

Plastics and the Environment

Assessing the Impact
of the Complete Ban on
Plastic Carry Bag



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A report by:



Toxics Link
for a toxics-free world

About Toxics Link

Toxics Link emerged from a need to establish a mechanism for disseminating credible information about toxics in India, and for enriching the debate on such issues. The goal was to develop an information exchange and support organisation that would use research and advocacy in strengthening campaigns against toxics pollution, help push industries towards cleaner production and link groups working on toxics and waste issues.

Toxics Link has unique experience in the areas of hazardous, medical and municipal wastes, as well as in specific issues such as the international waste trade and the emerging issues of pesticides and persistent organic pollutants (POPs). It has implemented various best practices models based on pilot projects in some of these areas. It is responding to demands upon it to share the experiences of these projects, upscale some of them and to apply past experience to larger and more significant campaigns.

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ABBREVIATION

DCB	Delhi Cantonment Board
DPCC	Delhi Pollution Control Committee
EPA	Environment Protection Act
HDPE	High-Density Polyethylene
IEC	Information Education and Communication
LDPE	Low-Density Polyethylene
MCD	Municipal Corporation of Delhi
MMT	Million Metric Tonne
MoEF&CC	Ministry of Environment and Forest and Climate Change
MT	Metric Tonne
NCR	National Capital Region
NCT	National Capital Territory
NDMC	New Delhi Municipal Council
NGO	Non-Governmental Organization
NGT	National Green Tribunal
NSDP	Net State Domestic Product
PCC	Pollution Control Committee
PP	Polypropylene
SPCB	State Pollution Control Board
TPA	Tonnes per Annum
TPD	Tonnes per Day

FOREWORD

There has been ongoing debate on the use of plastic/polythene bags across the world and many cities have banned or considered banning the use of this product. Polythene bags have today become the most visible indicator of environmental degradation as citizens associate polythene to environmental pollution on account of its prominence in the municipal waste stream. Polythene as a material is highly versatile, economical and convenient hence more acceptable to consumers resulting in increased consumption patterns over many years. While the consumption patterns have continued to grow the bags are also seen as one of the major sources of littering in cities and even rural areas. Most civic agencies in India have struggled hard to set up systems for collection and disposal of these bags but have found it extremely difficult to come up with any substantive solution towards managing this waste hence the conversation and debate on the use of polythene bags.

Various groups in the country have sought ban on manufacture and use of this product, and many municipalities and state governments have announced such bans perhaps the only means to deal with this visible environmental concern. The decision on material or product ban for environmental reasons may at times be easy to arrive at but requires effective implementation to achieve desired results especially in countries that have weak environmental governance mechanisms. The issue of restricting or banning use of such products in limited geographical areas is fraught with serious threats of failure but a national ban on products is more likely to succeed.

Such notifications across various states are expected to produce mixed results and the need to analyse the reasons for such results. The current study on prohibiting the use of polythene bags in various states throws up interesting results. The findings of such study can be extremely helpful in the future decision making process on material bans also on aspects of governance and role of implementing agencies and understand the bottlenecks of implementation process.

The study has considered three states with varying topography and cultural diversity with the objective of including diversity in sampling and conditions of operations thus ensuring objectivity of findings and its credibility. The results also suggest that the experiences in all three states/ UTs to be mixed. Both Chandigarh and Delhi clearly suggest that the notification on product ban has not achieved the desired result but the results in Sikkim are more positive.

The findings from this study has potential to impact future decisions on product bans on account of environmental pollution, also it might provide some important and critical inputs into the current campaign on Clean India.

Satish Sinha

Associate Director

Toxics Link



Chapter 1

INTRODUCTION

Background

In 1754, when Horace Walpole suggested the word ‘serendipity’, no one knew that it would come to be associated with some of the greatest scientists and discoveries in history. In 1898, Hans von Pechmann discovered, by accident or serendipity, a waxy substance at the bottom of the test tube, giving birth to one of the most controversial as well as most widely used substances of modern times—polythene. However, its main ingredient, diazomethane, was highly unstable, and it was Eric Fawcett and Reginald Gibson at Imperial Chemical Industries (ICI) who, again by serendipity, discovered its industrially practical version in 1933. This version too could not be mass-produced, and it was only in 1935, that Michael Perrin, again an ICI chemist, developed this accident into reproducible polythene, leading to its viable mass production in 1939.

The word ‘plastic’ comes from the Greek word ‘plasticos’, which means to be able to be shaped or moulded by heat. ‘Polymers’ is the generic term for all plastic materials, referring to organic, carbon-based compounds whose molecules are linked together in long-chain patterns.

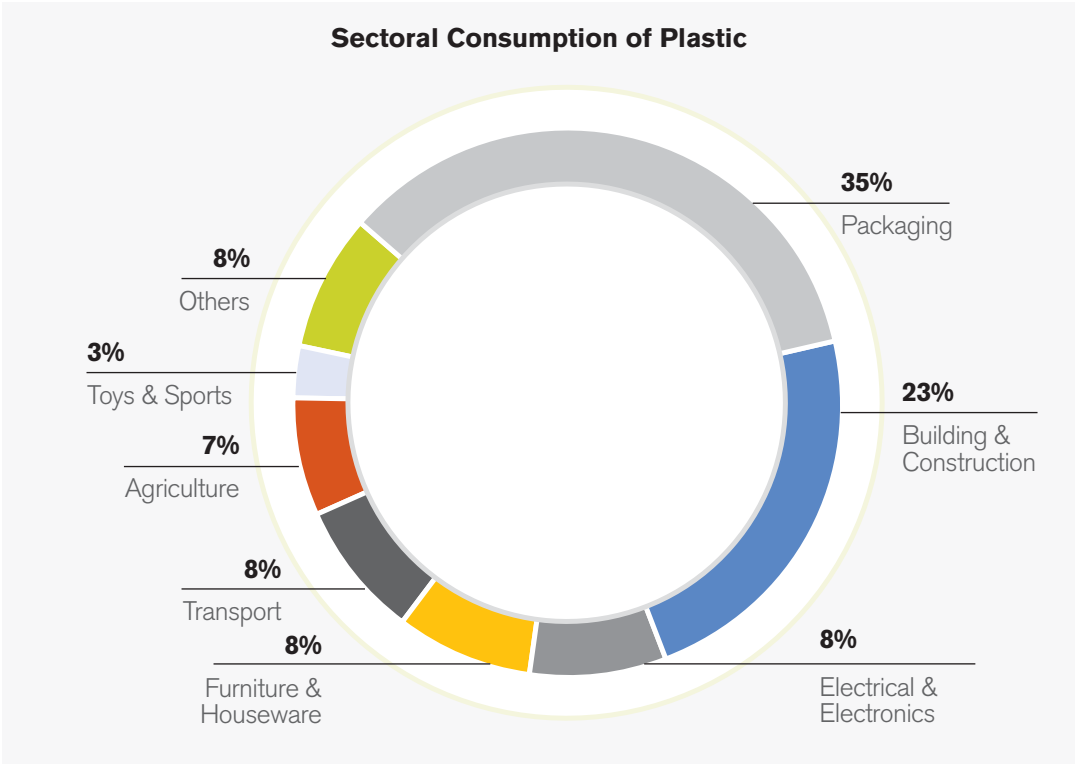
Polythene Bags

Plastic carry bags are generally made out of polyethylene (polythene). These are used for the purpose of carrying or dispensing commodities. The attributes that have made the use of plastics popular in packaging materials, in general, and in carry bags, in particular, are as follows:

- Inertness and chemical resistance
- Excellent barrier properties and water-proof characteristics
- Safe in handling due to non-breakability and light in weight
- Transparency, allowing easy visibility of content being carried/stored/packed
- Can also be opaque to protect the content from exposure to sunlight, when required
- Resistance to bacterial and other microbial growth

The Current Scenario

Plastic products have become an integral part of our daily life, encouraging its production to cross 150 million tonnes per year globally.¹ With its inception in 1957, the Indian plastics industry has also shown a significant growth and currently employs about 4 million people. It operates more than 30,000 processing units, of which 85 to 90 per cent are small and medium enterprises (SMEs). The utilisation of plastics ranges from toys to aircrafts, from dolls to hosepipes, from soft drink bottles to refrigerators, from gramophone records to television sets. Packaging represents the single-largest sector of plastics use and accounts for 35 per cent of plastic consumption.



According to an ASSOCHAM (Associated Chambers of Commerce and Industry of India) study, the demand for plastics is likely to double to about 20 million metric tonnes (MMT) by 2015 from the current level of about 10 MMT. The study further reveals that total consumption of plastics in India is about 4 million tonnes and the waste produced is about 2 million tonnes.

Plastics and the Environment

The very properties that have made plastic such a necessity for modern living pose problems once its useful life is over. Plastic is used in paints, cable coverings and window frames to prevent rotting, but this also makes degradation that much more difficult. Plastic food packaging increases the shelf life of foods, and provides a cheap, hygienic and versatile range of wrappings. Although it has obvious advantages for the food industry, the huge increase in plastic packaging has greatly increased plastic waste and, consequently, litter.

¹ Central Pollution Control Board (CPCB), India.

While no authentic figures on total generation of plastic waste in India are available, it is estimated to be approximately 5.6 million tonnes per annum (TPA), which is about 15,342 tonnes per day (TPD).² Thermoplastics or recyclable plastics contribute to about 80 per cent of the total post-consumer plastic waste generated in India, while thermoset plastics or non-recyclable plastics account for the remaining 20 per cent.

Plastic, especially that used in plastic bags, is one of the major toxic pollutants of our times. Being composed of toxic chemicals (lead and cadmium pigments, commonly used in light-density polyethylene (LDPE), high-density polyethylene (HDPE) and polypropylene (PP) as additives) and most importantly, being a non-biodegradable substance, plastic pollutes the air, water and soil. There are three possible environmental problems caused by plastic bags. First, plastic bags are mostly made from oil, natural gas or coal, and these are all limited natural resources that must be conserved. Second, the manufacture of plastic produces large quantities of harmful pollutants, which manufacturing companies need to deal with properly. The major chemicals that go into the making of plastic bags are highly toxic and some of the constituents of plastic such as benzene and vinyl chloride have been proven to cause cancer, while others like gases and liquid hydrocarbons spoil the earth and air. The noxious substances emitted during the production of plastic are synthetic chemicals like ethylene oxide, benzene and xylenes.³ Besides seriously impairing an already fragile ecosystem, these chemicals can cause an array of maladies ranging from birth defects, cancer, and nerve and immune disorders, to blood and kidney ailments.⁴

Third, old and unwanted plastic bags are not always easy to dispose of. Plastic bags defy any kind of attempt at disposal, be it through recycling, burning or land filling. Plastic bags when dumped into rivers, streams and sea contaminate the water, soil, marine life as well as the air we breathe. When plastic bags are burned, they release a host of poisonous chemicals including dioxin into the air. Moreover, recycling of plastic is uneconomical, polluting and labour intensive.⁵ It is associated with skin and respiratory problems resulting from exposure to and inhalation of toxic fumes, especially hydrocarbons and residues released during the process.⁶ Also, recycling plastic bags merely puts them back into circulation in the market place and eventually the environment, thereby making no reduction.

Plastic bags are known to clog drains and thus hit urban sewage systems. Choked drains provide excellent breeding grounds for mosquitoes, besides causing floods during the monsoon. Due to indis-



2 CPCB, India.

3 http://www.plasticsresource.com/plastics_101/manufacture/how_plastics_are_made.html

4 The source of this information is the letter written by Tim Krupnik of the Berkeley Ecology Center to Dr A. N. Bhat of Indian Centre for Plastic in the Environment (ICPE), supporting the attempt to ban disposable plastics in India, 15 March 2001. Courtesy Bharati Chaturvedi, Director, Chintan Environmental Organisation, New Delhi.

5 Zareena Begum, 'Plastics and Environment', Madras School of Economics.

6 The source of this information is a press release of No Plastics in the Environment (NoPE) titled 'Imports Versus Surplus: A Glut of Plastics in India Today', 10 January 2002. Courtesy Bharati Chaturvedi, Director, Chintan Environmental Organisation, New Delhi.

criminate dumping of plastic bags on land, toxic metals such as lead and cadmium pigments leach into underground water. Garbage mixed with plastic bags interferes in waste processing facilities and causes problems in landfill operations. Since plastic bags do not undergo bacterial decomposition, land filling using plastic bags would mean preserving the poison forever. Buried in landfill sites, plastic takes hundreds of years to degrade.

Alternatives

Plastic bags are so intrinsic to our everyday lives that it is hard to imagine life without them. However, more eco-friendly alternatives are now available and are being considered. In recent times, the central and state governments have taken measures to cut down the usage of plastic bags. Apart from government initiatives, many non-governmental organisations (NGOs) are spreading awareness on the impact of plastic bags on the environment. These initiatives have generated the demand for alternatives to plastic bags.

The following are some of the feasible alternatives:

- **Reusable bags:** This is an alternative to single-use paper or plastic bags, which can be reused many times for shopping. These come in canvas, woven plastic fibre, hemp, cotton and even leather.
- **Biodegradable plastics:** Bio-plastics or organic plastics are a form of plastic derived from renewable organic sources, such as vegetable oil, corn starch and pea starch. The basic characteristic of these plastics is that they are capable of being decomposed by bacteria or other living organisms.

Plastic Bag Ban in India

The central government has recently passed a ruling under the provisions of the Environment Protection Act 1986, restricting the sale of some products in plastic carry bags. The Ministry of Environment, Forests and Climate Change (MoEF&CC) has banned the manufacture and use of plastic carry bags less than 8 inches x 12 inches in size and 40 micron⁷ in width. The ministry has also directed state governments to register all plastic manufacturing units, so that these can be regulated.



Rules/Notices Regarding Plastic Bag Usage and Ban

Plastic (Management and Handling) Rules, 2011

Recycled Plastics Manufacture and Usage Rules were notified by Government of India in the 1999 and further amended in 2003 to have control over the manufacture, sale and use of virgin and recycled plastic carry bags and recycled plastic containers. These rules prohibited the manufacture, stocking, distribution and selling of carry bags made of virgin or recycled plastic less than 20 x 30 cm in size and 20 microns in thickness. These rules also disallow the use of recycled plastic bags and containers for storing, carrying, dispensing or packaging of food items. Under these rules, units manufacturing plastic bags were required to register with their respective State Pollution Control Boards (SPCBs) or Pollution Control Committees (PCCs) prior to the commencement of production.

⁷ Micron is the parameter, which measures the thickness of the plastic bags. The higher the microns size, the greater the thickness of the plastic bag and the better its reusability.

Recently, the government notified the Plastic Waste (Management and Handling) Rules, 2011, to replace the earlier Recycled Plastics Manufacture and Usage Rules, 2003, towards better management of plastic waste. According to the new rules, the minimum thickness of plastic bags has been raised to 40 microns and recycled carry bags made from compostable plastics need to conform to specific Bureau of Indian Standards (BIS) norms. The new rules require the municipal authority to constructively engage with waste pickers, and agencies or groups working in waste management. The district magistrate has been made responsible for the enforcement of the rules, and a committee is responsible for control at manufacturing level.⁸

Maharashtra, Delhi, Punjab, Rajasthan, Himachal Pradesh, Goa and West Bengal, among others, have banned the use of plastic bags. Some states have introduced incremental regulation towards controlling plastic bags. For instance, in 2003, Himachal Pradesh banned bags made of non-biodegradable material of thickness less than 70 microns and size less than 18 x 12 inches under the Himachal Pradesh Non-Biodegradable Garbage (Control) Act, 1995. Violations carry fines of up to Rs 1,00,000 or seven years in jail. Similarly, Maharashtra, Punjab, Kerala, Meghalaya and Goa have also prescribed norms for the thickness of plastic bags, varying between 30 and 50 microns. The Government of West Bengal has banned the manufacture, use, storage and sale of plastic bags of thickness below 40 microns and of size 16 x 12 inches. Gujarat, Odisha and Goa have banned the use of plastic bags in certain religious and tourist areas (such as Ambaji, Dakor and Somnath in Gujarat and the municipal area of Puri and Konark in Odisha).The union territory Chandigarh implemented a complete ban on the manufacture, use, storage and sale of plastic bags in the entire region since 2008. Most recently, Rajasthan, in 2010, and Haryana, in 2011, imposed a complete ban on plastic bags. In January 2009, the Delhi government also ordered a complete ban on the use of all plastic bags in market areas.

State	Plastic Bag Ban
Arunachal Pradesh	The use of carry bags have been banned in six districts
Gujarat	Banned in two districts, Kutch and Junagarh
Haryana	Yes
Himachal Pradesh	Yes
Jharkhand	Yes
Kerala	Ban on sale and use of carry bags in Sannidhan, Nitakkal and Erumeli
Madhya Pradesh	The use of plastic carry bags is banned in Gwalior
Meghalaya	Yes
Nagaland	Yes
Odisha	In pilgrimage centres, use of carry bags has been banned
Rajasthan	Yes
Sikkim	Yes
Tripura	Yes
Uttar Pradesh	The government has issued a notification on the complete ban on use of plastic carry bags within 2 km from the mid-stream of Ganga river
West Bengal	Blanket in ecologically sensitive areas and in heritage/tourist sites
Delhi	Yes
Chandigarh	Yes

Despite these efforts to control the usage of plastic bags and the consequent degradation of the environment, states and union territories have not been able to effectively implement the ban on plastic bags. In most parts of India, the bans have been ineffective due to various reasons, ranging from slack enforcement by the administration to lack of cost-effective alternatives. There is, therefore, a need to assess and compare the effectiveness of the ban on plastic carry bags in different parts of the country.

8 State of Environment Report, Chandigarh 2012.



Chapter 2

APPROACH AND METHODOLOGY

Objectives

The plastic bags ban has been, partially or fully, mandated in many of the Indian states. But, in the last few years, many questions have been raised regarding the effectiveness of the ban. The implementation of the ban has varied across states, indicating that there may be many factors influencing this. Thus, it becomes important to assess the effectiveness of the ban and also examine the reasons behind its success or failure.

This study sets out to check the compliance level of the plastic bags ban in Delhi, Chandigarh and Sikkim through a detailed primary and secondary survey. The study also tries to evaluate reasons for the success and failure of the ban in these three regions, and recommends measures to improve compliance. The study has the following objectives:

- To examine the various types of materials and methods used by shopkeepers, establishments and temporary vendors for the delivery of their goods and services
- To evaluate the level of awareness among vendors and consumers about the plastic bags ban and the issues associated with plastic use
- To examine the types of carry bags and materials used by consumers to carry their purchased items and the extent of adoption of this habit
- To explore the source of supply of plastic bags and alternatives within and outside the region under consideration
- To examine the attitude of the consumers when it comes to the use of alternatives to plastic bags, and the bottlenecks for shifting to these alternatives
- To examine the role of government agencies in implementing the plastic bags ban

Methodology

The study was carried out using qualitative research. The survey conducted was descriptive in nature through the collection of detailed information from the target respondents.

The following systematic approach was used to address the identified objectives:

Secondary Research

Secondary research comprised collecting documents relating to the plastic industry from the varied sources in the public domain. The following aspects were covered in the secondary research:

- City demographics
- Regulatory framework in the chosen areas for the plastic industry and in particular plastic bags
- Current scenario of the plastic industry

Primary Research

On the basis of the secondary research, survey guidelines were designed to tap the perception of different stakeholders in the specified region. The prepared survey tool was tested in the field in the first instance (pilot test). The outcome of the pilot survey was then examined thoroughly and necessary changes were made in consultation with the field interviewers for preparing the final sets of guidelines. These guidelines were a blend of quantitative and qualitative questions. An open-ended interview was conducted with major manufacturers, wholesalers and distributors of PP bags, paper bags and plastic carry bags.

Sample

Sample sizes varied depending on the availability of resources in particular regions. The attempt was to include respondents from diverse groups to understand different perspectives and viewpoints. The two important stakeholders included in the survey were vendors and consumers.

Delhi

A total of 834 respondents were included in the survey in Delhi. A random selection procedure was adopted for the selection of respondents in the sample areas. The distribution of samples is given in the table below:

Target Group	North	South	East	West	Central
Vegetable/fruit vendor	23	23	23	23	23
Grocery shops	10	10	10	10	10
Poultry/fish market	20				
Government booth (Verka/Milk Time/Vita)	10	10	10	10	10
Chemist shop	5	5	5	5	5
Small food joints (<i>dhaba, thela, sweet shop</i>)	20	20	20	20	20
Stationery	2	2	2	2	2

Target Group	North	South	East	West	Central
Clothing and shoe brands	12	12	12	12	12
International	4	4	4	4	4
Indian	4	4	4	4	4
Local	4	4	4	4	4
Shopping (multi-brand)	10				
Food joints (big ones)	20				
Consumers	374				
Total	834				

Chandigarh

A total of 500 stakeholders were interviewed for the survey in the sample areas of Chandigarh. A random selection procedure was adopted for the selection of respondents in the sample cities. The distribution of samples is given in the table below:

Target Group	North	South	East	West	Central
Vegetable/fruit vendor	15	15	15	15	15
Grocery shops	10	10	10	10	10
Poultry/fish market	10	10	10	10	10
Government booth (Verka/Milk Time/Vita)	5	5	5	5	5
Chemist shop	5	5	5	5	5
Small food joints (<i>dhaba, thela, sweet shop</i>)	10	10	10	10	10
Stationery	2	2	2	2	2
Clothing and shoe brands	10	10	10	10	10
International	3	3	3	3	3
Indian	4	4	4	4	4
Local	4	4	4	4	4
Shopping (multi-brand)	5				
Food joints (big ones)	5				
Consumers	155				
Total	500				

Sikkim

The sample size in Sikkim was 248, with 76 consumers and 172 vendors. A random selection procedure was adopted for the selection of respondents in the sample cities. The distribution of samples is given in the table below:

Target Group	
Vegetable/fruit vendor	32
Grocery shops	30
Poultry/fish market	12
Government booth	3
Chemist shop	5
Small food joints (<i>dhaba, thela, sweet shop</i>)	29
Stationery	10

Target Group	
Clothing and shoe brands	28
Shopping (multi-brand)	6
Food joints (big ones)	4
Others	13
Consumers	76
Total	248

Limitations of the Study

Due to resource and other constraints, there were limitations related to sample size. Also, plastic bags being a banned item, shopkeepers and customers were reluctant to speak about it.

Lack of response from the authorities also limited our understanding of government initiatives and actions to implement the ban.

Chapter 3

THE BAN IN DELHI

Delhi: An Overview

Delhi is the capital of India and its third largest city. The city consists of two parts: old Delhi, which was the capital of Mughal India between the 17th and 19th centuries, and New Delhi, the imperial city created as a capital of India by the British colonial government.



Demographics

Delhi is located in the north latitude of 28° 53' 17" to 28° 53' 00" and east longitude of 76° 50' 24" to 77° 20' 3". The extreme greatest length is nearly 52 km and greatest width is 48.48 km. There are 209 villages in Delhi and 11 districts. It is the second most populous metropolis in India, with a population of 22 million and coverage area of 1,487 sq. km.⁹ The main reasons for the rapid growth in the population are increased urbanisation and uncontrolled in-migration. Bordered by Haryana in the east and by Uttar Pradesh across the river Yamuna, Delhi is located approximately 213 to 305 m above the sea level.

**With a population of
2,20,00,000
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Economy

As per the *Economic Survey of Delhi 2012-13*, Delhi is the largest commercial centre in northern India, with an estimated net state domestic product (NSDP) of Rs 3,47,191 crore and a per capita income of Rs 2,10,000, the highest in India.

Plastic Pollution

Delhi, with its present population of 22 million, is one of the fastest-growing urban centres in the country. The city, being the capital and a commercial hub, has attracted people from all parts of the country. The growing population is directly adding to the stress on the local resources, resulting in mounting pressure on the environment. The changing consumption pattern is also driving significant impacts on the environment. The burgeoning retail sector (supermarkets, grocery stores and weekly *haats*) is probably one of the major reasons for the wide usage of plastic bags in Delhi. The increasing population and consumerism has added to the existing burden of industrial waste and pollution, with the state struggling with not only industrial waste, but also household hazardous and non-hazardous waste.

Plastic litter has led to clogged drains resulting in sanitation and sewage problems it clogs the soil, hampering tree growth; it often gets ingested by animals; its indiscriminate disposal by incineration pollutes the air and releases toxic substances.

A major component of the non-hazardous waste stream comprises plastic waste, including plastic carry bags, sachets, chips packets and magazine covers. Due to the poor waste management system in the state, the problem of plastic waste disposal has become grave. The environmental externality of solid waste associated with plastic bag consumption illustrates the classic tragedy of commons. Individual consumers benefit from the use of plastic bags because of their convenience, while the whole society bears the collective cost of their disposal. The public costs of plastic bag usage are well established. They are environmentally unfriendly, take hundreds of years to degrade and fill up landfills. Plastic litter has led to clogged drains resulting in sanitation and sewage problems; it clogs the soil, hampering tree growth; it often gets ingested by animals; its indiscriminate disposal by incineration pollutes the air and releases toxic substances.

These concerns have caused many states and union territories in India including Delhi to introduce legislation to limit the use of plastic bags. A variety of regulatory mechanisms have been established-

9 *Economic Survey of Delhi, 2012-2013.*

towards this purpose—the mandatory pricing of plastic bags, explicit levies on each bag, taxes at the manufacturing level, discounts on use of own bags, awareness campaigns, command and control approaches and, in some cases, a total ban on the use of plastic bags.

Regulatory Framework

In August 2008, the Delhi High Court directed the state government to raise the minimum thickness of plastic carry bags from 20 to 40 microns. The Delhi government not only passed legislation to this effect fairly quickly, but also ordered a complete ban on the use of all plastic bags within market areas in January 2009. However, after the initial enforcement drives, which netted about 300 violators, the ban was ignored and plastic bags reappeared. The ban was not effective as it only led to the disappearance of plastic bags from shopping malls and big retail outlets. Unlike 2009, the Delhi government, in October 2012, ordered a blanket ban (vide Notification No. F8 (86)/EA/Env/2008) on the manufacturing, import, sale, storage, usage and transport of all kinds of plastic bags. The ban now includes the manufacturing of plastic bags and the use of plastic sheets, films or covers for packaging books, magazines and cards. The notification which is under the Environment (Protection) Act, 1986 has provisions to impose penalties on the violators with a prison term of up to seven years and/or a fine of Rs 1 lakh.

The notification under the Environment (Protection) Act, 1986 has provisions to impose penalties on the violators with a prison term of up to seven years and/or a fine of Rs 1 lakh.

All India Plastic Industries Association challenged the Notification banning the plastic carry bags and the case is still on in the High Court, Delhi. Though there have been no written orders yet, the judge had made an oral observation that there will be no penalization till the case is pending.

Regulatory Agencies

The Constitution (Sixty-Ninth Amendment) Act, 1991, declared the union territory of Delhi to be formally known as the National Capital Territory (NCT) of Delhi. The NCT and its urban regions have been given the special status of National Capital Region (NCR).

(a) Municipality

The Delhi metropolitan area lies within the NCT, which has five local municipal corporations: North Delhi Municipal Corporation, South Delhi Municipal Corporation, East Delhi Municipal Corporation, New Delhi Municipal Council (NDMC) and Delhi Cantonment Board (DCB). The former Municipal Corporation of Delhi (MCD) was divided into three smaller municipal corporations—North Delhi, South Delhi and East Delhi.

The MCD is mainly responsible for providing civic services to 95 per cent of the total area in Delhi, which includes urban areas, rural and urban villages, resettlement colonies, regularised unauthorised colonies and slums. As per the Plastic Waste (Management & Handling) Rules, 2011, the municipal authority has been given the responsibility to regulate the use, collection, segregation, transportation and disposal of plastic bags. Moreover, plastic carry bags should not be available free of cost to consumers, and the responsibility of deciding the minimum price of the plastic carry bags has been vested upon the municipality.

(b) Delhi Pollution Control Committee

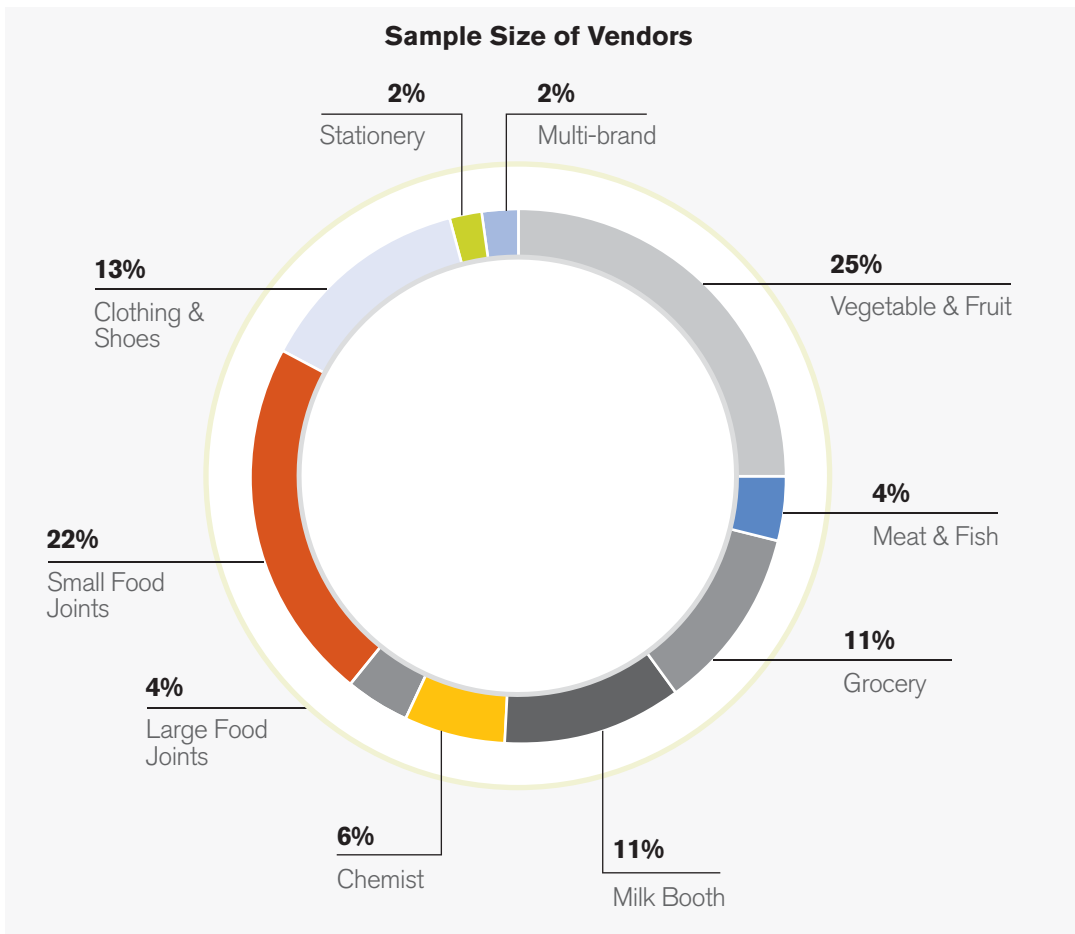
The Central Pollution Control Board delegated all its powers and functions under the Water (Prevention & Control of Pollution) Act, 1974, and the Air (Prevention & Control of Pollution) Act, 1981, to the Delhi Pollution Control Committee (DPCC) in March 1991.

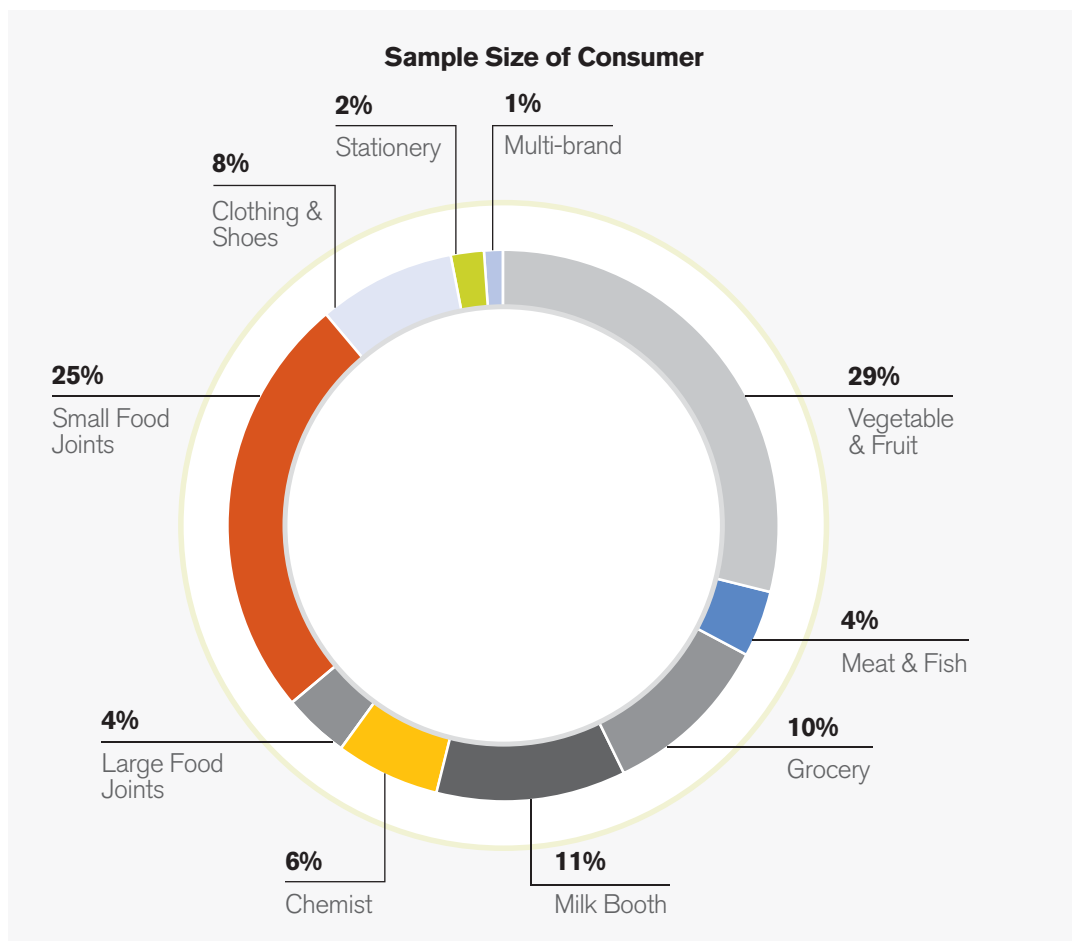
Under the Plastic Waste (Management & Handling) Rules, 2011, the DPCC has been given the responsibility to regulate the manufacturing and recycling of plastic carry bags in Delhi.

Effectiveness of the Ban in Delhi

In Delhi, the blanket ban on plastic carry bags was notified in October 2012. It has been two years since the notification came into force and, hence, it is important to understand whether the ban has been effective in controlling this menace. It is also important to comprehend the reasons for its success or failure as this will help in further improving the system and its possible replication in other states and union territories.

In order to check the effectiveness of the ban by the Delhi government on the manufacturing, sale, storage, import, usage, transport and disposal of polythene/plastic carry bags by any person including a shopkeeper, vendor, wholesaler or retailer, and trader, a survey was carried out in Delhi. The survey targeted the two most important stakeholders in this—vendors and consumers.





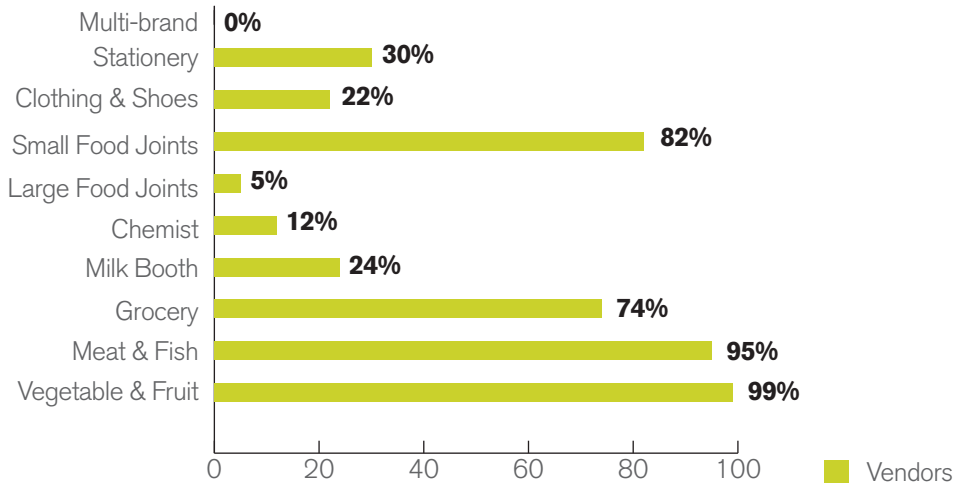
Sample

A total of 834 respondents were contacted during the field survey. In the survey, the sample size of the vendors and consumers was 460 and 374 respectively. Among the vendors, 11 categories were included: the largest proportion of respondents comprised the vegetable and fruit sellers, who made up 25 per cent of the total sample size; 22 per cent of the respondents comprised small food vendors, followed by clothing and shoes, grocery and milk booths with 13 per cent, 11 per cent and 11 per cent shares respectively. The focus was on vendors as they are major users of plastic carry bags and have the maximum reach into every corner of the city. Among consumers, 30 per cent of the respondents were surveyed at vegetable and fruit vendors, followed by 25 per cent at small food joints and 11 per cent at milk booths.

Usage

Despite a ban on plastic carry bags in Delhi, a majority of vendors and consumers are still using these environmental unfriendly bags. Approximately 62 per cent of the vendors and 78 per cent of the consumers interviewed during the survey were using plastic bags to sell and carry different products. Usage of plastic carry bags varied widely across segments, with a large per centage of vegetable and

Usage of Plastic Carry Bags



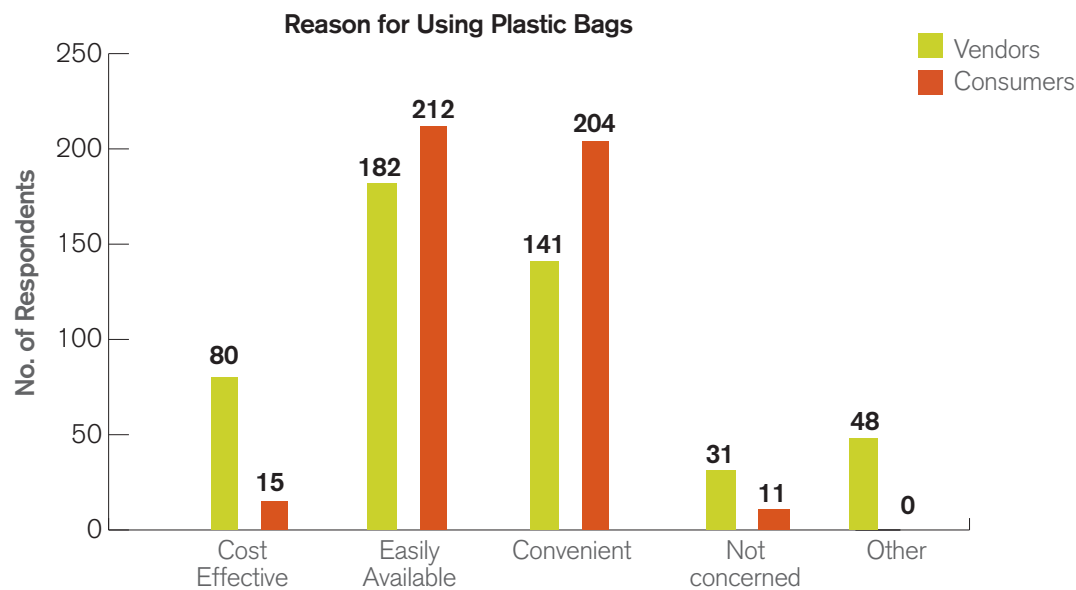
fruit, and meat and fish vendors using these bags and a very small per centage of large food joints and multi-brands using it. Almost 99 per cent of vegetable and fruit vendors, and 95 per cent of meat and fish vendors contacted during the survey were using plastic carry bags to hand over the consumables to consumers. The usage was also high among the small food joints like *rehriwalas* (roadside temporary food vendors) and *dhabas*, with almost 82 per cent found using plastic bags. Interestingly, very few milk booths, chemist and stationery shops were found using plastic carry bags. Among the clothing and shoe shops included in the study, the effectiveness of the ban was mixed. Though all the international and Indian clothing stores had stopped using plastic bags, the local brands were still using plastic bags. The multi-brand and large food vendors have, however, eliminated the use of plastic bags completely. Amongst the consumers, most of them were using plastic bags. The usage pattern is similar across all the sectors except milk booths, large food joints and multi-brand shops, where plastic carry bags are not provided.

Despite a ban in Delhi, approximately 62 per cent of the vendors and 78 per cent of the consumers interviewed during the survey were using plastic bags



Reasons for Wide Usage

The survey clearly indicated that plastic bags were being used widely by both vendors and consumers. Hence, it was important to find out the reasons that were driving the use of plastic bags among both these stakeholders. This would not only help us understand the barriers to the effective implementation of the ban, but also help find solutions to address the issue.



Amongst the vendors, 80 per cent preferred plastic bags due to their easy availability and 61 per cent because of convenience.¹⁰ This pattern was noticed across different segments of vendors. Easy availability and convenience were also the key factors behind consumers’ preference for plastic carry bags.

Production and Consumption

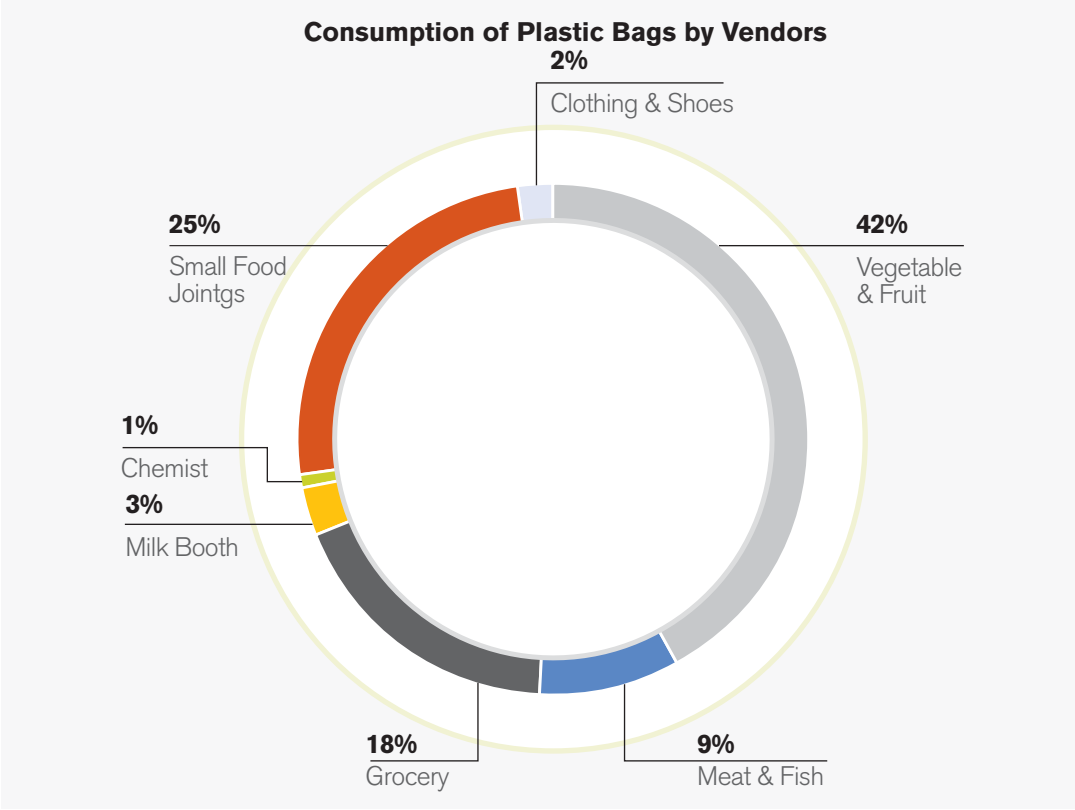
According to the notification on the plastic bag ban in Delhi, manufacturing is also banned within the city boundaries. Hence, it is important to find out if the bags, which are in use, are being manufactured locally or are being sourced from outside. During the study, it was found that there are a few units in Delhi that are, in spite of the ban, still involved in manufacturing of plastic carry bags. These units are mainly concentrated in areas of Mongolpuri, Narela and Bawana. Besides, the city also receives plastic bags from neighbouring cities.

Inspite of the ban, few units in Delhi, mainly in the areas of Mongolpuri, Narela and Bawana, are still involved in manufacturing of plastic carry bags.

The vendors mainly sourced plastic bags from the wholesale market around their area and at times from sales persons coming to their area. Vendors at the weekly *haats* or the smaller vegetable and fruit vendors, grocery and meat shops, and food joints usually bought them from sales persons coming to their localities, whereas the large vendors bought it mostly from wholesale shops. Wholesales shops are spread across Delhi and the prices varied from Rs 80 to Rs 120 per kg depending upon the quality of the plastic bags.

¹⁰ Most of the respondents stated more than one reason.

Out of the total 460 vendors interviewed during the survey, 284 were using plastic bags and they consumed almost 3 tonnes of plastic carry bags monthly. The highest consumption, among these respondents, was by vegetable and fruit vendors (42 per cent), followed by small food vendors (25 per cent) and grocery shops (18 per cent). Monthly consumption by vegetable and fruit vendors was 1,225 kg, by small food vendors 716 kg and by grocery shops 524 kg, adding up to almost 2.5 tonnes. The average consumption by these three vendor categories, along with meat shops, is quite high. Considering the fact that the actual number of these vendors in the city is very high, the consumption of plastic bags by them will be also very substantial in the city.



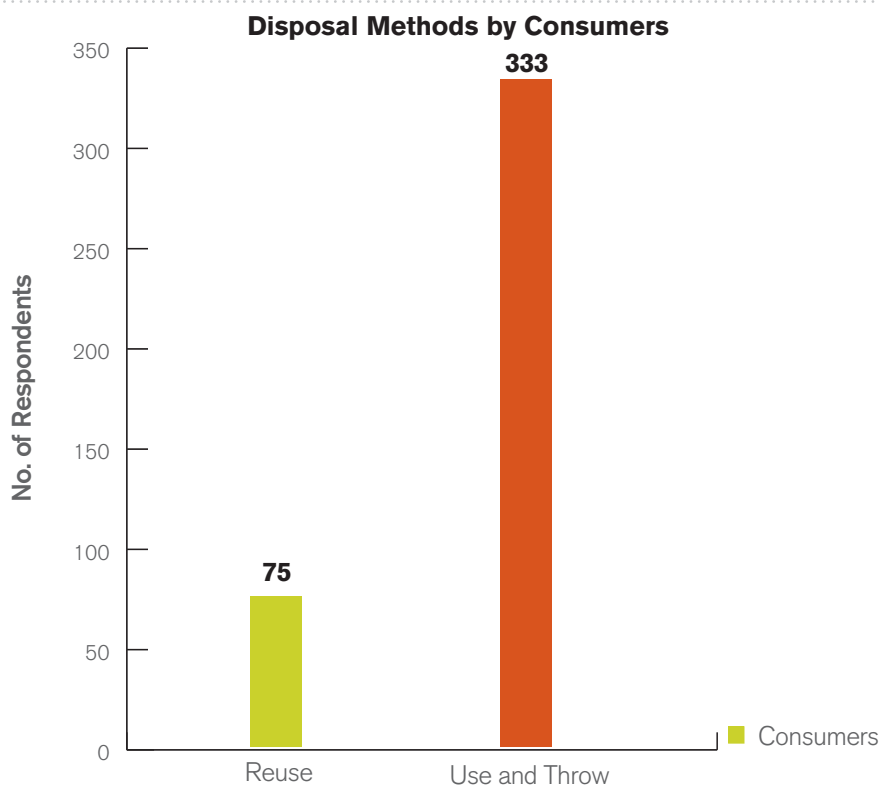
Looking at the average monthly consumption of plastic bags by individual units in Delhi city, among various types of outlets, grocery shops are the major consumers and consume approximately 14 kg of plastic bags per month. The average monthly consumption of vendors varies depending upon the size and quantity plastic bags used by each.

Vendors	No. of Vendors Interviewed	No. of Vendors Using Plastic	Plastic Usage (kg)	Average Monthly Consumption (kg)
Vegetable & Fruit	115	114	1225	10.75
Meat	20	19	262	13.79
Grocery	50	37	524	14.16
Milk Booth	50	12	80	6.63
Chemist	25	3	17	5.67
Large Food	20	1	0	0

Vendors	No. of Vendors Interviewed	No. of Vendors Using Plastic	Plastic Usage (kg)	Average Monthly Consumption (kg)
Small Food	100	82	716	8.73
Clothing & Shoes	60	13	68	5.23
Stationery	10	3	5	1.67
Multi-brand	10	0	0	0
Total	460	284	2896	

The survey revealed that most of the multi-brand, stationery and large food vendors have shifted to alternatives and have minimum consumption of plastic carry bags.

Disposal and Recycling



Disposal of plastic carry bags has been a major concern across the country since they are not biodegradable and stay in the environment for hundreds of years.

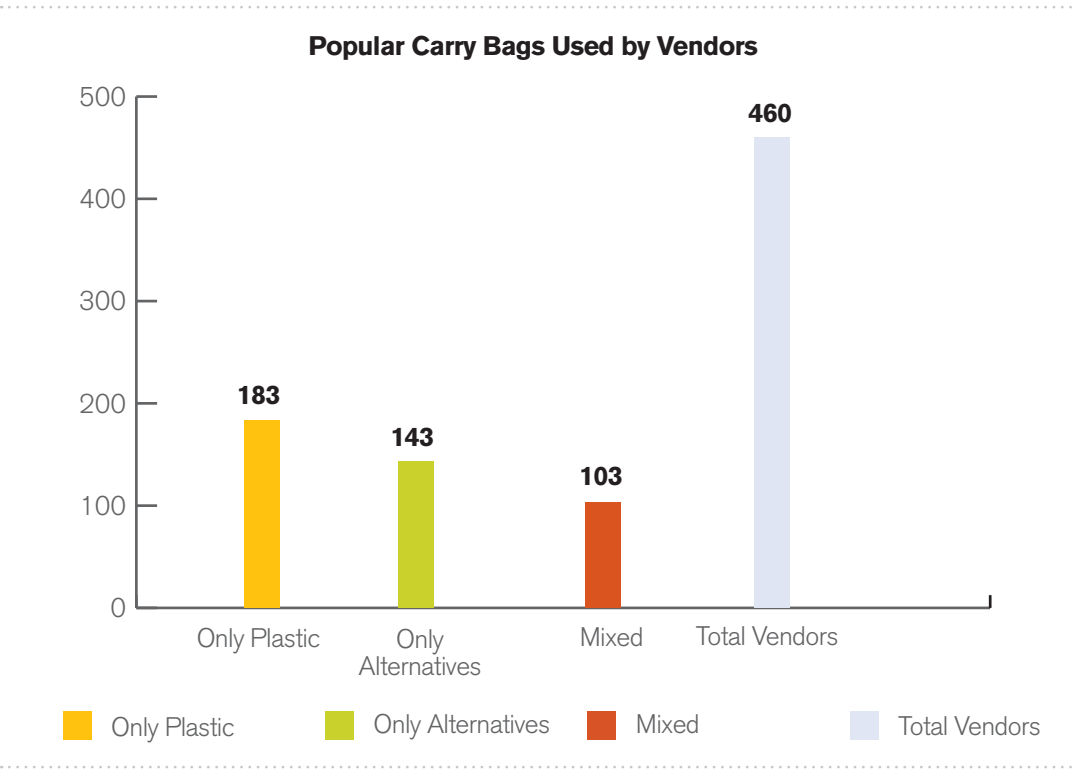
During this efficacy study, consumers were asked about their disposal practices for plastic bags; 89 per cent responded saying that they throw them in dustbins or community bins after use. Very few mentioned that they reused the plastic bags.

As per the current operational procedures of household waste management in the city, waste collectors collect garbage from each house and then this collected waste is taken to nearby community bins or *dhalaos*. Whatever plastics are there in the waste are picked up by ragpickers or waste collectors at this stage only.

In the survey, consumers also mentioned that they do not throw plastic bags on roads or other open areas. Though consumers denied littering of plastic bags on roads, drains or open spaces, the actual scenario in the city was very different. Plastic bags were found to be choking many drains and were littered on the roadside. Plastic bags were also found in landfills.

Though there is little information available on the recycling of plastic bags, our study discovered that a small quantity is recycled in Mundka region of Delhi, which is hub for plastic recycling. During the survey, only one unit was found that was involved in plastic bag recycling. A total of 20 tonnes of plastic bags is recycled in a day here, which is melted to form *gulla*, which is a composite mass of melted plastic. This '*gulla*' is then sold further to pipe manufacturers in Punjab and other states.

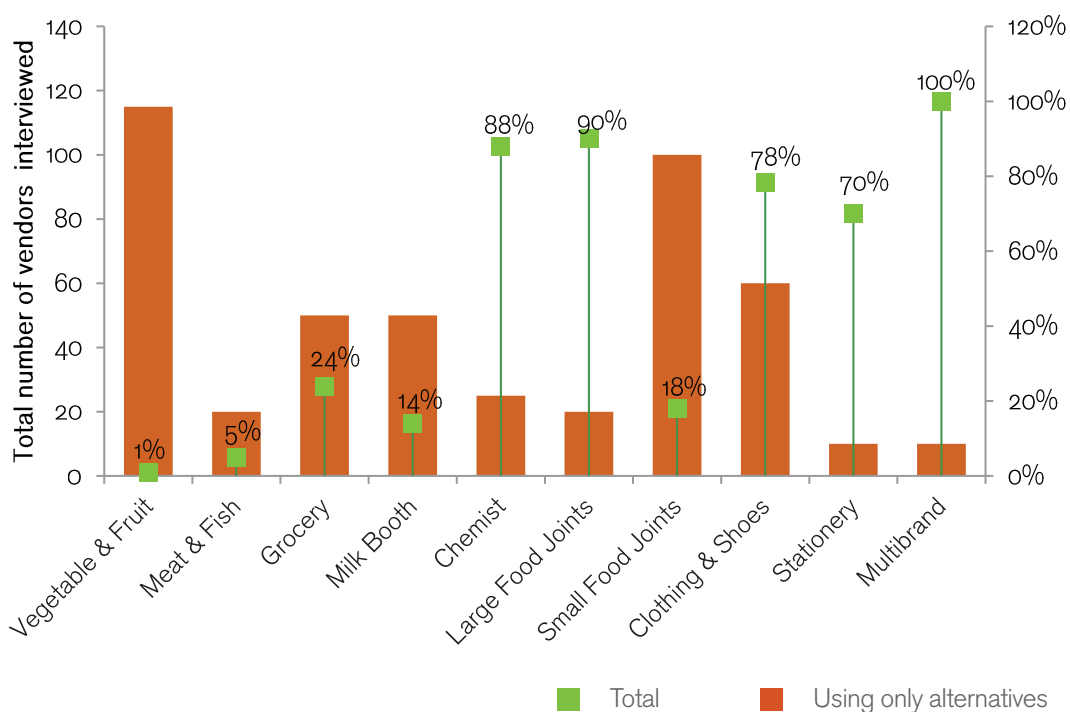
Alternatives to Plastic Bags



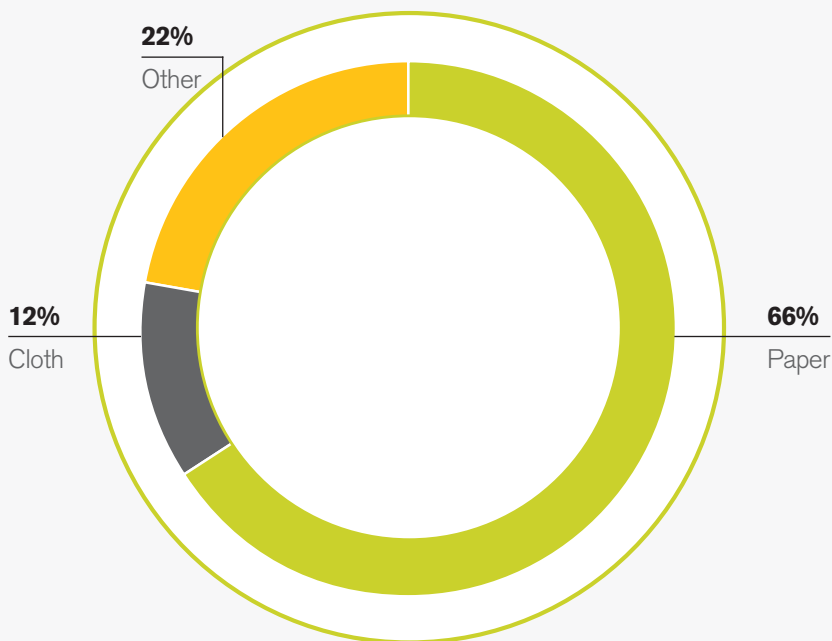
Currently, in Delhi, plastic carry bags are commonly used by both vendors and consumers for packing or carrying household goods. But there has been some move towards alternatives, especially after the notification banning plastic carry bags.

Among the surveyed, 60 per cent of the vendors have started using, either partially or completely, alternatives like paper (in form of bags, newspaper wrappings, etc.) and non-woven bags. Around 31 per cent of the vendors interviewed during the survey claimed to have shifted completely to non-plastic bags. The multi-brand shops were leading in this regard with a 100 per cent shift, followed by the large food joints (90 per cent) and chemists (88 per cent). Clothing and shoes, and stationery shops also are showing a big shift towards alternatives (78 per cent and 70 per cent respectively).

Vendor-wise Shift to Alternatives (Per cent)



Preferred Alternatives



However, alternatives to plastic bags are not yet popular among vegetable and fruit vendors, where there has been a negligible shift.

Among the alternatives, paper bags seemed to be the most preferred choice of vendors, with almost 66 per cent (of the ones who are using alternatives) choosing this. Paper was particularly popular among the chemist shops and large food vendors. A large per centage of the international and Indian clothing brands, grocery shops and small food joints were also using paper. Though the usage of paper bags is quite high among small food vendors and grocery shops, with almost 71 per cent and 56 per cent respondents respectively using paper, a large per centage of these vendors were using plastic bags as the main material (82 per cent of small food vendors and 74 per cent of grocery shops). Chemist shops are an exception, with almost 88 per cent of the vendors interviewed using bags made of paper; moreover, a large per centage of them have paper bags as the only option.

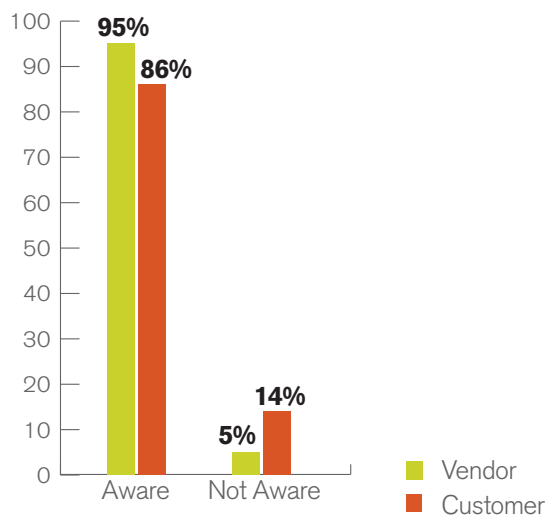
Cloth bags and other alternatives were not very popular among the vendors and were mainly used by clothing and shoes shops.

An important fact that emerged from the survey was that non-woven bags were a very popular alternative to plastic bags among vendors. It was especially popular among multi-brand (30 per cent), stationery (50 per cent) and chemist (40 per cent) shops. In 2008, when the first plastic bag notification was issued, non-woven bags were introduced into the market as a replacement for plastic bags. As a response to this, a writ petition was filed in 2009 stating that non-woven bags, being made up of plastic, should be put in the ambit of the ban on plastic bags. Under the court order, non-woven bags were tested and found to have 98.3 per cent polypropylene. Hence, the court finally decided to put it under the ambit of the ban. However, most vendors and customers remain unaware of this fact and believe that non-woven bags are non-plastic.

Though a majority of the consumers contacted during the survey were using plastic bags around 16 per cent said that they prefer alternatives made of cloth, jute or paper.

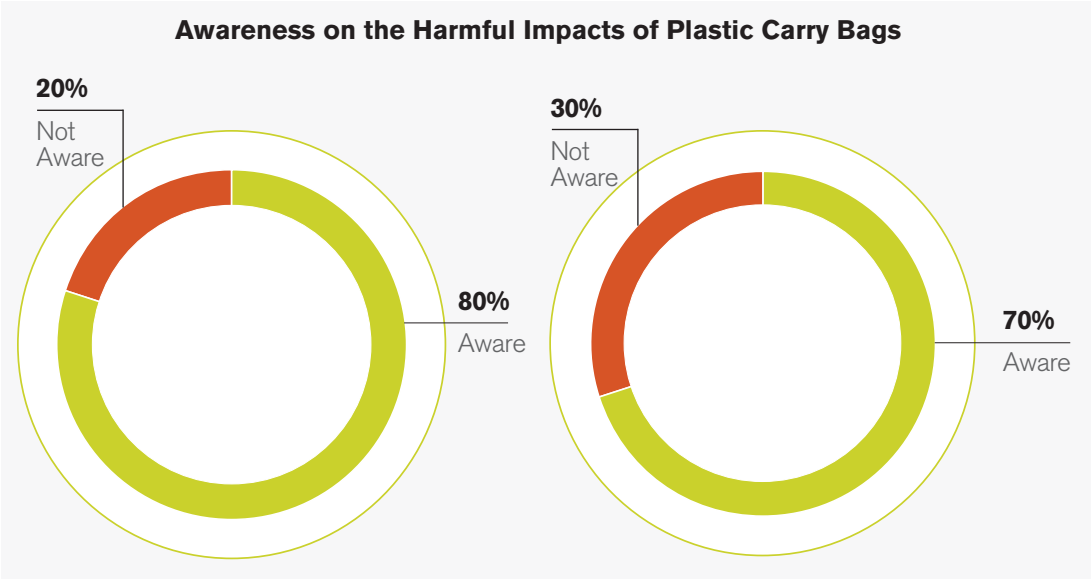
Awareness on the Plastic Bag Ban

Awareness on the Plastic Bag Ban in Delhi



The Government of Delhi has taken a few initiatives to spread awareness on the plastic bag ban among vendors and consumers. The awareness appeared more in the case of vendors, with 95 per cent being aware of the ban. Among the consumers, on the other hand, 86 per cent were aware of the notification. Most vendors saw the ban as a problem rather than a good initiative, primarily due to unavailability of proper alternatives. Among the general public or the consumers, most thought that the ban was a good initiative.

A majority of the respondents were aware of the harmful effects of polythene on health and the environment, but this awareness was again more in the case of vendors than consumers. As per the survey findings, 80 per cent of the vendors and 70 per cent of the consumers surveyed were found to be aware of the ill effects of plastic on human life. So, lack of awareness on the ban or on the problems related to plastic bags did not seem to be the key reason for the continued use of plastic bags in the city.



Action by Regulatory Authorities for Enforcement

The survey results provided sufficient evidence indicating the ineffectiveness of the plastic bag ban in Delhi. Even after one and a half years of the plastic bag ban notification(No. F8(86)/EA/Env/2008), barely any implementation could be seen on the ground. In 2009, when first plastic bag ban notification (No. F. 08(86)/EA/Env./2008/9473) was issued, initial enforcement netted about 300 violators, but after that the plastic bags reappeared.

The plastic bag ban notification makes the following officers responsible for implementing or enforcing the ban in Delhi:

Implementing Agency in Delhi	Designation
DPCC	Member Secretary
Department of Environment	Director
Government of NCT	Sub-Divisional Magistrate
Three Municipal Corporations	Sanitary, Health and Licensing Officers
Department of Food & Supply	Food and Supply Officer
Department of Labour	Labour Inspector
Department of Prevention of Food Adulteration	Food Inspector

As per the provisions of the notification under Section 19 of the Environment (Protection) Act, 1986, the officers authorised to register complaints on ban violations are the Chairman and Member Secretary of DPCC and Sub-Divisional Magistrates of the respective area/jurisdiction. As a part of the study, a letter was written to the DPCC enquiring about their course of action on implementing the plastic bag ban, activities planned or done for mass awareness, number of vendors penalised for violation, etc. **Unfortunately, no response was received from them.** So, no clear conclusion could be drawn regarding whether vendors were penalised for violating the ban.

Meanwhile, the Department of Environment, Government of NCT, has taken a few steps for creating public awareness on the ban. They have released various public notices and have also designed posters on the plastic bag ban. The Department of Environment also organises programmes with schools through eco-clubs for raising awareness on the issue.

Bottlenecks to Shifting to Alternatives

While more than a year of imposing a blanket ban on the use of plastic bags has passed, the survey indicates that the Delhi government has not been able to implement it effectively. Retailers, traders and consumers across the union territory have been flouting the ban. Some of the key reasons that emerged in our study were slack enforcement by authorities and lack of cost-effective alternatives to plastic bags.

Though there were some efforts in the beginning to enforce the ban with spot-checking and fines, these have petered out. The vendors interviewed also mentioned that they were a little apprehensive for the first few months about stocking plastic bags as there were surprise checks and seizures. Many of them started using alternatives during that time. But as the vigilance died down, they shifted back to plastic carry bags.

The other bottleneck is about the cost and availability of alternatives. The table below shows the price difference between plastic bags and alternatives. Even if we compare 100 pieces of 9 x 12 plastic bags with 6 x 12 paper bags, plastic bags would cost Rs 20 cheaper than the paper ones. Until this price gap is minimised, alternatives may not be a very viable option for vendors, especially the smaller ones.

Type of Bag	Size (in inches)	Quantity (in no.)	Price (in Rs)
Plastic bag	9 x 12	100	20
	16 x 12	100	25
	13 x 16	100	50
	20 x 26	50	50
Non-woven	9 x 12	100	120
	12 x 16	100	120
	14 x 18	100	120
White paper bag	2 x 3	30	8.5
	5 x 6	30	8.5
	6 x 6	30	9
	6 x 12	25	10

Other alternatives such as biodegradable and compostable bags are also costly in comparison to plastic bags. They require a large initial capital investment, both for the building of more composting sites and for structuring a method for their collection. Government subsidies for the costs of biodegradable and/or compostable bags would be necessary to increase their overall usage. Consumers also need to be educated on how to use and dispose these bags.

Conclusion

Despite a complete ban on the use of plastic bags in Delhi, vendors and customers are still using them due to easy availability and the convenience they offer to vendors and consumers. In addition to this, the cost effectiveness and demand of plastic bags has prevented major changes or decline in the usage of this harmful product.

Even after the ban, plastic bags are still being manufactured in Delhi, albeit on a smaller scale. Also, plastic bags are coming into the city from neighbouring cities, and the authorities have been ineffective in curbing the illegal supply of plastic bags. Moreover, most vendors and consumers tend to throw plastic bags after using them and are relatively ignorant or unconcerned with the reuse or recycling of plastic bags.



Chapter 4

THE BAN IN CHANDIGARH

Chandigarh: An Overview

One of the best experiments in urban planning in modern India, Chandigarh, referred to as ‘the city beautiful’, was established in 1966. It has the status of being the capital of two states, Punjab and Haryana. The districts surrounding the city are Mohali, Patiala and Roopnagar in Punjab, and Panchkula and Ambala in Haryana. The city also touches the boundary of the state of Himachal Pradesh at the northern border.

Demographics

Chandigarh city is spread over an area of 114 sq. km (+ 25.42 sq. km additional area declared as a wildlife sanctuary). As per Census 2011, 9,60,787 people reside in Chandigarh and the population density is 8,428 persons per sq. km. In terms of its literacy rate, a good indicator of the education level, Chandigarh stands at 86.77 per cent—much better than the overall literacy rate of India at 74.04 per cent.

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Being a limited and defined city in terms of area, Chandigarh has no margin to expand, but its population has expanded rapidly over the last three decades, and it faces problems common to other growing cities in India, including the proliferation of slums and squatter settlements. Planned for just half a million people, the city now is accommodating over a million people in the same defined area. The existing population growth rate coupled with in-migration is expected to double the population of Chandigarh in the coming decades, leaving the administration strained to keeping the city clean and green.

Economy

The economy of Chandigarh is witnessing a transformation from traditional manufacturing towards a knowledge-based economy

Regulatory Framework

Similar to other cities, a number of departments/institutions are involved in governing Chandigarh. These include the state government departments, local bodies and parastatals.

Municipal Corporation, Chandigarh

The Municipal Corporation, Chandigarh, was formed in 1994 with 20 wards under the Punjab Municipal Act, 1976, extended to Chandigarh with amendments. In the same year, certain works such as water supply, storm water management, drainage, internal roads, sanitation, fire services, enforcement and health were transferred to the jurisdiction of the Municipal Corporation, Chandigarh.

Chandigarh Pollution Control Committee

The Central Pollution Control Board delegated all of its powers and functions under the Water (Prevention & Control of Pollution) Act, 1974, and the Air (Prevention & Control of Pollution) Act, 1981, to the Chandigarh Pollution Control Committee in 1992. The Committee is responsible for managing, preventing and controlling water and air pollution, and for preserving of the quality of air in Chandigarh. Committee is performing functions under the following legislations:

- The Water (Prevention & Control of Pollution) Act, 1974
- Water (Prevention & Control of Pollution) Cess Act, 1977
- Air (Prevention & Control of Pollution) Act, 1981
- The Environment (Protection) Act, 1986: This is a comprehensive legislation aimed at the protection and improvement of the environment and matters connected therewith. Various rules related to waste management, including plastics, have been notified under this.

Current State of Environment

The galloping increase in population, industrialisation, modernisation and rapid increase in the number of vehicles have led to a rising trend in pollution levels in the union territory of Chandigarh. The population of the city has seen a significant rise in past five decades, though the population growth has been very low in the last decade. The major driving forces leading to environmental degradation can be listed as follows:

- Increasing population
- Unplanned development and expansion around the periphery zone
- Proliferation of slums
- Commercialisation and modernisation
- Industrial growth
- Increased spending power and changing lifestyles

Plastic Pollution

In many countries, including India, plastic bags have largely replaced reusable bags and containers in shopping. In India, the share of plastic waste in total solid waste has, thus, risen from 0.6 per cent in 1996 to 9.2 per cent in 2005¹¹ and it is estimated to follow the same increasing trend in the coming years as well. Over 50 per cent of this plastic waste comprises used plastic bags and packaging¹².

>50%
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and packaging.

Chandigarh is also following the same trend. With an increasing population, changing lifestyles and the rising income level of individuals, there has been a stiff rise in the demand for food and other essentials. This has resulted in a proportionate rise in the amount of plastic waste being generated daily by each household. This waste is ultimately thrown into municipal waste collection centres from where it is collected by the local municipalities for further disposal into landfills and dumps. However, not all of this waste gets collected and transported to the final dump sites, resulting in increased pollution, be it land, air or water.

Various concerns related to the use of plastic bags have caused many states in India and governments across the world to introduce legislation to limit the use of plastic bags.

Apart from various initiatives taken by different authorities and government departments to control pollution, the Department of Environment of Chandigarh has taken initiative step to curb plastic pollution in the region by putting a complete ban on the manufacture and usage of polythene bags.

Chandigarh Municipal Corporation (Ban on Manufacture and Usage of Polythene Bags & Containers) By-Laws, 2000

With a view to control the menace of polythene carry bags and plastic containers, the Municipal Corporation has framed by-laws known as Chandigarh Municipal Corporation (Ban on Manufacture and Usage of Polythene Bags & Containers) By-Laws, 2000¹³. These by-laws are implemented by the Inspectorate Staff of the Corporation. Besides, the Recycled Plastic Manufacture & Usage Rules, 1999, as amended are also being implemented in Chandigarh.

Notification No. ED/2003/543 dated 16.07.2003

The Chandigarh administration vide notification no. ED/2003/543 dated 16 September 2003 had prohibited the manufacture, sale and use of polythene/plastic carry bags of thickness less than 30 microns and of size less than 8x 12 inches.

Notification No. ED/2008/684 dated 30.07.2008

The Chandigarh administration has imposed a complete ban on the use of plastic carry bags in the union territory vide notification bearing no. ED/2008/684 dated 30 July 2008. This ban was issued by the Department of Environment under Section 5 of the Environment (Protection) Act, 1986, and came into effect from 2 October 2008. This notification bans the use, storage, import, sale, transporta-

11 *Solid Waste Management in India*, World Bank Report 2008.

12 The Energy Research Institute 2002.

13 *State of Environment Report*, Chandigarh 2008.

tion and disposal of polythene/plastic carry bags by any person including a shopkeeper, vendor, wholesaler or retailer, trader, hawker or *rehriwala* in the union territory of Chandigarh.

In order to enforce the orders of the administration, a committee comprising of inspectors driven from the Department of Food and Supplies, Department of Health and the Municipal Corporation have been constituted by the District Magistrate to check violations of the provisions of the aforesaid notification. The officials, empowered under the provisions of the Act, have been vested with the powers to inspect all the premises/places where polythene/plastic carry bags are being used in violation of the terms of the notification and launch prosecution against the defaulters.

The Act has provisions to impose penalties on the violators:

- Imprisonment for a term, which may extend to five years, or a fine which may extend to Rs 1,00,000 or both.
- If contravention continues, an additional fine to the extent of Rs 5,000 per day shall be imposed. If the failure continues beyond a period of one year after the date of conviction, the offender shall be punishable with imprisonment for a term which may extend to seven years.

Some items like packaged commodities including milk products and grocery items have been exempted from this Act.

Notification No. ED/2009/867 dated 06.10.2009

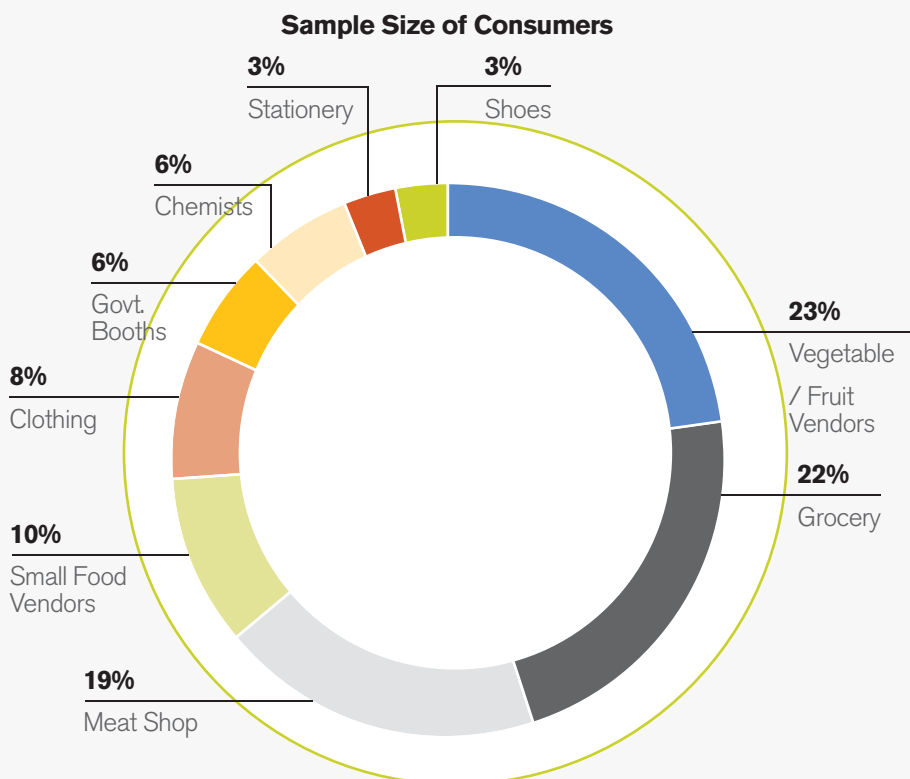
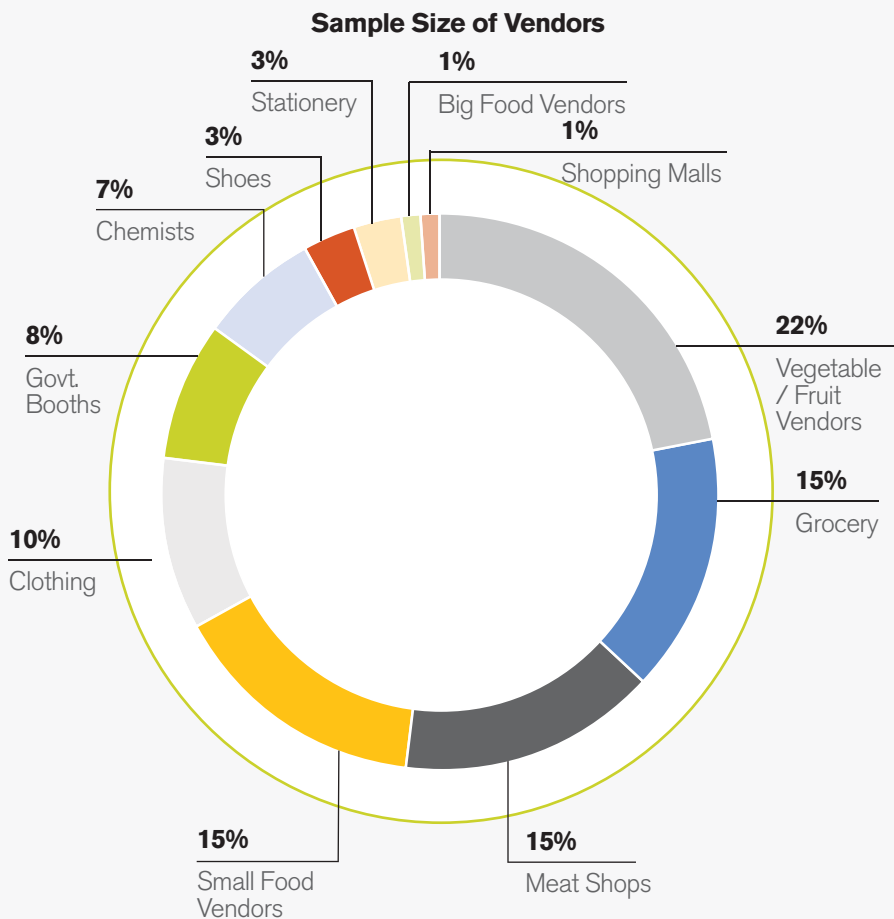
The Chandigarh administration has issued one more notification, bearing no. ED/2009/867 dated 6 October 2009, to substitute the words 'polythene/plastic carry bags' as mentioned in the earlier notification no. ED/2008/684 dated 30 July 2008 with the words 'polythene/plastic carry bags and flexible containers'.

Effectiveness of the Ban in Chandigarh

It has been more than half a decade of the plastic bag ban in Chandigarh and it is important to understand whether the ban has been effective in controlling this menace. It is also important to comprehend the reasons for its success or failure as this will help in further improving the system and its possible replication in other states and union territories.

To access the effectiveness of the ban imposed by the Chandigarh administration on the use, storage, import, sale, transportation and disposal of polythene/plastic carry bags by any person including a shopkeeper, vendor, wholesaler or retailer, trader, hawker or *rehriwala* in the union territory of Chandigarh, a survey was conducted. The survey was carried out among the two key stakeholders, the vendors and consumers in the study region.

In the survey, the largest vendor respondents were from the vegetable/fruit vendor segment, with a total share of 22 per cent, followed by the grocery and meat shop segments with equal shares of 15 per cent. Small food vendors also had a good presence with 15 per cent. Among the consumers, approximately 64 per cent of the respondents were surveyed at vegetable/fruit vendors, and grocery and meat shops locations, with the highest (23 per cent) at vegetable/fruit vendors, followed by grocery shops (22 per cent) and meat shops (19 per cent). The survey had an emphasis on these vendors (hav-

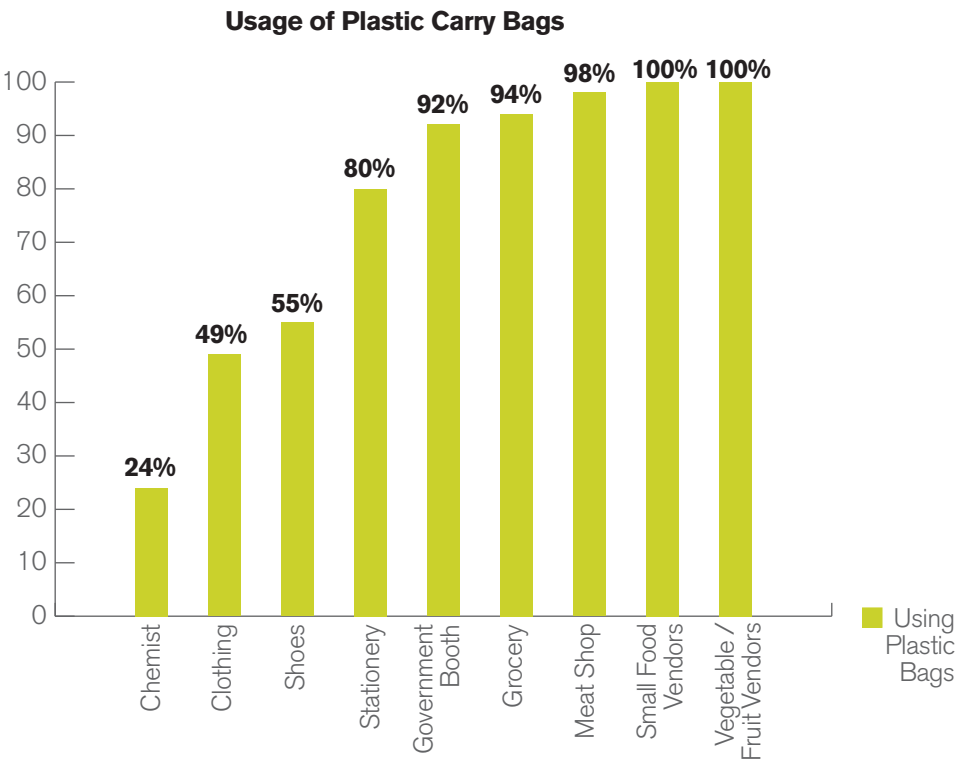


ing a combined share of approximately 66 per cent) as they comprise the major source of plastic bags in households and are primarily engaged in unorganised sales.

Usage Pattern

The survey reveals that despite having a complete ban on the use of plastic bags in the union territory of Chandigarh, vendors and customers are still using plastic bags. Even five years after the ban came into force, most shopkeepers, across different segments, are still handing over their products to consumers in plastic bags and the consumers continue to accept these. More than 80 per cent of the total respondents, including vendors and customers, were found to be using plastic bags, while 82 per cent of the vendor respondents and 79 per cent of the customer respondents were found using plastic bags to sell and buy different products.

More than 80 per cent of the total respondents, including vendors and customers, were found to be using plastic bags.

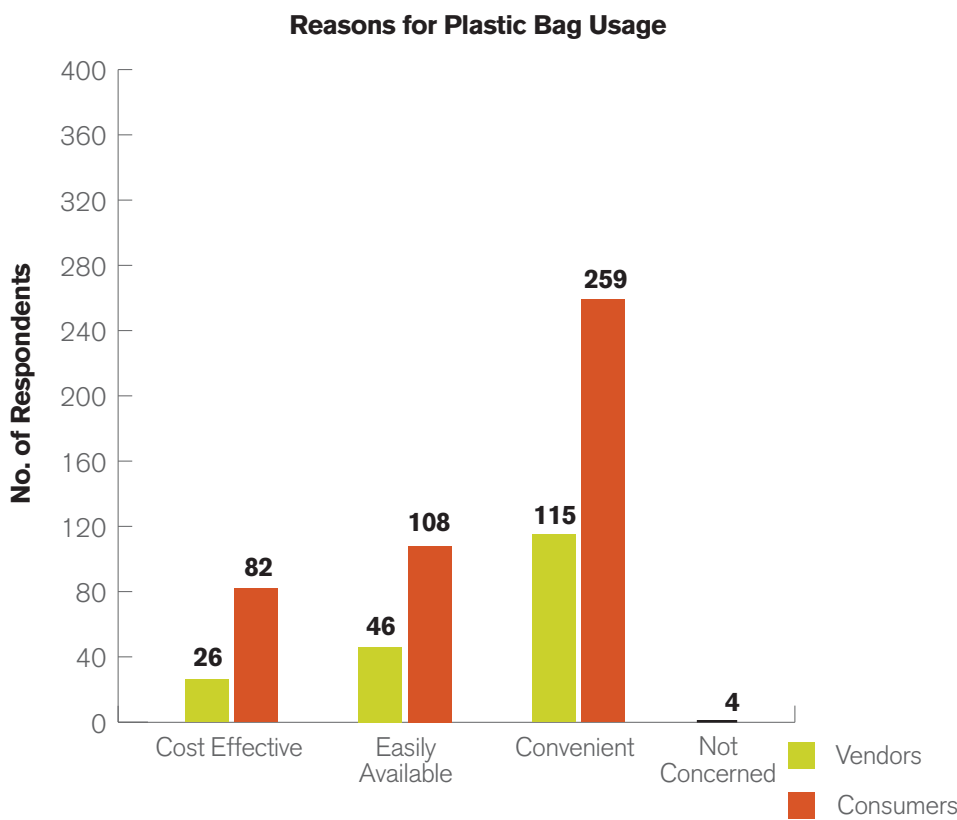


Among different segments of vendors, plastic bag usage varied. There is a widespread practice of using plastic bags among vegetable/fruit vendors and small food vendors, with 100 per cent of the respondents interviewed in these categories handing over the consumables to consumers in plastic carry bags. Meat was also generally sold in plastic bags, with 98 per cent of the respondent meat shops confirming that they are using plastic bags. Most of the grocery shops owners have also not replaced plastic bags, with 94 per cent of the grocery shops surveyed found to be using these non-biodegradable bags. Surprisingly, even a large per centage of the government milk booths were found to be giving plastic carry bags. Among the sectors interviewed, the plastic bag usage was minimum among the chemist shops as

only 24 per cent of them were using plastic bags to hand over the medicines, etc. Among the clothing shops, the effectiveness of the ban was mixed. Though all the international clothing stores had stopped using plastic bags, the Indian and the local brands are still using plastic bags. The large multi-brand and electronic shops have, however, eliminated plastic bags completely. Though most of the vendors were using only one type of bag, a small per centage was also using multiple bags.

The continuing use of the plastic bag in such a large proportion hints towards the failure of the plastic bag ban in the union territory. Though the ban has been in effect for long, these bags were being openly stored and used by shopkeepers across different sectors.

Reasons for Wide Usage



Since, despite a complete ban on plastic bags in Chandigarh, both vendors and the general public were found using plastic bags during the survey, an attempt was made to find the rationale behind this. This could help us to understand the barriers and address them, especially when we are looking at alternatives. When asked about reasons which prompt the use of plastic bags, the respondents came up with varied responses. A large per centage of consumers (almost 74 per cent) found the plastic bags very convenient and,

Use 74 per cent of consumers found the plastic bags very convenient and, hence, continued to use them.

hence, continued to use them. The other reasons include the easy availability of the bags, while a small per centage of the consumers interviewed also felt that the plastic bags are cost effective.

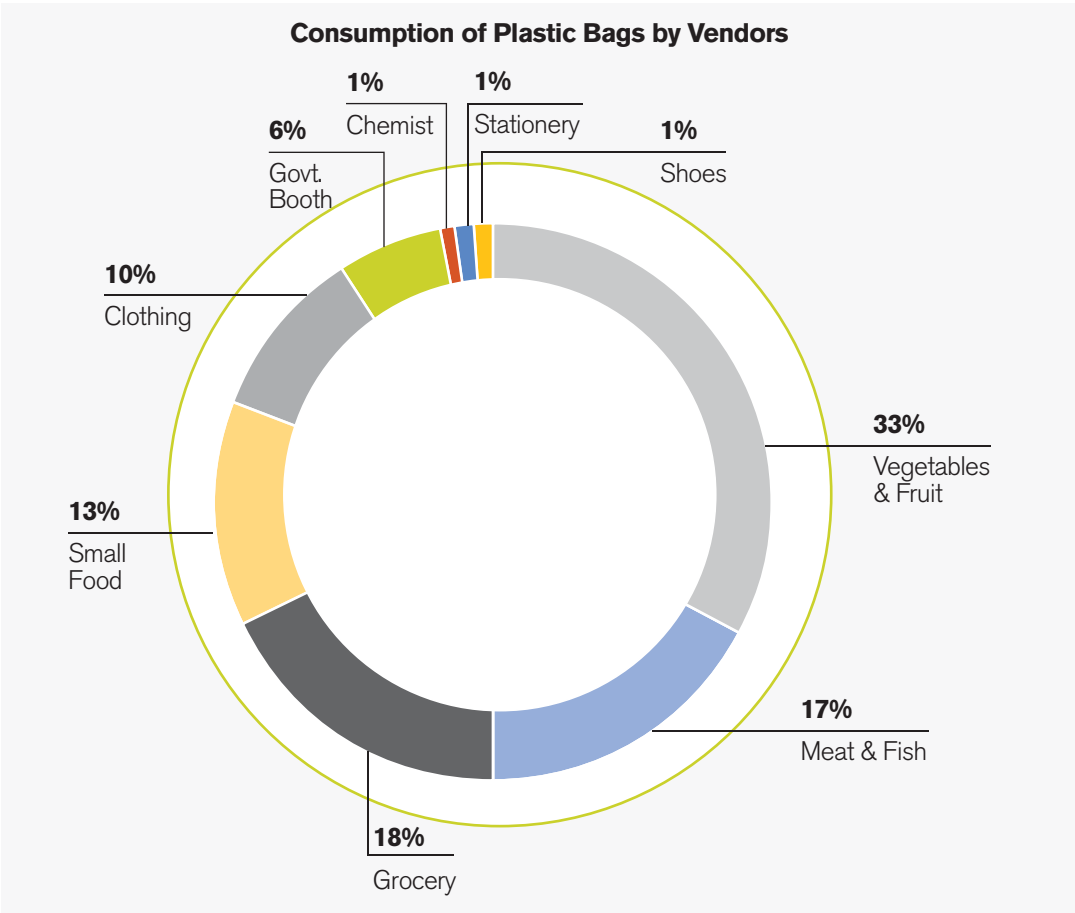
Among the vendors too, a large per centage (75 per cent) preferred the plastic bags due to convenience they provide. This was noticed across different segments of vendors. Easy availability was also an important factor for the vendors and 31 per cent of the interviewed vendors cited this as one of the reasons. Cost difference between the plastic bags and the alternatives was also a major driving force for vendors.

Production and Consumption of Plastic Bags

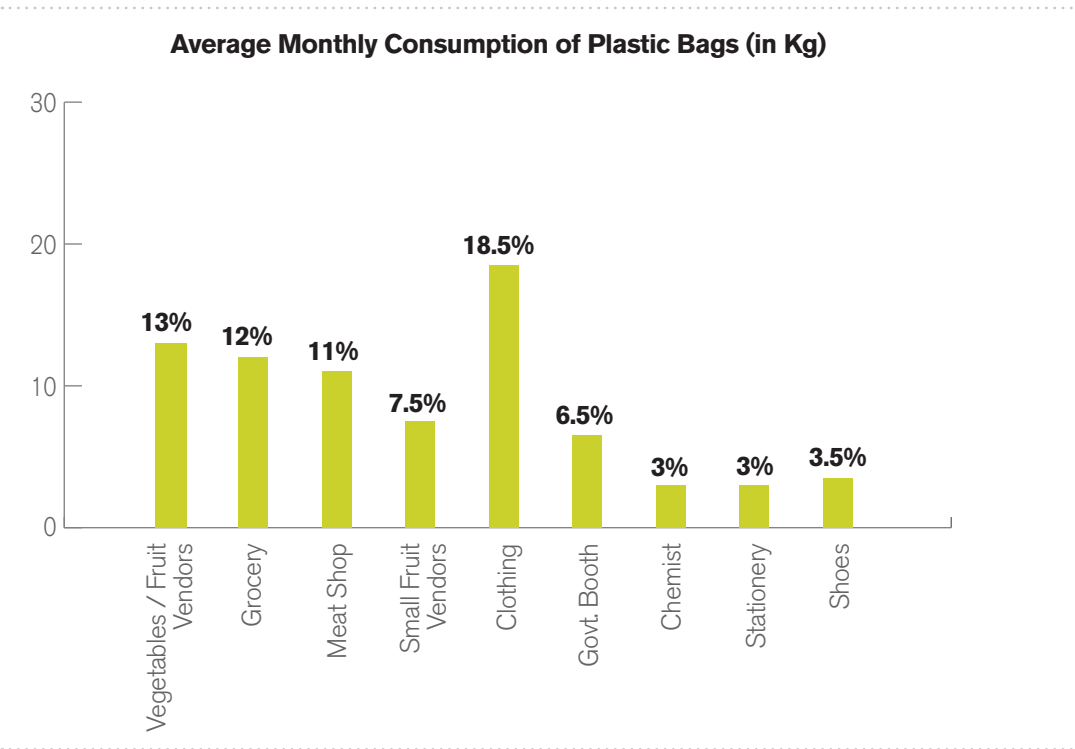
Due to the complete ban on the production of plastic bags in the union territory of Chandigarh, there are no manufacturing units for plastic bags in the region. The demand of plastic bags in Chandigarh city is illegally met from nearby cities like Mohali and Delhi. It appears that the Chandigarh administration has been ineffective in curbing this supply, and plastic bags are regularly brought in by traders.

The vendors mainly sourced the plastic bags from the wholesale market and from suppliers in their market. A small per centage of vendors also bought the plastic bags from visiting sales persons.

According to various suppliers and retailers, Chandigarh city has a per day consumption of 3.5 to 4 tonnes of plastic bags. The 345 surveyed vendors have a total monthly consumption of more than 3,100 kg of plastic bags. Since limited numbers of vendors were interviewed during the survey, it



appears that the 3.5 to 4 tonnes per day consumption for the city might be lesser than the actual consumption.



It is evident from the chart depicting the distribution of total monthly consumption of plastic bags in Chandigarh city among various surveyed establishments that vegetable and fruit vendors are the highest consumers of plastic bags (among the surveyed establishments, vegetable and fruit vendors were the highest at 75 per cent). They have a consumption share of approximately 33 per cent and more than 1 tonne (1,000 kg) in quantity, followed by grocery shops that consume approximately 18 per cent of the total consumption and 568 kg in quantity. Meat shops and small food joints are the other major consumers of plastic bags, with a consumption share of 17 and 13 per cent respectively. These four types of outlets together share more than 80 per cent of the total consumption, amounting to 2520 kg in quantity.

Looking at the average monthly consumption of plastic bags by individual units in Chandigarh city, among various types of outlets, clothing stores are the major consumers and have the highest monthly consumption of 18.5 kg, that is, on an average, each clothing shop tends to consume approximately 18.5 kg of plastic bags. This high average consumption can be attributed to the better quality and larger size of plastic bags given by them. The vegetables and fruit vendors, in comparison, give out plastic bags that are much smaller in size and thinner in width, but still have a monthly average consumption of 13 kg of plastic bags by each unit, which is because of the larger number of consumers they have on a per day basis. Chemist and stationery stores have the least average monthly consumption of plastic bags at 3 kg by each unit. This low consumption can be due to the fact that they have shifted to paper bags as the nature of their commodity supports the use of paper envelopes and bags.

Disposal of Polythene Bags

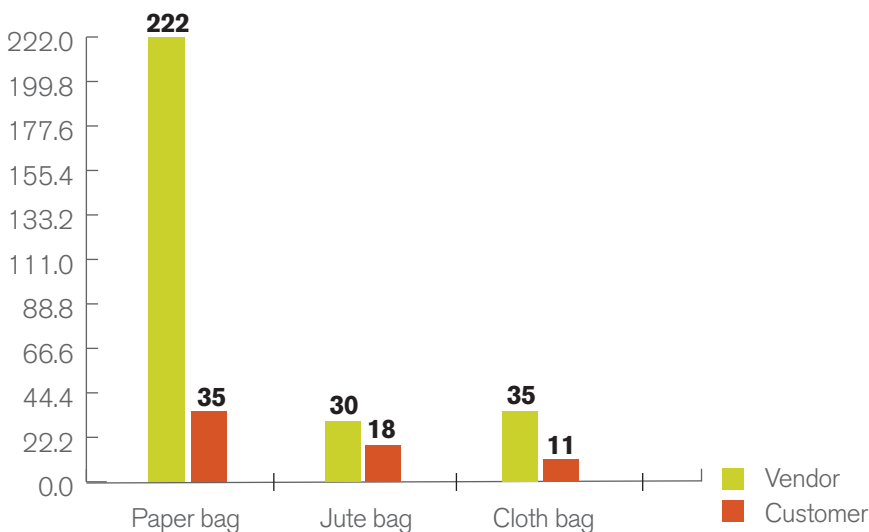
When the consumers who use plastic bags were asked about their disposal practices, all the customers unanimously said that they use the plastic bags and throw them after each use. None of them was reusing the plastic bags. The bags, after use, were disposed of in their household garbage bins or at *Sahaj Safai Kendras*/community bins. The consumers did not throw them on roads or other open areas. As per the current operational procedures of household waste management in the city, waste collectors collect garbage from each house and then this collected garbage waste is taken to nearby *Sahaj Safai Kendras*. The garbage, including plastic bags, from these ‘transfer stations’, that is, *Sahaj Safai Kendras* is transported to the waste processing plant, located near the landfill site, by municipal vehicles. This is to convert the waste into refuse derived fuel (RDF), after which the remaining parts are dumped at the landfill site. As per an estimation, everyday around 280-285 vehicles full of municipal waste are brought to this site for dumping. After dumping the residue at landfill site, the ground is treated with effective micro-organism (EM) solution. This is to prevent flies, mosquitoes and other insects from proliferating. Then heavy-chain dozer compactor vehicles are used to compress the waste. The waste is then covered with a 2 feet thick layer of soil or construction and demolition waste. The waste which is treated in these RDF plants includes the plastic bags dumped by the city’s residents.

All the customers unanimously said that they use the plastic bags and throw them after each use. None of them was reusing the plastic bags.

The respondents seemed to be concerned about the disposal of used plastic bags. The physical observation of Chandigarh city also revealed that littering of plastic bags was not found on city roads or open spaces, though it was common in some markets. In the case of residential areas also, there was no littering of plastic bags. As per the physical verification of the landfill site, no plastic bags were to be seen or found as all the disposed waste is compressed and covered with a layer of soil on each disposal.

Alternatives to Polythene Bags

Usage Pattern of Alternatives among Respondents

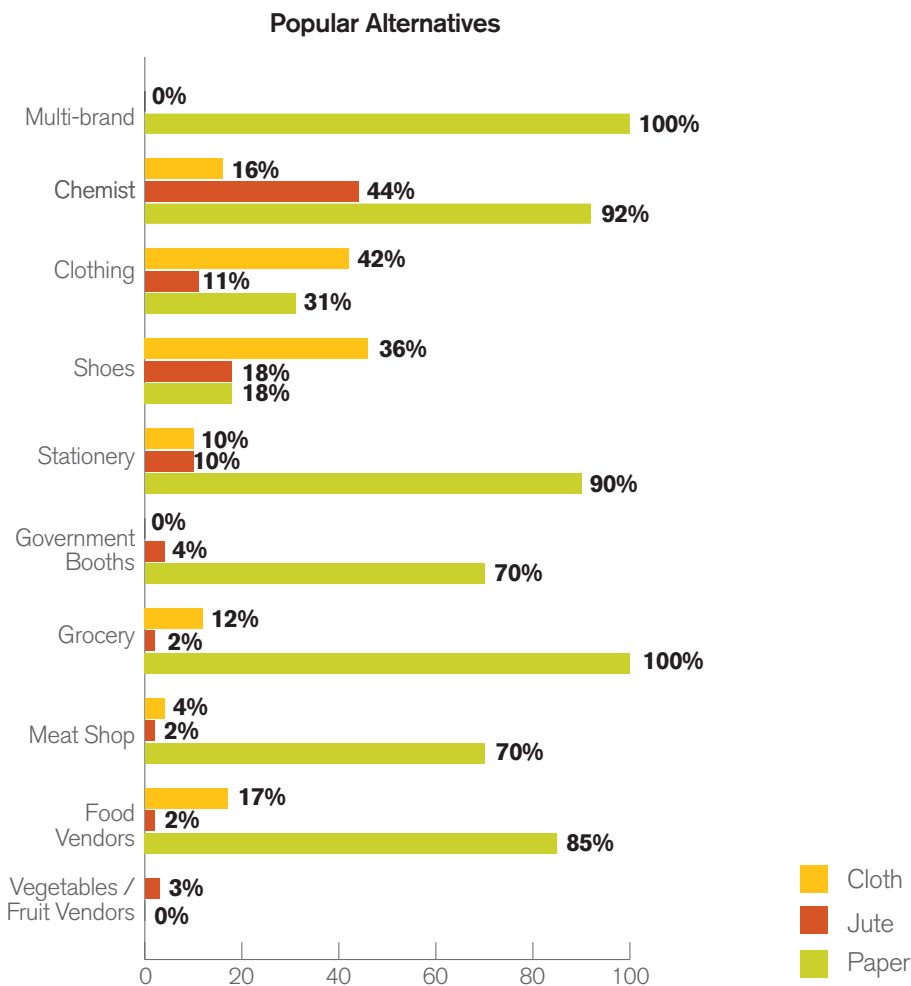


At present, it is a common practice to use plastic bags for carrying household goods. In such a situation, it has become challenge for the city administration to keep the city clean and plastic pollution free. The city administration along with some NGOs is spreading awareness on the consequences and ill effects of plastic bags. This, combined with the ban, has resulted in a rise in the use of alternatives to plastic bags.

The city administration along with some NGOs is spreading awareness, which has resulted in a rise in the use of alternatives to plastic bags.

Though a majority of the residents of Chandigarh are still using plastic bags, among alternatives, bags made of cloth, jute or paper are popular. Around 22 per cent of the interviewed consumers were using paper bags, making it the most popular in the alternatives category; however, this is still far behind the 79 per cent usage of plastic bags.

According to the survey, among the vendors also, paper bags (including newspaper wrappings) are a preferred alternative. Of all the vendors, 64 per cent was using paper bags, with a large majority using it along with plastic bags (paper bags were used for smaller or dry items). Paper was, in particular,



Note: Per centages do not add up to 100 as some of respondents have given multiple answers.

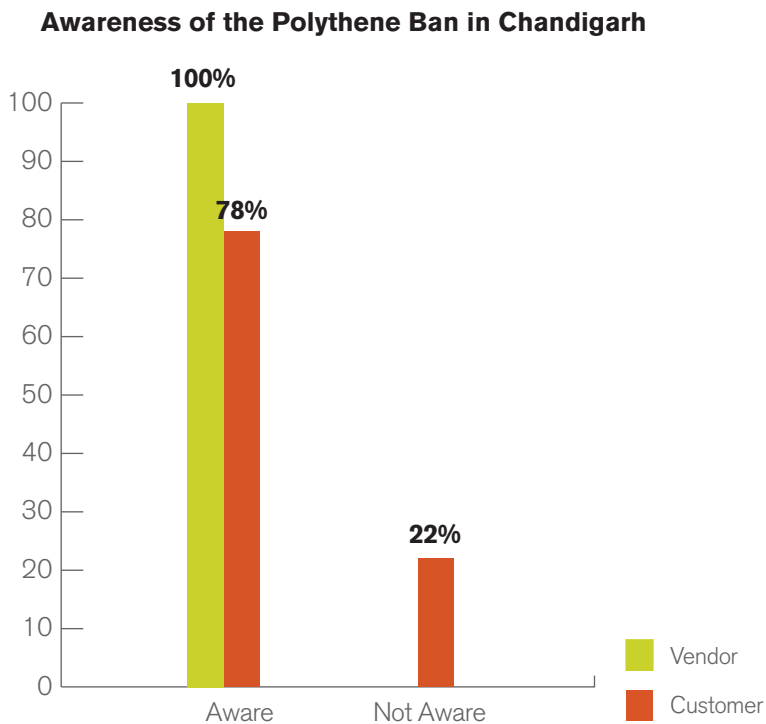
popular among grocery shops, where 100 per cent of the respondents in this category claimed to be using paper bags. However,almost 98 per cent of them are using plastic bags as well. The findings are similar among stationery shops, food vendors and meat shops, where paper bags are used in large numbers alongside plastic bags.

Chemist shops are an exception, with almost 92 per cent of the vendors interviewed using bags made of paper, and a large per centage of them have paper bags as the only option. Also, the multi-brand outlets and electronic shops interviewed were using only paper bags.

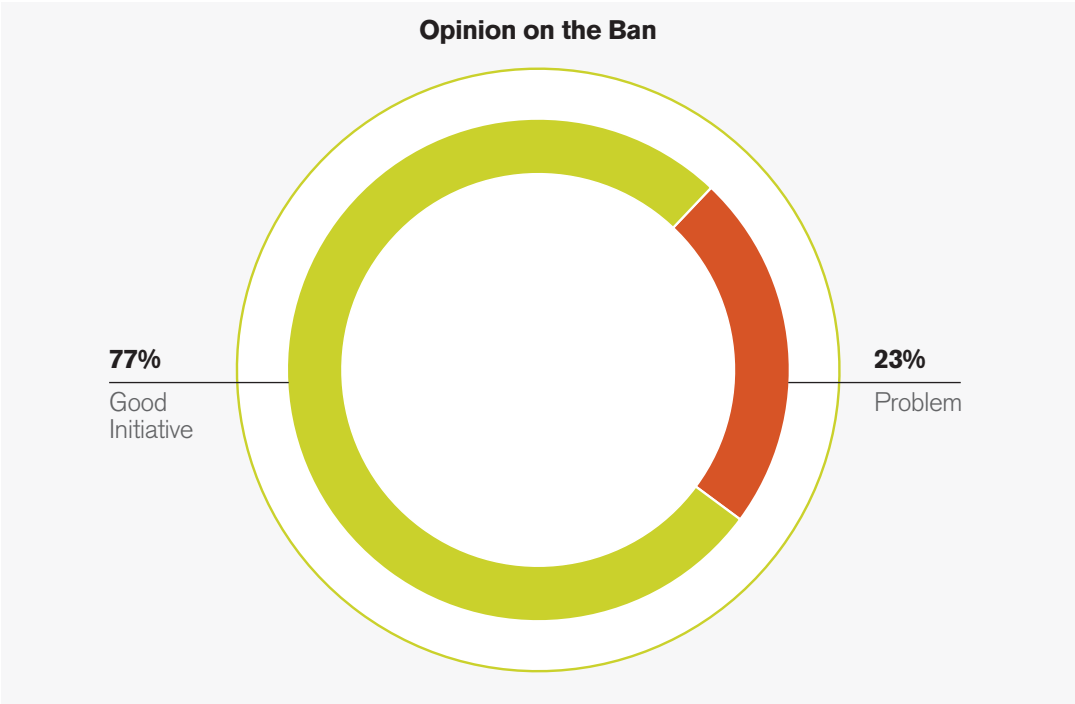
On the other hand, jute and cloth bags are being used only by 8.5 per cent and 10 per cent of the vendors respectively. These were mainly popular with international clothing brands.

The vegetable vendors are hardly using any alternatives and rely mostly on plastic bags, with only 3 per cent using alternatives.

Awareness and Understanding of Stakeholders



The Chandigarh administration has taken some initiatives for spreading awareness on the ban of plastic bags in the entire region by press releases and through associations with community groups like eco-clubs. Associating with community groups, as public government initiative, has helped the city administration in keeping the city clean.

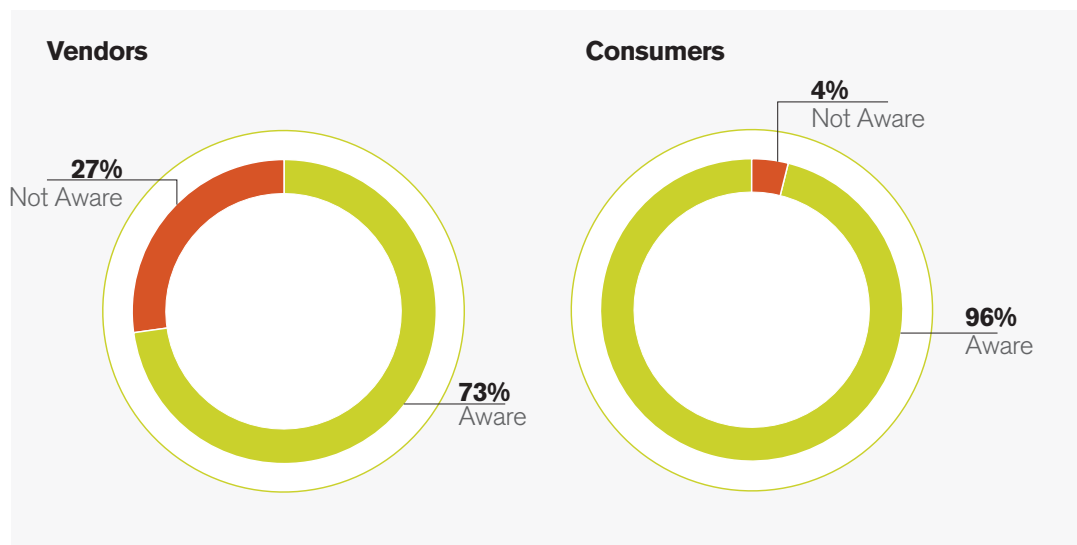


The awareness, however, seemed to be more in the case of vendors as 100 per cent of the vendor respondents were aware of the plastic bag ban, but only 78 per cent of the customer respondents were aware of the ban. Most vendors felt that the ban on plastic bags is a good initiative, but some of them did consider the ban as a problem. Among the general public or consumers, almost 98 per cent thought that the ban was a good initiative.

A majority of the respondents were aware of the harmful effects of polythene on health and the environment, but this awareness was more in the case of customers than vendors. As per the survey findings, 96 per cent of the customer respondents and only 73 per cent of the vendor respondents were found to be aware of the ill effects of plastic on human life. Thus, it seemed that in spite of being aware of the ban and the ill effects of plastic bags, the customers, especially, continued using them.

An attempt was also made to understand if the government initiatives in this regard have reached people. Unfortunately, 95 per cent of the customer respondents were not aware of any initiatives by the Chandigarh administration against the use of plastic bags. The customer respondents were also completely unaware of the authorities concerned who they could complain to in case they wanted to report violations or related issues. Physical verification of the city suggests that the contact numbers of complaint authorities have not been displayed anywhere in the city, leading to poor awareness among residents.

Awareness on the Harmful Impacts of Plastic Carry Bags



Effectiveness of the Ban, including Penalties and Closures (If Any)

The complete ban on the use of plastic bags in Chandigarh has been ineffective and survey findings suggest this. As per the provisions of the notification, the officers authorised to register the complaints of ban violations are the Deputy Commissioner, Director Environment, Divisional Magistrates in their respective jurisdiction, Joint Commissioner I & II and Municipal Corporation, Chandigarh. So far, the Deputy Commissioner's office has not received a single complaint for the ban violation.¹⁴ Meanwhile, the city administration has taken some steps to enforce the complete ban in the region. These steps included inspection of various premises/places where polythene/plastic carry bags were being used in violation of the terms of ban and prosecuting the defaulters. There have been many seizures after the implementation of the ban and during the inspection drives conducted by the SDM east from 2009 to December 2012, a total of 5,698 kg of polythene was seized by the authority¹⁵.

The city administration has taken some steps to enforce the complete ban in the region. These steps included inspection of various premises/places where polythene/plastic carry bags were being used in violation of the terms of ban and prosecuting the defaulters. There have been many seizures after the implementation of the ban.

The **Notification** bearing **No. ED/2008/684 dated 30.07.2008** has made some provisions to impose penalties on the violators including imprisonment for a term, which may extend to five years, or a fine which may extend to Rs 1,00,000 or both. If contravention continues, an additional fine to the extent of Rs 5,000 per day shall be imposed. If the failure continues beyond a period of one year after the date of conviction, the offender shall be punishable with imprisonment for a term that may extend to seven years. But, while talking to the stakeholders during the survey, it was revealed that the

¹⁴ A study conducted by an environmental organisation, Environment Matters, which was roped in by the Department of Environment of the union territory to assess the effectiveness and impact of the polythene ban in Chandigarh.

¹⁵ Ibid.

concerned authorities of Chandigarh administration are implementing a different set of rules. As per this, in the first two instances, the violator is warned and all plastic bags with the defaulter are seized. If the defaulter is caught with plastic bags for a third time, then he is charged with Rs 500 as a fine by the inspector and against it the defaulter gets a receipt of this amount. If the violator continues to use plastic bags in future and is caught then on the fourth instance, a case is lodged against him.

The constitutionality, legality and correctness of the notification no. ED/2008/684, dated 30.7.2008 was challenged by two applicants [Applications No. 26/2013(THC) and 53/2013 (THC)], namely, Goodwill Plastic Industries and Hardeep Industries, engaged in the manufacture and supply of virgin polythene bags. The National Green Tribunal (NGT) found these applications without any merit and dismissed them. The Tribunal termed the notification a step towards better environmental administration and in the larger public interest.

Bottlenecks towards Shifting to Alternatives (including Economics)

While it has been more than five years since the blanket ban on the use of plastic bags, the Chandigarh administration has not been able to implement it effectively. Retailers, traders and consumers across the union territory have been flouting the ban. The reasons for such a failure can be attributed to slack enforcement by the administration and lack of cost-effective alternatives to plastic bags.

Price Comparison				
Type of Bag	Size (in inches)	Quantity	Price	Features
Plastic bag	9 x 12	100	15	-
	16 x 12	100	48	-
	13 x 16	100	32	-
	20 x 26	50	58	-
Jute bag	9 x 12	100	140	-
	10 x 14	100	140	-
	12 x 16	100	150	-
	14 x 18	100	150	-
Paper bag	2 x 3	30	6	White paper
	5 x 6	30	4	Newspaper
	8 x 5	30	22	Brown paper
	8 x 12	30	30	Brown paper
Cloth bag	10 x 14	1	13	-
	12 x 18	1	20	-
	14 x 22	1	28	-

Source: Primary survey.

As depicted in the table, plastic bags are the most cost effective among all alternatives. A packet of 100 plastic bags of size 9 x 12 inches is available at a price of only Rs 15, while alternatives are comparatively much costlier. For instance, jute bags of the same size are available at a price of Rs 140 for a packet of 100 bags and a packet containing only 30 paper bags of size 8 x 12 inches costs Rs 30.

Cloth bags have a higher durability and cost approximately Rs 13 each of size 10 x 14 inches. As per some representatives of various market associations, the government's failure to provide a cost-effective alternative to plastic bags has forced retail traders to continue using it. According to retailers, paper and jute bags are costly in comparison to plastic bags, and they are willing to use them only if customers pay for them. Given the cut-throat price competition in the market and the pattern of consumer behaviour, the switch to alternatives seems near impossible.

Biodegradable and compostable bags are other alternatives, but these too are much more costly in comparison to plastic bags. They require a large initial capital investment for the building of more composting sites as well as for structuring a method for their collection. Government subsidies for the costs of biodegradable and/or compostable bags would be necessary to increase their overall usage. Consumers also need to be educated as to how these bags should be used and segregated for disposal.

As per some representatives of various market associations, the government's failure to provide a cost-effective alternative to plastic bags has forced retail traders to continue using it. According to retailers, paper and jute bags are costly in comparison to plastic bags.

Apart from their cost effectiveness, there are other useful qualities that make plastic bags ubiquitous in our lives. These qualities include durability, water-proof characteristics, non-breakability, light weight, and availability in various shapes, sizes and colours. No other alternative offers such a wide range of qualities together, as each and every alternative suffers from some limitation or other apart from cost effectiveness.

Conclusion

In Chandigarh, despite a complete ban on the use of plastic bags, vendors and customers are still using plastic bags. Most vendors and consumers tend to throw plastic bags after using them and are relatively ignorant or unconcerned with the reuse or recycling of plastic bags.

Plastic bags are still being used in Chandigarh primarily due to the convenience they offer to vendors and customers. In addition to this, the cost effectiveness and easy availability of plastic bags has prevented major changes or a decline in the usage of this harmful product.

Plastic bags are no longer produced in the Chandigarh region, but the Chandigarh administration's ineffectiveness in curbing the illegal supply of plastic bags from nearby cities like Mohali and Delhi has kept these bags popular in the city. The city administration along with some NGOs is working towards raising awareness on the consequences and ill effects of plastic bags. They are also promoting alternative materials such as cloth, jute and paper as viable substitutes for plastic.

The complete ban on plastic bags has been ineffective as it is still widely used, however, measures such as inspections and fines have helped curtail usage to some extent.

Chapter 5

THE BAN IN SIKKIM

Sikkim: An Overview

The tranquil and naturally pristine state of Sikkim is located in the Eastern Himalayas and is strategically bordered by three countries—Nepal, Bhutan and China—and by the Darjeeling District of the Indian state of West Bengal. The tiny former kingdom, which joined the Indian Union in 1975, is bestowed with an abundance of natural resources and beautiful landscapes.



In Sikkim, 82 per cent of the land is under administrative control of the Forest Department,¹⁶ leaving very little area freely available for non-forest developmental activities. Any development strategy needs to ensure protection of the fragile mountain ecology; therefore, the state has taken strong policy measures to ensure protection of its forest and biodiversity. Over 30 per cent of the state’s area comes under the protected category,¹⁷ and there is a total ban on tree felling for commercial purposes as well as a total ban on grazing in protected areas.

Demographics

Sikkim lies between 27°04’ 46” and 28°07’ 48” North latitude and 80°00’ 58” and 88°55’ 25” East longitude, with a geographical area of 7,096 sq. km. It is predominantly mountainous, with many glaciers, lakes and rivers, and a great variation in climate and vegetation. These physical attributes bless the state with tremendous biodiversity, diverse agro-climatic topography, and a strong potential for tourism and hydropower development. Climatic zones range from hot sub-tropical and temperate to cool alpine.

Current State of the Environment

Gangtok, the capital city of Sikkim, generates around 20-30 MT of solid waste per day with the figure going upto 50 MT during the tourist season.¹⁸ The composition of solid waste generated in the state is provided in the table below. It illustrates that plastic comprises 17.18 per cent of the waste in Sikkim. In a study conducted by the Ecotourism and Conservation Society of Sikkim (ECOSS) for the Zero Waste Himalayas group, it was estimated that extruded food—instant noodles, chips and various forms of potato-based snacks consumed in the state—alone generates 3.47 crore pieces of plastic packaging waste.

17.18%
of the 20-30
MT solid waste
generated in Sikkim
comprises of
plastic.

Types of Waste	% (By Weight)
Food waste	32.12
Paper	21.13
Plastics	17.18
Metal	4.50
Glass	2.32
Textile	1.80
Inorganic substances	20.95
Total	100.00

The quantities of solid waste generated within Sikkim are relatively small when compared to other cities and states of India, but given the state’s economically fragile landscape and environment as well as difficult terrain, it cannot afford to be complacent on the issue of solid waste management.

16 State of Environment Report, Sikkim 2007.

17 Forests, Environment & Wildlife Management [FEWM] Department, Government of Sikkim [GoS].

18 Urban Development & Housing Department, GoS.

Presently solid waste treatment is confined to collection and transportation to landfills near rivers or dumping into *jhoras* (streams) and the countryside or being subjected to burning. Only a small quantity of waste is recycled. Apart from the issue that the waste is being burned openly, another factor that adds to the urgency of the problem is that very little land is available for landfills. The issue of climate change has added a further dimension to the problem as it affects mountain regions more seriously than other regions. Given this scenario, the state government has no option but to make serious efforts to tackle the solid waste management issue, deliberations for which have already started.

Sikkim was one of the first states in India to issue a plastic bags ban order. At present, the plastic bag ban notification states that ‘You shall not deliver any goods or materials purchased or otherwise to any person, firm shop, company or any other agency or organization in plastic wrappers or plastic bags’. The notification is dated 4 June 1998, **No. GOS/UD & HD/97-98/6(84)** issued by the Government of Sikkim, Urban Development & Housing Department under the Sikkim Trade License & Miscellaneous Provisions (Amendment Rules, 1998). It was issued at a time when plastic bags were found to be choking drains and streams and thereby blocking and diverting the flow of rainwater, resulting in a spate of landslides in the state capital. However, since this notification is directed only at licensed traders and shopkeepers, it does not make customers liable.

The plastic bags ban in Sikkim was a significant development during a time when there was a spate of landslides in and around Gangtok. Discarded plastic bags were suspected to be the prime reason for choking the drainage system and the *jhoras*, resulting in water flows being diverted and causing these landslides.

As mentioned earlier, the plastic bags ban in Sikkim was a significant development during a time when there was a spate of landslides in and around Gangtok. Discarded plastic bags were suspected to be the prime reason for choking the drainage system and the *jhoras*, resulting in water flows being diverted and causing these landslides.¹⁹ People readily accepted the ban at that time due to the seriousness of the situation.

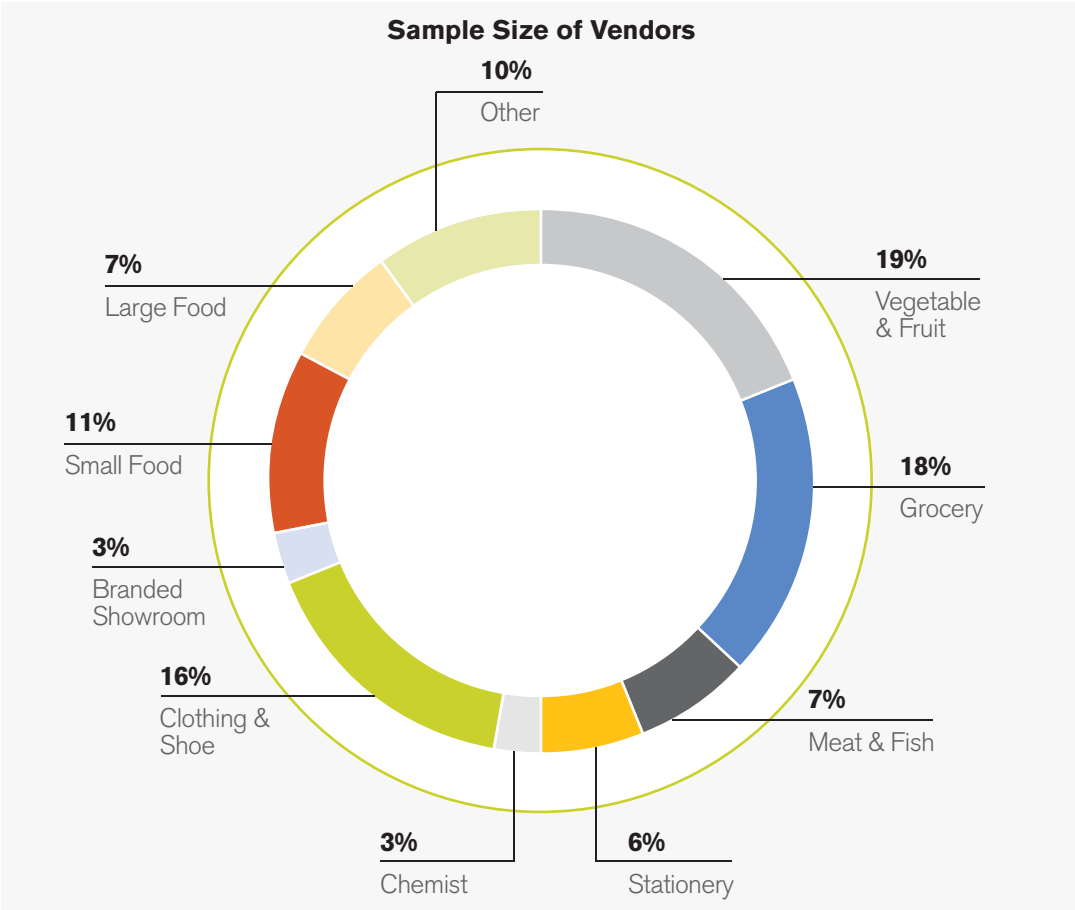
It has been 15 years since the plastic ban was notified under the Trade License & Miscellaneous Provisions (Amendment Rules 1998), Sikkim, and it is about time that the notification and its effectiveness was assessed so that necessary changes and improvements can be brought about. The notification is framed loosely and imposes responsibilities only on manufacturers and shopkeepers selling plastic carry bags and using plastic for wrapping items of sale. Currently, the Gangtok Municipal Corporation, in coordination with other government officials, is in the process of formulating a Plastic Ban Act that will be part of a larger and comprehensive State Level Solid Waste Management Policy. Therefore, this study is crucial for providing feedback and suggestions to make this policy more effective.

Effectiveness of the Ban in Sikkim

To assess the effectiveness of the ban imposed by the Sikkim administration on the use, storage, import, sale, transportation and disposal of polythene/plastic carry bags by any person including a shopkeeper, vendor, wholesaler or retailer, trader, hawker or *haat bazaar* in the state of Sikkim, a survey was con-

19 ‘No Plastic Bags, No Landslides’, *Down to Earth*, 1999.

ducted. The survey was carried out among various stakeholders, especially focusing on vendors and consumers in the region.



Sample

The survey included 172 vendors and 76 consumers to assess the implementation of the ban. In the survey, the largest vendor respondents in the survey were from the vegetable/fruit vendor segment, with a total share of 19 per cent, followed closely by grocery vendors with a share of 18 per cent. Clothing and shoes also had a good presence with 15 per cent. Small food vendors, including bakeries and sweet shops, comprised 11 per cent.

The field study was carried out in the following eight places:

- District headquarter towns: Gangtok (East), capital of Sikkim, and Mangen, district headquarters of the North District and a major transit town.
- Sub-divisional towns: Singtam (East), a major junction town linking the National Highway 31A to the South, East and North districts, and Jorethang (South), a border town near West Bengal and gateway to the West District.
- Villages: Chakung and Soreng (West) and Makha (East) where village-level bazaars are to be found.

Usage

The survey suggested that in Gangtok and other major towns, plastic carry bags have been substituted to a large extent by a wide variety of other materials, while in the smaller towns and villages, plastic carry bags are popular and do constitute a major portion of the material used to deliver purchases.

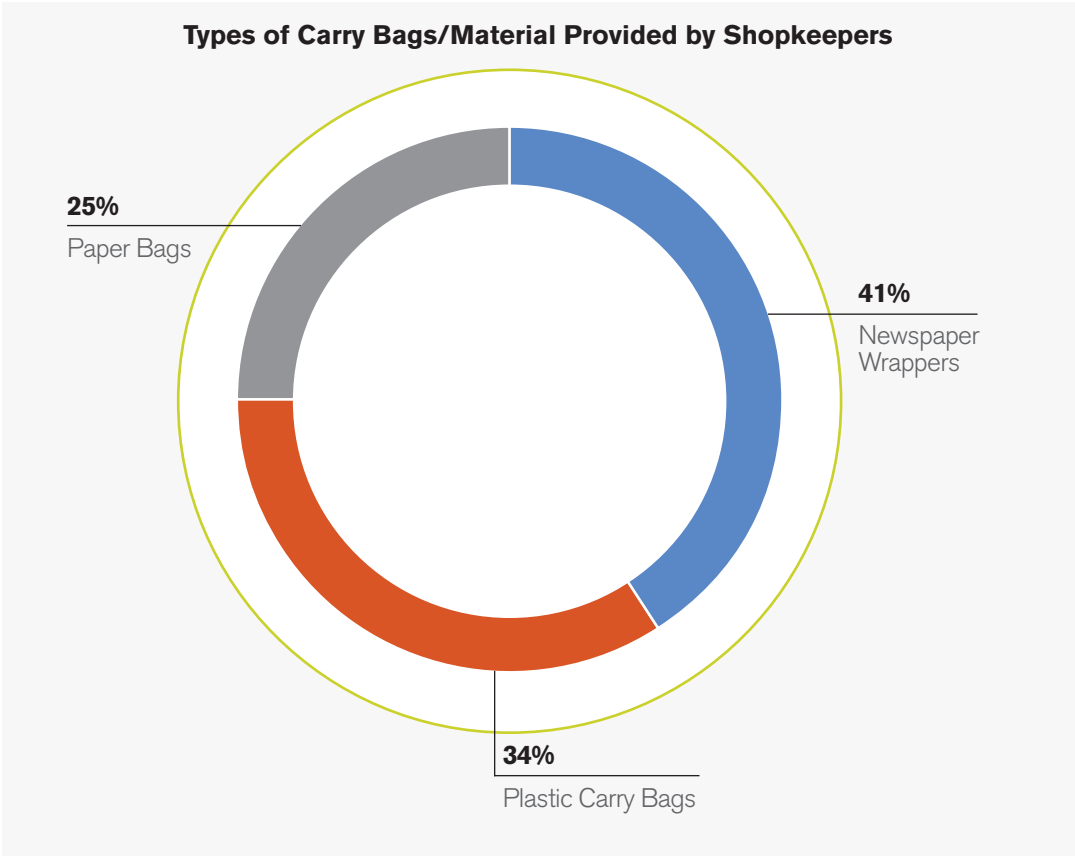
It was found that wherever plastic bags are used, the thin coloured variety, both of virgin and recycled material, is being provided, especially during purchase of vegetables, grocery, meat and fish. Black plastic carry bags of larger sizes were used mainly for garbage disposal by both households and commercial establishments, while the smaller ones were being used for the packing of meat and fish items. In the major towns, especially in Lal Bazaar, Gangtok, fish and meat were being sold wrapped in newspaper. In a few cases, however, vendors were found to be surreptitiously providing meat and fish in black plastic bags. In the shops on MG Marg in Gangtok, groceries and other items were being provided in brown paper bags and newspapers.

In the smaller towns and villages, especially in the *haat bazaars*, plastic bags were being used openly and extensively for vegetables, provisions, meat and fish. On an average, a grocer, fruit and vegetable vendor, or meat/fish vendor was using around 2-3 kg of lightweight low micron single-use plastic bags a month.

The table below depicts the various types of carry bags and wrapping material provided by different types of vendors at the various places surveyed around the state, and also the proportion of each type of bag in terms of the total use. It shows that 66 per cent of the shops around Sikkim use the more eco-friendly paper bags and newspaper wrappings, and around 34 per cent use plastic carry bags, including non-woven bags. Even though plastic carry bags are banned in Sikkim, people are still using them because these are lightweight, durable, cheap, hygienic and convenient.

Type of Shops	PP bags	Paper Bags	Plastic Carry Bags	Newspaper Wrapping
Vegetable & fruit vendors	11	7	7	17
Meat & fish	0	3	3	17
Wayside vegetable vendors	0	0	1	2
Fast food outlets	1	1	2	4
Sweet shops	4	11	9	7
Bakeries	2	2	0	2
Restaurants	3	5	6	9
Branded food outlets	2	0	1	0
Grocery & provisional stores	15	29	14	27
Government vegetable booths	1	1	0	0
Chemist	0	7	0	7
Stationery & gift shops	5	4	2	8
Hardware shops	5	6	1	7
Florists	0	0	0	7
Dry cleaners	0	3	2	3
Clothing	9	7	3	13
Shoes	0	0	7	8
Total	58	86	58	138

Local food items such as *churpi* (cottage cheese) and fermented soya bean and bamboo shoots were sold wrapped in leaves or placed in bamboo. One of the popular food items in state is steamed dumplings locally known as *momos*. As a takeaway food item, this was supplied in clear plastic bags sealed with rubber bands by all restaurants and fast food eateries as it was not feasible to wrap the dish in any form of paper. Sweet shops sell their syrupy sweetmeats in opaque plastic containers. Items such as sauces and chutneys were provided in small transparent plastic sachets.

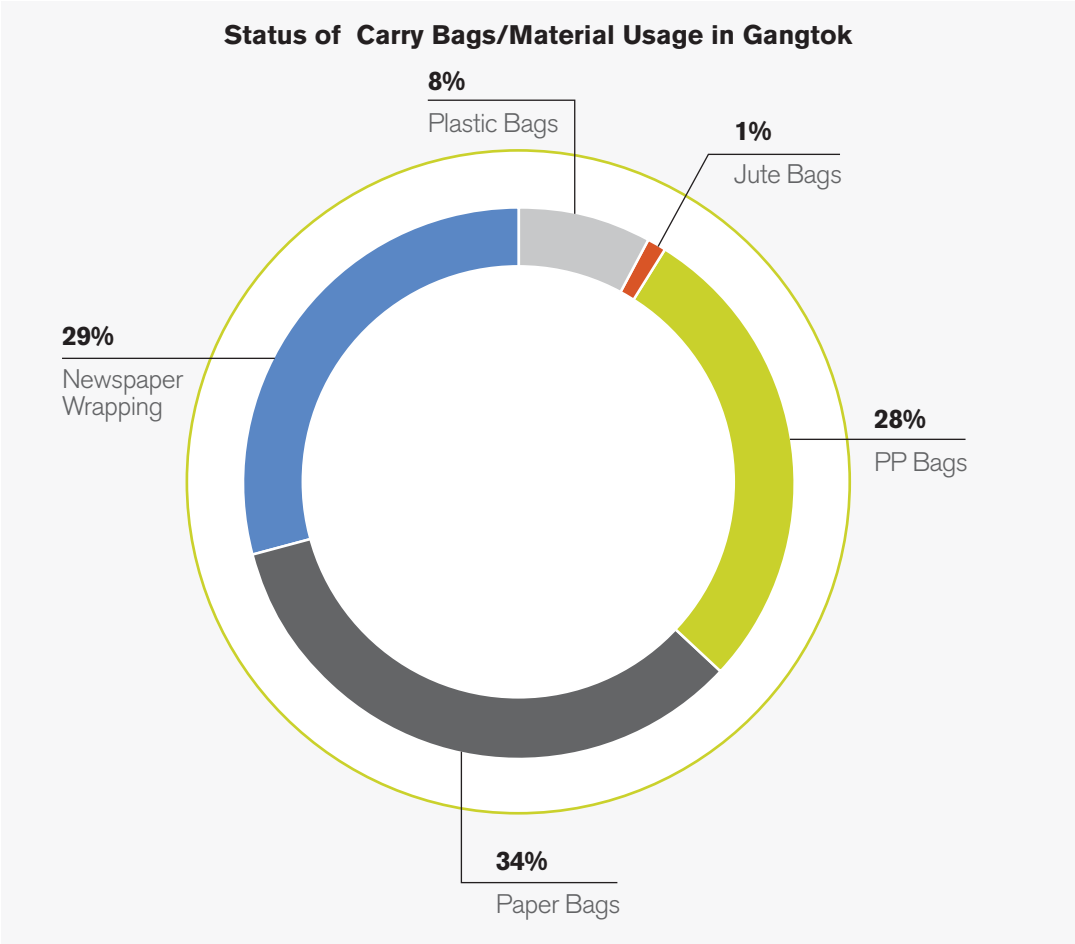


The data is based on the questionnaire interview of various shops around the state. It was found that 41 per cent of the shopkeepers use newspaper wrapping, followed by paper bags (25 per cent), transparent/opaque plastic HDPE/LDPE pouches (17 per cent) and non-woven PP bags (17 per cent). The survey observed *haats* (weekly temporary markets), grocery shops, fruit vendors, and meat and fish shops to be high users of plastic carry bags.

A critical finding of the survey was that non-woven PP bags have largely replaced the traditional plastic carry bags and more so in the major towns. This material was being increasingly used by restaurants, bakeries, clothing and hardware merchants, and branded establishments such as Big Bazaar as well as leading apparel brands. Except Big Bazaar, no shop was found charging for the carry bags (unless bought separately as a reusable carry bag).

A critical finding of the survey was that non-woven PP bags have largely replaced the traditional plastic carry bags and more so in the major towns.

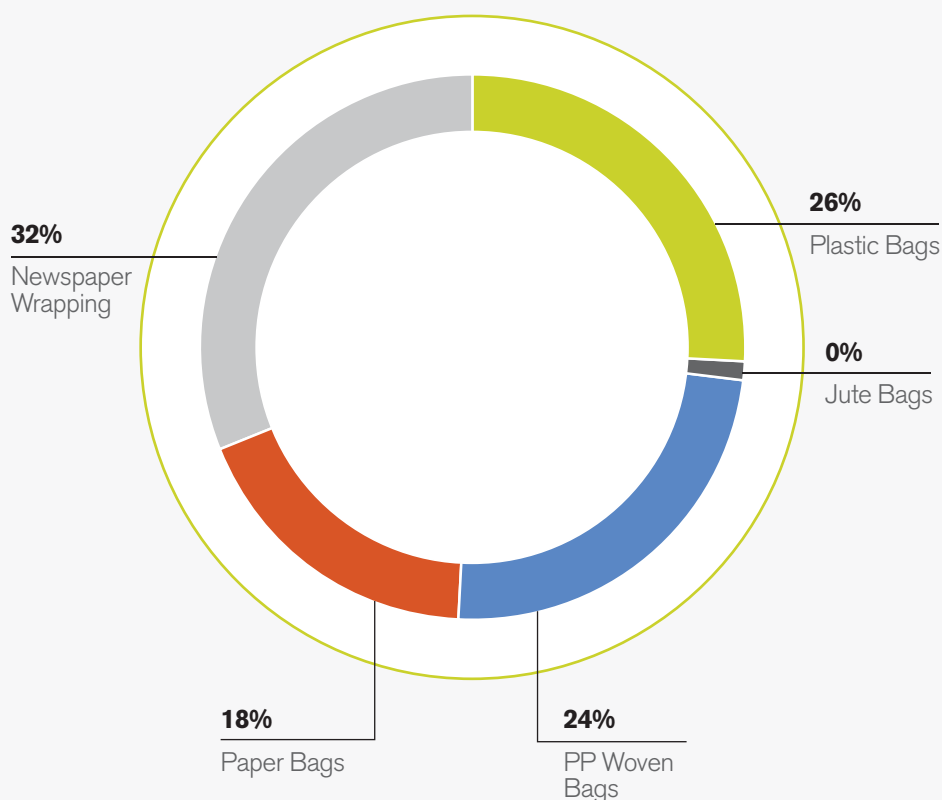
The second-most popular packaging material after plastic carry bags was paper. Brown paper bags and newspapers were being used to a large extent by the grocery stores, fruit and vegetable vendors, sweets shops and chemists, especially in the major towns. Hotels and restaurants were also using aluminium packaging to pack their take-away dishes, branded shops (such as Dominos and Subway) were using either paper bags and paper cartons or PP bags, and in some cases biodegradable bags (Reebok). Fast food joints and restaurants have been multiplying in the state due to the tourism boom. These joints and restaurants were found to be using non-biodegradable plates made of thermocol (Styrofoam) or metallised paper for serving drinks and food. Some use machine manufactured leaf plates and bowls with an inner plastic lining.



The chart on the above represents the status of carry bags being used in Gangtok: the usage of paper bags is 34 per cent, followed by newspaper and paper wrapping (29 per cent) and jute bags (1 per cent). Plastic packaging, including transparent plastic pouches, comprises 8 per cent, while non-woven PP bags make for 28 per cent.

The chart on the below represents the status of carry bags being used in Soreng: the usage of newspaper and paper wrapping is 32 per cent, followed by paper bags at 18 per cent. Plastic packaging (including transparent plastic pouches) comprises 26 per cent and non-woven PP bags make for 24 per cent. Plastic bags usage is more in rural areas (50 per cent) as compared to urban areas (36 per cent).

Status of Carry Bags/Material Usage in Soreng



In the case of consumers, it was found that except in the case of bulk purchase of vegetables/fruits and provisions, which were mostly during the weekly market days, most people were not in the habit of carrying their own shopping bags, but relied on the bags provided by the shopkeepers.



Manufacture, Storage and Supply

There is no plastic carry bag manufacturing unit in Sikkim though there are PET bottle manufacturers and a PP bag stitching unit. Plastic bags are imported into the state from West Bengal through local

dealers and wholesalers, who operate mainly in the towns of Singtam and Jorethang in East and South Sikkim respectively.

Our visit to Siliguri revealed that the major trading hubs for plastics in Siliguri are located in the Rail Gate Flyover, Bidhan Market, Khalpada and Court More areas. Bagwala is a major manufacturer of PP bags. In the markets of Sikkim and Siliguri, PP bags are sold openly, while other plastic bags are sold more clandestinely. We found that these are being provided to regular users in Sikkim through established channels. Vendors in weekly markets as well as vegetable and meat/fish shops seem to be the main customers. Till recently, plastic bags were sold openly in the Siliguri market, but with West Bengal also imposing a ban, open sale is no longer seen and whatever sale takes place is surreptitious. For those wanting plastic bags, the material can be obtained through secret negotiations in some of the shops selling plastic items. Overall, plastic bags sale has reduced to some extent as the fear of prosecution is posing a major deterrent.

During the survey, team members pretending to be buyers met few of these plastic carry bag and PP bag dealers in Siliguri. On questioning the dealers about the properties of the PP bags, they claimed it to be environmentally friendly, recyclable, porous and naturally disintegrable. It was found that all branded garment shops, food joints and hospitals are using PP bags in Siliguri. A women's self-help group Swayam Sewa, located in Gangtok, buys PP material in bulk from Siliguri and sews PP bags for sale within Gangtok and other areas.

Disposal and Recycling Practices

Plastic carry bags are generally for one-time use, with most of them ending up in the dustbins or landfills. In the absence of a proper waste disposal system, waste ends up being dumped in the open and in streams, drains and *jhoras*. Rural areas which are not serviced by waste vehicles have a major problem in the disposal of plastic bags. These bags clog drains and streams, sometimes leading to landslides, pollute farmlands; and are harmful to animals, thereby posing a great threat to the biodiversity and pristine nature of the environment in Sikkim.



Currently, the state does not have an efficient and environmentally safe system of waste disposal. In the capital Gangtok, mixed household waste is collected on a daily basis by waste collectors and collection vehicles. These people or vehicles arrive at designated spots in the morning and either blow a whistle or ring a bell, signalling the residents to come out and deliver their waste to the waste collector or the waste vehicle. The mixed waste is taken to and dumped at the 32nd Mile waste dumping site located near a river along the National Highway. During the survey, this dumping site was visited.

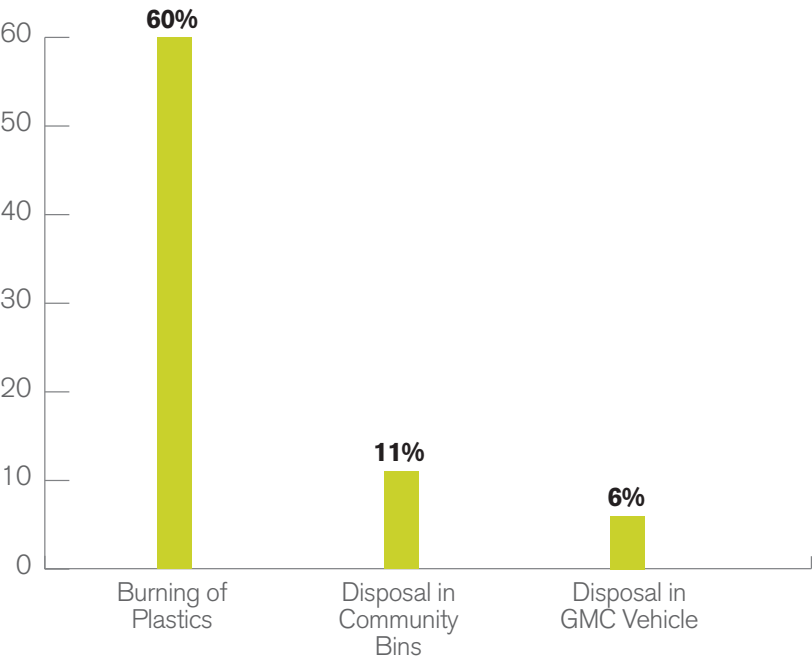
It was already running beyond its capacity. Recently an Asian Development Bank (ADB) funded project of the Urban Development & Housing Department has proposed to build a sanitary landfill at the same site and implement segregation at source.

In Sikkim, only 10 per cent of the waste is recycled through the informal sector. Unlike other places, plastic bags are not being picked up by the informal sector and it finally ends up at the landfill, posing a serious hazard to both human health and the environment. While conditions in the cities are relatively better, towns and villages poorly serviced. Large quantities of plastic get openly burned. Plastics are also commonly used for starting the morning wood fires in villages. A lot of waste gets washed down the streams and rivers and enters the Teesta River, which is the largest river in Sikkim. The Teesta subsequently flows down to West Bengal and Bangladesh, finally merging with the Bay of Bengal. In spite of its ‘green’ image, the state of Sikkim is ‘contributing’ its bit to plastics in the ocean.

Unlike other places, plastic bags are not being picked up by the informal sector (in Sikkim) and it finally ends up at the landfill, posing a serious hazard to both human health and the environment.

Out of the 76 customers interviewed in rural and urban areas, an overwhelming majority resorted to burning their non-biodegradable waste. A large percentage of these were in rural areas. Over 90 per cent of the residents in rural areas resort to burning of plastics as a means of disposal.

Disposal Methods for Plastic Bags

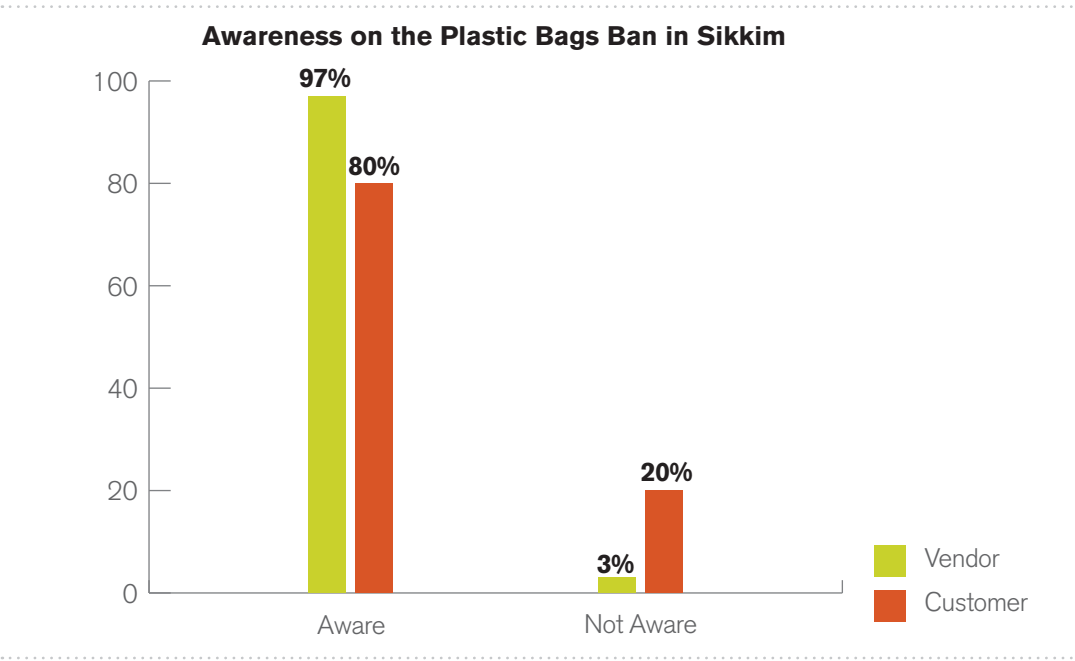


There is a general impression, more so in rural areas that the best and ‘clean’ way of disposing plastics is by burning. There are 48 registered scrap and waste dealers in Sikkim who are doing their own collection and segregation of waste, and have established their own channels of sourcing. Aalam, a leading

waste dealer and middle-man says, ‘Except for laminated plastic packaging, every other form of plastic is recycled.’ He collects and sells mixed plastics of all types including LDPE, HDPE and PP carrybags, pouches and packing material. These fetch him approximately Rs 10 to Rs 12 per kg. He adds further that if proper segregation is done, PP bags alone would fetch him around Rs 17 per kg. It is only the unorganised sector that is recycling plastics in a rudimentary manner. At the bottom line are the rag pickers scavenging from waste heaps and waste dumps, followed by wandering house-to-house collectors (*kabaariwallas*) and the waste handlers engaged by the urban bodies with the waste collection vehicles. They do a rough segregation and supply to the waste dealers like Aalam or to waste contractors licensed to operate in the official dumping sites. The dealers/contractors may do some value addition like washing, finer grading (according to colours and type of plastic) and shredding. Once sufficient material to fill a truckload is collected, it is sent to the main dealers in Siliguri and Kolkata, or sometimes even to Delhi.

Awareness on the Plastic Bag Ban

Awareness levels on the plastic carry bags ban were found to be very high amongst both shopkeepers and customers in urban areas (above 80 per cent). But the tourists were found to have very little idea about the ban (around 40 per cent).



Awareness levels on plastic carry bags ban among customers and shopkeepers in rural areas were found to be very low (around 75 per cent). Shopkeepers located on the main streets of Gangtok and other major towns were more sensitive about the ban. A majority of the respondents were aware of the harmful effects of plastic carry bags on health and the environment.

However, one vexing issue affecting the awareness on the plastic bags ban is the recent substantial increase and growing popularity of non-woven PP carrybags. This is in lieu of the HDPE/LDPE/recycled plastic carry bags of various colours used earlier. People’s assumption and, for that matter even of the

authorities, is that non-woven PP bags are cloth bags and not plastic and, therefore, safe. People are not aware that these are also plastic and non-biodegradable. The suppliers of these bags are also advocating that these bags are safe, biodegradable and harmless to the environment.

Effectiveness of the Ban Order

It is difficult to say if the plastic bags ban has been effective in the state of Sikkim. In urban areas, use of coloured plastic carry bags is very minimal due to regular checks, raids and access to the media. It was reported that in the initial days of the ban, continuous checks were undertaken and strict fines were imposed on offenders. This created a general fear of transgressing the law, which made the ban effective. Even today the sale/use of plastic carry bags, wherever done, is conducted in a clandestine manner. The plastic carry bag and PP bag wholesalers are situated in the border towns of Singtam and Jorethang, but the sale is not open and supplies are provided through visiting salesmen.

In the rural areas, the ban on plastic bags was found to be ineffective due to poor information and lack of monitoring.

A shocking thing revealed in the survey was that even though usage of plastic carry bags is very minimal in urban areas, use of non-woven PP bags has increased tremendously. Even in rural areas, these non-woven bags were rampantly being used. If we consider this scenario, then the plastic bag ban has actually failed in the entire state.



Action by Regulatory Authorities for Enforcement

There has been limited use of information, education and communication (IEC) tools for awareness on the plastic bags ban in the state, except by the SPCB. The SPCB has designed a poster on avoiding the use of plastic, as shown above, but it does not highlight the fact that plastic is banned in Sikkim. Other than this, no other promotional hoardings or banners were observed in the state, except for a single hoarding in the Rangpo border check-post. Other than an initial notification of the ban in the State Gazette/local papers and some regular notices in the government offices, there have been no concerted efforts to send circulars to large users and shops.

There has been limited use of information, education and communication (IEC) tools for awareness on the plastic bags ban in the state.

Alternatives to Plastic Bags and Challenges in Shifting to Alternatives

The main alternatives to plastic bags currently being used in the state are newspaper/paper wrapping, paper bags and reusable carry bags made from thick plastic, jute, cloth or some other strong material. The emerging and most favoured alternative is the PP bag, which, as already stated, has been erroneously propagated as a cloth bag. Another possible alternative is the increased use of leaf packaging (such

as banana, local fig and arum leaves). Certain gram panchayat units have passed a resolution banning the use of disposable cups and plates and replacing these with leaf plates and reusable cups/glasses. The main challenges in shifting to alternatives, which emerged from the survey, were as follows:

- Limited options for consumers as other alternatives such as cloth and jute bags are not easily available in Sikkim
- Changing people's perception and inculcating the habit of carrying their own reusable shopping bags is challenging
- Consumers prefer cheap, light, fancy, durable and convenient alternatives. Providing these is another challenge as eco-friendly material like jute and cloth seem to be more expensive. The non-woven PP bags have these desired characteristics and hence are being increasingly used.
- Existing laws and monitoring practices as well as IEC need to be strengthened to support the shift to alternatives. This requires a major effort from the government and civil society. There is no monitoring at the borders to check the influx of plastic bags and there is no liability upon consumers bringing in materials packed in plastic bags. There is also no joint monitoring or cooperation between the Sikkim and West Bengal governments to implement the plastic bags ban effectively and prevent the supply of plastic bags to the state.
- Respondents felt that to improve compliance, there was a need to strengthen existing laws, engage in mass awareness and sensitisation programmes, and also provide cheap alternatives to plastic bags. People should be sensitised to bring their own reusable shopping bags. Another suggestion was to provide cloth or other reusable bags at the shop level and charge at a high rate which would make customers bring their own shopping bags.

Conclusion

The findings of this study indicate that the plastic bags ban was found to be quite effective in the capital and bigger towns of Sikkim, with vendors opting for a substantial use of newspaper wrapping and paper bags. But in the smaller towns and villages, and in some cases in the more remote big towns and in weekly *haats*, the use of plastic bags is quite rampant. This can be largely attributed to a relaxation in the strict monitoring system prevalent in the early years of the ban. Generally vendors are more aware than customers about the ban and there is still a residual fear that prevents plastic bags being openly sold.

All plastic bags are sourced from the neighbouring town of Siliguri in West Bengal and there are no manufacturers of plastic bags in Sikkim. One major development that has diluted the ban is the growing use of non-woven PP carry bags. There is an erroneous belief that it is safe as it is cloth-like and there are false claims about its biodegradable qualities. The authorities are yet to take action to ban this type of bag.

Chapter 6

RECOMMENDATIONS

Each year, an estimated 500 billion to 1 trillion plastic bags are consumed worldwide. That's over 1 million plastic bags used per minute! These are the most widely used bags and they seem harmless until one starts counting the billions that are thrown away each day across the globe. Plastic bags are amongst the most littered items in the world and are found almost everywhere—roads, dumpsites, mountains and water bodies. It takes 100-500 years for a plastic bag to disintegrate (depending on the type of plastic) and hence they continue to exist, harming our environment. Plastic bags have emerged as an unsustainable option and constitute one of the most critical waste issues globally.

**It takes
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Banning plastic bags has been a key step in moving towards a sustainable society globally. In India, several states and municipalities have imposed a total ban on the use of plastic carry bags. With plastic waste management creating a major concern for all states, it has become necessary to examine the status of such bans and to evaluate their effectiveness in these states with a view to improving legislation and best practices, and showing the way forward for other states to emulate.

The study, which examined the plastic bags ban status in Chandigarh, Delhi and Sikkim, found that the ban has found limited or mixed responses. Though in the state of Sikkim, alternatives like paper are being used more widely, vendors in Delhi and Chandigarh are still largely dependent on plastic carry bags. Larger brands/shops in all the three areas have chosen to go the alternative route, but many of them have opted for non-woven bags, which are not an alternative as these are also made of plastic.

In the initial few months of the ban notification, there was strict monitoring, including spot seizures and fines, by regulatory bodies. This was effective in curbing the plastic menace and the usage came down substantially. But over time, as the monitoring was relaxed, plastic bags made a comeback in most places. This in spite of the fact that the awareness regarding the ban as well as concerns related to plastic bags is very good. The reason for this, which came out in the study, is mainly the availability and feasibility of alternatives. Not enough work has been done in looking for cheap and readily available alternatives to plastic bags and this might be an area that the regulatory bodies need to focus on.

The concerns at present are as follows:

- Plastic bags are being openly used by vendors, especially by small vendors like vegetable and fruit shops as well as grocery shops. These are mainly low-quality bags, causing greater concerns.
- In all the three regions included in the study, the ban was effective only in the early days of notification. But as the monitoring reduced, the usage went up again. Fines or penalties are not being imposed, resulting in weak implementation of the ban.
- Materials like non-woven bags are being used as an alternative. These are made of plastic and are not permitted, but there is a lack of awareness and knowledge on this.
- Alternatives like paper are being used, but their durability is an issue.
- Jute and cloth bags were popular only in brand shops as their costs are high.
- The plastic bags were routinely disposed of along with other municipal waste, finally ending up in dumpsites, roads, drains and landfills.
- Though the production of plastic bags has come down or stopped in these regions, the bags are coming from neighbouring states. In Delhi, there is still some production going on in a clandestine manner.

The recommendations below are on the basis of the study findings:

Strict monitoring and application of the law: Strict monitoring is required for the ban to be effective. Random checks, spot fines and seizures of the plastic bags—these measures, on a regular basis, can act as a deterrent, especially for the small vendors. The penalty amount should be sizeable and could be raised on repeat offences, thereby discouraging usage.

Participatory approach: The regulatory agencies should invite different groups and assess their problems in the implementation of the ban. It is important to understand the user perspective and in this case it will be important to understand the resistance from the vendors. This will help in planning action as well as resolve the bottlenecks.

Alternatives to plastic bags: For the purpose of establishing sustainable practices, the true goal is to eliminate all single-use practices, whatever the use, whatever the material being used. Towards this end, practices that encourage multi-use materials, such as reusable bags made of cloth or other durable materials help decrease dependence on non-renewable resources, while contributing towards the overall zero waste goal.

Serious efforts should be made to find sustainable and eco-friendly alternatives to plastic bags. The government can promote the alternatives through financial and other incentives. It is recommended that a detailed feasibility study on alternatives be carried out and the best types earmarked for mass production and distribution.

Check on inter-state movement: Though the production, sale and usage of plastic bags are banned in the three regions covered by the survey, plastic bags continue to come in from other states where there is no ban. A stricter monitoring of this will be highly effective in curbing the usage.

Comprehensive waste management policy: The plastic bags ban should not exist in isolation. Instead, the ban should be part of a well thought out futuristic Solid Waste Management Policy that aims to substantially reduce and recycle plastics, while eliminating those types that cannot be recycled.

Awareness and education: The most effective strategy to reduce the use of plastic bags and plastic wastes is to bring about behavioural changes in people. Continuous use of promotional material such as posters and hoardings should be put in appropriate public places. Consumers should be encouraged and motivated to always carry their own reusable shopping bags. Civil society organisations should be engaged for the IEC programmes.

ANNEXURE

Questionnaire

I. For Consumers

Interview Schedule

Impact of ban on polythene bags in Delhi region

North

☐

South

☐

East

☐

West

☐

Central

☐

Date of survey: _____ Place of intervention: _____

What type of shop?

(a) Vegetable/fruit vendors () () () ()

(b) Small food vendors *Dhaba* () *Thela* () Sweet () Other ()

(c) Big food Vendors _____

(d) Grocery _____

(e) Government booth DMS () Mother Dairy () Safal ()

(f) Chemist _____

(g) Stationery _____

(h) Clothing International () Indian () Local ()

(i) Shoes International () Indian () Local ()

(i) Shopping mall (name of the brand) _____

What type of carry bag is being used?

(a) Polythene bag ()

(b) Jute bag ()

(c) Cloth bag ()

(d) Paper bag ()

(e) Any other, specify _____

Do you know about the polythene ban in entire Delhi?

(a) Yes ()

(b) No ()

Your opinion on the polythene bag ban?

(a) Good initiative ()

(b) Problematic ()

(c) Any other, specify _____

Do you know that plastic bags are harmful for health and the environment?

(a) Yes ()

(b) No ()

Why are you still using polythene bags?

(a) Cost effective ()

(b) Easily available ()

(c) Convenient ()

(d) Not concerned ()

(e) Any other, specify _____

What do you do with polythene bags?

(a) Reuse ()

(b) Use & throw ()

(c) Waste collector for recycling ()

Where do you dispose of polythene bags after use?

(a) Local spots, open dumping or anywhere ()

(b) Community bins ()

(c) Waste collectors ()

(d) Any other, specify _____

II. For Vendors

North

☐

South

☐

East

☐

West

☐

Central

☐

Date of survey: _____ Place of intervention: _____

(a) Vegetable/fruit vendors () () () ()

(b) Small food vendors *Dhaba* () *Thela* () Sweet () Other ()

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Your opinion on the polythene bag ban?

(a) Good initiative ()

(b) Problematic ()

(c) Any other, specify _____

Why are you still using polythene bags?

(a) Cost effective ()

(b) Easily available ()

(c) Convenient ()

(d) Not concerned ()

(e) Any other, specify _____

From where do you buy the polythene bags?

(a) Within the market ()

(b) Factory ()

(c) Wholesale market ()

(d) Any other, specify _____

Consumption of the carry bags per month no./kg

(a) Polythene bag ()

(b) Jute bag ()

(c) Cloth bag ()

(d) Paper bag ()

(e) Any other, specify _____

How much amount you pay per kg _____ (Rs)

Chandigarh survey and report by:

Awareness of Social Unit and Market Evaluation

Manoj Rokare, Utpal Kant, Santanu Kumar and Prabhash Toni

Delhi survey and report by:

Toxics Link

Ankita Jena and Vinod Kumar

Sikkim survey and report by:

The Ecotourism & Conservation Society of Sikkim (ECOSS)

Yojna Lama, Aruna Pradhan, Meghna Thapa, Tashi Wangchuk Lepcha, Roshan Chhetri,

Tilotama Pradhan and Rajendra P. Gurung