What should happen to your used Toothpaste Tubes?

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Abstract

Every year almost 4.15 billion of toothpaste tubes are sold around the globe. Consumers throw away their used toothpaste tubes in waste bins and they end up sitting in our landfills for almost 500 years before getting decomposed and also sometimes reaches our water bodies harming aquatic lives. A toothpaste tube may look small but the large volume makes it a real-world problem to deal with. This paper will discuss the challenges that are being faced, while recycling these used or empty toothpaste tubes. It will also discuss several initiatives undertaken by the corporates and manufacturers to curb plastic pollution. This paper will propose ways to tackle the challenges that are being faced in recycling and also an alternative to toothpaste tubes. The methodology employed is a blend of concept, secondary and primary research. Secondary research will be conducted from sources such as online Newspaper articles, research articles from reputed journals regarding the topic. Primary data will be collected through a google form. Concepts will be brainstormed in an attempt to solve this major issue of responsible disposal of used toothpaste tubes.

Keywords*: Circular Economy, Plastic Pollution, Sustainability, Reverse Supply Chain, Toothpaste Tubes Recycle, Recycle, Responsible disposal of products,*

Introduction

In It is often witnessed that the most common of all things go unnoticed, and in terms of attaining sustainable future, one such example is the disposal of used or empty toothpaste tubes. It is probably the first and the last product of the day that people use, and yet consumers forget to pay

attention to where does the disposed toothpaste tube go, what happens to it after it is thrown away and where it should actually go. In order to make our world more sustainable, one must be aware and always look for ways to Reduce, Re-use and Recycle; and the same must apply to one of the most widely used household product i.e., Toothpaste tubes.

Imagining a world without plastic is difficult at present times. The invention of plastic helped brands and companies to solve a major issue in the supply chain, i.e., packaging and logistics, with little to no wastage. The benefits of employing plastics in human existence are enormous, but there are also shadier consequences, such as the polymers' non-biodegradable nature. Plastics being non-biodegradable has created a major crisis in contemporary times of polluting the land, oceans, and water bodies. Incineration is also not the solution in the management of plastic waste. Plastics is a major component of the packaging industries as well as innovations in space experiments. Oral hygiene is a major industry that has been employing plastics to a great extent such as toothpaste tubes, toothbrushes, flosses, etc. Oral hygiene products such as tooth powders were packed in flat tins or jars and sold in the market until the year 1892 when toothpaste in its present form was first packaged in collapsible metal tubes (Anatasia, 2017). These tubes were mostly made of aluminum because of advantages such as protection of volatile oils against moisture and taste loss however it had the disadvantage of cracking and the inner contents getting spilled out. Moreover, though aluminum collapsible tubes are made entirely of one material and are recyclable but they were seldom collected owing to the difficulties of removing the toothpaste residue, and the brands find metallic tubes inconvenient for market shelves' space. Considering such reasons, the companies started incorporating plastic as a replacement for aluminum in toothpaste tubes, though a slighter percentage of aluminum was still used because of its certain key advantages.

The discovery of plastics in the 1950s changed the packaging of products, and many FMCG products, such as toothpaste, shampoos, creams, etc. were filled and packed in plastic tubes of varying shapes and sizes. Plastic tubes are more puncture-resistant than metal tubes, and the flattened end of the tube is less pointed, preventing harm to the package, which leads to its success (Anatasia, 2017).

Toothpaste is probably the first and last product of the day that people use, and yet consumers forget to pay attention to where the disposed toothpaste tube goes, what happens to it after it is

thrown away, and where it should actually go. McMonagle (2021) reported that 1.5 billion toothpaste tubes are discarded every year globally. This is a significant figure, as most of the countries in the developing world or the Global South do not have a proper waste management system. Therefore, a huge chunk of these discarded tubes is directly going to landfills. The growing awareness of oral hygiene and oral care products has increased their sales to a significant amount, and in a country like India with a population of 1.4 billion people, the quantity of toothpaste used and discarded toothpaste tubes is bizarre.

Geyer, Jambeck, and Law (2017) estimated that as of 2015, plastics of around 6300 Mt (Metric tons) had been generated, of which 9% had been recycled, 12% were incinerated and the rest, 79%, were still accumulated in landfills and water bodies like rivers, seas, and oceans. The UN Environment Program (UNDP) and the Plastic Disclosure Project (PDP) estimated the total natural capital cost of plastics in the consumer goods industry at USD 75 billion, of which USD 40 billion was related to plastic packaging, exceeding the profit pool of the plastic packaging industry (World Economic Forum, Ellen Macarthur Foundation and McKinsey & Company, 2016). The report also mentioned that the number is expected to quadruple by 2050. Toothpaste tubes are one of the major constituents of these pollutants.

Some of the major companies in the oral hygiene industry are Colgate-Palmolive, Unilever, GlaxoSmithKline Consumer Healthcare (Sensodyne), Dabur etc. in India. Out of these companies like Colgate-Palmolive in their 2025 Sustainability & Social Impact Strategy (Corra, 2022), has pledged to design and deliver circular and alternative solutions for all Colgate products. The company aims to go zero plastic waste to the environment. They have taken up certain strategies like-

- Reduce unnecessary packaging
- Make all our packaging recyclable, reusable or compostable
- Reduce use of new (virgin) plastic by one-third (against a 2019 baseline)
- Use at least 25% post-consumer recycled plastic in packaging

Unilever too is working on reducing their plastic packaging by 2025 and are trying to shift their toothpaste brands into fully recyclable tubes (Unilever, n.d.). Therefore, major oral care companies and their brands are taking concrete steps in reducing their plastic consumption. However, these initiatives are yet to be seen producing results. Even if the tubes are composed

entirely of recyclable plastic, transporting these tubes to the appropriate recycling facilities is a difficult task.

Moreover, recycling cannot be the only probable options, thus, this paper will discuss the challenges that are being faced, both technical and practical, while recycling these used or empty toothpaste tubes. It will also discuss several initiatives undertaken by the corporates and manufacturers to mitigate the situation of such high amount of plastic waste from getting into the landfills. This paper will propose ways to tackle the challenges that are being faced in recycling and also few alternatives that can be employed to reduce waste disposal.

Review of Related Literature

Plastic Pollution, toothpaste tubes and recycle

Majority of plastics are derived from fossil fuels (such as petroleum), often known as "virgin" feedstock. The manufacture and disposal of such fossil-based polymers is anticipated to add 19% to the global carbon budget by 2040. Packaging, building and construction, textiles, consumer and institutional items, transportation, electronic/electrical, and so on are some of the key contributing sectors (Ritchie & Roser, 2022). Every year, 1.5 billion toothpaste tubes are abandoned globally, and these tubes wind up in landfills or, worse, in the seas. Per year, 10 million tons of plastic are poured into the seas, which is equivalent to more than a garbage truckload per minute (World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, 2016). Single-use plastic (SUPs) is one of the most commonly used commodities worldwide, and their environmental impact has been widely debated. Approximately 40% of all plastic manufactured is utilized in the packaging industry, which accounts for a sizable market share. These are mostly single use plastics which ultimately ends up in landfills. Tons of plastic end up in landfills and other unwanted areas, unable to be recycled. Toothpaste tubes are one of such products which are hard to recycle as it is made of the aluminum/plastic laminate, which offers higher reliability (Anatasia, 2017). The brands have started taking initiatives and innovated new fully plastic tubes mostly made of HDPE (2).

Plastic pollution has been a major issue being discussed across all forums among world leaders and environmentalists. To achieve the UN Sustainable Goals (SDGs) 2030, curbing plastic is a major challenge. Colgate-Palmolive started the recycling of toothpaste tubes currently in US as per reports of Packaging Gateway (Packaging Gateway, 2022). These tubes are made from high-

density polyethylene (HDPE) and the company claims it to the first tube recognised as recyclable by external recycling authorities. Essel Propack (EPL) plans to produce Platina toothpaste tubes for Colgate-Palmolive India and thus, helping Colgate to convert their toothpaste product line into 100% recyclable (The Packman, 2021). The Association of Plastic Recyclers (APR) and RecyClass European certification has certified platina tubes and caps as 100% recyclable by Code 2 (recycling). Moreover, Unilever too plans in launching recyclable toothpaste tubes in India and France to reach a goal of turning the entire global toothpaste to recyclable tubes by 2025. In India, Unilever has joined hands with organisations like Saahas, CARPE, Recykal, etc. for collection of plastic waste and it plans to cover 100 towns across India (Lim, 2021). HDPE will replace aluminium of the traditional tubes to make it recyclable and it will be available at 220-microns to reduce the amount of plastic needed for manufacturing of each tube. Lim (2021) mentioned of Unilever setting up materials recovery facilities in Mumbai, India. However, local Government and Municipal Boards has critical role to play in setting up of recycle bins to collect this particular waste. According to Ritchie and Roser (2022), India is one of the countries responsible for a large amount of mismanaged trash. This is why plastic waste management is a major worry for the planet's long-term future.

Reverse Supply Chain and Waste Management Sasikumar & Kannan (2008) defined Reverse Supply Chain Management (RSCM) as "The tool to streamline and optimise the task of collecting end-of-life (EoL) products, refurbish them and sell them is referred to as Reverse Supply Chain Management (RSCM)".

Mathiyazhagan et. al (2020) elucidated that with the inclusion of Reverse Supply Chain Management (RSCM) into the Supply Chain of the manufacturers, the RSCM primarily entails the flow of recycled and reused or end-of-life (EOL) items and product information from end consumers to suppliers or manufacturers (Doan et al., 2019). Reverse Supply Chain (RSC) is the collaborative responsibility of both producers and consumers to reduce waste by recycling, remanufacturing, reusing, and properly disposing of unacceptable products or items to improve environmental sustainability (Govindan et al., 2012; Bouzon et al., 2016). Reverse supply chain is applicable to a numerous industry like automotive, manufacturing, electronics, solid waste,

paper, textile, medical textile, food retail, construction, household waste, plastic, E waste, logistics provider, etc. (Mathiyazhagan et. al., 2020)

According to Baud et al. (2001), a solid waste management system begins with a methodical assessment of the primary types of partnerships, such as public-private, public-local area, local area private, and private-private partnerships, that are conformed to its activities, which include "formal collection, transportation, and disposal as well as informal collection, trade, re-use, and recycling." They determined that while local governments work with large businesses and non-governmental organizations (NGOs), they refuse to work with informal trading and recycling businesses that recover large amounts of garbage (Binalla & Mateo, 2022).

In contrast to typical waste management, reverse logistics puts value back into the chain by recovering and reusing materials, whereas waste management mostly focuses on disposal. Offering efficient, possibly profitable means of disposing of end-of-life items and garbage is critical to reverse logistics (Barloworld Logistics, 2017).

Methodology

The methodology used by the authors is mixed in nature. It is a blend of concept, secondary and primary research.

Secondary research will be conducted from sources such as online Newspaper articles, research articles from reputed journals regarding the topic and facts and figures would be highlighted.

Primary data was collected through a google form shared online to a wide range of sample of varying age groups, educational qualification and profession. The sample size is 80 and method undertaken was convenience and snowball sampling. Concepts were brainstormed in an attempt to solve this major issue of responsible disposal of used toothpaste tubes.

Survey

A primary survey was conducted to determine what consumers currently do with their used toothpaste tubes and check on their awareness and willingness about the alternates. Mode of data collection was online via google forms, sample size was 80 and method undertaken was convenience and snowball sampling. The results that were found through this small survey is given below:

Figure 1 Pie chart of responses on the question "What do you do with your toothpaste tube once its empty?" Source: Primary Data Collection

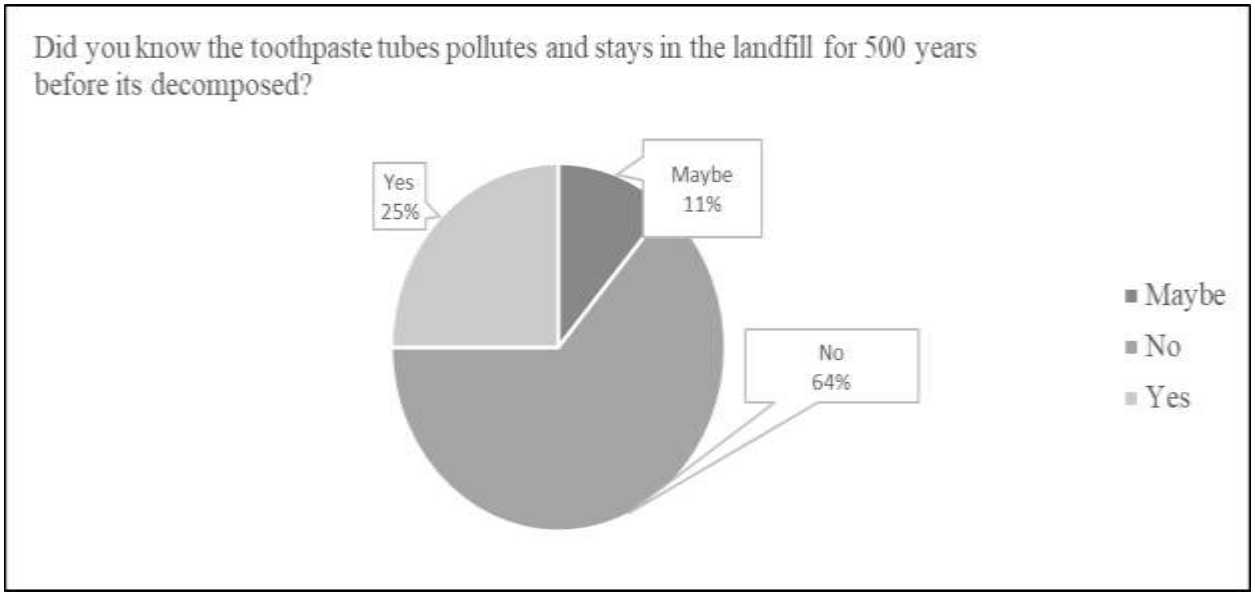

Figure 2 Pie chart of responses on the question "Did you know the toothpaste tubes pollutes and stays in the landfill for 500 years before its decomposed?" Source: Primary Data Collection

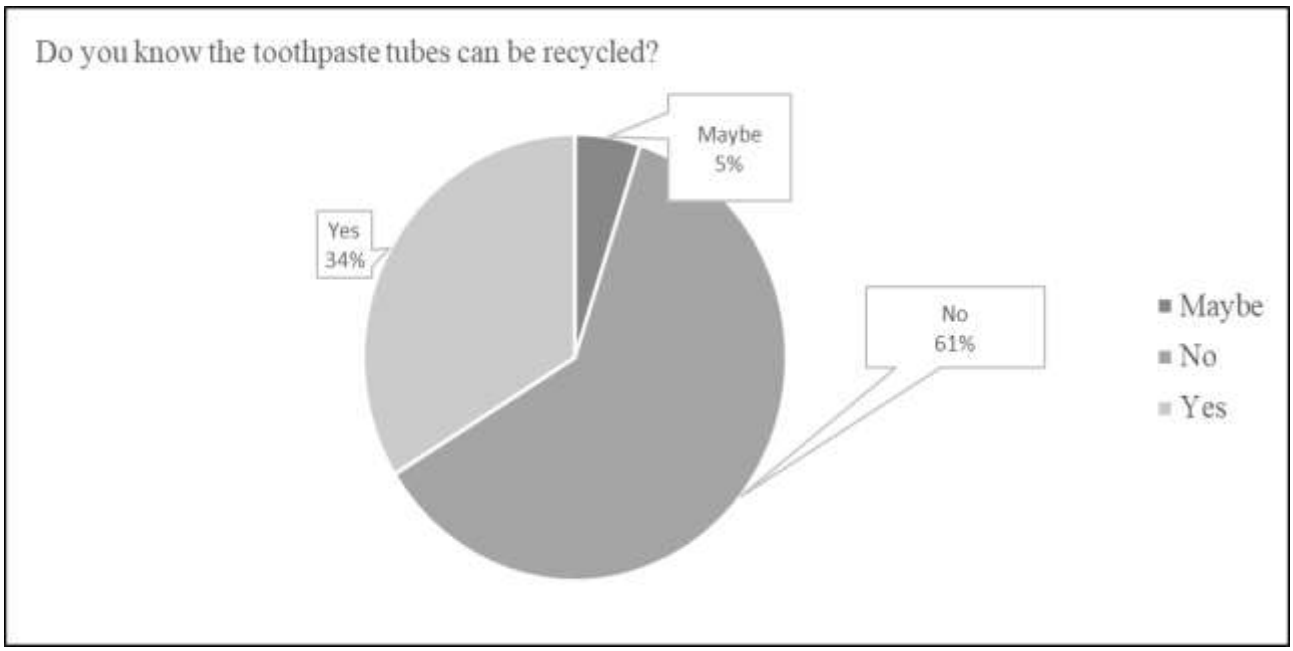

Figure 3 Pie chart of responses on the question "Do you know the toothpaste tubes can be recycled?" Source: Primary Data Collection

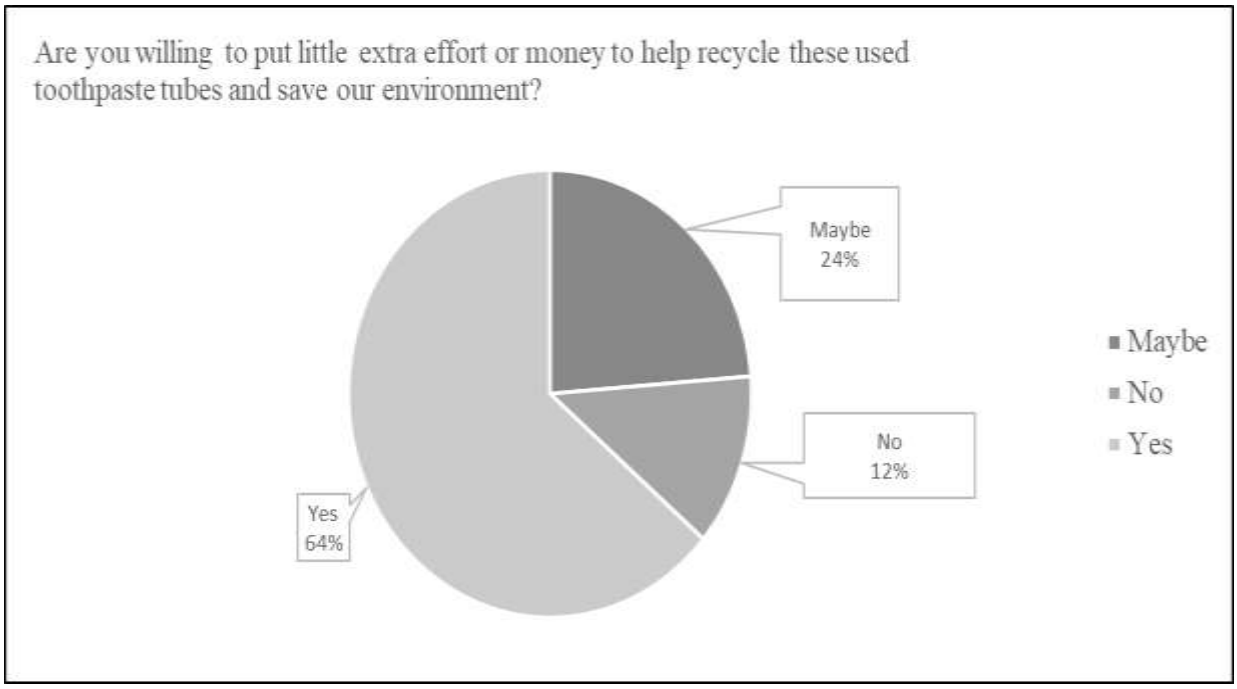

Figure 4

Pie chart of responses on the question "Are you willing to put little extra effort or money to help recycle these used toothpaste tubes and save our environment?" Source: Primary Data Collection

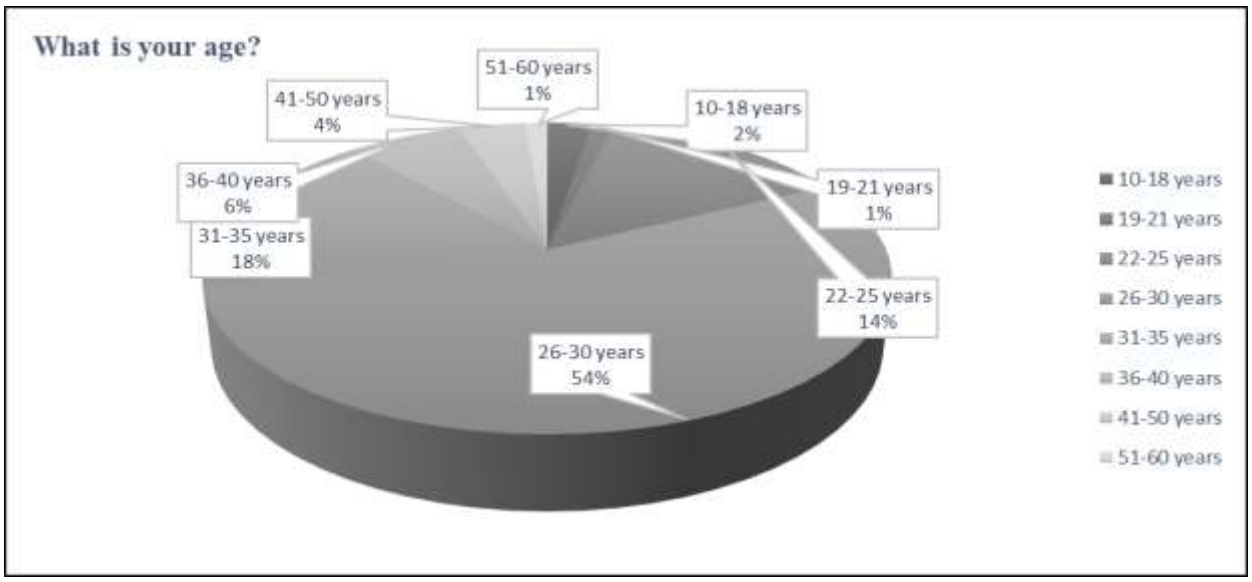

Figure 5 Pie chart of responses on the question "What is your age?" Source: Primary Data Collection

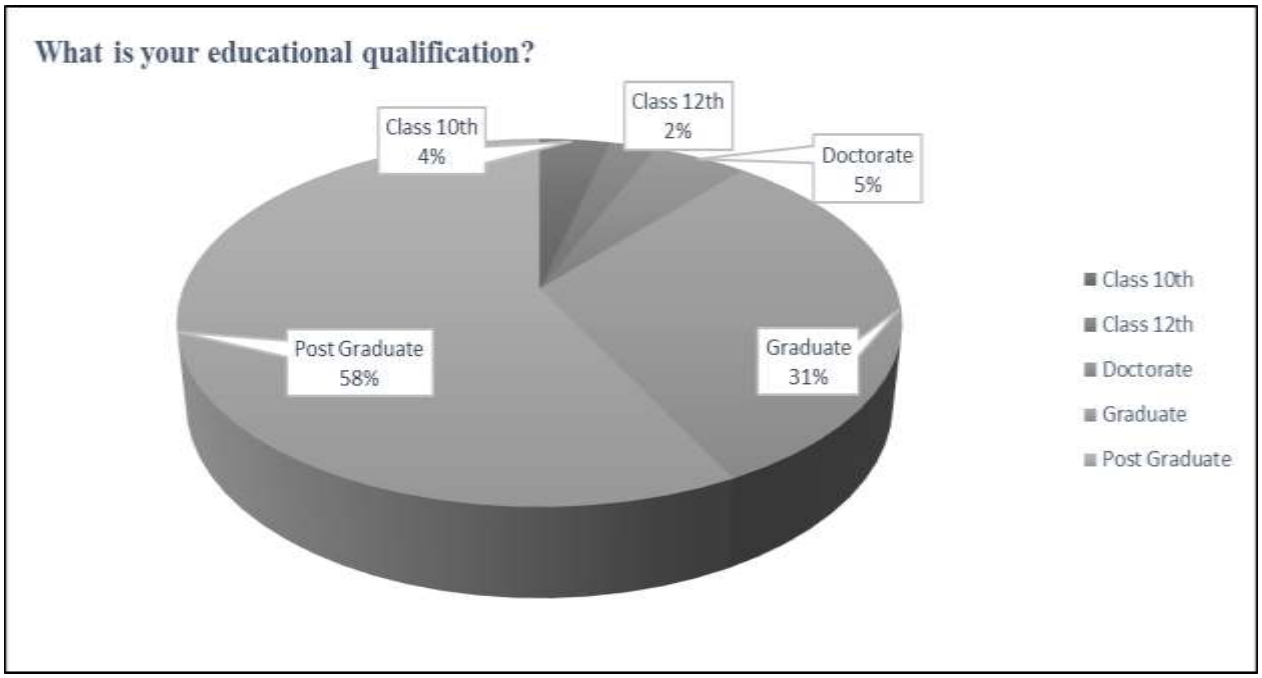

Figure 6 Pie chart of responses on the question "What is your educational qualification?" Source: Primary Data Collection

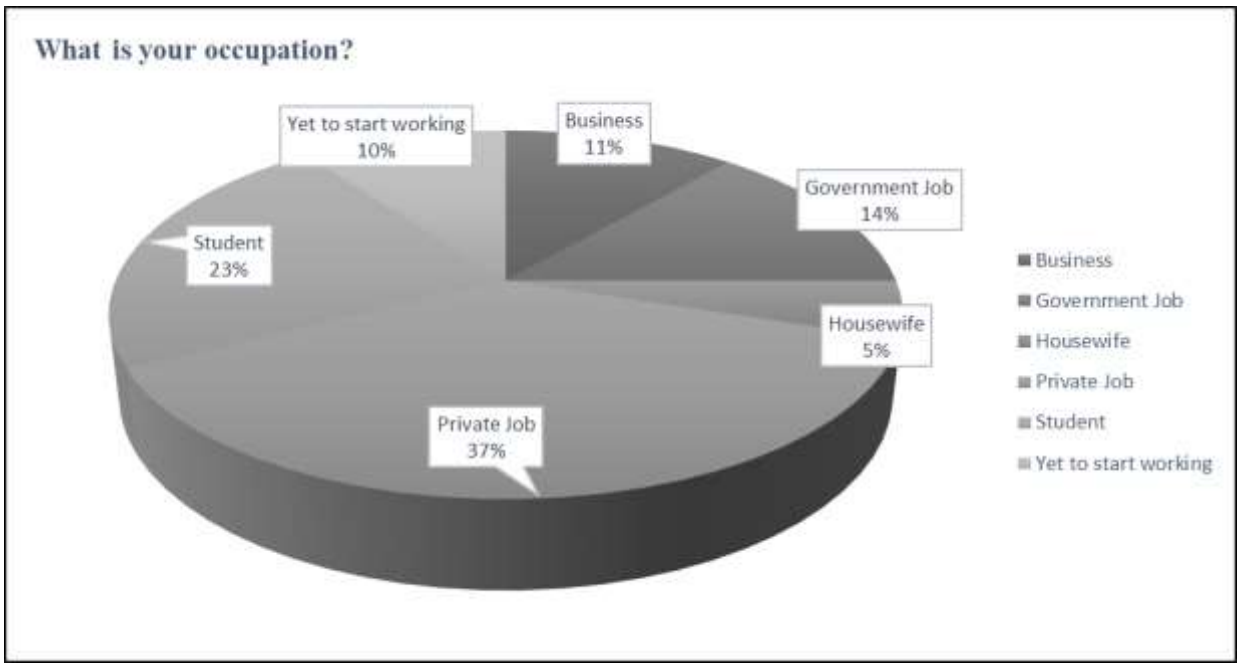

Figure 7 Pie chart of responses on the question "What is your occupation?"

Source: Primary Data Collection

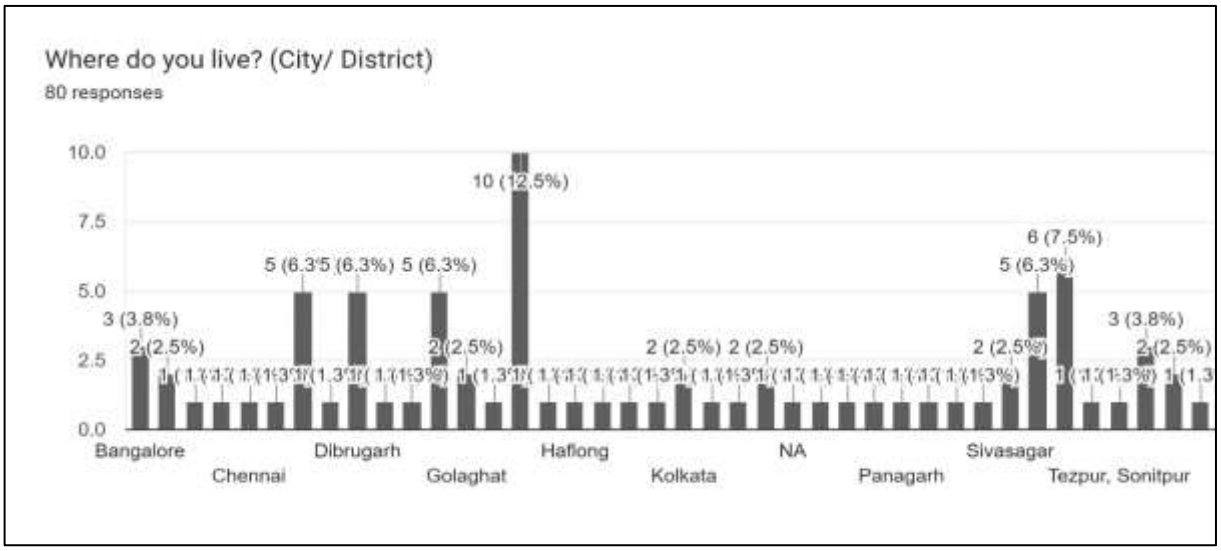

Figure 8

Bar diagram of responses on the question "Where do you live? (City/ District)"

Source: Primary Data Collection

Results and Discussion

Survey Summary

From the above results it is evident that almost everyone (97.5% respondents) throws away their toothpaste tubes once its empty and majority of the people are not even aware about harmful effects it has on the environment (63.7% respondents) or that they could be recycled (61.3% respondents).

But on the brighter side, it can be seen that 63.7% respondents are willing to invest little extra effort or money to help recycle the used toothpaste tubes and save the environment.

Speaking about the demographics, the respondents are evenly distributed in terms of occupation i.e., they come from different occupation and background but have the same opinion. In terms of age, majority respondents fall in 26-30 years. While observing about the educational qualification of the respondents it can be well concluded that the respondents were educated since 93.8% of them are graduates or above.

These results give us primary evidence that most consumers throw away their used toothpaste tubes, are unaware of the harmful effect and don't know that it can be averted, saving the environment big deal. Thus, the paper will discuss the alternates with keeping the data in view.

Proposed Solutions:

1) Re-Useable Dispenser:

The best way to curb the pollution caused by thrown away used toothpaste tubes is to stop using disposable single use plastic toothpaste tubes at all. This solution might sound very simple but it is equally difficult to implement since the first question that arises is that if not disposable plastic, then what? In an attempt to find the answer, a completely different packaging method can be employed.

A re-usable toothpaste dispenser illustrated in Figure 1 can be manufactured by the toothpaste brands or could be outsourced from 3rd party OEMs which would be filled by toothpaste in the assembly line. These re-usable dispensers filled with toothpaste can be sold instead of conventional toothpaste tubes and the additional cost that the company has incurred while manufacturing the dispensers can be levied on it as a one-time cost. Now, as the consumer buys this dispenser-based toothpaste, they are advised not to throw away the dispenser and bring it back when buying their next toothpaste. So, this time when the consumer returns the previous

empty dispenser and buys a new one, no additional cost for dispenser should be levied on it and they should be charged only for the toothpaste. This cycle can now run in rotation where consumer just pays for the toothpaste when he/ she returns the empty dispenser and if in case the consumers damages/ lost/ throws away the dispenser, he/ she has to pay additional amount for the new dispenser again.

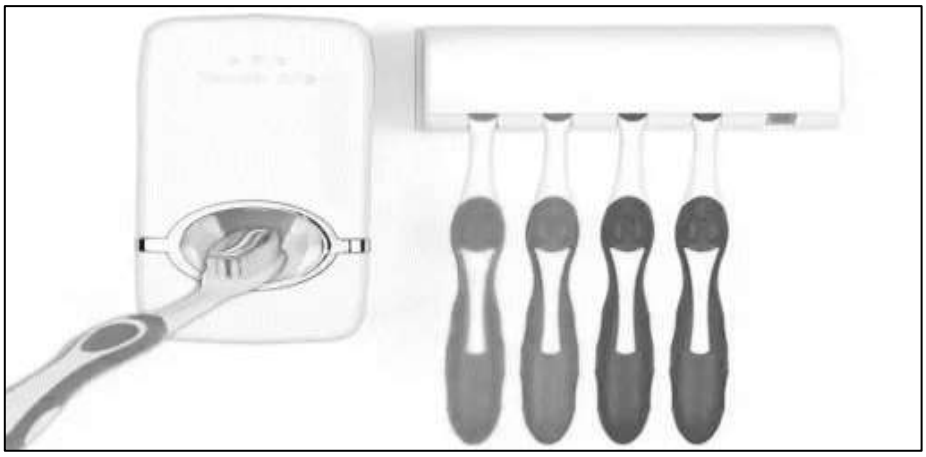

Figure 9: Illustration of Toothpaste dispenser (Not actual image)

[1] *Source: https://www.amazon.in/Toothpaste-Dispenser-Tooth-Brush-Holder/dp/B0CLJKDZW4*

(Note. An illustrative toothpaste dispenser model which can be exchanged at stores and later refilled by manufacturers. Inspired by existing model of such dispensers where a toothpaste tube is inserted directly from the top.)

Once the used empty dispenser is returned to the store, it will follow back the same supply chain to reach the manufacturer. It can be then washed & sterilized and made ready for refilling in the assembly line. This will reduce the plastic waste drastically.

From the survey, it can be clearly concluded that consumers are willing to pay little extra for a sustainable solution to save the environment and thus the additional one-time cost of the dispenser will be accepted by the consumers. In the second scenario, when the consumer damages/ lost/ throws away the current dispenser and has to pay again for the dispenser the next time they go to buy toothpaste, will act as a soft penalty in monetary form for polluting the environment and thus consumers will be motivated and cautious not to do so.

The material used could be food grade re-usable plastic or food grade metal or a combination of both, whichever is more feasible from both ease of use and manufacturing point of view. It can

be made available in 3 sizes i.e., small, medium and large. Consumers will have the option to choose sizes according to their usage.

Financials: As we all know, any company functions to make money and it can remain in the market only till it is making profit. Any new concept can fly only if it is financially feasible else it just remains as a concept. So, taking care of financials becomes very important while introducing anything new.

The expense of manufacturing these dispensers can be shared between the company and the consumers to make it a feasible solution for all. The part of share that the consumer is bearing is just one-time cost and they are willing to bear it (Source: Survey data) and the part of share which the company is bearing has to be taken care of. Now, companies were already manufacturing plastic toothpaste tubes previously and were incurring expenses there which can be shifted to manufacturing the dispensers and a part of the entire expense is covered. Remaining share of expense can be recovered by marketing their social responsibility, sensitivity towards environment and a sustainable future.

Alternatively, government can also contribute towards it by allowing companies to spend some percentage of their CSR budget in setting up and production of the dispensers. Since, this act is contributing towards sustainable future and is for a good cause, some amount of CSR funds could be allowed towards it. This move will encourage companies to take this step and move ahead with the plan since it would be financially feasible for them.

2) Recycle and Re-Use:

Recycling is a simple yet powerful way to make a positive impact on our environment. It involves the collection and processing of materials like paper, plastic, glass, metal etc., and transforming them into new products instead of allowing them to end up in landfills or incinerators. Recycling conserves valuable resources, reduces energy consumption, lowers pollution, and lessens the strain on the planet's finite raw materials. By participating in recycling efforts, one can contribute to a more sustainable and eco-friendly future. Thus, taking this idea forward and finding a way to recycle used toothpaste tubes.

Now one might think that why aren’t we recycling the used toothpaste tubes yet, so first let’s shed some light on the major challenges that are being faced:

• **Complex Materials:** Toothpaste tubes are often made of a combination of materials, typically a layer of plastic (polyethylene) and a layer of aluminum. These materials are bonded together, making separation for recycling difficult.

• **Lack of Standardization:** Different brands and types of toothpaste tubes may use different materials or combinations, making it difficult to establish standardized recycling processes.

• **Consumer Awareness:** Many people are not aware that toothpaste tubes can be recycled, and they might dispose of them in the regular trash instead of taking the time to clean and recycle them properly.

Now, since the challenges that are being faced are discussed and known to all, let's move ahead and try to solve them, so that recycling of empty toothpaste tubes become feasible and none goes to the landfill.

A simple approach would be to solve the challenges one after the another to resolve the issue entirely and thus let's focus on the first challenge i.e., Complex Materials. Since the toothpaste tubes are created with a mix of aluminum and plastic, it gets very difficult to recycle it, but few recycle plants in the United States (US) is doing it. The catch is that such plant's operation is limited to the United States (US) only that too at some specific locations, thus making it unfeasible to use at larger scale.

First and foremost, such recycle plants needs to be setup in every country and efforts are to be made to recycle used toothpaste tubes. The plants should be first setup one in each state, preferably in a central location which is mostly equidistant from rest of the places in that state and then maybe every district can have a recycling plant of its own, depending upon volume of used toothpaste tubes and its feasibility. Recycling such used and empty toothpaste tubes would require collective effort. Let's try to create a supply chain which makes recycling these toothpaste tubes feasible.

The different components and actions of the supply chain (illustrated in Figure 2) are mentioned below:

1. **Collection Points:** The first component of the supply chain is a collection point where all the used tubes can be collected. Establish collection points at places where consumers visit frequently or on daily basis like retail stores, schools, colleges, workplace, or community centers, where they can drop off used toothpaste tubes easily without having to put extra effort.

2. **Transportation:** Next step would be to transport the collected empty toothpaste tubes from the collection points to the recycle plant, which always plays a major role in any supply chain. This is the transportation which will act as the backbone of the project. To efficiently transport these toothpaste tubes from collection points to the recycle plants, Indian Postal Courier Service or Indian Railways could be used. Indian postal service has reach to every nook and corner of India including the most remote places. Indian Postal services can be used to transport the tubes to recycle plants very efficiently and economically, making the project financially feasible for entrepreneurs to take up.

Also, Indian Railways has its presence across the nation which makes it one of the longest rail networks in the world. Goods services of Indian Railways can be employed to transport the used toothpaste tubes from every district to the recycle plant. Government's support would be required for this.

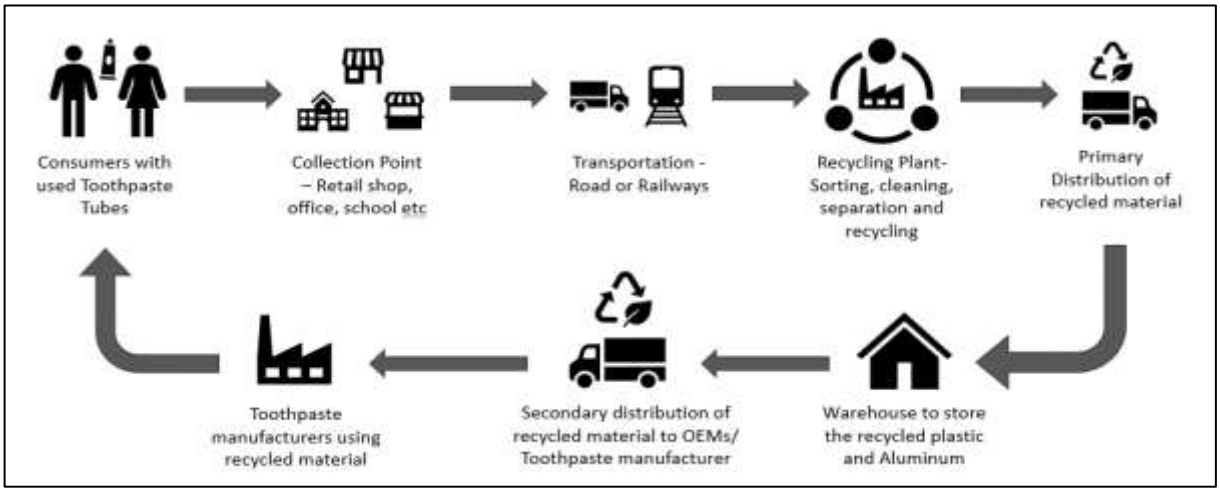

Figure 10 Illustrative Reverse Supply Chain (RSC) for recycling used Toothpaste tubes

Note: Authors' own creation

[1] *Source:* Authors' own creation

3. Recycle Plant:

i) **Sorting and Inspection:** Bring the collected tubes to a sorting and inspection facility. Here, the tubes are separated from other recyclables (if any) and inspected for contaminants.

ii) **Cleaning and Shredding:** After inspection, the tubes are cleaned to remove any residual toothpaste or contaminants. Then, they are shredded into smaller pieces for easier processing.

iii) **Material Separation:** Separation processes are used to extract the different materials present in the toothpaste tubes. Typically, this includes separating the plastic (usually polyethylene) from the aluminum layer.

iv) **Recycling and Processing:** The separated plastic and aluminum materials are sent to appropriate recycling belts. The plastic can be melted and reformed into new plastic products, while the aluminum can be melted down and used for various applications.

4. **Quality Control:** Quality control measures ensure that the recycled materials meet specific standards for use in manufacturing new products.

5. **Manufacturing Partners**: Partner with manufacturers to use the recycled materials to create new products. For toothpaste tubes, the recycled plastic could be used in the production of new tubes, and the aluminum may find applications in various industries including new toothpaste tubes.

6. Product Distribution: Primary distribution of the recycled materials (Plastic and Aluminum) will be done by roadways and stored in a warehouse nearby. According to demand, as and when required, supply of these recycled materials will be done to toothpaste manufacturers or other OEMs. This is the last mile distribution or secondary distribution. Later, the toothpaste manufacturer can use these recycled materials to produce new toothpaste tubes and sell it to consumers thus, completing the cycle.

7. Consumer Education: Educate consumers about the recycling process and the importance of proper disposal. Encourage them to participate in recycling initiatives.

8. Sustainability Initiatives: Collaborate with environmental organizations and local governments to promote sustainable practices and create incentives for consumers to participate in the recycling program.

9. Data and Reporting: Maintain records of the number of tubes collected, the amount of materials recycled, and the environmental benefits achieved. Regular reporting helps in tracking progress, making improvements and spreading convincing awareness based on data.

10. Continuous Improvement: Regularly assess the supply chain's efficiency and sustainability, making improvements where necessary to reduce waste, energy consumption, and costs.

Alternatively, Colgate Palmolive is creating toothpaste tubes which would be made of recyclable plastic alone without the complexity of an aluminum layer (Corra, 2022). They have started

working on it a long time back and are confident enough to launch these tubes soon. Once these toothpaste tubes made of recyclable plastic is launched, no specialized technology would be needed to recycle it and it would be possible to recycle the used tubes in any plastic recycle plants, thus making it more feasible and easier.

Consumer Awareness: The success of this project would mostly rely on consumers. If consumers are aware and willing to take the step to contribute towards recycling the used toothpaste tubes, only then the initiative will be implemented well. To increase the awareness in consumers and motivate them to contribute in recycling these tubes, campaign must be run by private players as well as governments. Some influencer celebrity with a credible image could be roped in to promote this initiative and motivate consumers. Firstly, the harmful effect of irresponsible disposal of toothpaste tubes on environment should be explained to the consumers and then request can be made to contribute towards this green initiative. Governments can run campaigns in rural areas with the help of their network of panchayats.

Conclusion

The paper addresses a very major issue of responsible disposal of products in both urban and rural areas across the globe. It discusses a very common yet grave issue of disposing used toothpaste tubes irresponsibly and proposes conceptual solution to curb the pollution and promote sustainable living and future. It contributes to the Goal No.12 (Ensure sustainable consumption and production patterns), Goal No.14 (Conserve and sustainably use the oceans, seas and marine resources for sustainable development) and Goal No.15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss) of UN's Sustainable Development Goals (SDG).

The major concern is the lack of awareness in consumers regarding the magnitude of threat and pollution these used toothpaste tubes cause and also the lack of infrastructure to recycle it. The right infrastructure must be developed, supply chain must be setup and most importantly consumers must be educated about the importance of responsible disposal of products. Once everything is in right place, a collective ecosystem of disposal is created contributing to less pollution and sustainable future.

This paper is not just about recycling toothpaste tubes but a cry to the world out there to pay attention to the usual and common habits or stuffs that we do, which unknowingly ends up harming our environment. This paper urges each and every one to try and incorporate habits that are eco-friendlier and more sustainable in nature. These small and minor changes in habits can lead to a big impact when done by the mass.

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14/10/2023, 17:37 Survey on Toothpaste Tubes disposal

Survey on Toothpaste Tubes disposal

Dear Respondent,

This form is created by Akram Azaz and Trideep Borsaikia, Research Scholars from Tezpur University. This is intended to collect some information regarding your toothpaste tubes disposal, which will be used to write a paper titled "What should happen to your used Toothpaste Tubes". The data/information collected will be used solely for this academic purpose.

Thank you for your co-operation in advanced.

* Indicates required question

1. What do you do with your toothpaste tube once its empty *

Mark only one oval.

- ◯ Throw it away
- ◯ Re-use the tube in some other way
- ◯ Recycle it
- ◯ Keep/ Collect/ Store it with me
- ◯ Other: _____

2. Did you know the toothpaste tubes pollutes and stays in the landfill for 500 years before its decomposed? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

14/10/2023, 17:37 Survey on Toothpaste Tubes disposal

3. Do you know the toothpaste tubes can be recycled? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

4. Are you willing to put little extra effort or money to help recycle these used toothpaste tubes and save our environment? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

5. What is your age? *

Mark only one oval.

- ◯ 10-18 years
- ◯ 19-21 years
- ◯ 22-25 years
- ◯ 26-30 years
- ◯ 31-35 years
- ◯ 36-40 years
- ◯ 41-50 years
- ◯ 51-60 years
- ◯ Above 60 years

6. What is your educational qualification? *

Mark only one oval.

- ◯ Class 10th
- ◯ Class 12th
- ◯ Diploma
- ◯ Graduate
- ◯ Post Graduate
- ◯ Doctorate

7. What is your occupation? *

Mark only one oval.

- ◯ Government Job
- ◯ Private Job
- ◯ Business
- ◯ Student
- ◯ Housewife
- ◯ Yet to start working

8. Where do you live? (City/ District) *

9. What is your name? *

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