Role of Environmental Education in Changing Behaviour on Using Plastic to Eliminate Plastic Pollution

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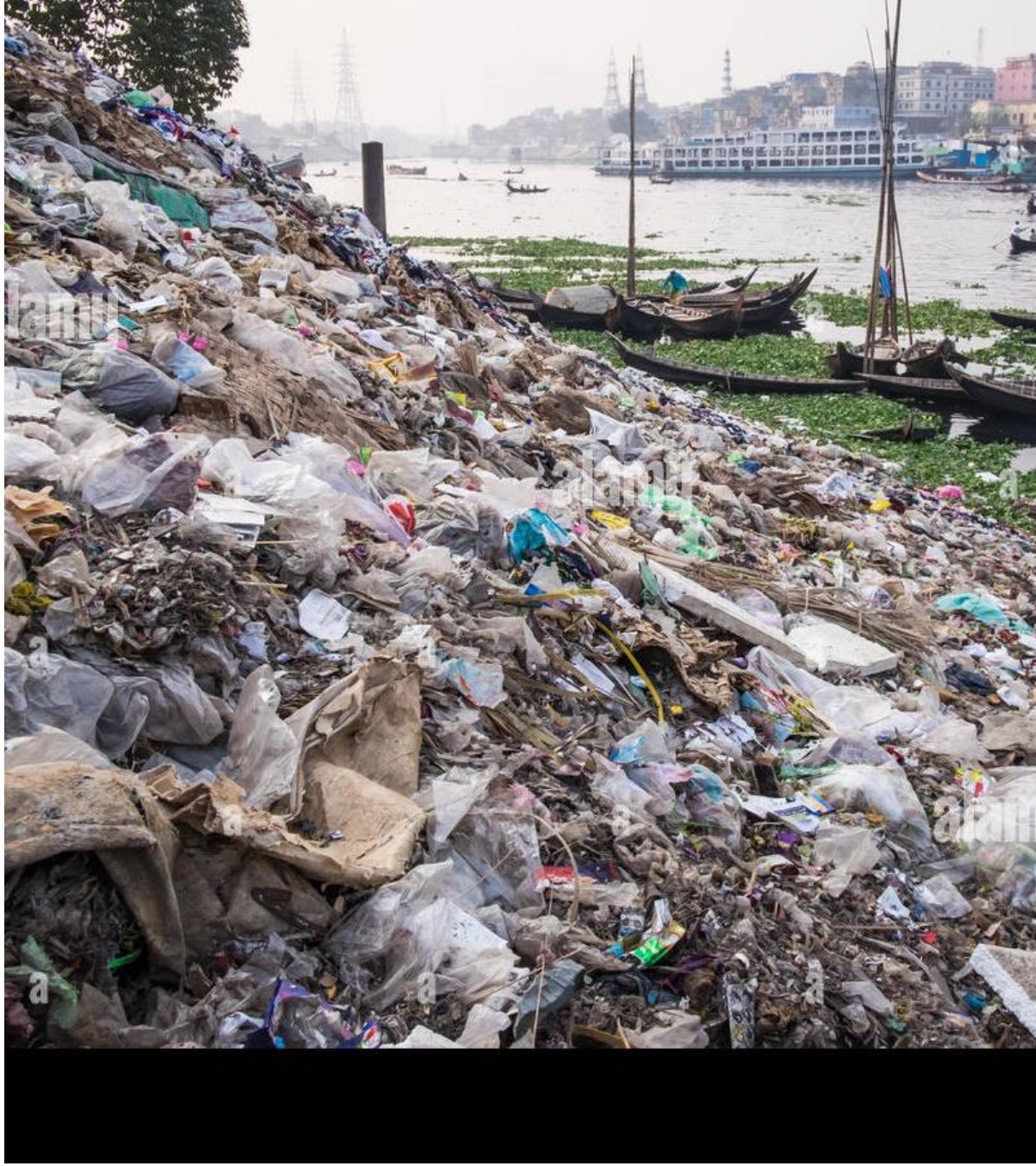

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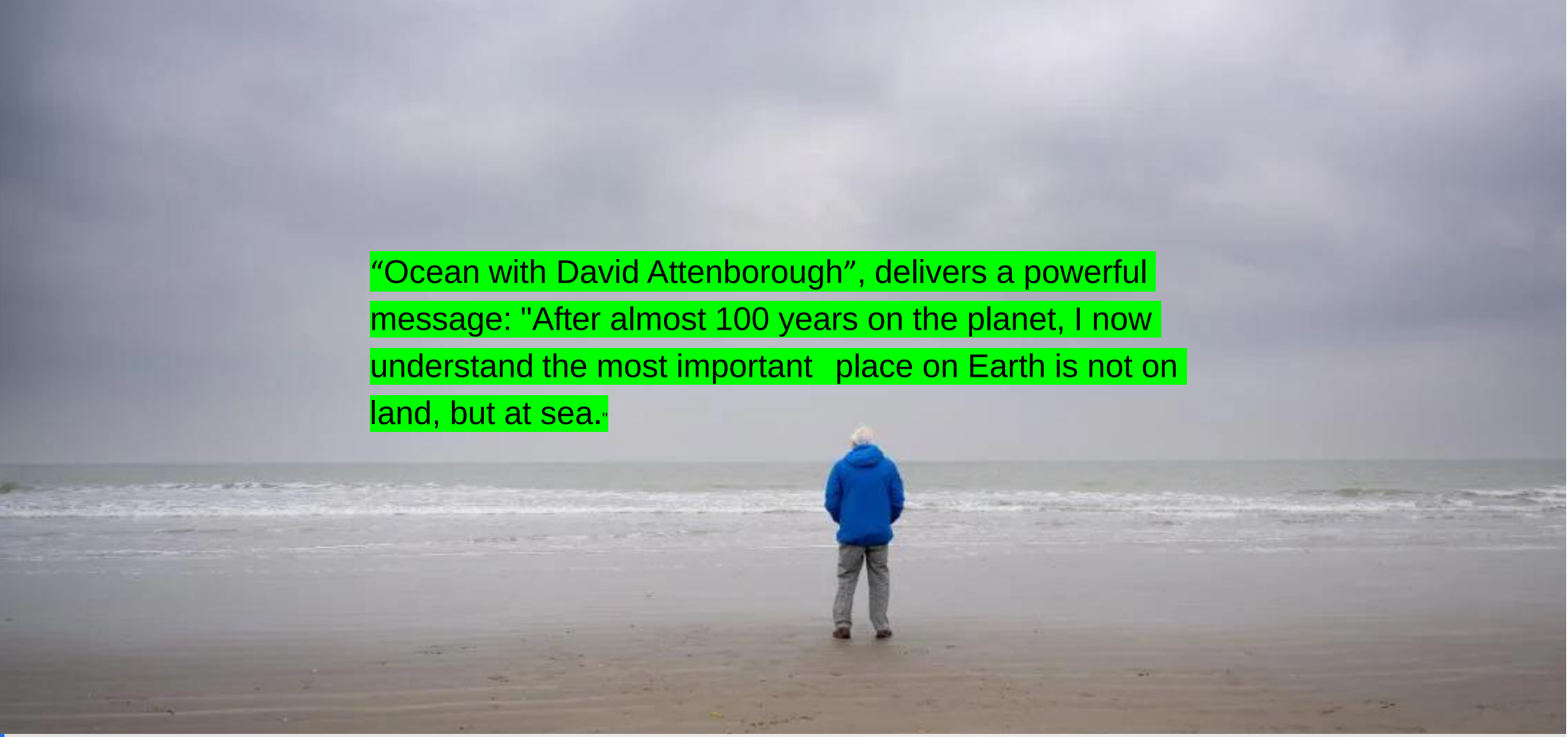
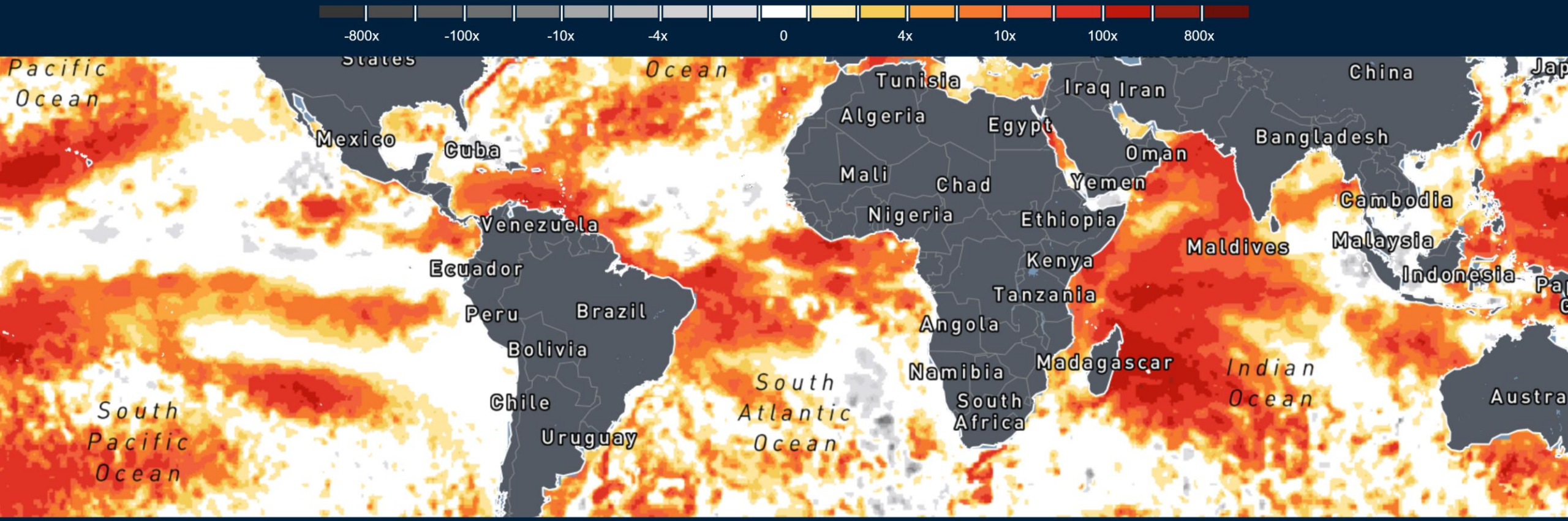

“Ocean with David Attenborough”, delivers a powerful message: "After almost 100 years on the planet, I now understand the most important place on Earth is not on land, but at sea."

Climate Shift Index: Ocean

Apr 23, 2025

Change in likelihood due to climate change



Climate Shift Index: Ocean for average sea surface temperatures.
Based on NOAA OISST. Dates are UTC.

CLIMATE CENTRAL

Why Plastic Pollution is Global Problem?

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Strategic Context

- Plastic debris is a pervasive, complex pollutant that is causing growing concern in the environment
- Plastics account for up to 12% of global waste, but inadequate waste management and their persistence in the atmosphere result in substantial environmental pollution (Duncan et al., 2020).
- In 2019, global plastics production almost reached 370 million tonnes, of which 51% produce in Asia (*Plastics Europe*, 2020).
- As of 2015, approximately 6300 Mt of plastic waste had been produced, with approximately 9% recycled, 13% incinerated, and 79% accumulating in landfills or the natural environment
- By 2050, if existing manufacturing and waste management practices persist, about 12,000 Mt of plastic waste will be disposed of in landfills or the natural environment.
- An estimated $13 billion in annual environmental damage to marine ecosystems, as well as other economic losses and significant human and environmental health concerns (UNEP, 2014)
- So far, Plastic pollution is a significant global environmental problem that requires immediate action. It was widely believed for a long time that people had to follow a "reduce, reuse, and recycle" plan for eliminating plastic waste (Geng et al., 2019).

Institutional Context

- As part of the 2030 Agenda for, Sustainable Development Goal 14.1 states the need “by 2025, [to] prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution,” making the issue of plastic pollution a top global priority
- The widespread use of single-use plastics has become a significant environmental concern, contributing to pollution and resource depletion. These plastics, prevalent in everyday items such as packaging, utensils, and bottles, persist in the environment, leading to long-term ecological damage and posing threats to wildlife and human health (Geyer, Jambeck, & Law, 2017).
- Despite growing awareness and various initiatives aimed at reducing plastic use, the adoption of sustainable behaviors remains inconsistent. Understanding the factors that drive individuals to avoid single-use plastics is crucial for developing effective interventions.

(CORVI assessment, 2022)

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Background

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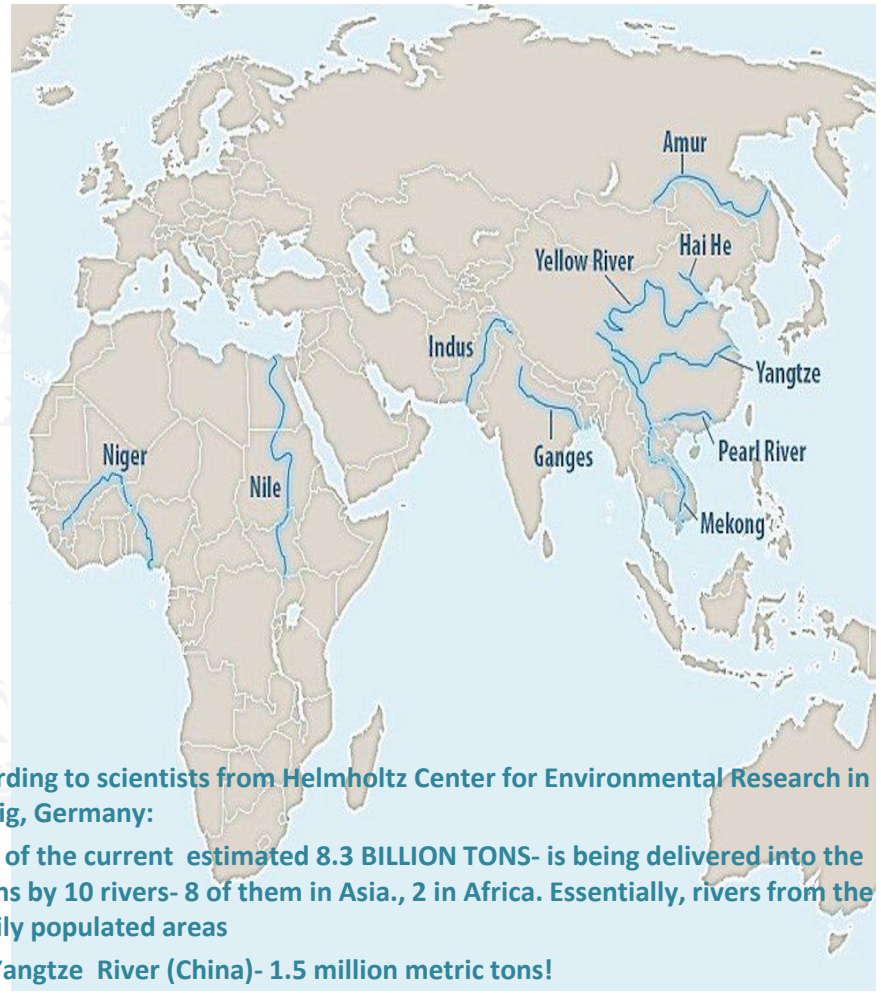
Bangladesh Context

- Single-use plastic water bottles are now a widespread and readily recognizable source of marine plastic waste
- Plastic beverage bottles were the 5th most recorded littered item reported by the International Coastal Cleanup over a 25-year period (1985–2010), and in 2018, they were the 4th most reported item in Bangladesh and the 5th in India during the International Coastal Cleanups
- The Gangetic delta zone of India and Bangladesh receives and emits a massive amount of plastic into the Bay of Bengal (BOB).
- Bangladesh's rapid growth of population, economic, and urban development have all contributed to the generation of solid waste, especially plastic waste
- The plastic industry employs about 3000 Small Medium Enterprises (SMEs) and accounts for 1% of the country's GDP. This large domestic and export-oriented plastic market is rapidly spreading across the world, employing approximately 2 million people (Islam, 2011).
- In the fiscal year 2013–2014, Bangladesh received about USD 340 million from the export of plastic items (Ahmed, 2014).
- According to an analysis of plastic consumption in Bangladesh's urban areas, per capita plastic consumption was 2.07 kg in 2005 and sharply increased to 3.5 kg in 2014 (Masud et al., 2019).

Two Major Cities (Dhaka & Chattogram) Plastic status

- From 2005 to 2020, Dhaka's daily plastic waste saw a mammoth spike of around 260 percent, from 179 tonnes to 646 tonnes, of which only around 37 percent is recycled.
- A recent study by Chittagong University of Engineering and Technology found that Chattogram city produces around 249 tonnes of plastic waste on a day-to-day basis, which could go up to 428 tonnes per day by 2052. A whopping 56 percent of Chattogram city's waste remains uncollected
- Mismanaged plastic waste has been listed as one of the major contaminants among various forms of solid waste, with Bangladesh ranking 10th among the top 20 mismanaged plastic waste producing countries in the world (Kibria, 2017).

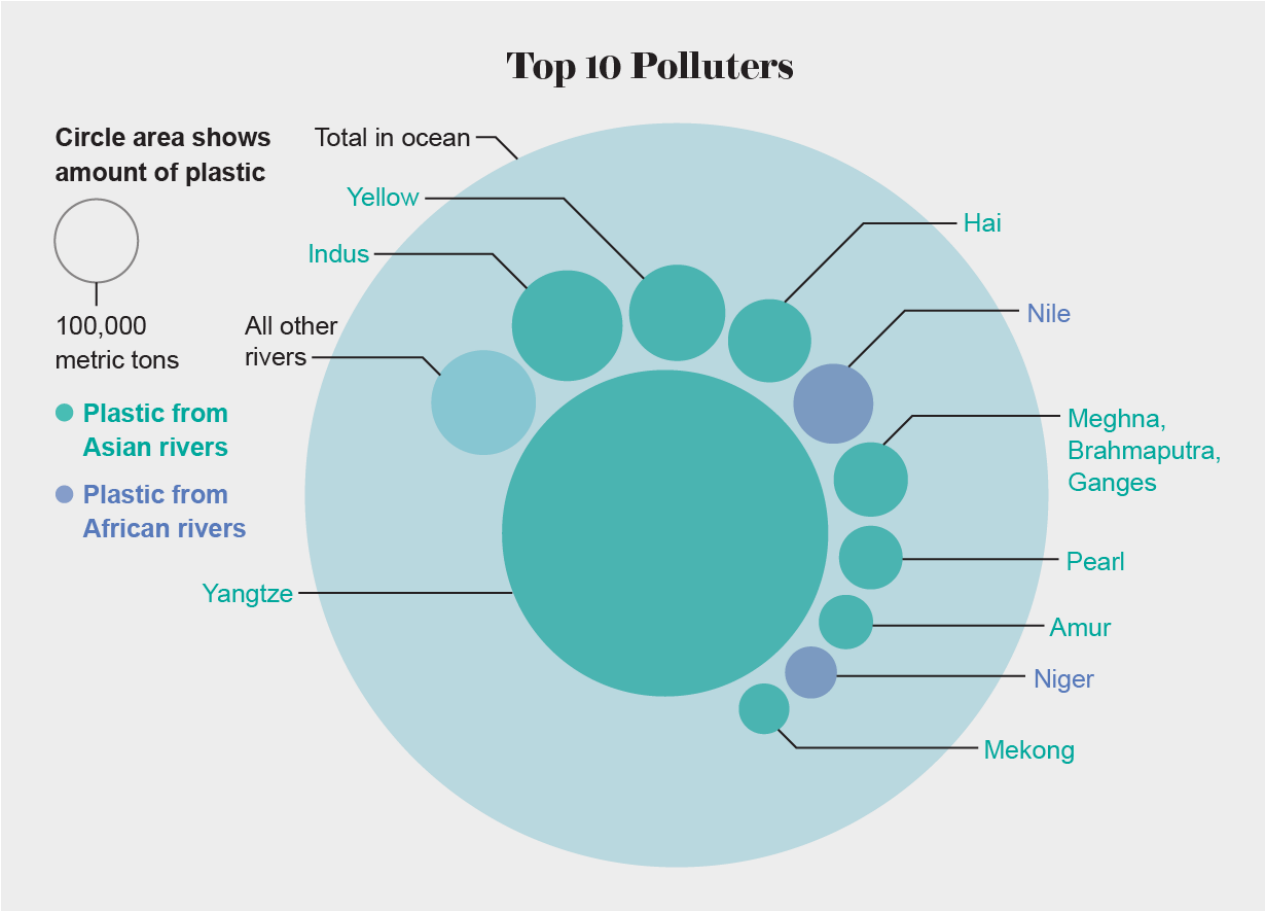
Top 10 Polluters



According to scientists from Helmholtz Center for Environmental Research in Leipzig, Germany:

•95% of the current estimated 8.3 BILLION TONS- is being delivered into the oceans by 10 rivers- 8 of them in Asia., 2 in Africa. Essentially, rivers from the most heavily populated areas

 # 1: Yangtze River (China)- 1.5 million metric tons!

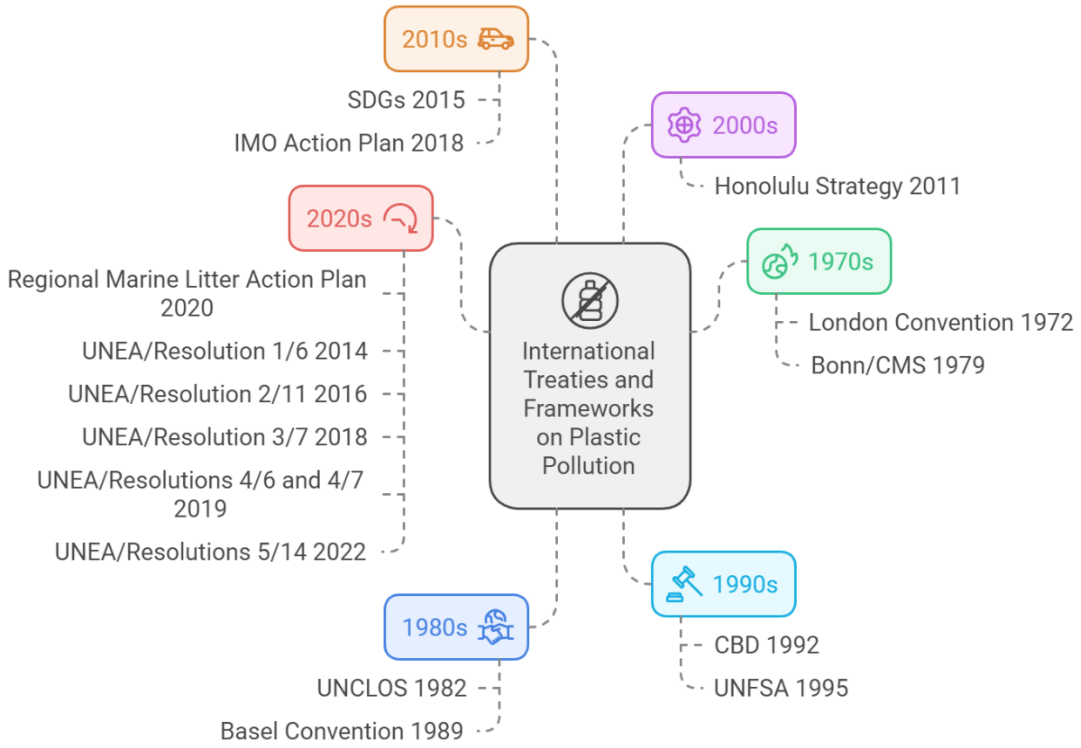


Credit: Amanda Montañez; Source: "Export of Plastic Debris by Rivers into the Sea," by Christian Schmidt et al., in *Environmental Science & Technology*, Vol. 51, No. 21; November 7, 2017

Global Policy and Regulations to Control Plastic Pollution

Global Policy

- Global legal instruments could be categorized under two regime including policy instruments: those developed before 2000 and those after 2000



- **UNEA Resolution 5/14 entitled "End plastic pollution: Towards an international legally binding instrument"**

The intergovernmental negotiation committee (INC) has been organizing the consultation and negotiators meeting are set to meet five times between 2022 and 2024 to work out the details of the legal instrument.

Concept	Possible explanation
Full life cycle of plastic	Based on the above definition plastic as a material and it lifecycle divided into four stages – a) upstream- production of virgin plastic polymers; b) midstream- product design and use; c) downstream- plastic waste management and treatment d) leakage-plastic in the environment (Grabiel et al., 2022).
Virgin plastic vs recycled plastic	According to UNDP (2023) the "virgin plastics refers to plastics that have been newly manufactured from petrochemical feedstock, such as gas or oil, which has never been used before" "Recycled plastics on the other hand are plastic polymers that were manufactured from post-consumer plastic scrap or waste, for example, through melting plastic waste into new flakes or pellets that are then reprocessed into new plastic products."
Legacy plastic	According to UNDP (2023) refers to "plastics that cannot be reused or recycled, including plastics that are already in the environment as existing pollution."

INC Plastic Treaty
Timeline & Outcomes

UNEA 5.2 Nairobi

Agreed to form an INC and start negotiations

INC-1 Punta del Este

Request for 'options for elements' document

INC-3 Nairobi

Request for a revised zero-draft based on compilation of submissions by delegations and elements in the synthesis report

INC-4 Ottawa

- Compilation of draft text for final negotiations
- Mandate for technical work before INC-5 on
  - Approaches for plastic products, chemicals, and design.
  - Treaty financing mechanisms

2022 | **2023** | **2024** | **2025**

OEWG Dakar

- Draft Rules of Procedure – no agreement on voting rights
- INC's meeting schedule

INC-2 Paris

- Request for zero-draft and one-day meeting post-INC-3 to address elements not covered in INC-2
- INC Bureau elected
- Agreed upon use of draft Rules of Procedure

UNEA 6 Nairobi

Report on progress of the INC

INC-5 Busan

Final meeting

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Key Argument

Argument

- The pervasive use of single-use plastics has become a critical environmental challenge, necessitating a comprehensive understanding of the factors that drive individuals to avoid these materials.
- The lack of solid waste management, with waste regularly blocking drainage points and contributing to urban flooding, stagnant water in urban areas, and the spread of vector-borne diseases. Open drainage caused for death accident too (CORVI assessment, 2022).
- Plastic waste degradation takes a long time, up to a few hundred years, to occur naturally. As a result, to combat these issues, proper plastic waste recycling practices and behavior will greatly promote the recycling process and preserve the value of the recycled plastics (Cheung, Chow, & So, 2018).
- One of the important factors that can help to improve the situation is community members' awareness of plastic waste recycling, especially among the next generation (pupils), and their corresponding acceptable behavior in handling plastic waste. Hong Kong for example has introduced Plastic Resources Education (PRE) into primary school as part of environmental education. Because, environmental education in the classroom allows students to engage with complex environmental problems while also developing positive behaviors, awareness, and inspiration to take action on the environment (So & Chow, 2019).

Objectives of the study

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Objectives

The general goal is to examine a program inducement of behavioural change through introducing environment-aware learning tools and basic knowledge, environment education on plastic and general waste disposal; under this goal the following objectives could achieve-

- to investigate the behavioral status of single-use plastic usage in the designated city;
- to explore how social norms and perceived barriers shape intentions to eschew single-use plastics.
- to examine a program, using the GO and NGO footprint, for a practical and pragmatic program for plastic waste collection and environment friendly recycling; and
- to propose a national legislative framework to control plastic pollution in highlight to environment protection.

Hypothesis

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H1: Perceived descriptive norms are positively associated with behavioral intentions to avoid single use plastic

H2 **:** Behavioral intentions are significantly influenced by perceived descriptive norms, with the relationship moderated by perceived injunctive norms, outcome expectations, group identity, and behavioral identity to avoid single use plastic

H3: Positive outcome expectations strengthen the relationship between perceived social norms and the reduction of plastic use

H4: The influence of perceived social norms on plastic use behavior is stronger for individuals with a higher degree of identification with an environmentally conscious social group.

Theoretical Framework

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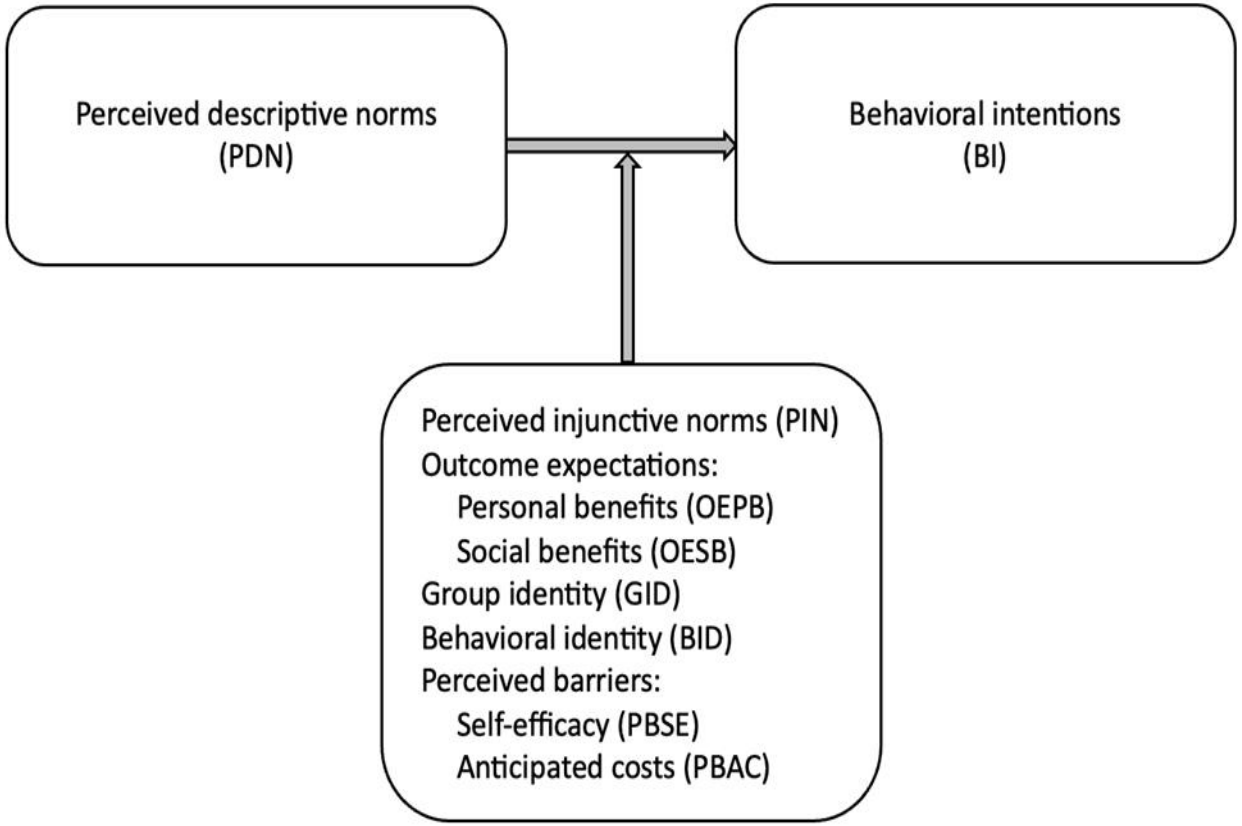
Theory of Normative Social Behavior (TNSB)-

According to the TNSB theory, behavioural intentions are influenced by perceived descriptive norms, moderated by perceived injunctive norms, outcome expectations, group identity and behavioral identity (Lapinski and Rimal, 2005).

- Theory of Normative Social Behavior:

1. **Descriptive Norms**: The theory assumes that people's behavior is influenced by their perceptions of what others do. Descriptive norms refer to individuals' beliefs about the prevalence of a behavior within their social group. If people believe that a certain behavior is common, they are more likely to engage in it.
2. **Injunctive Norms**: These norms pertain to individuals' beliefs about what others think they should do. Injunctive norms are related to perceived social approval or disapproval of a behavior. If people believe that important others expect them to perform a certain behavior, they are more likely to conform to that behavior.
3. **Outcome Expectations**: The theory posits that individuals' behavior is also influenced by their expectations of the outcomes associated with that behavior. If people anticipate positive outcomes or benefits from engaging in a behavior, they are more likely to adopt it.
4. **Group Identity**: TNSB assumes that the influence of social norms is stronger when individuals identify with the group that holds those norms. The more an individual identifies with a group, the more likely they are to conform to that group's norms.
5. **Group Norms**: The theory also assumes that group norms (both descriptive and injunctive) are powerful predictors of individual behavior. When people perceive that a behavior is typical and approved of by their group, they are more likely to engage in that behavior.
6. **Normative Influence**: TNSB suggests that social norms exert a normative influence, meaning that people adjust their behavior to align with the perceived norms of their social group, especially when they seek social acceptance and avoid social sanctions.



Literature Review

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Author	TPB Theory Used in Plastic Pollution Study
Borriello, Massey, Rose, (2022)	Demonstrates the utility of TPB in understanding public intention to avoid buying products containing microplastics, highlighting the importance of attitudes, subjective norms, and perceived behavioral control.
Vina, Mayangsari, (2020)	Investigates factors influencing single-use plastic bag consumption using TPB, emphasizing attitudes, subjective norms, and perceived behavioral control.
Tonglet, Phillips, Read, (2004)	Examines recycling behavior determinants using TPB, identifying the roles of attitudes, subjective norms, and perceived behavioral control.
Sun et al., (2017)	Explores consumer intentions to use plastic bags by extending TPB, including additional factors like environmental concerns and knowledge.
Soares et al., (2021)	Surveys public knowledge and attitudes towards plastic pollution, linking these to pro-environmental behaviors using TPB.
Willis et al., (2021)	Highlights the significant influence of social norms on compliance with plastic pollution reduction strategies, alongside economic and regulatory factors. Investigates how state legislation, waste levies, and socio-economic factors drive changes in municipal plastic pollution strategies, highlighting the role of the Theory of Planned Behavior.
Deng et al., (2022)	Investigates public intention to reduce the use of PCCPs containing microplastics using an extended TPB model. Highlights the significant roles of attitude, perceived behavioral control, and environmental concern.
Mathew et al., (2023)	Analyzes the application of TPB in various voluntary behavior change interventions aimed at reducing SUP consumption, highlighting the roles of attitudes, subjective norms, and perceived behavioral control.
Levavi et al., (2023)	Integrates TPB elements into the SOR framework to explain how awareness, attitudes, and PBC influence SUPT consumption.
Negash et al., (2021)	Identifies key factors influencing waste sorting behaviors using an extended TPB model, including attitudes, subjective norms, perceived behavioral control, economic drivers, and waste sorting capacity.
Galati et al., (2021)	Analyzes the purchasing behavior of Italian students using TPB, highlighting the roles of attitudes, subjective norms, and perceived behavioral control in choosing eco-friendly packaging.
De Fano et al., (2022)	Analyzes the impact of attitudes, perceived behavioral control, and subjective norms (including social media influence) on consumers' intentions to recycle plastic.
Moshood et.al, (2022)	Explores the motivations (both hedonic and environmental) influencing young Malaysian consumers' switching intention from synthetic to biodegradable plastics, using TPB as a framework.
Loh Chun T'ing et al., (2020)	Examines factors influencing Malaysians' 3Rs behaviour in plastic usage using an extended TPB model, highlighting the roles of attitude, subjective norm, perceived behavioural control, habit, and facilitating conditions.
Adam, (2022)	This study compares rational and moral antecedents of tourists' intentions to use reusable alternatives to SUPs, finding that moral considerations generally have a stronger influence, especially among international tourists.
Dorina et al., (2021)	The study investigates the determinants of soft plastic recycling behavior in Australia, using TST to show that intention and habit significantly predict recycling behavior, while self-control does not. It emphasizes the need for habitual recycling practices.
Aruta, (2021)	This study extends the TPB by incorporating cultural and gender perspectives to predict Filipinos' intention to reduce plastic use. It identifies attitudes, perceived behavioural control, and prescriptive norms as significant predictors, with prescriptive norms being the strongest. Descriptive norms significantly influenced males' intentions in an experimental context.
Dunn, (2020)	The study used a randomized control trial to measure the impact of Blue Planet II on viewers' plastic consumption behaviors. It found that while the documentary increased environmental knowledge, it did not significantly change plastic consumption behaviors.
Aruta, (2021)	The study extends the TPB by incorporating cultural and gender perspectives to predict Filipinos' intention to reduce plastic use. It identifies attitudes, perceived behavioral control, and prescriptive norms as significant predictors, with prescriptive norms being the strongest. Descriptive norms significantly influenced males' intentions in an experimental context.
Heidbreder & Schmitt, (2020)	This study explores the potential of using Lent as a period to reduce plastic consumption by leveraging moral norms and perceived behavioral control. It finds that plastic consumption was significantly reduced during and after Lent, emphasizing the role of moral norms in sustained behavior change.
Yan et al., (2022)	The study uses BRT and the ABC model to explore the gap between attitudes and behaviors regarding reusable bag use in China. It identifies practical barriers and cultural factors, such as "face," as significant influences on behavior, suggesting that interventions must address these barriers to be effective
Heidbreder et al., (2023)	The study identifies key psychological predictors of plastic reduction behaviors, highlighting the roles of personal norms, perceived behavioral control, sufficiency orientation, and collective efficacy in influencing consumer intentions to reduce plastic consumption through various activities.
Adibe et al., (2023)	The study utilizes the Theory of Planned Behavior to analyze plastic dependency in Nigeria. It identifies social acceptance, convenience, and lack of effective legal frameworks as key drivers of plastic use. The research suggests a multifaceted approach involving education, policy enforcement, and market-based instruments to address the issue.
Gao & Shao, (2022)	Investigates the switching intention of young Chinese consumers towards biodegradable plastics using the PPM model and institutional theory. Push factors (environmental threat, regulative environment), pull factors (alternative attractiveness, normative environment), and mooring factors (self-efficacy, switching cost) are significant predictors.
Raab et al., (2023)	This study applies the demarketing framework to reduce single-use plastic consumption among city tourists. It finds that promotion of negative consequences, reducing availability, substituting with alternatives, and imposing price premiums effectively encourage tourists to reduce SUP use.
Borg, Curtis, Lindsay, (2020)	This paper highlights the significance of descriptive norms in influencing the avoidance of single-use plastics. It also discusses the moderating roles of injunctive norms, outcome expectations, group identity, and behavioral identity in this context.
Oturai et al., (2022)	The study evaluates the impact of a citizen science intervention on children's perceptions and behaviors regarding plastic pollution, finding no significant overall effects but notable age-related patterns.
Allison et al., (2022)	This study used the COM-B model and the Behaviour Change Wheel to categorize variables and interventions. Persuasion, enablement, and environmental restructuring were the most effective interventions, highlighting the importance of addressing capability, opportunity, and motivation simultaneously to reduce plastic waste.
White et al., (2009)	The study demonstrates the importance of descriptive and personal injunctive norms in predicting recycling intentions and behaviors. It emphasizes the significance of social influence within TPB and the utility of incorporating additional normative variables to improve the model's predictive capabilities.

Research methodology (tentative)

Philosophical worldviews

- Pragmatic

Selected strategies of inquiry

- Concurrent (Quan+Qual)

Research design

- Mixed method

(Convergent parallel)

- **Research area:** Chattogram city corporation HH members
- Sample size: 403 HHS
- Population-CCC Coverage HHs

Research methods

- Both open & close ended questions
- HHs survey, FGDS & KII
- Descriptive statistic; thematic
- Social Network Analysis
- Merge and interpretation

- **Secondary data: PRISMA**
- Research instruments- Questionnaire & Checklist
- Participants- CCC HHS & Experts

Sampling Strategies for Survey

Sampling Procedures Chart

Final Survey Phase
400 households surveyed
100 from each selected ward
Purposive sampling technique used

Third Stage: Select 4 Wards
One ward from each economic category selected

Second Stage: Select 10 Wards
Wards chosen based on economic dimensions

Classification Phase
Wards classified into four economic categories:
Category A: Affluent households
Category B: Upper-middle-class households
Category C: Lower-middle-class households
Category D: Impoverished households

Initial Phase: Ward Selection
Every Ward in CCC is considered a distinct population unit

Sample Size Determination
Krejcie and Morgan Formula (1970)
Population size 75,000 to 1,000,000
Required sample size: 384 households
Study sample size: 384 households

Population and Household Data
Total population of CCC: 3,227,245
Average household size (national urban): 4.41
Average household size (CCC urban): 4.25
Total households in CCC: 754,029

Findings

Demographic and Socioeconomic characteristic

Demographic and socioeconomic indicators	Frequency	Percent
Gender		
Male	334	83
Female	69	17
Age		
20-30	75	18.6
31-40	131	39.5
41-50	65	25.1
51-60	29	12.6
60+	8	3.5
Average age	**41.21 years**	
Marital status		
Unmarried	15	3.7
Married	195	95
Divorced	1	0.2
Widow	5	1.2
Education		
Can't sign	30	7.4
Can sign	76	18.8
Primary education	119	29.5
Secondary school education	54	13.4
Higher Secondary school education	49	12.2
Bachelor Honors/BA	67	16.6
Masters/PhD	8	2.0

Main occupation		
Big bussinessman	31	7.7
Day laborer	51	12.6
Rickshawpuller	24	6.0
Domestic worker	13	3.2
Driver/auto/uber	14	3.5
Farmer	02	0.5
Fishing	4	1.0
Government job	7	1.7
Garment workers	31	7.7
Hawker	9	2.2
Private job	119	29.5
Small bussiness	79	19.5
Others	19	4.71
Household average member	4.75	
Monthly income of the household		
Below the poverty line	283	70.2
Above poverty line	120	29.8
Monthly average income of the household	37,725.12	
Monthly average expenditure of the household	**29,420.10**	
HHs Housing ownership		
Government free housing	13	3.2
Own housing	39	9.7
Rental housing	351	87.1

Source- Survey data

Findings

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Behavioral status of single-use plastic usage in the designated city

Metric	BI	PDN	PIN	OEPB	OESB	GID	BID	PBSE	PBAC
Mean	2.98	3.10	3.15	3.05	3.20	3.08	3.25	3.30	2.90
Standard Deviation	0.85	0.75	0.80	0.78	0.85	0.82	0.79	0.80	0.85
Minimum	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Maximum	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00

- The descriptive statistics reveal moderate levels of avoidance behavior across different types of single-use plastics

Findings

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Multiple regression analysis

Variable	Coefficient	Std. Error	t-Statistic	p-Value
const	2.756	0.897	3.073	0.002
PDN	0.623	0.134	4.651	0.000
PIN	0.312	0.102	3.059	0.003
OEPB	0.221	0.095	2.326	0.021
OESB	0.145	0.082	1.768	0.078
GID	0.076	0.056	1.357	0.176
BID	0.183	0.064	2.859	0.005
PBSE	0.389	0.109	3.569	0.001
PBAC	-0.197	0.084	-2.345	0.020
PDN*PIN	0.212	0.078	2.718	0.007
PDN*OEPB	0.187	0.069	2.710	0.007
PDN*OESB	0.112	0.065	1.723	0.085
PDN*GID	0.043	0.043	1.000	0.318
PDN*BID	0.158	0.052	3.038	0.003
PDN*PBSE	0.293	0.089	3.292	0.001
PDN*PBAC	-0.155	0.078	-1.987	0.048
Gender	0.128	0.067	1.910	0.057
Age	-0.022	0.009	-2.444	0.015
Income	0.035	0.016	2.188	0.030

The regression analysis demonstrates that perceived descriptive norms (PDN) have a significant positive effect on behavioral intentions (BI) to avoid single-use plastics ($\beta = 0.623$, $p < 0.001$)

Perceived barriers, specifically self-efficacy (PBSE) and anticipated costs (PBAC), were significant moderators in the relationship between perceived descriptive norms and behavioral intentions

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Author(s)	Title	Year	Methodology	Key Findings / Contributions
Hungerford, H. & Volk, T.	Changing learner behavior through environmental education	1990	Theoretical Review	Developed a framework for behavior change in environmental education, stressing responsible citizenship.
Palmer, J. A.	Environmental Education in the 21st Century: Theory, Practice, Progress and Promise	1998	Book (Mixed-Method Analysis)	Reviews global trends and the evolution of environmental education; emphasizes lifelong learning.
Tilbury, D.	Environmental Education for Sustainability: A Force for Change in Higher Education	1995	Case Study	Advocates integrating sustainability into university curricula through active and participatory learning.
Monroe, M. C., Andrews, E., Biedenweg, K.	A Framework for Environmental Education Strategies	2007	Conceptual Framework	Proposes a strategy framework linking education to environmental behavior change.
Orr, D. W.	Earth in Mind: On Education, Environment, and the Human Prospect	1994	Philosophical Essay	Argues that environmental problems are rooted in educational shortcomings; proposes ecological literacy.
Fien, J.	Education for the Environment: Critical Curriculum Theorizing and Environmental Education	1993	Curriculum Theory Analysis	Critiques traditional education; promotes critical pedagogy for environmental understanding.
Gough, A.	Globalizing Environmental Education: The Power of One, The Power of Many	2002	Qualitative Analysis	Examines globalization's impact on EE; suggests inclusive, culturally relevant teaching strategies.
Sterling, S.	Sustainable Education: Re-visioning Learning and Change	2001	Theoretical Framework	Advocates systemic change in education to support sustainability learning across disciplines.
Chawla, L.	Significant Life Experiences Revisited	1999	Empirical Study (Interviews)	Identifies key life experiences (e.g., time in nature, mentors) shaping environmental commitment in adults.
UNESCO	Education for Sustainable Development Toolkit	2006	Toolkit/Policy Guide	Provides global policy and practice guidance for implementing ESD in formal and informal learning

Author(s)	Title	Year	Methodology	Key Contributions
Zaenuri, Z. et al.	Habituation Model of Implementing Environmental Education in Elementary School	2017	Qualitative (FGDs, Interviews)	Promoted routine-based environmental behavior (cleanliness, hygiene) through daily practices.
Dimitrova, B.	Environmental Education as Part of Compulsory Education at School	2013	Curriculum Analysis	Integrated EE across subjects; promoted interactive learning and environmental awareness activities.
Rieckenberg, C. R.	Sustainable Environmental Education in Public Elementary Schools	N/A	Case Study (Interviews)	Identified success factors: leadership, peer support, administrative backing, and teacher training.
Arani, M. H. A.	Role of Environmental Education in Increasing Awareness and Reducing Risks in Primary Students	2016	Quantitative Survey	Found significant correlation between EE and increased environmental awareness among students.
Kalita, S.	Status and Evolution of Environmental Education in Delhi Schools	2017	Mixed-methods	Evaluated curricular and extra-curricular EE practices; emphasized campaign-based learning.
Goldman, D. et al.	Influence of Non-Formal EE on Junior High-School Students	2013	Pre/Post-test Design	GCP program improved students' environmental worldviews and sensitivity to ecological issues.
Erdogan, M.	Effect of Summer EE Program on Elementary Students' Environmental Literacy	2015	Experimental Study	Found improved knowledge, attitude, and behavior among students after SEEP participation.
Cole, L. B.	Teaching Green School Building: Architecture & Environmental Education	2014	Architectural/Educational Analysis	Linked building design with hands-on environmental learning through interaction with school facilities.
Armstrong, H. G.	Environmental Education in Tobago's Primary Schools	2005	Pilot Program	Demonstrated effective coral reef education using interactive tools and field trips.
Spinola, H.	Environmental Literacy Comparison in Eco vs. Ordinary Schools (Madeira, Portugal)	2015	Comparative Study	Eco-Schools showed stronger student pro-environmental attitudes and behaviors than regular schools.

Role of Environmental education

- **Study found that in the context of using single use plastic among the city dwellers their behavioural intentions are influenced by perceived descriptive norms**

Plastic Resource Education (PRE)

a. **Inducing behavioural change through knowledge-dissemination**

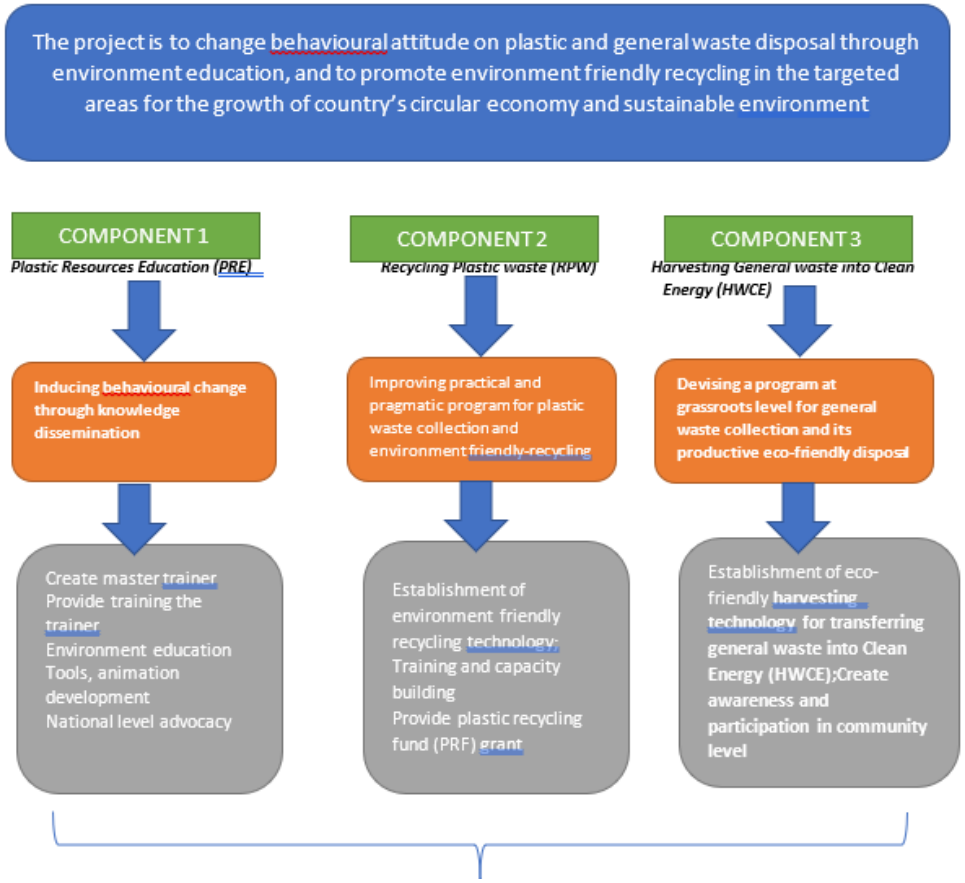
Recycling Plastic Waste (RPW)

a. **Adopting a practical and pragmatic program for plastic waste collection and environment friendly-disposal**

Harvesting General Waste into Clean Energy (HWCE)

a. **Devising a program at grassroots level for general waste collection and its productive eco-friendly disposal**

Model EE for eliminating plastic pollution



Source- Emadul Islam, (2024)

Question

Thank you so much for contributions