

Assessing the Behavioral Impact of the UK's Plastic Packaging Tax on Manufacturers and Importers: Insights for Implementing a Sustainable Policy Framework in India

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1. ABSTRACT

UK is the only country to levy a Plastic Packaging Tax(PPT) on packaging with less than 30% recycled plastic content. It was implemented on 1st April 2022. This taxation has a positive impact, encouraging manufacturers and traders to increase the use of recycled materials. On the other hand, India banned single-use plastics on July 1, 2022, which has not been fully successful. This research aims to analyze the behavioral responses of manufacturers and traders in the UK to the implementation of the Plastic Packaging Tax(PPT).Furthermore, this study intends to explore the applicability of a similar tax framework in India in a very efficient manner, evaluating how such a policy could be tailored to the Indian context. Qualitative data will be collected from structured surveys and analyses of Industry Reports in UK to assess the changes in behavior post-PPT implementation. Key Performance Indicator will include the percentage increase in recycled plastic usage .Through existing literature, secondary data, government reports, and expert interviews,We have found that the ppt has some drawbacks also,Hence, this research will conduct a analysis to provide a better tax tiered model for india by evaluating those drawbacks This comparative analysis will identify potential challenges and opportunities in India for implementing a plastic packaging tax. Hence, this research paper would help understand the behavioral changes that happened in UK's manufacturers and traders due to PPT and how well India could adopt it in a good manner.

KEYWORDS :-

Plastic Packaging Tax , UK , India , Behavioral Changes , Plastic Alternatives , Sustainability.

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2.Introduction

There has been a hike in demand for innovative and sustainable solutions to the ‘Global Plastic Waste Crisis’. The UK’s Plastic Packaging Tax(PPT) seems to be a pioneering policy initiative for the above crisis. This research delves into the PPT’s leveraging behavioural nudges to drive sustainable change and its impact on manufacturers & importers. By zooming into the pros and cons of PPT, we aim to develop a model policy framework for India, which renders economic growth and environmental stewardship go hand-in-hand. The global plastic waste crisis presents a series of peculiar and multifaceted plastic-related challenges. The recyclability of plastic is also one of its key strengths as an extremely resource-efficient material and used plastic should ideally be regarded as a valuable resource rather than ‘waste’

“Plastic has been the default option in design for too long. It is time to redesign products to use less plastic, particularly unnecessary and problematic plastics, to redesign product packaging and shipping to use less plastic, to redesign systems and products for reuse and recyclability...”

-Inger Andersen, Executive Director, UN Environment Programme.

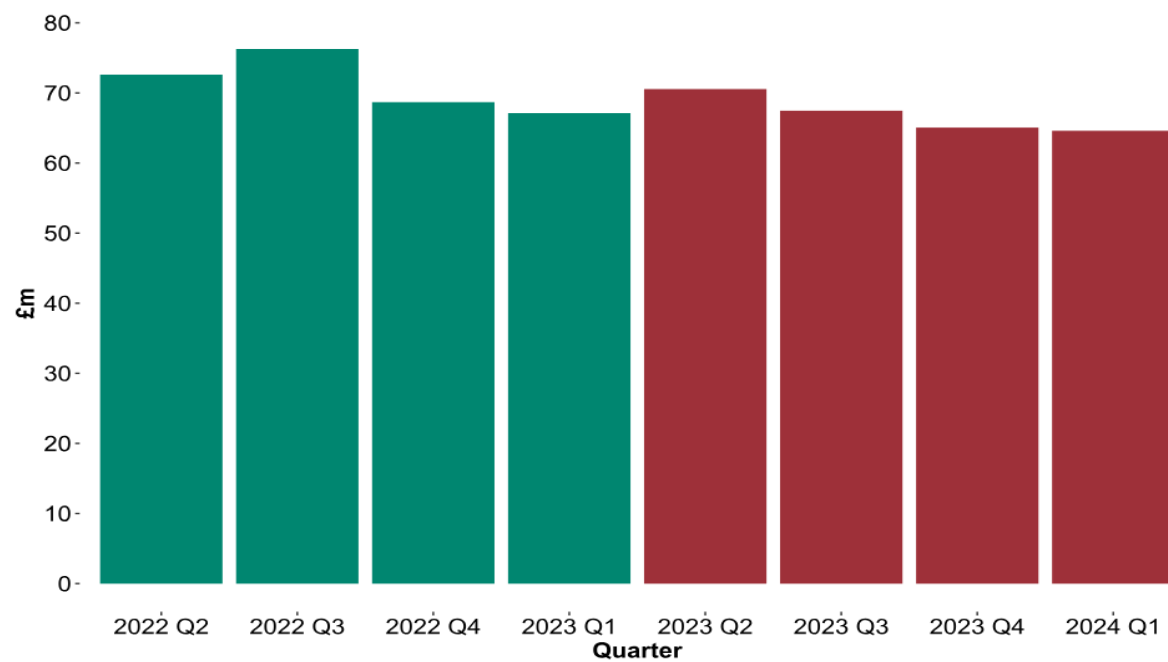
3. A Roadmap for Sustainable Future: Plastic Packaging Tax(PPT)

The UK’s plastic packaging tax went into effect on April 1, 2022, as part of an initiative that sets recycling targets for six types of packaging by 2030. The PPT requires manufacturers and importers to use at least 30% recycled plastic by weight, or pay a tax currently assessed at £210.82 per ton of plastic packaging. It nudges manufacturers to use higher recycled content percentages as the default option in their packaging design and production processes. The UK’s PPT Tax can serve as a valuable reference to implement a similar tax in India with custom changes made to coincide with Indian Industries.

4. Methodology

Here we used the qualitative/descriptive method by incorporating graphs, statistics/tables, and experts' opinions to review the PPT tax.

Figure 1: PPT quarterly revenue from chargeable plastic packaging manufactured in and imported into the UK in the financial year of 2022 to 2023 and 2023 to 2024



Source¹: [gov.uk](https://www.gov.uk)

Table 1 :Total amount of plastic packaging that was relieved or exempt

¹ <https://www.gov.uk/government/statistics/plastic-packaging-tax-ppt-statistics/plastic-packaging-tax-ppt-statistics-commentary>

Plastic packaging type declared	Tonnage (thousands of tonnes) 2022-2023	Tonnage (thousands of tonnes) 2023-2024
Exported and converted	722	326
Immediate packaging of human medicinal products	19	20
30% or more recycled content	1,293	1,371

Source:gov.uk²

5.Findings:

Figure 1: The above graph clearly shows decreasing trend in the revenue earned from Imposing PPT Tax. This decrease in revenue shows that the companies have started to adapt to the PPT Tax as a result they were exempted from PPT , which might have resulted in decreasing trend in revenue.

Table 1: This table represents the companies that were exempted from PPT Tax. In this table, column “30% or more recycled content” witnessed a gradual increase in the number of companies

² <https://www.gov.uk/government/statistics/plastic-packaging-tax-ppt-statistics/plastic-packaging-tax-ppt-statistics-commentary>

exempted. Which directly conveys that more producers have started to use more than 30% recycled plastic which ultimately leads to exempted category.

5.1. Limitations of the UK PPT:

- **Flat Tax Model:** The UK PPT applies a uniform tax rate of £210.82 per tonne for plastic packaging with less than 30% recycled content, regardless of material type (e.g., PET vs. PVC) or product end-use. This structure lacks incentives for higher recycled content or differentiation based on recyclability.
- **For Consumers:** The most immediate and obvious consequence is that consumers would likely bear a portion of the tax burden through higher prices on goods, especially in essential goods. This could disproportionately impact low-income household

5.2 Proposed Tiered Tax Framework for India

The findings from the UK PPT inform the development of a **tiered tax structure** tailored for India. This framework addresses the UK's limitations by incorporating recyclability, recycled content, and end-use into tax differentiation.

Recycled Content (%)	Essential Goods (₹/tonne)	Non-Essential Goods (₹/tonne) (PET)	Non-Essential Goods (₹/tonne) (PVC)	Luxury Goods (₹/tonne) (PET)	Luxury Goods (₹/tonne) (PVC)
< 30%	₹0 (Exempt)	₹6,700	₹13,400	₹13,400	₹26,800
30% - 50%	₹0 (Exempt)	₹5,695	₹11,930	₹11,930	₹22,780
50% - 70%	₹0 (Exempt)	₹4,840.75.	₹9,681.5	₹9,681.5	₹19,362
> 70%	₹0 (Exempt)	₹0 (Exempt)	₹0 (Exempt)	₹0 (Exempt)	₹0 (Exempt)

***Plastic Packaging with the other 4 types of plastics will follow PET tax structure.**

Proposed Tax Structure & Calculation of the Proposed Tax Structure:

PPT imposed on recycled content <30% by UK - £217.85 per tonne from 1 April 2024.

Purchasing Power Parity (PPP) conversion factor, (per international \$) latest value as on 2023 reported by World Bank:

India - 20.20

Uk - 0.67.

Tax Calculation for PET(Polyethylene Terephthalate):

Non-Essential Goods (Rs./tonne) :

- Suggested tax structure for India(in Rs.)= UK Tax(in £) *(India's PPP Conversion for Non-Essential Goods(Rs./tonne)(PET) Factor / UK's PPP Conversion Factor) (Recycled content<30)

$$= 217.85 \text{ GBP} * (20.20 \text{ INR/USD}) / (0.67 \text{ GBP/USD})$$

$$= \text{Rs.} 6,568.015$$

Suggested tax rate for India (in Rs.)

~ Rs.6,700.(This will be considered as starting tax amount)

- For each succeeding tier with additional recycled content, the percentage categorized above will be charged 15% less the tax amount of the preceding category tier. (PET).

a. 30%-50% (PET) = Preceding tax amount - (Preceding tier's tax amount * 15%)

$$= \text{Rs.} 6700 - (\text{Rs.} 6700 * 15\%)$$

$$= \text{Rs.} 5,695.$$

b. 50%-70% (PET) = Preceding tier's tax amount- (Preceding tier's tax amount * 15%)

$$= \text{Rs.} 5695 - (\text{Rs.} 5695 * 15\%)$$

$$= \text{Rs.} 4,840.75.$$

c. Above 70% = Exempted from the tax to encourage their current practice.

Luxury Goods:

Luxury goods are taxed, double the tax slab amount of their respective Non-essential(PET) percentage slab.

1. <30% = 2 * [Respective tax slab in Non-Essential (PET)]
 = 2 * Rs. 6700
 =Rs. 13,400.
2. 30%-50% = 2 * [Respective tax slab in Non-Essential (PET)]
 = 2 * Rs. 5965
 =Rs.11,930.
3. 50%-70% = 2 * [Respective tax slab in Non-Essential (PET)]
 = 2 * Rs.4840.75
 = Rs.9681.5.
4. Above 70% = Exempted from the tax to encourage their current practice.

Tax Calculation for PVC(Polyvinyl Chloride):

Here, for PVC the tax rate will be double the amount of PET rate for each respective category. This is because of the following reasons:

- PVC often contains additives like stabilizers and plasticizers, which can contaminate other plastics during recycling. This makes it difficult to recycle PVC effectively and maintain the quality of the recycled material. The demand for recycled PVC is lower compared to recycled PET, making it less economically viable to recycle PVC.

Non-Essential Goods (Rs./tonne) :

1. Less than 30% = 2 * [Respective tax slab in Non-Essential (PET)]
 = 2 * Rs. 6700
 = Rs. 13,4000.
2. 30%-50% = 2 * [Respective tax slab in Non-Essential (PET)]
 = 2 * Rs.5695
 = Rs.11,390.

$$\begin{aligned}
 3. \quad 50\%-70\% &= 2 * [\text{Respective tax slab in Non-Essential (PET)}] \\
 &= 2 * \text{Rs.}4840.75 \\
 &= \text{Rs.}9681.5.
 \end{aligned}$$

$$4. \quad \text{Above } 70\% = \text{Exempted from the tax to encourage their current practice.}$$

Luxury Goods ((Rs./tonne) :

$$\begin{aligned}
 1. \quad \text{Less than } 30\% &= 2 * [\text{Respective tax slab in Luxury Goods(PET)}] \\
 &= 2 * \text{Rs. } 13,4000 \\
 &= \text{Rs. } 26,800.
 \end{aligned}$$

$$\begin{aligned}
 2. \quad 30\%-50\% &= 2 * [\text{Respective tax slab in Luxury Goods(PET)}] \\
 &= 2 * \text{Rs.}11,390 \\
 &= \text{Rs. } 22,780.
 \end{aligned}$$

$$\begin{aligned}
 3. \quad 50\%-70\% &= 2 * [\text{Respective tax slab in Luxury Goods(PET)}] \\
 &= 2 * \text{Rs.}9681.5 \\
 &= \text{Rs.}19,362.
 \end{aligned}$$

$$4. \quad \text{Above } 70\% = \text{Exempted from the tax to encourage their current practice.}$$

The reason why only PET and PVC are considered here is likely due to their high production level and their widespread usage in Plastic packaging. Also adding other 4 types of plastics would complicate the Tax structure.

6.Projected Impacts for India:-

Revenue Generation:

Using India's annual plastic consumption of 20 million tonnes, the proposed tax structure could generate an estimated ₹150,000 crore annually:

- Essential Goods (50%): Exempt.
- Non-Essential Goods (40%): Significant revenue from moderate tax rates (₹7,500 to ₹15,000 per tonne).
- Luxury Goods (10%): High tax rates on PVC and low-recycled-content plastics contribute substantially.

Environmental Impact:

- The tiered structure incentivizes, A shift from hard-to-recycle plastics (e.g., PVC) to easily recyclable materials (e.g., PET).
- Increased use of recycled content, especially in non-essential and luxury products.
- Anticipated amount of waste reduction: 9 million tonnes of uncontrolled plastic annually through increased recycling and reduced use of virgin plastic.

Behavioral Outcomes:

- Manufacturers: Facilitated to use above 70% recycled content for tax exemptions.
- Luxury Sectors: Practicing sustainable materials due to increased penalties on plastics with low recycled content.
- Consumers: Barely perceptible rises for essentials guarantee affordable items; high taxation for luxurious and discretionary items stimulate 'green' purchase behavior

7.Conclusion :-**Limitations of the UK PPT :**

- The UK PPT system with the flat rate design was less incentivizing in offering high recyclability rates, besides offering meager deterrent to less-recyclable plastics. In this respect, the suggested graded taxation model in India obliterates such challenges through the following.
- Distinct taxes based on plastic type with respective recycling percentage level.
- End-use categories-divided into essential, non-essential, luxury-to balance affordability and sustainability.

Behavioral Nudges and Policy Implications :Behavioral Nudges:

- Higher taxes on "hard to recycle" plastics and low-recycled-content products discourage users of these products. Exemptions for high-recycled-content products support consumers adopting environmentally friendly practices.
- Taxes with different rates create an incentive for producers to shift their production to PET and content of >70%.

Policy Recommendations:

- Form alliances with industry partners to validate recycled content and recyclability.
- Use tax revenues to invest in recycling infrastructure and public awareness campaigns.
- Offer subsidies or tax rebates for SMEs embracing sustainable packaging technologies.
- Challenges and Solutions

Verification of Recycled Content:

Challenge: It is hard to verify the recycled content.

Solution: Implement mandatory certifications and periodic audits.

Compliance Among SMEs:

Challenge: The smaller businesses may incur more costs to switch.

Solution: Provide financial incentives and technical support to SMEs.

Public Awareness:

Challenge: Consumers are not well aware of sustainable packaging.

Solution: Organize nationwide awareness campaigns that focus on the environmental and economic benefits of the tax.

Wider Implications for India

The proposed tax structure addresses behavioral incentives and aligns with India's Sustainable Development Goals, especially SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). It positions India as a global leader in integrating behavioral nudges into environmental policy.

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