

Is a Ban the Best Way to Reduce Plastic Bag Use? A Case Study from Delhi

In many developing countries plastic bags are a significant environmental problem. This is particularly true in the city of Delhi, which faces rapid development with un-matched and inadequate waste management systems. To address this problem, the government of Delhi passed a blanket ban on the use of plastic bags in 2009. However, the ban has been largely ineffective. This Brief discusses how the problem of plastic bag use might be more effectively tackled. The Brief is based on a study by Kanupriya Gupta from the Delhi School of Economics.

This study assesses the impact of a number of complementary approaches to the plastic ban: providing information on the environmental impact of plastic bags to consumers; providing a cash-back scheme to consumers who do not use plastic bags; and providing substitutes for plastic bags. It finds that cumulatively these interventions increase the proportion of consumers who bring their own bags to shop from 4.6% to 17.8%. They also reduce the number of consumers who would only use plastic bags from 80.8% to 57.1%. The study concludes that in developing countries with little enforcement capacity, a blanket ban may not be the best possible solution to the plastic bag challenge. Multiple approaches, such as those assessed, might be better options.

The Plastic Bag Challenge

In many countries plastic bags have largely replaced the use of re-usable bags and containers for shopping. In India, the share of plastic waste in total solid waste has risen from 0.6% in 1996 to 9.2% in 2005. Over 50% of this waste comprises used plastic bags and packaging.

Plastic bag usage can be environmentally very damaging. The bags take hundreds of years to degrade and fill up landfill sites. Plastic litter can also lead to clogged drains, which result in sanitation, flooding and sewage problems. In addition, plastic bags can harm animals through ingestion and the incineration of plastic bags pollutes the air and releases toxic substances. Plastic bags are also responsible for using up oil, a scarce natural resource.

These concerns have caused governments across the world, including the authorities in India, to introduce legislation to limit the use of plastic bags. They have used a variety of regulatory instruments for this purpose. These include the mandatory pricing of plastic bags, explicit levies on each bag, taxes at the manufacturing level, discounts on the use of 'own bags', awareness campaigns, command and control approaches and, in some cases, a total ban on the use of plastic bags. The evidence on the effectiveness of such policies is mixed. For example, plastic bag retail levies in Ireland have resulted in a dramatic fall in the demand for plastic bags, and an environmental levy at the point of manufacturing in Denmark has been similarly effective. However, complete bans have yielded mixed results.

The Ban on Plastic Bags in Delhi

Delhi contributes around 5% of the packaging waste produced in the country, although it represents only about 1.5% of the population of India. Despite the scale of the problem, only

Other Factors that Influence Plastic Bag Use

The study looked at the factors that affected consumer behaviour with respect to the use of plastic bags (and their own bags). These factors included shop types, gender and employment.

In the sample of 180 shops, 70% were fruit and vegetable shops and 30% were grocery shops. The average value of purchase per plastic bag was INR 40. The study found that consumers used more plastic bags per rupee in the case of fruit and vegetable shops (at INR 30) than at grocery shops (at INR 67).

A significantly higher proportion of consumers brought their own bags for grocery shopping than for fruit and vegetable shopping (4.9% in the fruit and vegetable shops and 20.8% in grocery shops). This shows that consumers are comfortable using more reusable bags for grocery items but find plastic bags indispensable for fruits and vegetables, especially soft and small vegetables and wet purchases like cottage cheese and cut pumpkin.

The study also found that women were more receptive to interventions (the initiatives to reduce bag usage) compared to their male counterparts. However, even in the control shops, women used their own bags more than men. This pattern continued in the intervention shops with about 11.9% of females and 9.7% of males using reusable bags.

The interventions had a maximum impact on the non-working-age population in the treatment shops. The highest proportion of individuals getting their own bags was amongst those aged less than 20 and more than 60. This suggests that the younger generation and senior citizens might be either more environmentally conscious or more receptive to messages about the environment.

When the impact of occupations was assessed, it was found that people who were non-earners - students, housewives and the retired - appeared to be most affected by the study interventions. This complements the findings relating to age. In the case of the income category, it was again the non-earning category that showed the maximum influence from the interventions and switched most readily to using their own bags.



recently was there a surge of political and administrative will to curtail plastic litter in the city. In August 2008, the Delhi High Court directed the state to raise the minimum thickness of plastic bags from 20 to 40 microns. Five months later, on the 7th of January 2009, it ordered a complete ban on the use of all plastic bags within market areas. Unfortunately, this ban has been ineffective. The study finds that some 94% of consumers continue to use plastic bags in blatant violation of existing rules.

Looking at Alternatives to a Ban

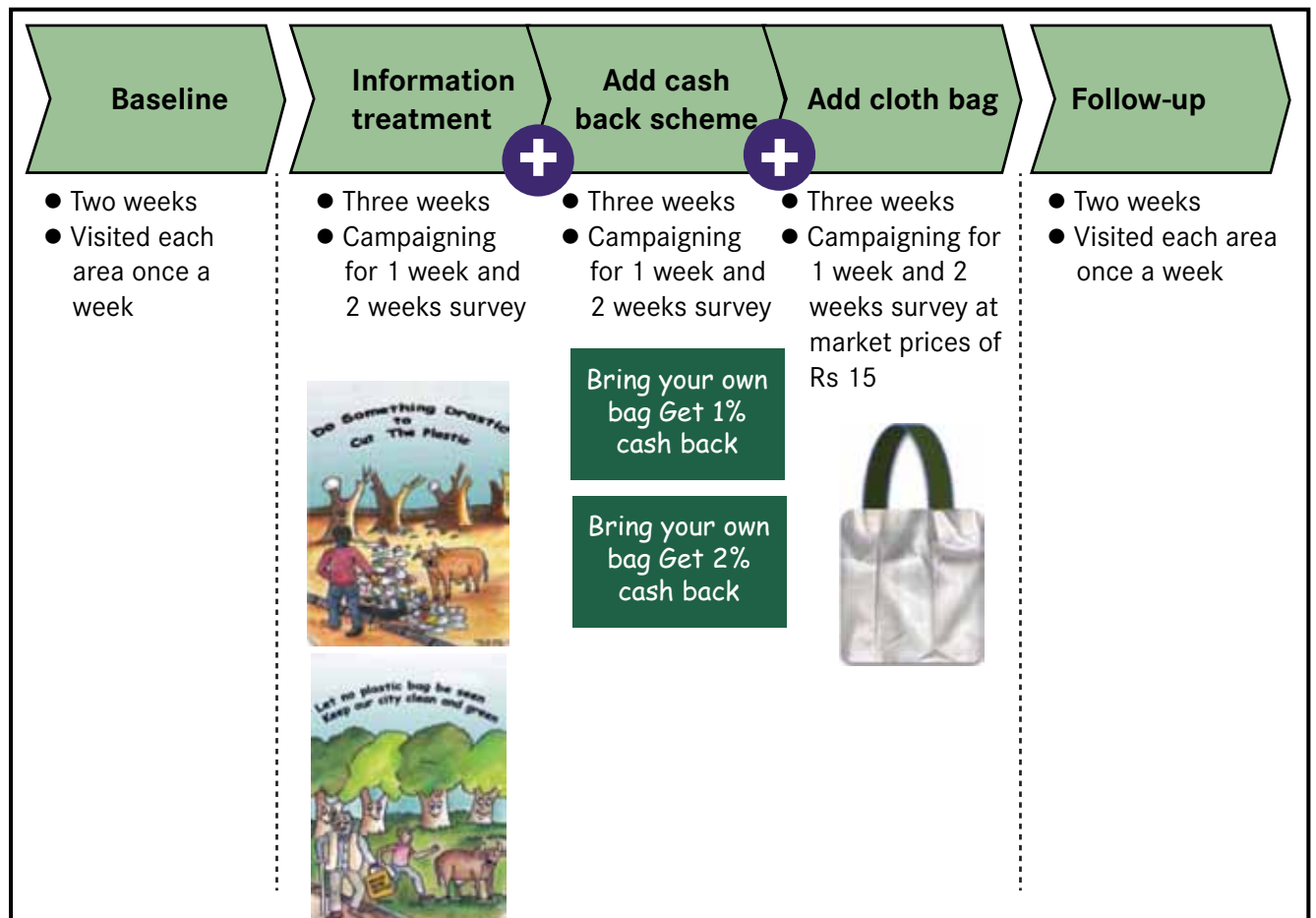
Since the ban is ineffective, the study focused on alternate strategies to reduce plastic use and wanted to find out if they would work. The study team assessed three different approaches and looked at their impact both individually and cumulatively. The approaches were: (i) the provision of information about the environmental impact of plastic bag use, (ii) a cash-back scheme to encourage people to stop using plastic bags, and (iii) the provision of substitutes for plastic bags. Each approach addressed a different problem - lack of information, lack of incentives and lack of cheap alternatives. It was hypothesized that the three approaches would together have a strong effect.

To test the impact of the policies - and their cumulative effects - the researchers conducted a series of field experiments. These were done in four randomly-selected neighbourhoods in Delhi (that were covered by the government ban) and one in National Capital Region (Ghaziabad) that did not fall within the capital's administrative boundaries and was therefore not within the area covered by the ban.

Plastic Bag Use in Fruit and Vegetable and Grocery Shops

The field experiments were conducted in three randomly selected market areas within the five neighbourhoods (15 market areas in all) in and around Delhi. In each market 12 fruit and vegetable and grocery shops were chosen at random, making for a total sample of 180 fruit and vegetable and grocery shops. A sub-sample of markets was chosen as the 'treatment' group, while others were control groups.

Figure 1: The Experimental Design



The experiment involved several stages: First a two-week baseline survey was used to record transactions in each shop and the different types of bags that consumers used. In the next phase, information on the environmental impact of using plastic bags was provided to consumers in the treatment markets. Following this ‘information treatment’, alternate choices were introduced.

Cash-back Schemes and Plastic Bag Alternatives

After two weeks of ‘information treatment’, a cash-back scheme was introduced in six of the nine ‘information shops’ in each treatment market (information provision was continued). Under the cash-back scheme, a consumer who was not using a retailer-provided plastic bag received 1% or 2% of the value of his or her purchase as cash-back.

After two weeks of this cash-back treatment, an alternative to plastic bags (reusable cloth bags) was introduced in each treatment market. This was only done in three out of the six ‘information and cash-back’ shops (information and cash-back schemes were continued). The shops sold these cloth bags to the consumers at the cost price of INR 15 per bag. However, cash transfers of INR 3 per bag were given as an incentive to the shops that participated in the cloth bag treatment.

Five weeks after the last stage of the study a two-week follow-up survey was done to find out if the behavioural changes observed during the study period had persisted.

Low-Cost Interventions can Work

The results from analysing consumer behaviour in the treatment and control shops show that the cash-back scheme was the most effective intervention and that it reduced plastic bag usage by 5.5%. The cloth bag and information schemes reduced plastic bag use by 4.5% and 3.5% respectively. Cumulatively, the three schemes increased the proportion of consumers bringing their own bags from 4.6% to 17.8%. On the other hand, plastic bag usage came down from 80.8% to 57.1%.

The study shows that information highlighting the environmental impacts of plastic bag usage can influence consumer behaviour. In other words, relatively low cost interventions can change consumer attitudes towards

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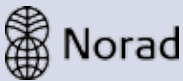
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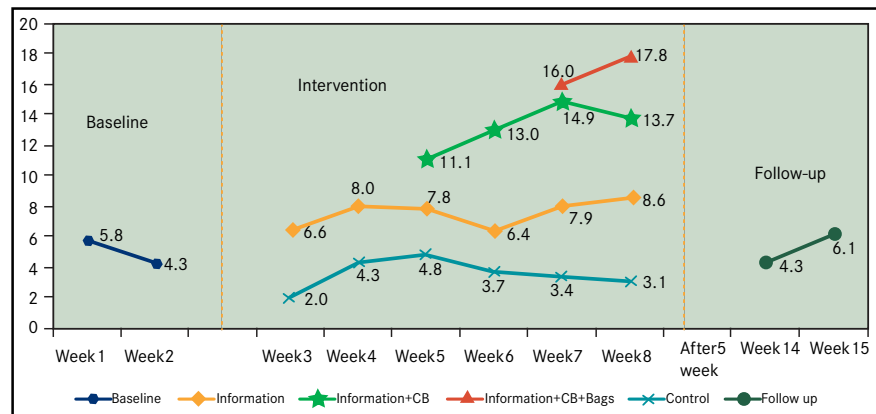


The World Bank

reusable bags. The study also shows that subsidies, either in cash or in kind (in the form of reusable bags) and explicit pricing could lead to lower plastic bag use.

A comparison was made with studies conducted in other countries where similar interventions were introduced. The countries included Ireland where plastic bag use came down by 90% and China where it came down by 49%. These other studies suggest that the reduction in plastic bag use in the Delhi study was small, but it is possible that this gap might go down over a period of time.

Figure 2: Impact of Differential Interventions on Own Bag Usage Over Time



Source: Survey data from Delhi-NCR

Note: Values are two week moving averages

Policy Recommendations

The study highlights some important lessons relating to the Indian government's blanket ban on plastic bags. First, for the ban to be effective, it should be enforced with credible information about the penalties that those using plastic bags will face – this should be provided to both shop owners and consumers. This is something that is clearly lacking in the ban currently espoused by the Delhi government.

In developing countries with little enforcement capacity, a blanket ban may not be the best possible solution. In fact, no single solution is likely to produce large enough results. Instead, a combination of strategies might be required to create an incentive-based system for the consumer and the retailer.

This policy brief is an output of a research project funded by SANDEE. The view's expressed here are not necessarily those of SANDEE's sponsors.

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