Recycling water sachet plastic wastes in Nigeria: Is there a difference between what people say and do?

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Introduction

- The quest for cheap and readily available source of potable water has led to the emergence of 'sachet water.'
- Over 70% of Nigerian adults consume at least one sachet of water daily.
- There are more than 50 to 60 million water sachets in need of waste disposal per day across the country (Ikhile & Aifesehi, 2011).

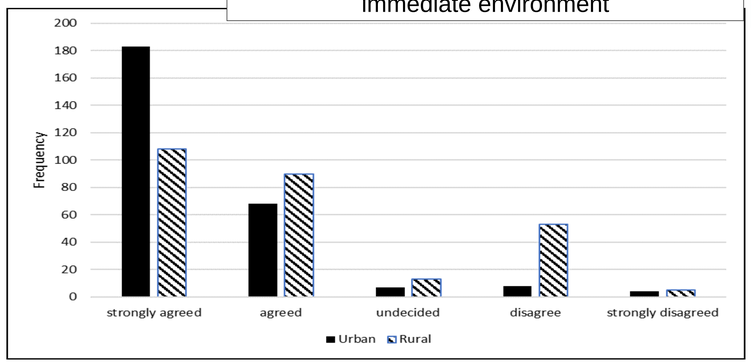
Research Problem and Objective

- One of the popular methods used for addressing externalities from plastic pollution around the world is the deposit-refund system (DRS).
- The stated preference method (CVM) is used for estimating the Willingness to accept (WTA) the DRS.
- People tend to misstate their preferences for a private good when a hypothetical question is asked, especially in cases of non-market valuation (Aadland and Caplan, 2003).
- This study intends to assess the existence of hypothetical bias between stated and actual behavior – comparing CVM responses to actual responses in a simulated market.

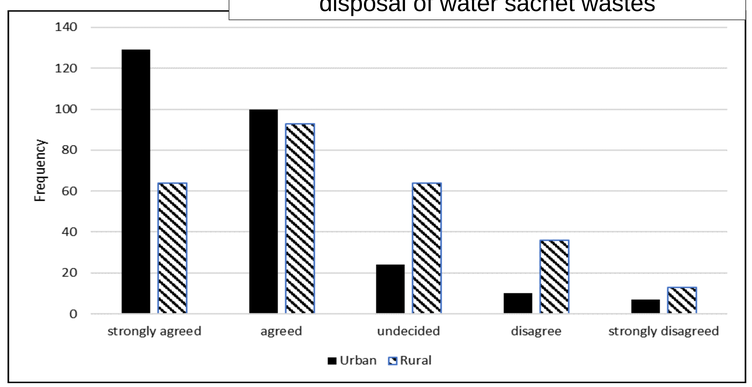
Survey and Empirical Methods

- Survey randomly sampled households from randomly selected areas in Nsukka local government, Enugu, Nigeria
- Questions asked about…
  - Access to potable water.
  - Households' patronage of sachet water
  - Attitudes towards and concerns about disposal of plastic sachet wastes.
  - Willingness to accept the DRS – Real vs Hypothetical.
- Probit regression models were estimated to identify what drives WTA the DRS.
- Resulting coefficient estimates were used to predict the existence of some form of bias between the stated preference approach and actual experiment.

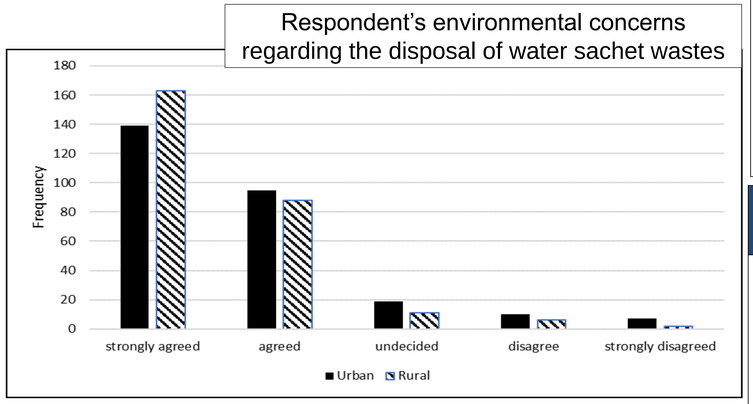
Visibility of water sachet wastes in respondents' immediate environment



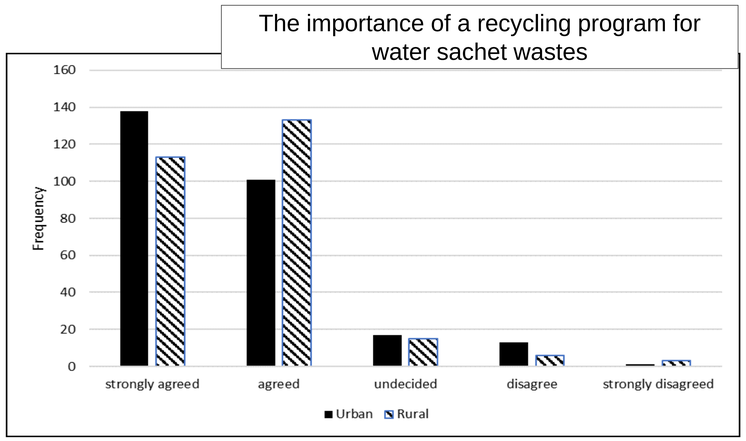
Respondent's health concerns regarding the disposal of water sachet wastes



Respondent's environmental concerns regarding the disposal of water sachet wastes



The importance of a recycling program for water sachet wastes



Preliminary Results

Figure 1: Willingness to accept the deposit refund system

Independent Variables	Dependent Variable: WTAR-DRS (Hypothetical)	(Actual)
Refund amount	**-0.0307***	**0.0178***
	(0.0054)	**(0.0017)**
Expenditure on sachet water per year	0.0473*	-0.0318*
	(0.0053)	(0.0018)
Household income per year	-0.0005*	-0.0015*
	(0.0002)	(0.0001)
Gender	0.0333*	0.0450*
	(0.0032)	(0.0023)
Age	0.0096*	0.0065*
	(0.0002)	(0.0002)
Occupation	0.0428*	0.0153*
	(0.0013)	(0.0009)
Year of education	-0.0130*	0.0015*
	(0.0005)	(0.0004)
Number of children in the household	-0.0079*	0.0063*
	(0.0013)	(0.0004)
Number of adults in the household	0.0080*	-0.0006
	(0.0013)	(0.0007)
Auxiliary Parameters		
N	260	174
Prob > F	0.0000	0.0000
LR Test	0.0000	0.0000

H_0: Hypothetical willingness to accept discounts is equal to actual willingness to accept discounts: $\mu_h - \mu_a = 0$

$$|t_{cal}| = \frac{\mu_h - \mu_a}{\sqrt{\frac{\mu_h{}^2}{n_h} + \frac{\mu_a{}^2}{n_a}}} = 20.78$$

Comparing $|t_{tab}|$ to $|t_{critical}|$, we reject H_0 in favor of H_A.

Results and Discussion

- Preliminary results reveal some form of bias between the stated preference approach and the actual experiment. Both were statistically significant at the 5% level of significance.
- It validates the microeconomic theory according to Samuelson (1955) which proposes that people do not have an incentive to reveal their true WTP and intend to take advantage of other as "free riders."
- For both the stated preference approach and actual experiments, household are willing to accept (WTA) the DRS if…
  - there is a decrease in household income per year
  - the household head is a woman