Are pro-environment behaviours substitutes or complements? Evidence from the field.

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Abstract

This paper uses a field experiment in India to study how interventions designed to increase one pro-environment activity, namely, recycling single-use plastic carry bags, spill over to other pro-environment activities. I show using lab and field experiments combined with survey data that (i) providing information on the need to recycle does not change recycling behaviour, whereas (ii) providing incentives along with the information leads to higher recycling. There is a positive spillover from the incentive treatment to other pro-environment activities. The positive spillover is observed among those in the treatment who responds to the incentives and change recycling behaviour as well as those who do not, indicating the presence of positive spillovers even if the target behaviour is unaffected. This evidence indicates complementarities among pro-environment behaviours and suggests that interventions may have unaccounted positive effects on non-target environment behaviours.

Keywords: pro-environment behaviours, behavioural interventions, spillovers, willingness to pay, field experiment

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1 Introduction

Policy interventions aiming to promote pro-environment behaviours are very common. A recent example is the proposed European Union ban on single-use plastics.[1] While such measures might lead to a reduction in the use of single-use plastics, little is known about how these will affect other domains of pro-environment behaviours, for example, using public transport or changing diet. Would individuals who reduce the consumption of single-use plastics consider that they have done their share towards the environment and engage in fewer other pro-environment behaviours? Or would they increase other pro-environment behaviours to be consistent with the broader goal? This paper looks at the spillovers from interventions targeted at influencing one pro-environment behaviour on other pro-environment behaviours.

In collaboration with the Green Kerala Mission[2] of the government of Kerala, I set up single-use plastic bag recycling centers across 120 classrooms in 30 schools covering over 3,750 students in the state of Kerala, India. Students can bring single use plastic bags to these school recycling centers, which are then counted, weighed, sorted, and recycled at a centralized facility. These recycling centers are used to collect baseline data on student recycling behaviour. Two interventions are then implemented to increase recycling. First, is the information intervention, where students are provided information on the environmental consequences of improper disposal of single-use plastics and why it is important to recycle them. In the second, we provide incentives to students to recycle in addition to communicating the above information. I find that recycling levels in the baseline for all students are very low. They are statistically not different from zero. Providing information alone does not change the recycling behaviour. The incentive treatment, however, leads to a positive and significant increase in the recycling levels.

To measure the spillover effects from these interventions into other behaviours, I collect data on students' willingness to pay (WTP) for seven environment activities before and

[1] Press release from the EU: www.consilium.europa.eu/en/press/press-releases

[2] Green Kerala Mission is an umbrella unit under the government of Kerala to address issues on environment and ecology by co-opting public participation and engagement. For more information: kerala.gov.in/harithakeralam

after the interventions. WTP is elicited through a lab-in-the-field experiment. Positive spillovers from the interventions occur when the students are willing to pay more for environment activities after the intervention than what they were willing to pay before. We find that the information treatment does not spillover into WTPs for different environment activities. But the incentive treatment spills over positively to every measured environment activity. This result indicates that the incentive intervention targeted at increasing recycling of single-use plastic bags not only changed recycling behaviour but also increased the WTP for other environment activities, thus bringing out the complementarities between them. Importantly, the spillover is not limited to the students who increase recycling, but is also observed in those who do not, but are exposed to increased recycling through peers. Thus the intervention spills over positively into non-target behaviours even when failing to alter the target behaviour.

Since the realization that environmental quality depends significantly on human behaviour, and given the ubiquity of behavioural tools, efforts at various scales have been in place to encourage or 'nudge' individuals to adopt pro-environment behaviours. The array of choice architectures used to influence sustainable behaviours have included provision of information (Allcott and Rogers, 2014; Torres and Carlsson, 2018; Delmas et al., 2013), modifying in the defaults (Araña and León, 2013; Brown et al., 2012), triggering social comparisons (Farrow et al., 2017; Nolan et al., 2008; Schultz et al., 2007; Ayres et al., 2013; Ferraro and Price, 2013), and changing the physical environment in which the behaviour is undertaken (Kallbekken and Sælen, 2013). We extend this literature by going beyond the target behaviour, to look at the effect interventions have on non-target behaviours.

More recently, attention has also focused on how different environment behaviours are related. The behaviours most studied are household water use and energy consumption and interventions to reduce household water use also reduce energy consumption, indicating a positive spillover (Carlsson et al., 2020; Jessoe et al., 2021; Goetz et al., 2021). The evidence from a broader set of behaviour, however is mixed - from positive (Lanzini and Thøgersen, 2014; Thøgersen and Noblet, 2012; Alacevich et al., 2021), negative (Truelove et al., 2016), to no spillovers (Poortinga et al., 2013; Carrico et al.,

2018) observed between them. Meta-analyses that evaluate the overall body of literature on environment behaviour spillover reach a similar conclusion on self reported intentions to engage in pro-environment behaviour and actual behaviour (Maki et al., 2019; Geiger et al., 2021).

Identifying credible exogeneities in observational data poses a challenge, more so because of the difficulty involved in observing multiple environment activities that people engage in. Hence, much of the existing literature focuses on self reported intentions to study environmental behaviours and the relationship between them. However, individuals are likely to over report when asked about behaviours that are generally viewed as desirable. In case of RCTs, the number of behaviours observed is often limited to two. We use lab-in-the-field experiment to overcome these challenges by generating exogenous variation and collect the willingness to pay for multiple environmental behaviours.

The paper also relates to a growing literature on pro-social behaviours and moral licensing; as in the broader context, pro-environment behaviours are a category of pro-social behaviours. As individuals engage in a costly pro-social behaviour, it serves as a signal of their pro-social identity and they are more likely to stick to that identity and repeat the behaviour (Gneezy et al., 2012). On the other hand, if the behaviour is costless, the signalling effect vanishes. Individuals may even reduce the behaviour, a finding consistent with the growing literature on moral licensing (Blanken et al., 2015). Moral licensing occurs when an individual initially behaving in a moral way finds it acceptable to later engage in behaviours that are immoral. Evidence for moral licensing is observed, most frequently in charitable donations (Conway and Peetz, 2012; Sachdeva et al., 2009). In a lab experiment subjects who chose to shop in a green store compared to a regular store were more likely to engage in 'less ethical' behaviour in dictator games and lying games that followed (Mazar and Zhong, 2010). Following this line of logic, interventions that encourage one pro-environment action could potentially give individuals the license to reduce other pro-environment actions.

The rest of the paper is structured as follows. In the next section, I describe the design of the field experiment, lab-in-the-field experiment and sources of survey data. Section 3

discusses the hypotheses and empirical strategy. Section 4 outlines the data, results and discusses the potential mechanisms behind the results and section 5 concludes.

2 Research design

The experiment is conducted among school students aged 12-15 in the district of Ernakulam in the state of Kerala in Southern India. The state currently relies on a decentralized system of waste management where households manage the waste generated by either (i) burning or burying it in their premises or (ii) dumping in open spaces or water bodies (Government of Kerala Report, 2020). Almost half of the municipal waste generated in the state is collected by local government bodies and disposed in local landfills. Plastic waste is occasionally separated at source, however, most of it eventually ends up in landfills or in water bodies.

For the study, thirty schools were randomly chosen to form a sample size of around 3,750 students [3] and in each classroom, a plastic waste collection center is set up. We organize monthly collection drives and students are informed in advance of the days they can use the collection boxes to dispose their household recyclable single-use plastic bags. Since there is no regular recycling services offered by the city administration, this is the only place students can recycle. Once the students have deposited items in the collection boxes, they are counted, sorted by weight and thickness, and taken to a centralized recycling facility.[4] We collect student level recycling data for over nine months pre-intervention and three months post-intervention.

2.1 Treatment interventions

Control. There is no intervention in the classrooms that fall in the control treatment. We continue to measure the number of single-use plastic bags that the students bring to recycle.

[3] Power calculations indicate that we can detect effect sizes of .10 pp at $\alpha = 0.05$ with power $p > 0.05$ with this sample size.

[4] We pay the recycling facility to recycle the items given to them. This is consistent with the observation that households do not recycle on their own as it is costly.

INFO treatment. In this treatment we provide information to the students on the need to recycle single-use plastics through an awareness session and posters. The awareness session involved a classroom presentation by the research team on the consequences of single-use plastics ending up in the landfills and rivers of Kerala[5] and the importance of recycling single-use plastics. The same script was used in each of the classrooms that received the information treatment. Additionally, a poster highlighting the message was displayed prominently in each of the classrooms throughout the intervention period, serving as a reminder to the students (figure 9, in Appendix A1). We continued to collect data on the amount of recycling of the students. This treatment is referred as the INFO treatment in the rest of the paper.

INFO + INC treatment. Students in the third treatment are incentivized to increase their recycling, in addition to receiving the above information on the importance of recycling. The top five students in each class who recycle the most number of items received certificates from the district administration and were invited to an "evening with a celebrity".[6] The awareness sessions remain the same as the INFO treatment, except that at the end of the awareness sessions, the incentive structure is announced to the students. Posters in the classrooms under this treatment highlighted both the importance of recycling as well as the incentives (figure 10, in Appendix A1). This treatment is referred as the INFO + INC treatment.

2.2 WTP for pro-environment behaviours: Lottery task

While the levels of recycling are directly observable, it is challenging to observe and accurately measure other environment activities that the students engage in. A lab in the field experiment is set up to capture other dimensions of pro-environment behaviours in addition to recycling. The willingness to pay measure captures the extent to which

[5] Environment friendly waste management has received increasing attention over the last three years due to unexpected floods across the state during the monsoon season of 2018, resulting in large scale loss of life and property. The awareness sessions emphasized this. The details of the sessions are available in the appendix.

[6] We stayed away from monetary incentives as in the context of moral behaviours, such incentives could potentially crowd out intrinsic motivation Benabou and Tirole (2003); Bénabou and Tirole (2006); Ariely et al. (2009). In the pilot we tested the responsiveness of students towards several non-pecuniary incentives. An "evening with a movie star" was the most popular among the students followed by certificates from the district administration.

students care about pro-environment activities, and serves as a close proxy in the absence of observational data.

WTP is elicited through a lottery task. Every student gets a lottery that gives them a 1/10 chance of winning 100 INR ($\approx$ 1.50 USD). Before drawing the winner of the lottery, students are given a list of seven environment activities. They are as follows: plastic recycling, paper recycling, reduce air pollution, reduce water pollution, plant trees, promote public transport and save wildlife. They are then asked if they want to give a(ny) share of their earnings towards each activity, in case they win. Students have to enter an amount (between 0 and 100, both limits inclusive) that they are willing to give towards every activity item on the list.

The students are informed *before* they enter the amounts, that in case they win the lottery, one of these activities will be randomly picked, the amount they agreed to spend on the picked activity will be deducted and the rest paid to them. Students receive the exact details of how their contribution to a particular activity will be spent before they decide their contributions. For example, if a student gave 10 INR for planting trees, the money is used to buy saplings and plant them in a particular location in the school district.[7]

Once the students have entered the amounts for the seven activities, we draw the lottery. For each of the winners we randomly pick an activity from the list. We deduct their contributions to the picked activity from the prize money and pay the remaining to the winner. The payoffs are realized immediately after the task. All the students undertake the lottery task a month before the treatment interventions and three months after the interventions.

Such a task overcomes some of the challenges encountered in observational data. First is the advantage of using an incentive compatible elicitation of the WTPs over the alternative of self reporting of environmental activities. Secondly, performing

[7] Contributions to plastic (paper) recycling is spent to run an awareness campaign in the city on the need to recycle plastics (paper). Contributions to reduce air (water) pollution is spent to run an awareness campaign in the city to reduce air (water) pollution. Contributions to promote public transport is used to run an awareness campaign to increase the use of public transport among the city residents. Contributions to save wildlife is spent on running a campaign to create awareness about protecting endangered animals in the region.

pro-environment activities are costly for individuals (Thøgersen and Crompton, 2009). This poses a difficulty in analysing observational data because additional assumptions need to be made on how these costs are distributed among the individuals. Here, we experimentally control for the cost using the lottery task. As every individual is given a lottery with 1 in 10 chance of winning 100 INR, this is the maximum amount that the individual can spend on each of the pro-environment activities.

2.3 Survey questionnaire

We use a survey questionnaire to collect data on intrinsic motivation of the students towards engaging in pro-environment behaviours. We adapt the standard New Environmental Paradigm (NEP) scale to measure attitudes and beliefs of students towards environment, awareness about the consequences of human actions, and the different pro-environment activities they undertake everyday (Dunlap and Van Liere, 1978). Based on the responses in this survey, we compute an environment score for all the students. The full survey design and scoring methodology are presented in appendix.

Additionally, we collect data on classroom norms pertaining to recycling and other pro-environment behaviours. The data on classroom norms are elicited in a two stage process consistent with the Krupka-Weber elicitation method (Krupka and Weber, 2013). First, the students are asked a series of four questions on their self-behaviour. These questions concern whether they recycle, switch off electrical appliances after use, litter, and use disposable plastic cups and plates. After students have responded, they are informed that their classmates also just answered these questions, and are asked to guess the response of their classmates. Students are given a four point scale with options including "almost all my classmates", "some of my classmates", "not a lot of my classmates" and "none of my classmates". If students believe that most of their classmates behave pro-environmentally on the four questions, we categorize the classroom as having strong norms regarding environment activities. The questionnaire for norm elicitation is available in the appendix.

While WTP is an increasingly popular outcome variable in social and environmental science studies, there may be social desirability elements to the measurement of WTP. To control for these, the survey measures the respondent's propensity to give responses that are considered socially desirable or responses they think experimenters expect from them, using the Marlowe-Crowne scale (Crowne and Marlowe, 1960; Reynolds, 1982; Dhar et al., 2018). We also collect socio-demographic characteristics like gender, age, and household income.

3 Hypotheses

To measure the spillovers, the first goal is to check if the treatments succeed in changing the recycling behaviour of the students. We use a difference-in-difference estimation. This is essential due to the absence of data on recycling behaviour of the students at the start of the study as they do not have access to any recycling facilities. We use the data from all schools in the sample to arrive at baseline recycling levels before dividing the schools into control, INFO treatment and INFO + INC treatment. This gives a difference-in-difference setting where we can measure if the difference in recycling levels pre- and post- intervention of a treatment is different from the difference in the recycling levels pre- and post- intervention in the control.

3.1 On recycling levels

Both the treatments are aimed at nudging the students to increase recycling levels either by providing information on the need to recycle or providing direct incentives to recycle in addition to the information.

Hypothesis 1a Change in recycling level of students in the INFO treatment pre- and post- intervention is larger than the change in recycling level of students in the Control pre- and post- intervention.

$$\Delta \,\text{Recycling}^{\text{INFO}} - \Delta \,\text{Recycling}^{\text{Control}} > 0$$

Hypothesis 1b Change in recycling level of students in the INFO + INC treatment pre- and post- intervention is larger than the change in recycling level of students in the Control pre- and post- intervention.

$$\Delta \text{Recycling}^{(\text{INFO } + \text{ INC})} - \Delta \text{Recycling}^{\text{Control}} > 0$$

3.2 On WTP for other pro-environment behaviours

As discussed in the last section, we collect the WTP data using the lottery experiment a few months before and after the intervention. We are interested in the change in the willingness to pay, i.e. $\Delta \text{WTP}_{ij} = \text{WTP}_{ij}^{\text{post}} - \text{WTP}_{ij}^{\text{pre}}$, for each student i for each environment activity j in the list of 7 activities. The rest of the hypotheses are on ΔWTP_{ij}.

If the ΔWTP_{ij} is positive, it implies that students are willing to pay more for an environment activity j after the intervention compared to before the intervention. If this goes hand in hand with an increase in the levels of recycling, these two activities are complements. There are multiple potential explanations for this complementarity. If the interventions succeed in increasing the awareness levels of the subjects on environment issues and changes the intrinsic motivation to engage in pro-environment behaviours, this would be reflected in a simultaneous increase in both recycling behaviour as well as willingness to pay. Once individuals engage in a pro-environmental activity, a preference to behave consistently as predicted by the consistency theory (Abelson, 1983) and cognitive dissonance theory (Festinger, 1962) would also suggest a positive spillover to other similar behaviours. Another potential channel is through changes in social norms among peers. If interventions cause an increase in recycling levels, subjects would update their beliefs about environment norms among peers. If subjects believe that increased engagement in environment behaviours is the revised norm, positive spillovers can be expected onto the willingness to pay.

A negative ΔWTP_{ij} indicates that students have lowered their contributions to the environment activity j. And if this happens with those who increase their levels of

recycling, these two activities are substitutes. This substitutability can be attributed to moral licensing, as subjects who increase recycle levels in response to the interventions might find it acceptable to reduce their WTP towards other environment activities. We are agnostic about the direction of spillovers and have the following hypotheses:

Hypothesis 2a Change in the WTP of the subjects for an environment activity j in the INFO treatment pre- and post-intervention is different to the change in the WTP for activity j in the Control pre- and post- intervention.

$$\Delta\,\mathrm{WTP}_{ij}^{\mathrm{INFO}} - \Delta\,\mathrm{WTP}_{ij}^{\mathrm{Control}} \gtrless 0$$

Hypothesis 2b Change in the WTP of the subjects for an environment activity j in the INFO + INC treatment pre- and post-intervention is different to the change in the WTP for activity j in the Control pre- and post- intervention.

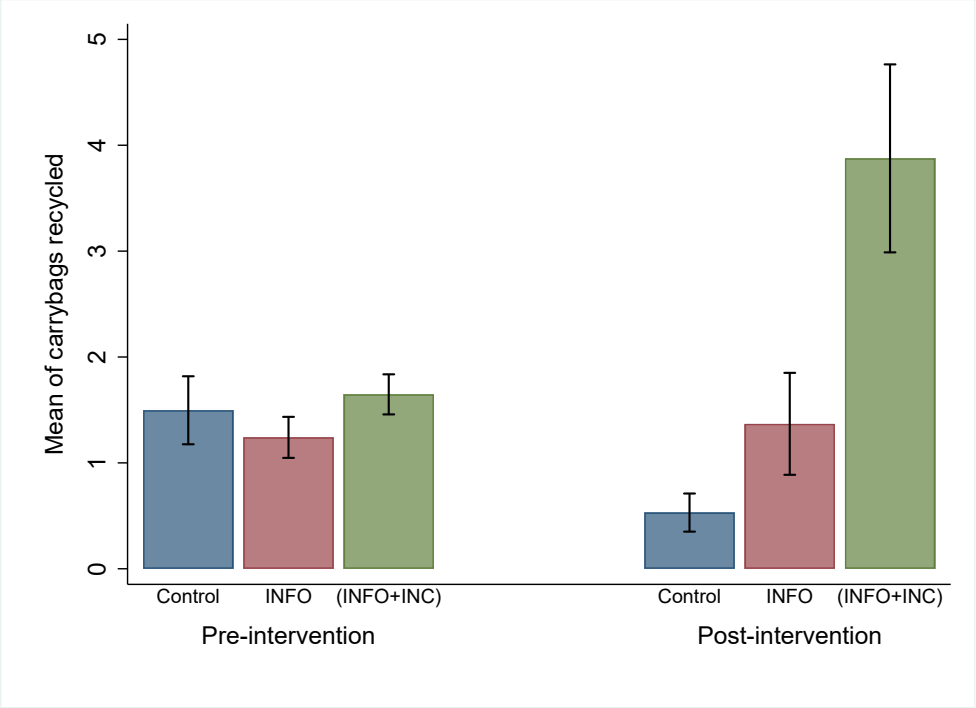
$$\Delta\,\mathrm{WTP}_{ij}^{(\mathrm{INFO}\ +\ \mathrm{INC})} - \Delta\,\mathrm{WTP}_{ij}^{\mathrm{Control}} \gtrless 0$$

When $\Delta\,\mathrm{WTP}_{ij}$ takes the value zero, it implies that there are no spillovers. Meta-analyses suggest that there may be interventions that do not cause spillovers, although none of the studies have considered a WTP outcome measure (Maki et al., 2019; Geiger et al., 2021).

4 Data and Results

The study was conducted over the period of February 2019 to March 2020. From the baseline data we find that, on average, students recycle about 1.4 carry bags before the intervention. Around 8.8% of students recycle and the recycling level is not statistically different in each of the three treatment groups. These baseline averages are shown in figure 1 (detailed table 6 can be found in the appendix).

Figure 1: Pre- and post-intervention recycling of single-use plastic bags



Note: The figure shows the pre- and post-intervention recycling of single use plastic bags across the three treatments. The plots show the mean and 95% confidence intervals.

4.1 On recycling levels

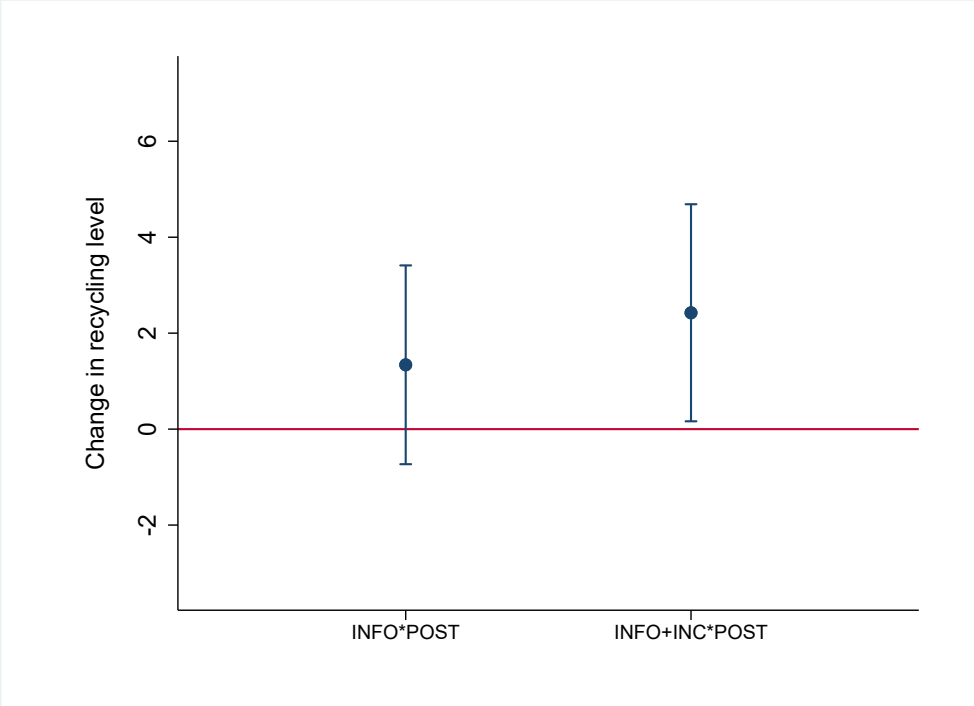
We estimate following difference-in-difference regression using OLS:

$$Y_i = \beta_0 + \beta_1 t_i + \beta_2 \text{INFO}_i + \beta_3 (\text{INFO} + \text{INC})_i + \delta_1 (t_i.\text{INFO}_i) + \delta_2 (t_i.\text{INFO} + \text{INC}_i) + \beta_4 X_i + \epsilon_i$$

The outcome variable Y_i indicates the number of carry bags recycled by subject i. The variable INFO_i takes value 1 if the subject i is in INFO treatment, $(\text{INFO} + \text{INC})_i$ takes the value 1 if subject i is in INFO + INC treatment, t_i takes the value 1 if the observation is from the post intervention period, and X_i is a vector of control variables including age, gender, and income. The co-efficients of interest are δ_1 and δ_2 and they capture the effect of being in the treatments post the intervention. In other words, they capture the change in recycling levels for treated schools less the change in recycling levels for control schools.

Figure 2 shows the first main result. We find that information alone as a nudge does not lead to a significant increase in recycling levels. However, offering incentives in addition to the information increases recycling levels. The change in the recycling levels of students who are in the INFO + INC treatment pre- and post- intervention is 2.38 percentage points higher than the change in the recycling levels of students in the control pre- and post- intervention. This is significant ($p < 0.05$).

Figure 2: Recycling of single-use plastic bags



Note: The figure shows the effect of the treatments on the change in the recycling levels. The plots show the coefficient estimates and 95% confidence intervals obtained from difference-in-difference estimation (specification 4 in table 1), regressing the outcome variable (change in the recycling level) on the INFO * POST dummy and the (INFO + INC)*Post dummy. The INFO * POST dummy captures the effect of being in the INFO treatment post the intervention. Similarly, the (INFO + INC)*Post dummy captures the effect of being in the INFO + INC treatment post the intervention.

Table 1 reports these results from the difference-in-difference regressions. The dependent variable is the number of single-use plastic bags recycled. The variables of interest are INFO*Post and (INFO + INC)*Post. INFO*Post is the difference-in-difference indicator that takes the value 1 if the individual student is in the INFO treatment post the intervention. The estimated co-efficient for INFO*Post variable equals 1.09 and is significant ($p < 0.01$) (column 1). This indicates that the

change in recycling level pre- and post-intervention in the INFO treatment is 1.09 percentage points larger than the change in recycling levels pre- and post-intervention in the control schools. However, clustering the standard errors at the classroom level (presented in column 2) makes the effects insignificant. Adding the control variables (column 3) and school level fixed effects (column 4) do not qualitatively change the results.

Result 1a: There is no significant difference between the change in recycling level of students in the INFO treatment pre- and post- intervention compared to the the change in recycling level of students in the control pre- and post-intervention.

The variable (INFO + INC) * Post captures the effect of an individual student being in the INFO + INC treatment post the intervention. Column 1 of table 1 indicates that it has an estimated co-efficient of 3.19 which is significant ($p < 0.01$). The change in recycling levels pre- and post- intervention in the INFO + INC treatment is 3.19 percentage points larger than the change in recycling levels pre- and post- intervention in the control schools. Adding control variables and clustering the standard errors gives a revised co-efficient of 2.38 which is also significant ($p < 0.05$). Adding school level fixed effects does not further change the results.

Result 1b: Change in recycling level of students in the INFO + INC treatment pre- and post- intervention is larger than the change in recycling level of students in the Control pre- and post- intervention.

Standard errors are clustered at the classroom level (grade-by-division-by-school) in columns 2 to 4 in table 1. Additionally, in column 4, I add school level fixed effects to the estimation. The set of controls include age and gender of students. Girls are 1.51 percentage points more likely to recycle and younger students are 2.84 percentage points more likely to recycle (both at $p < 0.05$).

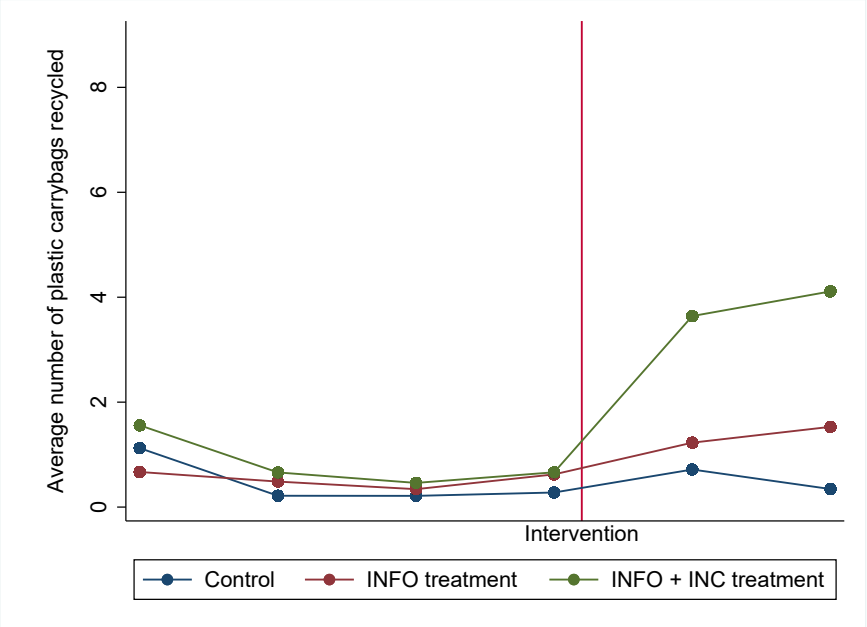
Table 1: Recycling of single use plastic carry bags

	Number of single-use plastic bags recycled			
	Specification: DID			
	(1)	(2)	(3)	(4)
INFO * Post	1.094***	1.094	1.341	1.295
(Diff-in-Diff)	(0.325)	(0.759)	(1.049)	(1.035)
(INFO + INC) * Post	3.195***	3.195***	2.425**	2.388**
(Diff-in-Diff)	(0.500)	(1.155)	(1.145)	(1.135)
Post	-0.966***	-0.966	-0.943	-0.947
	(0.188)	(0.587)	(0.826)	(0.826)
INFO	-0.256	-0.256	-0.807	-0.873
	(0.191)	(0.663)	(0.990)	(0.995)
INFO + INC	0.150	0.150	0.271	0.534
	(0.190)	(0.600)	(0.801)	(0.729)
Clustering	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
School FE	No	No	No	Yes
Constant	1.497***	1.497***	25.90***	25.69***
	(0.164)	(0.553)	(7.577)	(7.468)
No. of Obs.	26050	26050	14118	14118
R-Squared	0.00493	0.00493	0.0129	0.0133

Note: Dependent variable in this estimation is the number of single use plastic bags that an individual student brings to recycle. INFO * Post and (INFO + INC) * Post are the Diff-in-diff variables of interest. They capture the effect of being in the respective treatments post the intervention.
The variable post takes value 1 if the period is after intervention and 0 if period is before intervention. INFO indicates schools that are in the information treatment and (INFO + INC) indicates information + incentive treatment. Ordinary least squares (OLS). Standard errors are clustered at the classroom level. Robust standard errors in parentheses.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

It is important for the difference-in-difference specification that the co-efficients of the terms INFO and INFO + INC are not significant. There is no significant difference in recycling levels between the two treatment groups and the control in the sample *before* the intervention kicks in. There are more periods pre-intervention than post-intervention in the data to credibly establish these parallel trends. Moreover, the two treatments and

Figure 3: Pre-trends in the recycling of single-use plastic bags



Note: The graph shows average number of plastic carry bags recycled by students every month. Blue dots indicate the control group, red dots indicate the INFO treatment, and green indicates INFO + INC treatment. Before the intervention, the average recycling levels are statistically the same in the three treatment groups and are not statistically different from 0.

control are similar not just in the levels of recycling but also in trends in recycling before the intervention. Figure 3 plots the average number of plastic carry bags recycled in the three treatments over time. The average number of carry bags recycled is statistically the same across treatment groups before the intervention.

Additionally, the risk of cross contamination of the treatment and the control groups is very minimalThe entire data collection process lasted one school year and students did not drop out of one classroom and join another in the sample. The control variables including demographics are also orthogonal to the treatment interventions.

A comparison of the two interventions shows that the change in recycling levels in INFO + INC treatment pre- and post- is significantly higher than the change in the INFO treatment. This indicates that incentives drive the increase in recycling. The results are presented in table 2. As column 3 indicates the change in the recycling levels of students in the INFO + INC treatment is positive and is 2.67 percentage points larger than that

of the INFO treatment (clustered, $p < 0.01$). Conservative estimation with school level fixed effects gives a revised co-efficient of 1.66 percentage points ($p < 0.10$).

Table 2: Difference between treatments on recycling of single-use plastic carry bags

	Number of single-use plastic bags recycled			
	Specification: DID			
	(1)	(2)	(3)	(4)
Baseline: INFO treatment (INFO + INC) * Post	2.101*** (0.533)	2.675** (1.067)	1.660* (0.853)	1.649* (0.851)
Clustering	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
School FE	No	No	No	Yes
No. of Obs.	17412	26050	14118	14118
R-Squared	0.00528	0.00466	0.0124	0.0128

Note: This table presents estimations using data from only the INFO treatment and (INFO + INC) treatment. Dependent variable in this estimation is the number of single use plastic bags that an individual student brings to recycle. (INFO + INC) * Post is the Diff-in-diff variables of interest. Ordinary least squares (OLS). Standard errors are clustered at the classroom level. Robust standard errors in parentheses.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

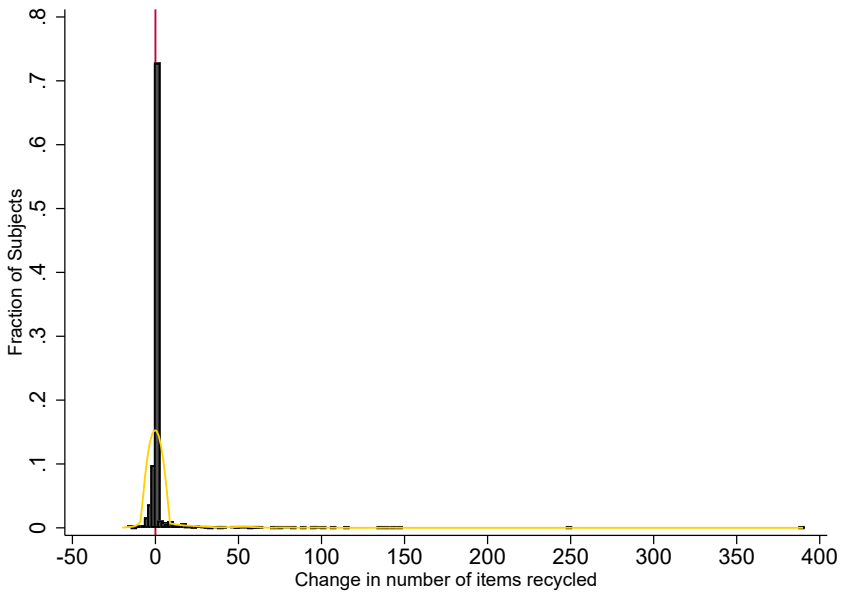
Next, we look at whether the students' decision to recycle is influenced by the treatment. Table 3 presents the estimation results. The analysis shows that neither of the treatments has an effect on the students' decision to participate in recycling. A closer look into the recycling behaviour shows that, most of the effects we identify in Result 1b are driven by a subset of "super-recycler" students (roughly 10% of the students) who increase their recycling levels substantially in the INFO + INC treatment. The effect of the treatment works entirely through the intensive margin, where individuals who already brought some (albeit, very few) plastic bags to recycle, after the intervention, significantly raise their recycling levels. There is no significant change in the remaining 90% of students who belong in the INFO + INC treatment (Figure 4).

Table 3: Decision to recycle

	Decision to recycle			
	Specification: DID			
	(1)	(2)	(3)	(4)
INFO * Post	0.0196***	0.0196	0.0317	0.0311
	(0.00705)	(0.0198)	(0.0225)	(0.0228)
(INFO + INC) * POST	0.00436	0.00436	-0.0126	-0.0130
	(0.00788)	(0.0220)	(0.0226)	(0.0227)
Clustering	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes
School FE	No	No	No	Yes
No. of Obs.	17412	26050	14118	14118
R-Squared	0.00528	0.00466	0.0124	0.0128

Note: Dependent variable in this estimation is a binary variable that captures the student's decision to recycle or not. It takes value 1 if the student recycles and 0 otherwise. LPM. Standard errors are clustered at the classroom level. Robust standard errors in parentheses.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 4: Share of subjects who change recycling behaviour in the INFO + INC treatment



Note: Change in the number of single-use plastic bags recycled after the intervention in the INFO + INC treatment. The peak is between 0-5 carry bags, with a very long right tail.

4.2 Effects on the WTPs

The spillovers are calculated as the difference between pre- and post-intervention WTP for an individual student i for each environment activity j (represented as $\Delta WTP_{(i,j)}$) and checking if this difference varies significantly across treatments. The pre-intervention WTP ranges between 7.30 INR for promoting public transport to 19.50 INR for planting trees. Table 4 presents the average WTP for the activities across treatments before and after the interventions.

Table 4: Average WTP contributions (in INR)

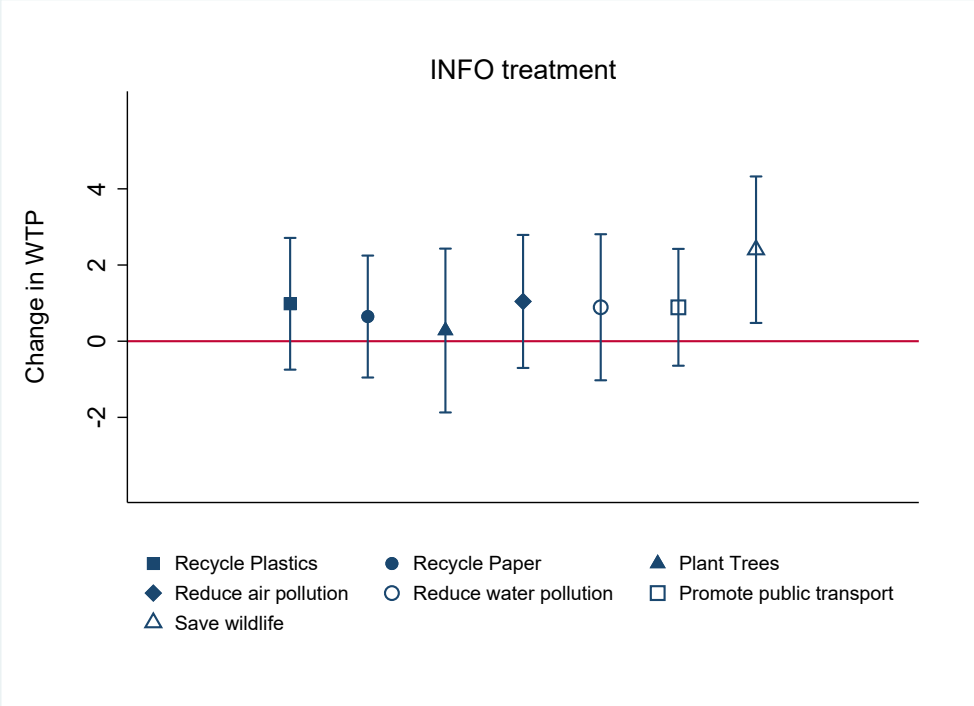
	Pre-Intervention			Post-Intervention		
	Control	INFO	(INFO + INC)	Control	INFO	(INFO + INC)
Average contribution to WTP						
Recycle plastics	11.49	13.09	11.00	9.98	12.16	12.87
Recycle paper	8.41	9.37	7.62	8.04	9.30	10.03
Plant trees	19.61	22.25	18.24	15.59	16.85	18.95
Reduce air pollution	11.74	11.80	8.99	10.25	11.10	11.29
Reduce water pollution	12.34	12.46	11.24	11.46	11.88	12.87
Promote public transport	7.32	8.09	6.57	7.38	8.78	8.25
Save wildlife	13.24	12.62	11.47	11.07	12.28	12.32

The changes in the WTP of all seven activities in the INFO treatment are statistically not different from the changes in the control. However, in the INFO + INC treatment, post-intervention WTP is larger than the pre-intervention WTP. This increase is significant ($p < 0.01$) for all activities other than saving wildlife. Figure 14 in the appendix shows how the change in WTP for each activity varies across the three treatments.

Figure 5 shows the effect of being in the INFO treatment on the change in WTP compared to the control. The change in the WTP for each activity j pre- and post- intervention is not significantly different from the control, except for promoting efforts to save wildlife which sees an increase of 2.4 percentage points. The magnitude and direction of ΔWTP for the other six activities are statistically not different from the ΔWTP in the control.

INFO + INC treatment, on the other hand, spills over positively into the WTP for all the seven environment activities, that is, students in this treatment on average contribute more in the post-intervention lottery task compared to the pre-intervention lottery task.

Figure 5: Change in the WTP in INFO treatment



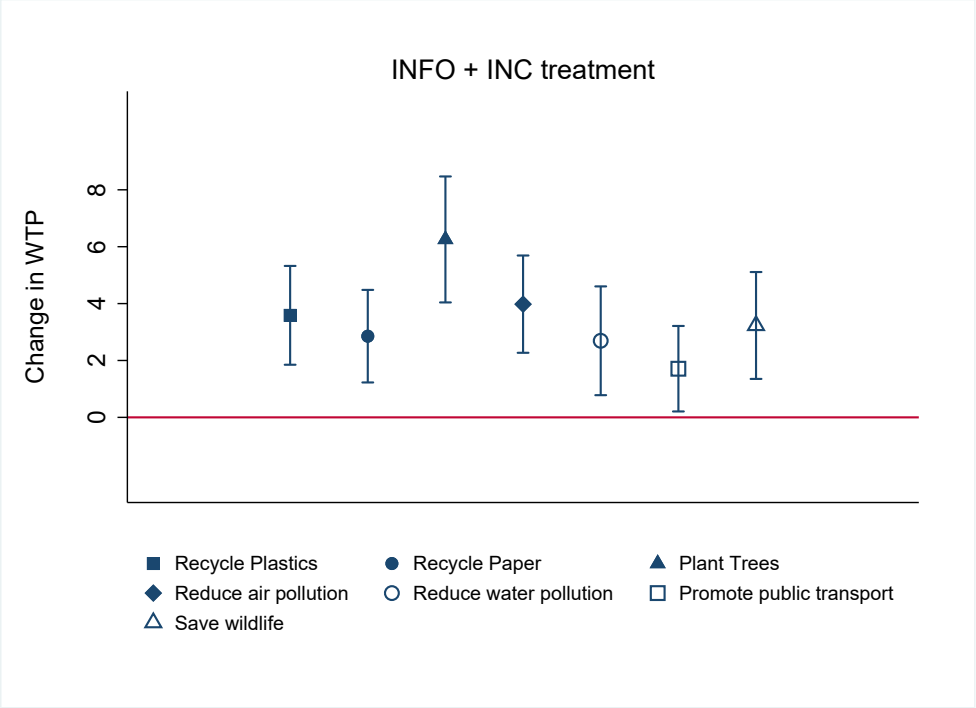
Note: The figure shows the effect of the INFO treatment on the change in WTP for different environment activities. The plots show the coefficient estimates and 95% confidence intervals obtained from regressing the outcome variable (change in the WTP) on INFO treatment dummy. Coefficients are obtained from the regression estimation clustered at the classroom level, with all the control variables (same specification in table 5). Y-axis displays the outcome variable. The horizontal line at zero represents the control group. Here, the plots indicate that the change in WTP for environment actions of the students in the INFO treatment is not statistically different from that of the control, except in the case of saving wildlife.

Figure 6 shows that the change in WTPs for every activity j is positive and significantly different from zero for the students in the INFO + INC treatment.

The regression results are presented in table 5. From the last section, we know that the INFO treatment does not change the recycling behaviour of students. Consistent with that, there is no change in the WTP for environment activities in this treatment. The co-efficients are small and not statistically significant. The only exception is the 2.4 percentage point increase in contributions to saving wildlife ($p < 0.05$).

In contrast, those in the INFO + INC treatment considerably increase their contributions to *every* environment activity. The effects are significant ($p < 0.01$). There is a 3.58 pp increase in contributions to promoting plastic recycling, 2.85 pp increase in case of promoting paper recycling, 6.25 pp increase in planting trees, 3.98 pp

Figure 6: Change in the WTP in INFO + INC treatment



Note: The figure shows the effect of the INFO + INC treatment on the change in WTP for different environment activities. The plots show the coefficient estimates and 95% confidence intervals obtained from regressing the outcome variable (change in the WTP) on INFO + INC treatment dummy. Coefficients are obtained from the regression estimation clustered at the classroom level, with all the control variables (same specification in table 5). Y-axis displays the outcome variable. The horizontal line at zero represents the control group. Here, the plots indicate that students in the INFO + INC treatment have a positive and statistically significant change in the WTP for every environment action compared to the control. This indicates that students in this treatment increase their WTP for every environment action.

increase in promoting reduction of air pollution, 2.69 pp increase in promoting reduction of water pollution, 1.71 pp increase in promoting public transport and 3.23 pp increase in contributions to saving wildlife. This analysis implies that when the intervention is strong enough to induce a change in recycling behaviour, it spills over positively into other dimensions of environment behaviours that we measure.

Since the "super-recyclers" drive most of the change in recycling behaviour in the INFO + INC treatment, we compare the change in WTP of this group to the non-recyclers in the same treatment. There is weak evidence that super-recyclers have a higher increase in the average WTP compared to the non-recyclers (Wilcoxon Mann-Whitney Test, $p = 0.07$, panel (a) of figure 7). However, compared to the students in the control group, the non-recyclers in INFO + INC treatment also increase their average WTP (i.e. they have a

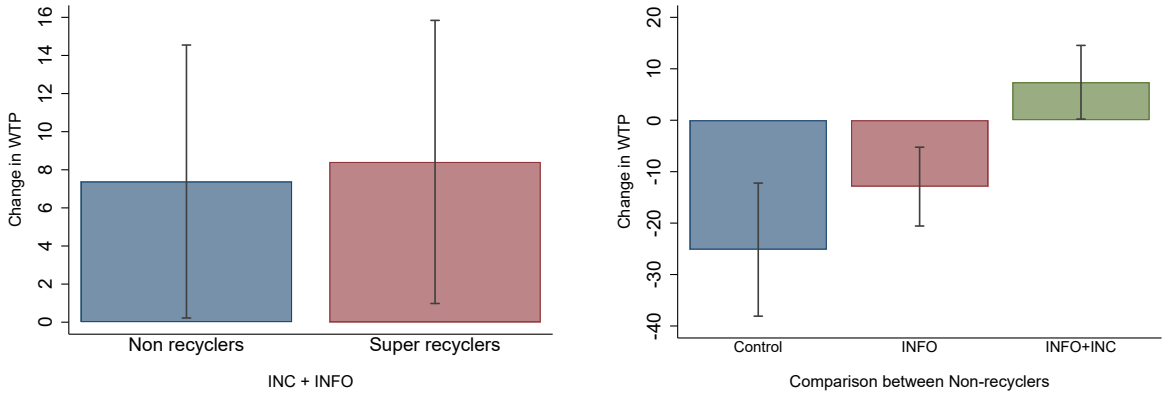
Table 5: WTP for different environment activities

	Dependent variable: $\Delta\ WTP_{ij}$						
	Plastic recycling (1)	Paper recycling (2)	Planting trees (3)	Reduce air pollution (4)	Reduce water pollution (5)	Promote buses (6)	Save wildlife (7)
Baseline: Control group							
INFO treatment	0.982	0.647	0.280	1.044	0.891	0.890	2.402**
	(0.882)	(0.817)	(1.097)	(0.891)	(0.978)	(0.782)	(0.981)
INFO + INC treatment	3.587***	2.854***	6.255***	3.980***	2.693***	1.711**	3.231***
	(0.886)	(0.830)	(1.129)	(0.872)	(0.975)	(0.766)	(0.958)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.	3255	3252	3254	3252	3255	3249	3254

Note: Dependent variable in this estimation the change in WTP for each of the environmental activities. Ordinary least squares (OLS). Standard errors are clustered at the classroom level. Robust standard errors in parentheses.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

higher post-intervention WTP compared to the pre-intervention WTP). This increase is significantly different from the negative change in WTP of the students in the control treatment and the INFO treatment (panel (b) of figure 7). This indicates a positive spillover from the intervention into non-target behaviours in some individuals even when the intervention had no effect on the target behaviour.

Figure 7: ΔWTP among recyclers and non-recyclers, and across treatments



(a) (b)

Note: Panel (a) shows that there is no statistical difference in ΔWTP between recyclers and non-recyclers in the INFO + INC treatment. On the other hand, panel (b) indicates, that the non-recyclers in the INFO + INC treatment on average have a higher ΔWTP compared to the non-recyclers in both Control and INFO treatments. The ΔWTP is not statistically different between Control and INFO treatments.

Both the interventions used here focus primarily on the recycling of single-use carry bags. Recycling is made very salient, and an increased salience of recycling could potentially lead to students focusing exclusively on that in the lottery task at the expense of other pro-environment behaviours. However, the results do not indicate that students disproportionately favour recycling of plastic or recycling of paper in the lottery task. Complementarity between recycling of single-use plastics and other environment activities could also be an artifact of intrinsic motivation towards pro-environment activities. Intrinsic motivation is controlled through the environment score, and is not significant. A concern about social approval among subjects could also lead to an increase in several (or all) pro-environment behaviours. We control for this using the Marlowe-Crowne scale and is also insignificant.

Studies from the environmental science literature state that positive spillovers could be observed between environment activities that are behaviourally similar to each other or those that contribute to the same final goal (Truelove et al., 2014; Margetts and Kashima, 2017; Thøgersen and Ölander, 2003; Cornelissen et al., 2008). The lottery task helps control for behavioural similarity and dissimilarity theories as explanations for substitutability or complementarity. There are different dimensions along which behaviours are similar or dissimilar. Similarity could be in terms of time and place of their action, or the resources required to do it, or the inherent goal of the activity. The major advantage of the lottery task is that the time and place of the action as well as resources required to do it are held constant. The list of activities that are used in the task neatly classify into behaviours that are relatively similar to recycle of single-use plastic bags (e.g. recycling paper) and those that are relatively dissimilar (e.g. planting trees). Our results indicate a consistent positive spillover from recycling plastic bags to WTP for different environment causes. However, it is to be kept in mind that the inherent activity in the lottery game could be thought of simply as a *contribution* to different causes. In this way, we are capturing spillovers between recycling and willingness to contribute to a pro-environmental cause.

4.3 Empirical expectations of peer behaviour as a potential mediator

Individual actions are also influenced by the peer group and the observed change in recycling behaviour could be a reflection of changes in the peer norms surrounding environment activities in general and recycling in particular. Empirical expectations that individuals have about behaviour in the reference group is shown to influence a range of behaviours (Bicchieri and Xiao, 2009). If the treatments change recycling behaviour, that could in turn change the empirical expectations in the classrooms, not just on recycling, but also on environment actions in general. I elicit (non-incentivized) empirical expectations of peer behaviour when it comes to recycling of single-use plastic bags and other environment activities (namely, littering, switching off electrical appliances after use, and use of single-use plastic cups and plates)[8].

Students in the (INFO + INC) treatment on average have higher empirical expectations than the other two treatments (mean value of 2.35 compared to 2.31 in Control and 2.30 in INFO treatment, Kruskal-Wallis equality-of-populations rank test, $p = 0.0316$). Interestingly, no significant difference is found between the empirical expectations of the super-recyclers and non-recyclers within the (INFO + INC) treatment (Kruskal-Wallis equality-of-populations rank test, $p = 0.3317$). (INFO + INC) treatment could have changed the recycling behaviour as well as WTP through its effect on the empirical expectations of the students regarding their peers' behaviour. I instrument the empirical expectations by the treatment variable in a 2SLS estimation to see if there is a mediating effect. The results presented in table 7 in Appendix A.6 does not point to empirical expectations as a potential mediator.

4.4 Environment scores and effect of the treatment

One of the results from the last section is that the INFO treatment does not have an effect in increasing the recycling levels. One of the possible reasons for this observation is that the levels of awareness about environmental issues and the need for recycling is already quite high in the baseline, i.e., before any intervention and that the treatment

[8] Full questionnaire and elicitation methodology are presented in the appendix A.4.

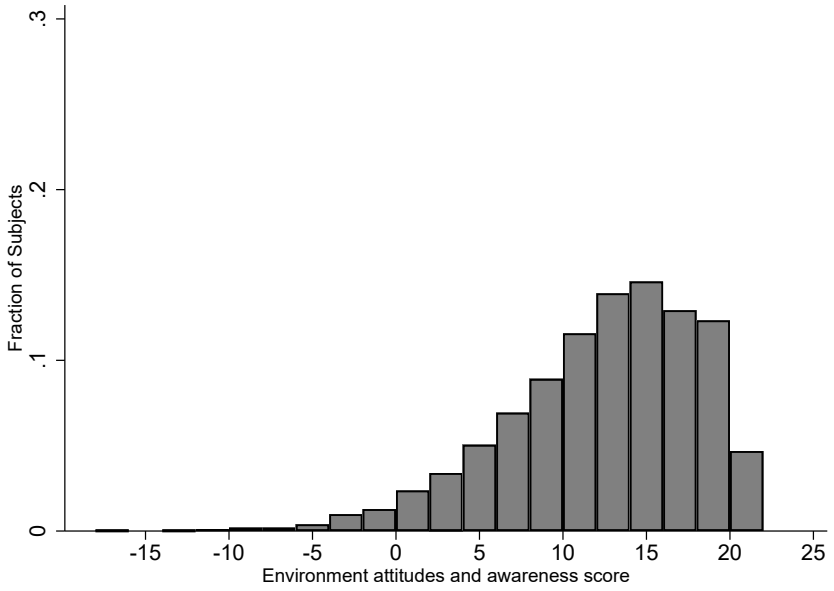
did not provide any new information. This would imply that individuals do not recycle not for want of knowledge or awareness, but for other reasons.

I use the data collected from the environment attitudes and awareness survey to test this mechanism. The intrinsic link between environment attitudes and subsequent environment behaviours has been extensively documented (Gardner and Stern, 1996; Hines et al., 1987). The underlying principle is that those individuals who exhibit stronger pro-environmental attitudes are more likely to engage in such behaviours, whether they are self-reported or observed. Hence measuring an individual's concern towards the environment is an essential first step in understanding pro-environment behaviours. I use an adapted[9] New Environmental Paradigm survey that covers beliefs and attitudes of the students towards the quality of the environment, human actions and its consequences on the environment, and whether they engage in activities that improve the quality of the environment (Dunlap and Van Liere, 1978). The responses are made into an environment score – a higher score implies higher awareness about the environmental issues and a positive attitude about contributing to improving environment quality. The survey is implemented in June 2019, five months before the intervention, to construct a baseline environment score.

The main finding from the pre-intervention baseline survey is that majority of the respondents in our sample are highly aware about the threats due to environmental issues and exhibit a concern towards the environment. Figure 8 shows the pre-intervention environment scores of students. As illustrated, students on average score on the top quartile of environment scores, suggesting that INFO treatment probably did not do much to raise awareness levels.

[9] I adapt the NEP survey along two dimensions. First, the survey is made age appropriate to suit young adolescents. Second, it is modified to fit the socio-cultural scenario of Kerala and its local environmental issues. The adapted NEP survey design is in appendix A.3.

Figure 8: Distribution of environment scores



Note: The graph shows the distribution of environment scores among the students. Environment scores are computed using survey data collected at the start of the study. Data is collected five months before the interventions are introduced. The survey is modelled along the New Environment Paradigm scores, and captures attitudes and awareness levels of the students towards environmental quality and the need to improve it.

5 Conclusion

In this paper I use a field experiment to study the effects of two interventions aimed at increasing recycling on other environment behaviours. The objective is to measure if engaging in one pro-environment behaviour spills over positively or negatively into other environment behaviours. The paper brings together evidence from a randomized control trial, a lab-in-the-field experiment, and survey data.

There are four major findings. Firstly, current interventions in the form of information provision do not change recycling behaviour of the students. Secondly, providing incentives in addition to the information provision causes an increase in the recycling levels. Thirdly, there is a positive spillover from the incentive intervention to other environment behaviours. This indicates that the treatment resulted in increased recycling as well as an increase in the students' willingness to pay for different environment activities, captured through a lab experiment. Lastly, the spillovers are not

limited to those students who recycle more, but also to the students who see their peers respond to the intervention. These findings suggest that there are previously unaccounted benefits from the intervention resulting from complementarities between pro-environment behaviours.

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A Appendix

A.1 Treatment details

Figure 9: Poster for INFO treatment

Figure 10: Poster for INFO+INC treatment

Note: Posters with messages about the need to recycle and information on the incentives were displayed prominently in the classrooms during the intervention. The plastic carry bag collection date for the month was also written on the posters to serve as a reminder to the students.

Figure 11: Awareness sessions

Note: Awareness sessions in progress at schools under the INFO treatment and INFO + INC treatment.

Figure 12: Sorting of plastic carry bags by weight

Note: Plastic carry bags collected every month were weighed and sorted before sending to the centralized recycling facility.

A.2 Elicitation of the Willingness to Pay

Figure 13: Template for collecting the WTP

In case you win, do you want to give any money to any of the following activities?

	Activity	Amount
	Plant Trees	
	Promote Buses 	
	Reduce air pollution	
	Recycle Plastics 	
	Save Wildlife	
	Recycle Paper 	
	Reduce Water Pollution	

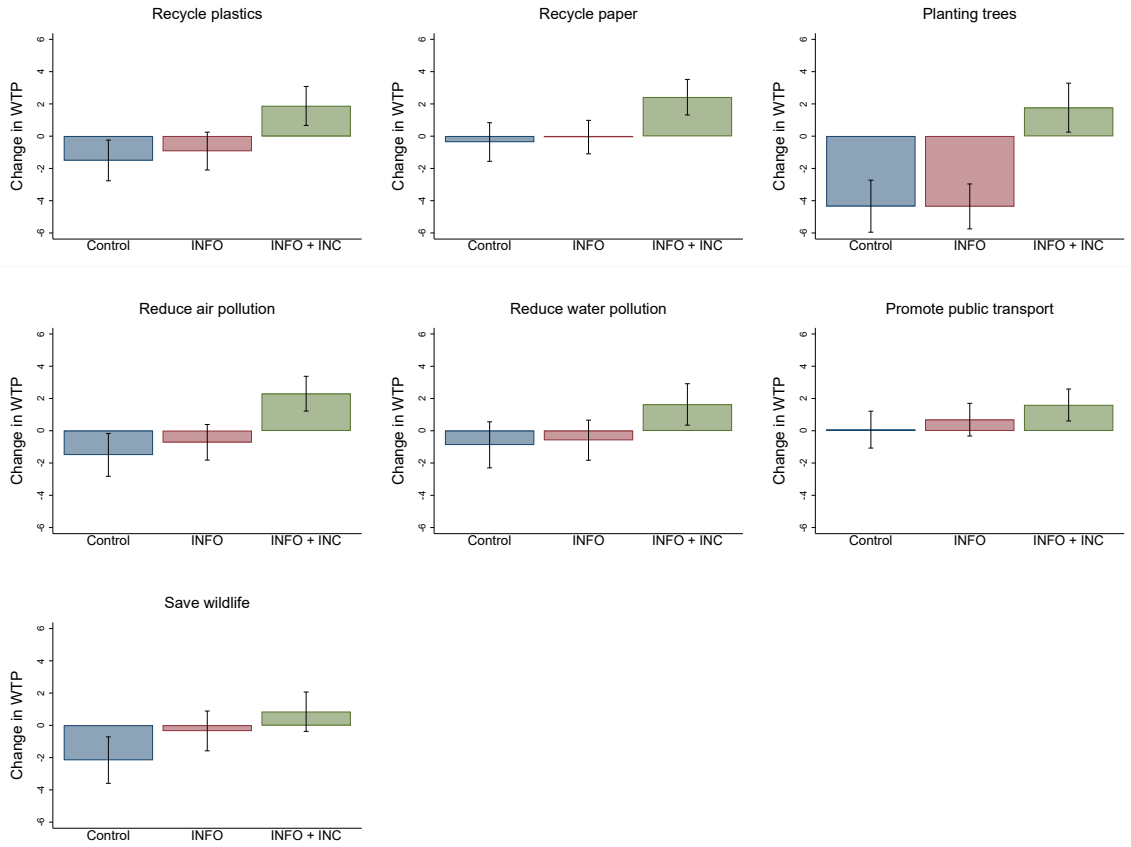
Note: This is the template used to elicit the WTP for each of the activities before and after intervention. A lottery task is used to elicit the WTP, where every subject is given a lottery with 1/10 chance of winning 100 INR. Before the lottery is drawn, subjects are given this template, and asked if they want to donate a(ny) amount between 0 and 100 INR (both limits inclusive) for the activities mentioned in the template. They are informed that if they win the lottery one of these activities will be randomly chosen and the amount they pledged for that activity deducted and the remaining paid out to them.

Table 6: Average recycling levels

	Control	INFO	(INFO + INC)	Diff	p-value
Pre-Intervention	1.39	1.21		0.1843	0.3513
Pre-Intervention	1.39		1.56	0.1687	0.3645
Post-Intervention	0.51	1.36		0.8542	< 0.001
Post-Intervention	0.51		3.87	3.3630	< 0.001

Note: The table presents the average recycling levels in the three treatments. Column 5 reports p-values of a Wilcoxon rank-sum test (two-sided) for equality between Control and INFO or (INFO + INC).

Figure 14: Change in the WTP Pre- and Post-intervention



Note: The figure shows $\Delta\,\mathrm{WTP}_{ij} = \mathrm{WTP}_{ij}^{\mathrm{post}} - \mathrm{WTP}_{ij}^{\mathrm{pre}}$ for different environment activities.

A.3 Survey on environmental attitudes and behaviour

Hello and Welcome! Please take a few minutes to fill the survey. The data collected are for the sole purpose of scientific enquiry and will not be disclosed to third parties. Your participation in this research is voluntary. You are free to leave the survey anytime you wish so. Please tick I AGREE to begin the survey.

1. Below is a list of some items. Please indicate how you feel about each of them.

1.1 The Environment	Very worried Somewhat worried Not so worried Not at all worried
1.2 Climate Change	Very worried Somewhat worried Not so worried Not at all worried
1.3 Pollution	Very worried Somewhat worried Not so worried Not at all worried
1.4 Water resources running out	Very worried Somewhat worried Not so worried Not at all worried

2. Here are some statements about people and the environment. For each statement, please indicate whether you: strongly agree, agree, disagree, or strongly disagree.

2.1 We are reaching the limit of the number of people the earth can support.	Strongly agree Agree Disagree Strongly disagree
2.2 When humans interfere with nature it produces great damage.	Strongly agree Agree Disagree Strongly disagree
2.3 Plants and animals have the same right as humans to exist.	Strongly agree Agree Disagree Strongly disagree
2.4 If we keep going like this, there will be an environmental disaster.	Strongly agree Agree Disagree Strongly disagree
2.5 Humans deserve more natural resources than other species.	Strongly agree Agree Disagree Strongly disagree
2.6 We can protect the environment through our actions.	Strongly agree Agree Disagree Strongly disagree
2.7 In my opinion, many environmental issues are exaggerated by environmentalists.	Strongly agree Agree Disagree Strongly disagree
2.8 It worries me when I think about the environmental conditions in which I probably have to live in the future.	Strongly agree Agree Disagree Strongly disagree

3. Please tick the actions you do at your household.	Recycle newspapers/ other paper waste Recycle plastic waste Rainwater harvesting Separating recyclable waste at home Use solar panels/ heater Make compost from waste

5. Do you do any of the following?

5.1 Turn off all electrical appliances if I leave a room.	Yes No
5.2 Use hot water for showers.	Yes No
5.3 Use public transport/ shared transport/ school bus to come to school.	Yes No
5.4 Completely shut off electrical equipment and do not leave it in stand-by mode.	Yes No
5.5 Participate in environment friendly activities.	Yes No
6. Right now, do you think that you should act to improve the quality of the environment around you?	I already do Yes No
7. Do you consider actively participating in environmental conservation?	Yes No

Age Gender Name of School Class	

A.4 Environment norm elicitation questionnaire

Questions on self-behaviour:

1. Do you dispose garbage in a public place?	Yes No
2. Do you turn off all electrical appliances if you leave a room?	Yes No
3. Do you recycle plastic wastes?	Yes No
4. Do you use disposable plastic cups and plates?	Yes No

Questions on peer behaviour: According to you, how many of your classmates do the following:

5. dispose garbage in a public place.	Almost all of my classmates Some of my classmates Not a lot of my classmates None of my classmates
6. Turn off lights and fan when they leave the room	Almost all of my classmates Some of my classmates Not a lot of my classmates None of my classmates
7. Recycle plastic waste	Almost all of my classmates Some of my classmates Not a lot of my classmates None of my classmates
8. Use disposable plastic cups/plates	Almost all of my classmates Some of my classmates Not a lot of my classmates None of my classmates

A.5 Social desirability score elicitation

I use the following questions based on the questionnaire developed by Crowne and Marlowe (1960) and Reynolds (1982) to compute the social desirability score for every student. For each question, students state whether they agree or disagree. The score is computed by adding up the socially desirable answers. A higher score indicates that the respondent is more likely to give socially desirable responses.

1. I am always polite, even to people who are disagreeable
2. I sometimes feel angry when I don't get the things I want.
3. I am always willing to admit it when I make a mistake
4. I was jealous of the good fortune of others in the past
5. No matter who I am talking to, I am always a good listener

A.6 Mediation analysis regression

Table 7: Mediation Analysis: Empirical expectations as a potential channel through which (INFO + INC) treatment affects behaviour

	Δ WTP	Δ Carrybags
	(1)	(2)
Empirical expectations	104.6661	75.1219
	(115.1243)	(54.4712)
Constant	- 236.4590	-173.0562
No. of Obs.	2621	2663

Note: This table presents results from the second stage of the 2SLS estimations. The empirical expectations of the students are instrumented using the (INFO + INC) treatment. The dependent variable in column (1) is the change in the number of carrybags recycled pre and post intervention and column (2) is the change in the WTP pre and post intervention.
*$p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

A.7 Survey data analysis

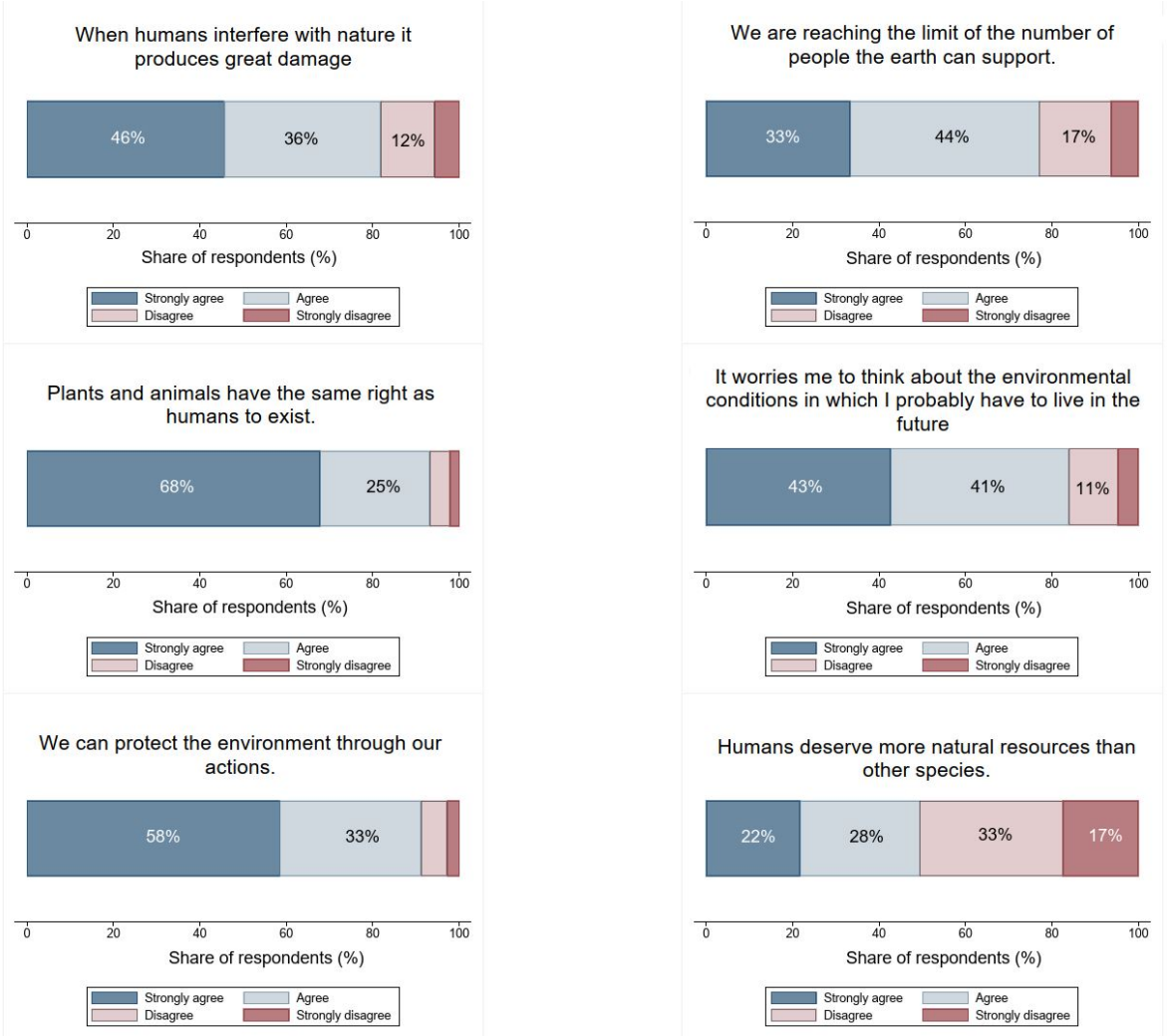
Most adolescents in India receive some form of environmental education in classrooms, either as a separate subject or as part of the general science curricula. However, other than being able to answer factual questions in the exam, whether this develops as a concern for environment is up for debate.

The New Environmental Paradigm (NEP) scale developed by Dunlap and Van Liere (1978) is the most frequently used tool measure attitudes towards the environment. This survey is modelled along the lines of the NEP scale. However, the questions are adapted along two dimensions – (1) they are modified to fit the socio-cultural and environmental issues of Kerala and (2) they are modified to be age appropriate. Most of the survey is measured in a Likert scale, where participants are asked to what degree they agree (or disagree) with each statement, and the different environmental activities they engage in.

Environmental Beliefs

The objective of this section to measure the fundamental worldview that an individual shares about the environment and the human relationship with it. The focus is on gauging the opinions on human actions and consequences, human domination over nature and future consequences.

Figure 15: Environment attitudes survey: Beliefs about the environment

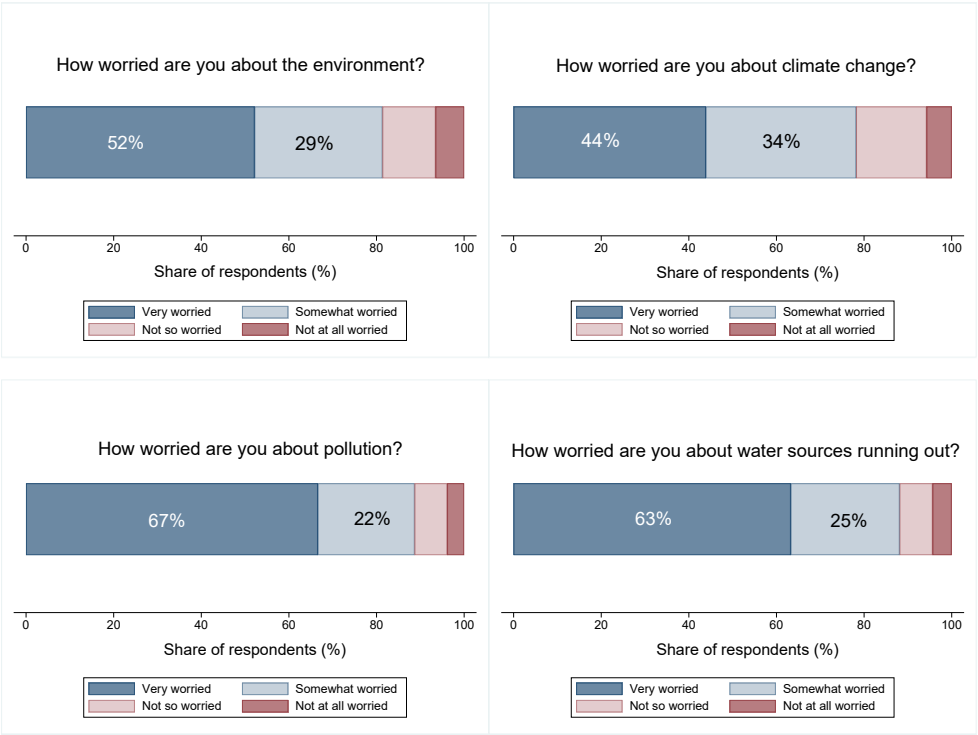


Note: The graph shows the degree to which students agree with the given statements.

Environmental Attitudes

Figure 16 describes how concerned the respondents are about (i) the environment, (ii) climate change, (iii) pollution, and (iv) water sources running out.

Figure 16: Environment attitudes survey: Concern towards the environment

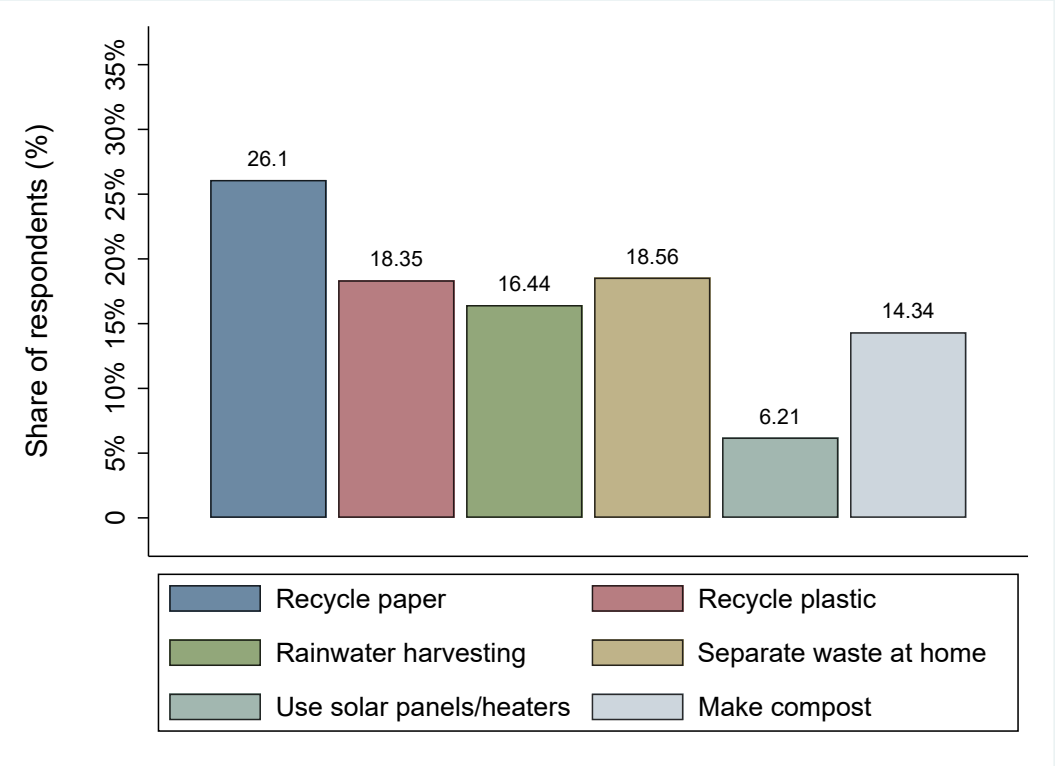


Note: The graph represents how concerned the respondents are about the environment, climate change, pollution, and water sources running out.

Environmental Behaviours

Figure 17 shows most commonly done activities are recycling paper (26.10% of respondents do this) and separating recyclable waste at home (18.56%) and recycling plastic waste (18.35%).

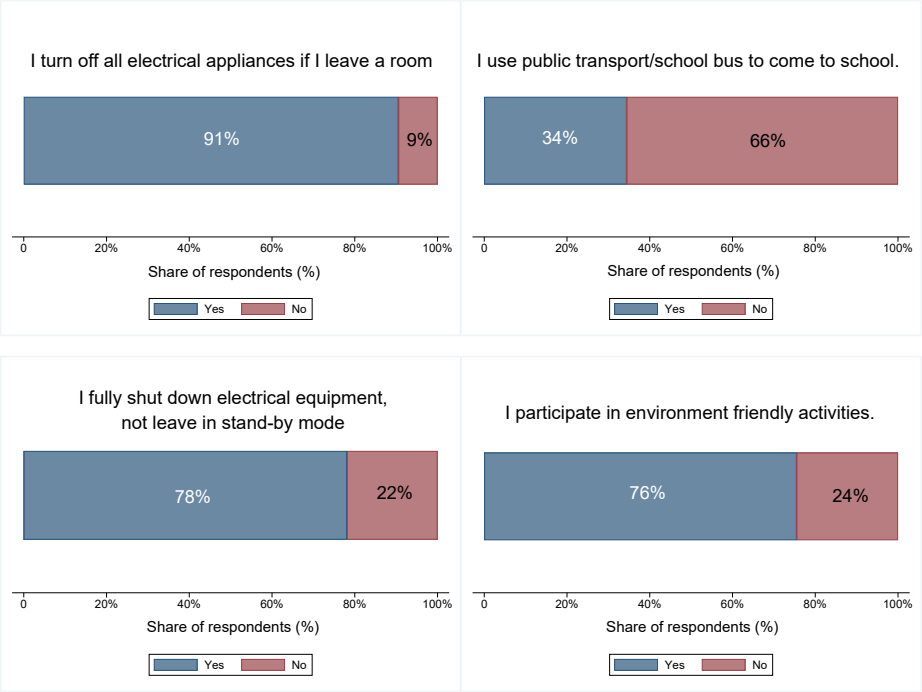
Figure 17: Environment activities done at home



Note: The graph shows the share of students engaged in each of the listed environment activities.

Figure 18 shows the response rates to some specific everyday activities. 91% of the respondents state that they turn off all electrical appliances while leaving room. Only 34% uses public or shared transport. This item needs to be interpreted with more nuance, as using public transport is also an issue of safety and environmental concerns are not usually the priority when deciding the mode of transportation. 78% of the respondents always shut down electrical equipment and 76% state that they participate in environment friendly activities.

Figure 18: Environment attitudes survey: Self reported activities



Note: The graph shows the share of respondents who engage in each of the listed activities.

Socio-demographic features Girls score on average 2.2 percentage points higher on the environment score. We also collect data on household income and higher income is also correlated with higher pro-environment score. A part of this is driven by students from richer households engaging in more environmental actions at home, but is not entirely explained by it. Students with higher household income also exhibit more pro-environmentality in beliefs and attitudes consistent with existing literature.