives were both used by 25% of the restaurants which came down to 2.8% forks and 0% knives. Packaging materials were being used by 100% of the restaurants which were still used by 25% of them after the ban. The number remained the same for plastic containers alike packaging material both before and after the ban. Lids which were used by 75% of the restaurants before the ban were later found to be used only by 25% of them after the ban.

Has the ban affected the restaurant business?



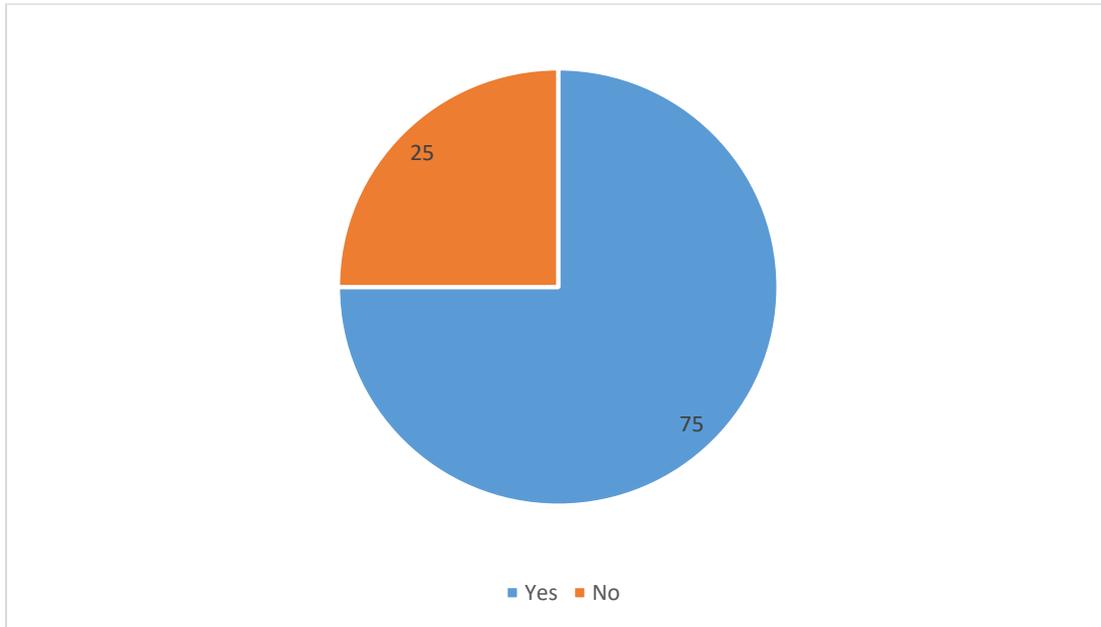
According to the respondents 25% of the respondents agreed that the ban had an effect on their business. Whereas 50% of the restaurants completely disagreed stating that there was no effect of the ban on the business. Remaining 25% of the restaurants seemed to have no idea about whether the business was affected or not.

Inconvenience in operation of the restaurants due to the plastic ban?



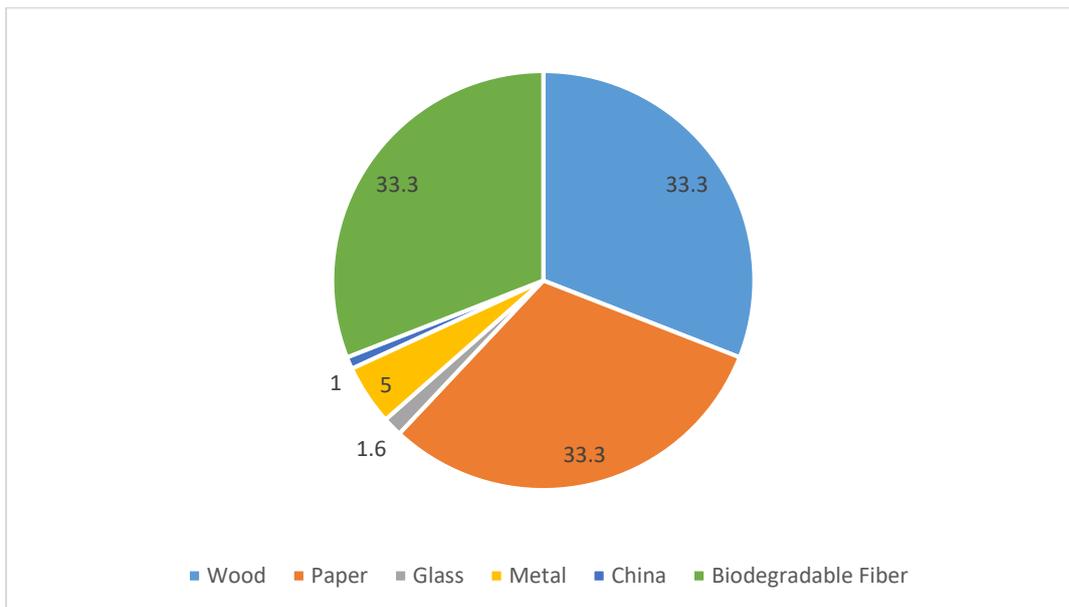
According to the survey 78% respondents stated that there was inconvenience in operations due to the ban, whereas 22% claimed that their operations went on smoothly even after the ban.

Has the cost of operation of the restaurants increased?



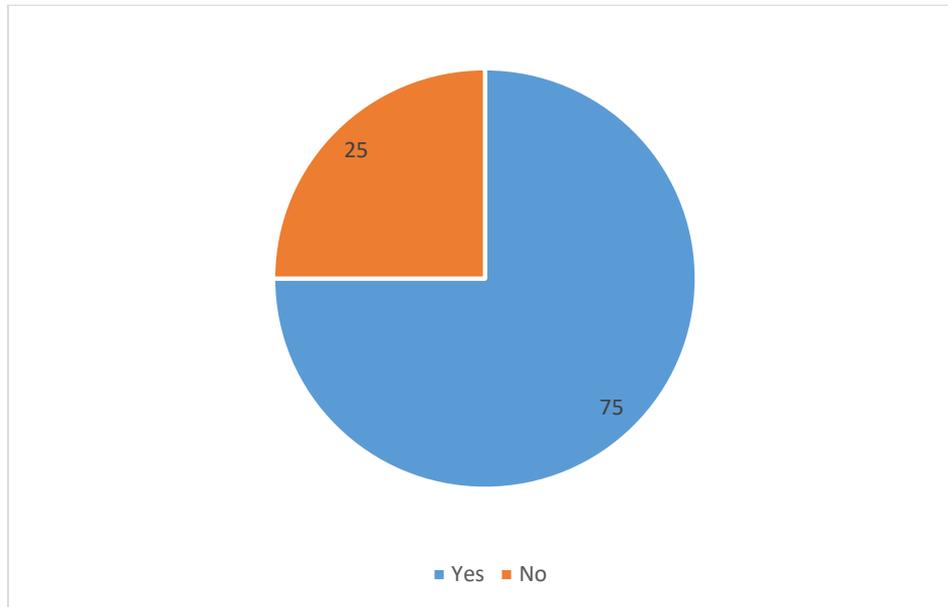
It was found during the survey that 75% respondents agree that the cost of operation has increased after the ban, whereas 25% say that it is the same.

Materials replacing the plastic after it was banned?



During the survey it was found that materials like wood, paper and biodegradable fibre are replacing plastic at an equal share of 33.3%. Other materials metal, glass and china were found to be replaced at 5%,1.6% and 1% respectively.

Has the ban affected the parcel facilities of the restaurants?



According to the survey 75% of the respondents claimed that the parcel facilities in their restaurant have been affected by the ban. 25% of the respondents claimed that there was no effect of the ban on their parcel facilities.

Suggestions/ Recommendations

- As the plastic has been banned now there is an opportunity for disposables made of bio degradable material to come in the market.
- Restaurants can provide the parcel facilities to its customers in metal boxes.
- Packaging products used by the restaurant can include specified amounts of recycled content in the products.

Conclusions and limitations

Limitations:

- Time constraint affected the quality of my project which could have been much better.
- Wanted to gather more data but had to wait for respondents to come as they were always busy with the guests. So time consuming.
- If the ban is not strictly enforced by the authorities, then it may not be that effective.

Conclusion:

It was a pleasure for me working on the topic “Impact of plastic ban on the restaurants in Pune”. In my research I came to the conclusion that the ban enforced by the government of Maharashtra was a necessary action as the pollution due to plastic was increasing rapidly in the state resulting in many health and hygiene issues. The ban has been welcomed by the restaurants and food industry in the Pune city and they have replaced all the plastic products being used in the restaurants with other bio degradable materials. Initially it was a little inconvenient for the restaurants in giving the parcel facilities to the customers, but now they’ve come up with various better options. Overall, plastic isn’t a bad material but the pollution it causes is a concern. Plastic is a recyclable and reusable item if it is disposed of properly. Awareness should be created amongst people regarding the proper disposal of plastic, such that it can be collected and sent for recycling.

Bibliography

1. In vitro Meats foundation, the disposable cutlery which can be used in a Restaurant.
<https://invitromeatfoundation.com/the-disposable-cutlery-which-can-be-used-in-a-restaurant.html>
2. Dayle Pereira, 5 smart alternatives to use instead of plastic.
<https://swirlster.ndtv.com/work-money/5-smart-alternatives-to-use-instead-of-plastic-1884908>

3. Joseph L. Nicholson and George R. Leighton, "Plastics Come of Age," Harper's Magazine, August 1942, p. 306
4. Conflicts in Chemistry: The case of plastics.
<https://www.sciencehistory.org/the-history-and-future-of-plastics>
5. Maria Lamagna, Disposable cups started as a way to stop the spread of Cholera and Diphtheria. (July 15, 2018)
<https://www.marketwatch.com/story/before-the-humble-straw-theres-a-long-history-of-banning-plastic-packaging-2018-07-10>