



National Policy Workshop Webinar Series

On

*Countermeasures for Riverine and Marine Plastic Litter
in India*

12 -22 May 2020

Session 4: Assessment of plastic pollution impact on natural capital and riverine and marine ecosystems needing policy intervention

Policy Instruments for mitigating plastic pollution



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Economics

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Introduction

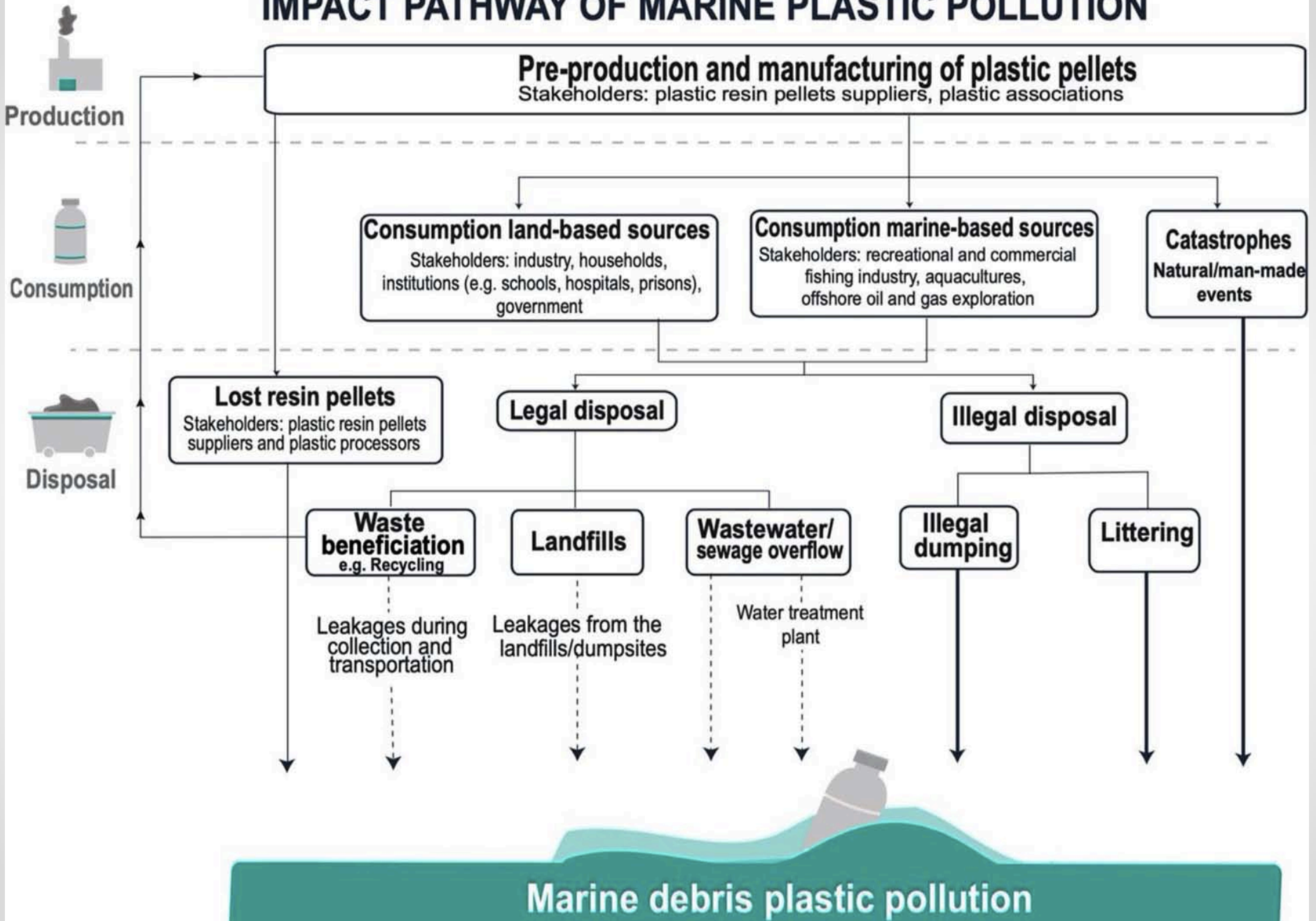
- Plastic consumption is 18.45 MMT in 2018-19 vis-à-vis 0.9 MMT in 1990; 43% is used in packaging
- Annual per capita consumption is about 13 Kg in India vis-à-vis 108 Kg in US and global average of 30 Kg in 2018-19
- India generates about 9.4 million tons plastic waste in 2017 (CPCB); 94% thermoplastic and remaining thermoset.
- Plastic contributes about 8% of total solid waste (CPCB)
- Collection efficiency of plastic waste is about 80.3%, out of which 28.4% was treated in 2014 (CPCB)
- The seas near Mumbai, Kerala and A&N Islands are among the worst polluted in the world; land based sources are the major cause of marine plastic pollution (MPP)
- Need is to design policies that help in managing plastic pollution/MPP by discourage consumption at source and encouraging waste treatment

Plastic waste management rules 2016

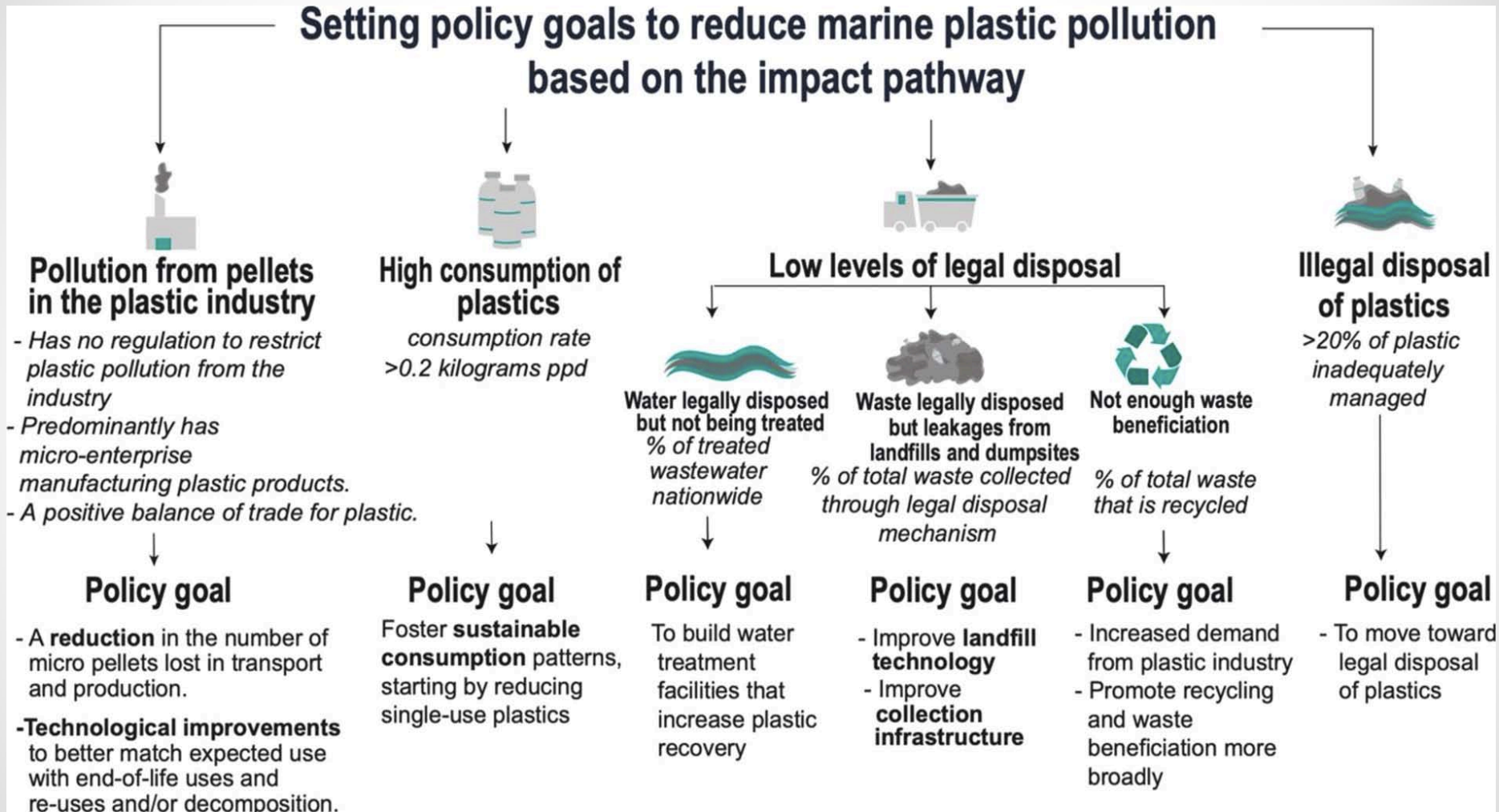
- A complete ban on plastic below 50 micron
- Phasing out use of multi-layer packaging and
- Introduced extended producer responsibility (EPR) for producers, importers and brand owners
- These rules were amended in 2018

India follows broadly a Command and Control (CAC) mechanism to manage the plastic waste

IMPACT PATHWAY OF MARINE PLASTIC POLLUTION






Policy goals



Source: Alpizar et al. (2020)

Policy Options

	Price-based instruments	Rights-based instruments	Regulation instruments	Behavioral instruments
 Targeting the plastic industry	<ul style="list-style-type: none"> - A tax based on environmental performance of the plastic products. - Subsidies for research and innovation. 	<ul style="list-style-type: none"> - Extended producer responsibility (EPR). 	<ul style="list-style-type: none"> - Standards for pellets spills from the industry. 	<ul style="list-style-type: none"> - Information provision. - Nudging such as setting defaults to “no plastics”. - Use of social comparisons.
 Targeting consumption of plastic by households and firms	<ul style="list-style-type: none"> - Increasing the price on plastic products. - Deposit-refund schemes for plastic bottles. - Waste charge. 	<ul style="list-style-type: none"> - Waste-based billing. 	<ul style="list-style-type: none"> - Bans (single-used plastic, light-plastic bags). - Mandatory recycling. 	<ul style="list-style-type: none"> - Information provision. - Nudging such as setting defaults to “no plastics”. - Use of social comparisons. - Explicit use of social norms.
 Targeting disposal of plastics	<ul style="list-style-type: none"> - Weight-based pricing of waste. - Subsidizing appropriate behavior. 	<ul style="list-style-type: none"> - Extended producer responsibility. - “Pay-as-you-throw” (PAYT) systems. - Provision of waste collection that promotes separation of waste for recycling. 	<ul style="list-style-type: none"> - Landfill bans. - Mandatory recycling laws. 	<ul style="list-style-type: none"> - Education, information campaigns. - Information appealing to social and personal norms, pro-social behavior. - Door-to-door information provision. - Face-to-face information facilitating the adoption of recycling.

Source: Alpizar et al. (2020)

Reducing use of plastic bags: a case study

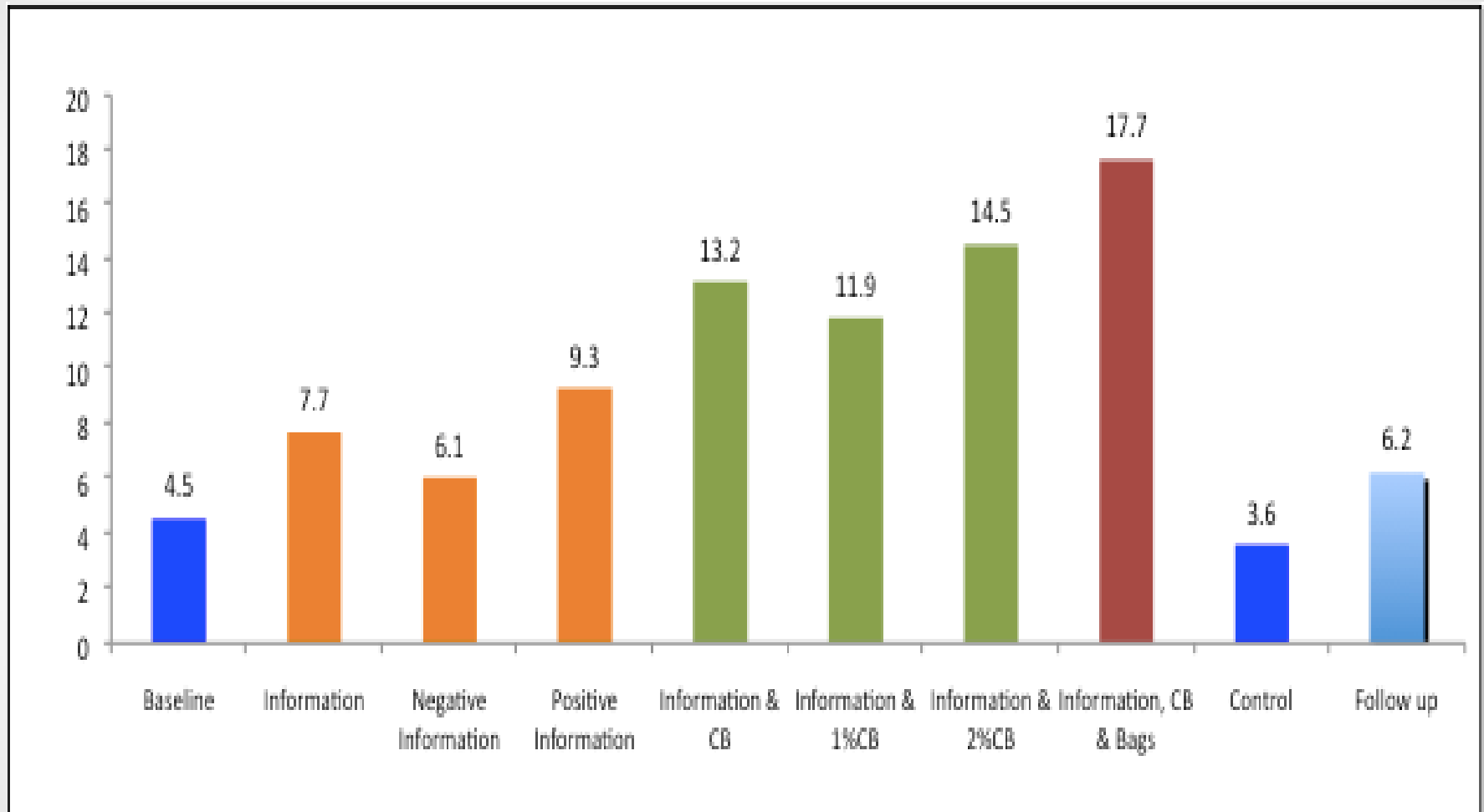
- Gupta and Somanathan (2011) analyze the effectiveness of ban on the use of plastic bags in Delhi vis-à-vis a combination of three policy instruments (i) information provision, (ii) a cash-back scheme, and (iii) provision of substitutes for plastic bags
- The study highlights the issues of monitoring and enforcement in context of regulation
- The study applies an experimental approach in actual market to test instruments that can control an environmental externality
- The sampling frame of the study is a retail consumer market in Delhi and NCR (4 neighborhoods in Delhi and 1 in Ghaziabad)

The experimental design

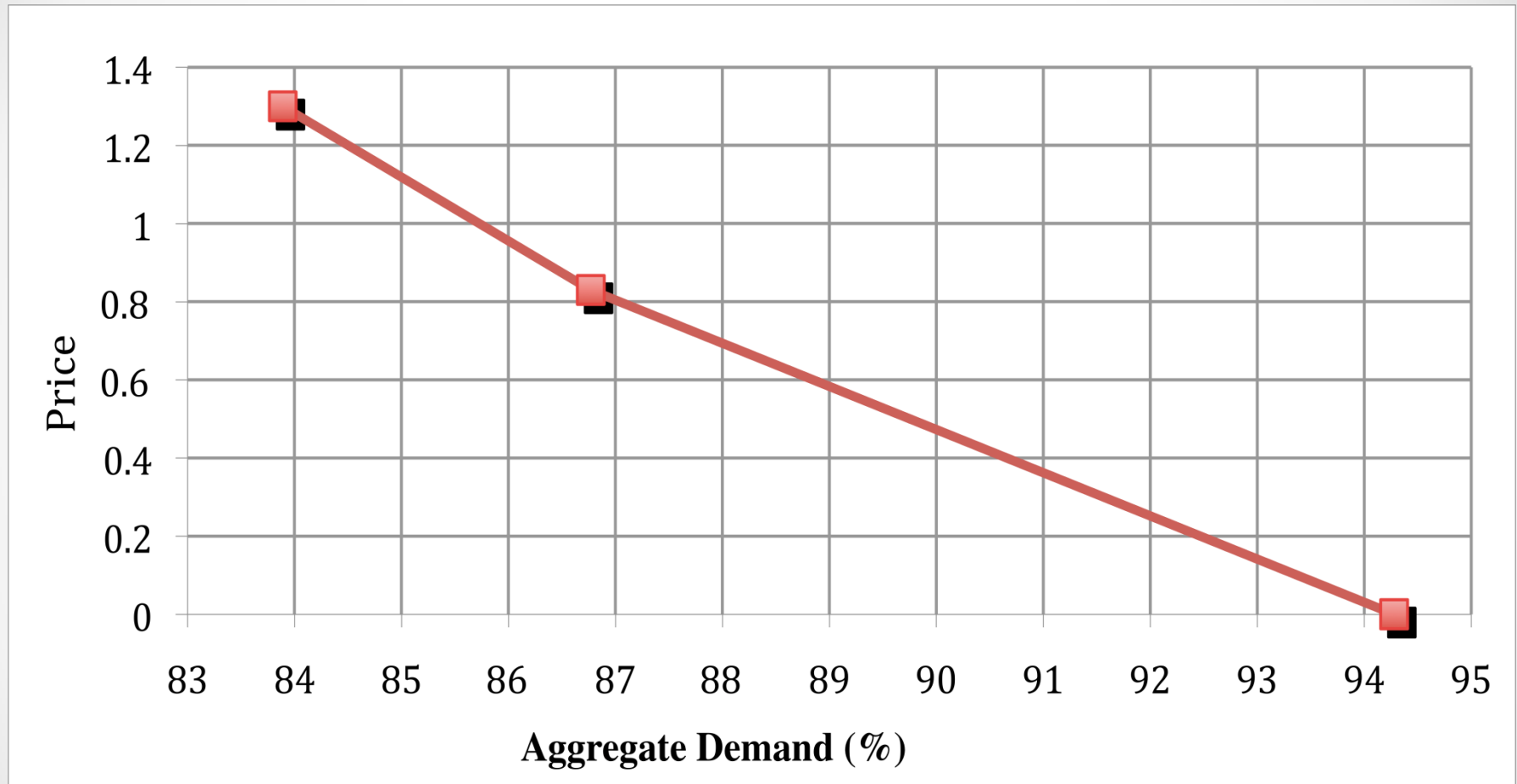


Source: Gupta and Somanathan (2011)

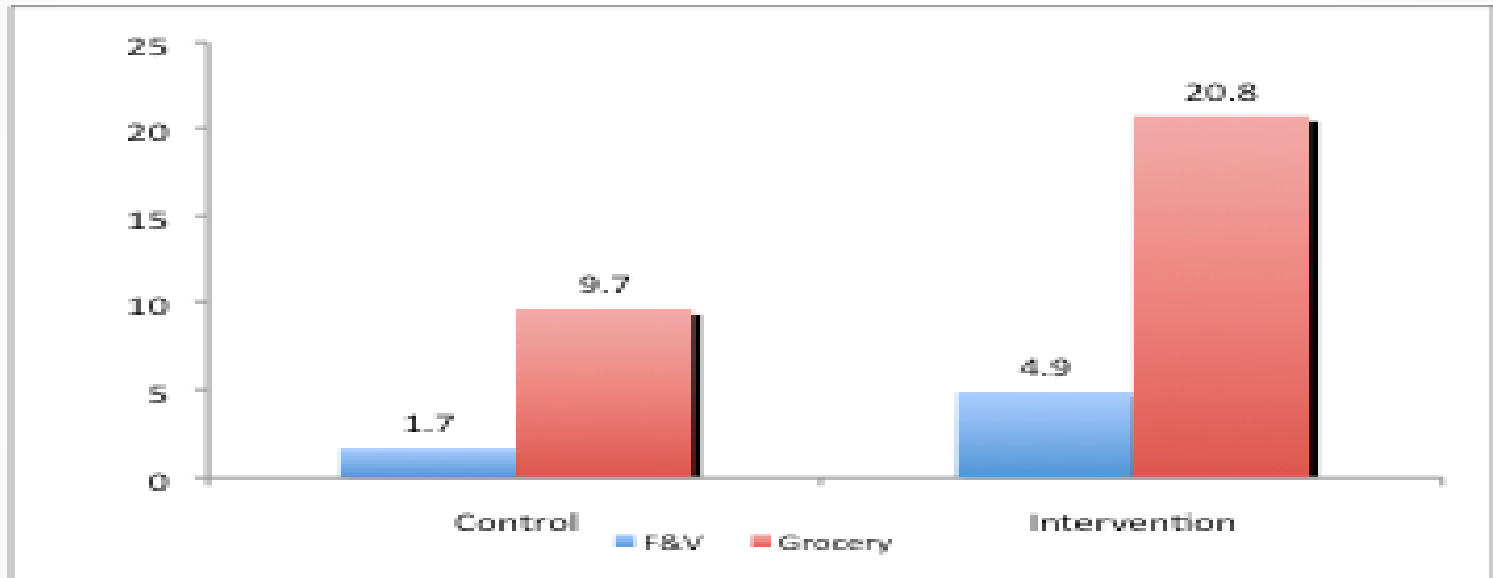
Impact of differential interventions



Price elasticity of demand



Consumers using their own bags



Econometric Analysis

	Dependent Variable: Consumer Brings Own Bag in the Grocery Shops		Dependent Variable: Consumer Brings Own Bag in the Fruits and Vegetable Shops	
	Model 1	Model 2	Model 3	Model 4
	Marginal Effects (with Robust Standard Errors)			
Information	0.06***	-	0.01	-
Negative Information	-	0.04**	-	-0.00
Positive Information	-	0.09***	-	0.01**
Information & Cash back	0.12***	-	0.04***	-
Information & 1% Cash back	-	0.12***	-	0.02**
Information & 2% Cash back	-	0.14***	-	0.07***
Information, Cash-back & Cloth Bags ¹	0.19***	0.19***	0.08***	0.08***
Weekend	-0.003	-0.005	-0.01***	-0.01***
Grocery				
Soft F&V	-	-	-0.01***	-0.01***
Wet Items	-0.08***	-0.08***	-0.002	-0.002
Unpacked Grocery	-0.13***	-0.13***	-	-
Female	-0.004	-0.005	0.02***	0.02***
Age: less than 20yrs ²	0.14***	0.14***	0.03***	0.03***
Age: 20-40yrs	0.05***	0.06***	0.002	0.002
Age: more than 60yrs	0.24***	0.24***	0.06***	0.06***

Concluding remarks

- Plastic waste in general and MPP is a serious concern in India, and land based consumption of plastic is a major source of MPP
- Effective solutions require reduction in real consumption and treatment/recycling of waste
- Economic cost of implementation and socio-cultural, environmental, and the factors that affect behavioral changes determine the effectiveness of mitigation strategies
- A combinations of policy instruments is more effective rather than a single instrument, i.e., policies such as deposit-refund scheme combined with behavioral instruments



Thank you !

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