

India – Australia Industry and Research  
Collaboration for Reducing Plastic Waste

# Enabling behaviour change towards a circular economy for plastics in India

A review of social and behavioural enablers

Zeenat Niazi, Andrea Walton and John Gardner

Report Number 2021-4  
September, 2021



# India – Australia Industry and Research Collaboration for Reducing Plastic Waste

The India – Australia Industry and Research Collaboration for Reducing Plastic Waste is a three-year collaboration with partners in both India – the Council of Scientific and Industrial Research (CSIR), Development Alternatives and The Energy and Resources Institute (TERI) – and Australia – the University of New South Wales (UNSW), the University of Technology Sydney (UTS) and CSIRO. Through key activities, this collaboration works closely with industry, government and community stakeholders to evaluate the economic and policy implications of transitioning to a circular economy for plastics.



Project co-ordinating  
organisation



ISBN 978-1-4863-1670-0

## Citation

Niazi, Z, Walton, A and Gardner, J (2021). Enabling behaviour change towards a circular economy for plastics in India: A review of social and behavioural enablers. Report Number 2021-4. Development Alternatives and CSIRO, India and Australia.

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# Acknowledgments

This research collaboration, part of the India-Australia Comprehensive Strategic Partnership announced by Indian and Australian Prime Ministers in June 2020, reflects a shared commitment to applying science and technology to reduce plastic waste. The initiative is supported by the Australian Government's Department of Industry, Science, Energy and Resources.

The project team would like to thank Sorada Tapsuwan and Karin Hosking for their time in reviewing and editing this report, respectively, and providing valuable feedback.

# The Challenge

**Over 300 million tonnes of plastic waste are created globally each year yet only nine per cent of this plastic waste is recycled. Plastic waste also leaks into the environment and creates large problems for terrestrial and marine ecosystems and species as well as a loss of material value.**

Both India and Australia are committed to take action to reduce plastic waste by driving innovation and enabling new technologies and business models to achieve this. By doing so, both countries can reduce the environmental and health impacts of plastic waste and enable new growth industries and employment in a zero-plastic waste economy.

*The India – Australia Industry and Research Collaboration for Reducing Plastic Waste* is a three-year collaboration with partners in both India - the Council of Scientific and Industrial Research (CSIR), Development Alternatives and The Energy and Resources Institute (TERI) – and Australia - the University of New South Wales (UNSW), the University of Technology Sydney (UTS) and CSIRO. Through key activities, this collaboration works closely with industry, government and community stakeholders to evaluate the economic and policy implications of transitioning to a circular economy for plastics.

The three-year research program will result in:

- a comprehensive knowledgebase of plastics material flows from import and domestic production, to use, disposal, recycling and reuse;
- a full supply chain analysis of plastics used in key sectors including packaging, agriculture, construction, automotive, electronics and household appliances sectors identifying supply chain participants and physical and monetary interactions;
- a roadmap identifying the main technical innovations, both at community and large industrial scale, that will help to innovate across the plastics supply chain reducing end-of-life plastics waste and enabling design for circularity;
- a set of principles and strategies including institutional and economic factors, new business models and markets that facilitate the transition to a circular plastics economy;
- a series of demonstration projects located in different parts of India including in urban and rural locations and both small and community scale and large industrial scale applications of circular economy;
- a continuous process of evaluation and learning that will build a knowledgebase that can be scaled up to the whole economy for all types of materials to foster circular interactions; and
- a platform for research and industry collaboration between India and Australia beyond the initial three-year research program.

This report focuses on programs and initiatives that can enable social and behavioural changes to improve the circularity of consumer-used plastics.



# Executive summary

The India-Australia Plastics Research Initiative, conceived in June 2020 by the Indian and Australian Prime Ministers, brings together research and industry partners in the two countries to work on reducing plastic waste and driving a circular economy for plastics in India. The project aims to take a holistic approach to understand plastic flows and supply chains, circular economy technologies and circular economy enablers including public policy, circular business models, behaviour change programs, and initiatives led by communities and industries. The project will use insights and strategies from these wide-ranging enablers to develop a roadmap that sets out a pathway for achieving change towards a circular economy for plastics in India.

This report focuses on behaviour change programs and provides evidence to guide the design and implementation of strategies and action plans to roll out a road map for the circular economy of plastics in India. The report analyses existing initiatives that have been undertaken in India to: i) improve people's knowledge and awareness of problems related to plastic pollution, and ii) promote changes in behaviours needed to mitigate these problems. In addition, the report draws from other research literature to identify a range of alternative behaviour change strategies that could be used to support change, thus identifying gaps and opportunities for the Indian context.

Using a comprehensive framework for understanding the various behaviours related to the consumption of plastic, the analysis and findings consider strategies that address the key components of social practice theory: people's skills and competences; the materials, infrastructure and physical aspects related to plastic consumption; and the symbolic or social meanings of how plastic is consumed and how this can be changed. This approach has identified knowledge-based interventions, technological and structural interventions, and social interventions as new opportunities for enabling behaviours that would support increased circularity of plastic.

This report focuses on four key types of consumption behaviours associated with plastic: the 3'R's of reducing, reusing, recycling, along with responsible disposal, which are collectively referred to as the 'R-behaviours' in the report. In addition to avoidance of plastic consumption, 'Reducing' behaviours include purchase choices, such as 'green' purchasing, and product switching to non-plastic substitutes. 'Responsible disposal' behaviours include litter avoidance. This report identifies the motivators, drivers, barriers, and enablers from a consumer's perspective that are needed to be incorporated or addressed in future behaviour change strategies to encourage the circular economy of plastic.

## Findings

Analysis showed that programs and initiatives in India that are aimed at increasing consumer awareness about plastic pollution and R-behaviours are promulgated through a wide range of channels: national announcements, the media, civil society, various state and local governments, and school education. Most of the information-based initiatives focused on two elements underpinning behaviour. One, changing citizens' attitudes and motivations through increasing their awareness as to the extent of plastic pollution and its harm to the environment, and two,

improving skills and competences for undertaking R-behaviours by increasing people's knowledge about how to recycle or how to substitute for single-use plastic. However, the associated changes to the necessary materials and infrastructure needed to support the behaviour change were not often addressed. In addition, the extent to which behaviours changed was unable to be determined due to a lack of evaluation and lack of available data.

### **Knowledge gaps and intervention opportunities**

Knowledge gaps and intervention opportunities represent potential initiatives and ideas to enable the increased circularity of plastic through more sustainable consumption practices. The opportunities emerged from identifying strengths and weaknesses in the initiatives that have been undertaken to date in India, and from approaches that have been used in other parts of the world or in other resource conservation domains that are so far underutilised in the Indian context. Both the gaps and opportunities provide avenues for further exploration of their possible use in implementing India's roadmap for a circular economy of plastics.

#### **A number of key gaps in research knowledge were identified that warrant further investigation in future studies:**

- A lack of understanding about the consumption practices of rural citizens, as most research has focused on urban settings.
- A lack of research involving SMEs and the contributions that this sector could make to improved labelling and consequent reducing, recycling, and disposal behaviours.
- A lack of understanding about the specific role of women and their decision making, as they are often the key determiners of household plastic consumption, particularly purchasing and recycling.
- Reuse behaviours have been under-researched and are particularly relevant in a developing country context.
- A lack of data on the effectiveness of interventions that attempt to change habits and maintain these changes over time.
- Limited studies that document the outcomes of interventions, and studies that evaluate the effectiveness of different behaviour change strategies, particularly those targeted to children and young consumers.

A range of potential opportunities and interventions for supporting the R-behaviours necessary for the sustainable consumption of plastic were identified and grouped into three categories.

1. Opportunities and interventions to improve citizens' skills and competences for undertaking R-behaviours. These opportunities are based largely around augmenting existing consumer awareness and education programs and extending the effectiveness of knowledge platforms and portals.
  - Improve the quality and targeting of information provided. Ensure that information targets a particular behaviour and a particular demographic or stakeholder group.
  - Extend single-use plastic information initiatives to ensure that information addresses all types of single-use plastic.

- Utilise industry to support broader educational initiatives about waste and recycling of plastic, especially through the increased involvement of polymer manufacturers, which has been an underutilised industry sector to date.
- Strengthen the ENVIS portals with up-to-date, credible, scientific and easy to understand information about the management of plastics in the environment, using different languages to increase popularity and usefulness among NGOs, schools, universities, think tanks and municipalities.
- Develop information and communication products specific to improving circularity for plastic.

2. Opportunities and interventions to **drive changes in people’s motivations and social meanings** associated with sustainable consumption behaviours. These opportunities are aimed at using information and other mechanisms for nudging social norms and shifting attitudes, and to use social influences to drive and reinforce changes in behaviour.

- Reduce the ‘yuck factor’ (i.e., the reflexive disgust of pre-used and ‘dirty’ material) to improve attitudes towards correct waste disposal and recycling.
- Utilise social influencers to champion green purchasing, recycling, and waste disposal behaviours.
- Incorporate more emotional cues into sustainable consumption messaging.
- Use targets and feedback mechanisms to increase incentives for R-behaviours.
- Empower consumers with a sense that their actions can make a difference.

3. Opportunities and interventions to **provide the materials and infrastructure needed** to undertake sustainable consumption of plastic. These opportunities are aimed at providing increased access and opportunities for consumers to undertake greener purchasing choices and other reducing, reusing, and recycling behaviours, and to reduce littering and leakage of plastic to the environment.

- Facilitate a category-wide shift in sustainable packaging.
- Extend industry initiatives to focus on rural areas, smaller cities, and towns.
- Support behaviour shifts through targeted infrastructure improvements that encourage improved collection systems for households.

In summary, this working paper identifies gaps in knowledge that need more research but potentially offer prospects for promoting future improvement in R-behaviours. There are also opportunities for extending the effectiveness of initiatives currently undertaken and to incorporate new initiatives that have not yet been tried. The next steps in the research will be to build on these knowledge gaps and potential opportunities so that future initiatives and interventions will create greater impact and change in consumers’ R-behaviours.

To this end the next research phase will comprise a qualitative study incorporating key informant interviews to investigate opportunities for enabling behaviour change in a comprehensive and holistic approach: influencing social meanings and attitudes, addressing materials and infrastructure aspects, and improving skills and competences. The next study will also identify ways for improving tailoring and targeting of initiatives to maximise impact, to understand issues that impede or enhance program implementation, and to identify potential data for program

evaluation. These insights will contribute to the recommendations and priorities for the national roadmap designed to deliver and drive change towards a circular economy for plastics in India.



# 1 Introduction

## 1.1 Intent and overview of the report

The purpose of this working paper is to provide a baseline of evidence for future research into social and behavioural changes that support the implementation of a circular economy of plastics in India.

The paper has two primary objectives:

- To learn from existing initiatives to inform the nature and implementation of strategies for the roadmap, and to identify factors enabling success.
- To identify gaps and opportunities for the next phase of research, and plan the next steps, including data collection.

To achieve these objectives, we analysed initiatives that have been implemented in India over the past two decades that were aimed at enabling the social and behavioural changes needed to shift society to a circular economy of plastics. This analysis depended primarily on the grey literature and case studies. In addition, we provide an analysis of the barriers and drivers that underpin more circular social practices and behaviours, and possible interventions that could be used to enable social practice and behaviour changes. This analysis primarily drew on the academic literature and case studies.

Much of the relevant existing research focuses on the production side of the circular economy, with fewer studies specifically addressing the circular economy from the perspective of the consumer (Kirchherr et al., 2017), yet consumers are often the driver of new markets and are fundamental to achieving more sustainable consumption. We address this gap by exploring from a consumer's perspective those factors that act as motivators, provide opportunities, and help to reinforce and maintain consumption that aligns with circular economy principles.

### Scope

Plastic packaging of various kinds was a primary focus of this review. Packaging was targeted as it is the most ubiquitous use of plastics, specifically with respect to domestic and commercial stakeholders; it represents the largest component of plastic waste in the environment; and it is a focus of policy makers and industry in the plastics sector.

In providing examples of programs and the effects on social practice, the literature review focused on the status of key awareness and education programs led by and targeted towards different stakeholders in the plastic value chain, and the impacts of these programs on behaviours and actions towards more sustainable management of plastics in the environment. The review attempts to understand the effects on knowledge, attitudes, and behaviours of consumers with respect to purchase of products, reduction in use, and disposal of waste, including for recycling. These effects are analysed using the Competences, Meanings and Materials components of the social practice framework (Sahakian & Wilhite, 2014; Shove, Pantzar, & Watson, 2012).

Gaps in knowledge and action and **challenges** faced in the desirable shifts to a circular economy in plastics are also identified. These gaps are framed as questions for primary stakeholder interviews and discussions, which are expected to contribute to the design of follow-up research activities that will inform recommendations for the roadmap of a circular economy for plastics in India.

# Part A Theoretical and conceptual frameworks

## Theoretical frameworks

1. A circular economy framework based on circularity strategies was used to discuss social practices, behaviours and factors contributing to barriers and success. Circularity strategies are also referred to as the 'R' strategies and include Refuse, Rethink, Reduce, Reuse, Repair, Refurbish, Remanufacture, Repurpose, Recycle, and Recover. To these we added Disposal or 'Removal', because it represents an important component of the cycle for plastic waste.
2. Social practice theory and other social-psychological theories were used to identify and analyse the barriers, drivers and enablers that underpin the range of behaviours required for an effective circular economy. Social practice theory addresses materials and infrastructure, meanings and motivations, and skills and competences, which together underpin behavioural outcomes. Social-psychological theories contain overlapping concepts but do not always address all these factors. Social-psychological theories also provide useful





evidence for mapping interventions to potential outcomes. In combination, both social science approaches to theory provide opportunities for a comprehensive and rich discussion of social and behavioural enablers.

3. A typology based on informational, structural, and social influence strategies was used to describe the types of interventions that have been used (or could be used) to support social and behaviour changes.

## Other conceptual frameworks

Understanding the factors that affect different types of behaviours important to a circular economy providing opportunities for decision makers to devise policies, programs, and initiatives that are suitable and effective in supporting a transition away from the produce – use – dispose consumption typically found in most economies.

Behaviours such as avoidance, reducing, reusing, and recycling can all result in reducing the volume of virgin materials and lost resources used to make plastic, help retain the value inherent in the plastic material for as long as possible, and mitigate plastic loss to landfill and the broader environment. In addition, growing new markets for recycled products through consumer. 'green' purchasing provides new employment and business opportunities. In this section we draw from the academic literature to identify the range of factors that influence and shape these behaviours, specifically, of consumers with respect to purchase of products and disposal of waste.

## 2 Theoretical frameworks

### 2.1 Circular strategies or the 'R' strategies

There are several different frameworks that use the 'R' strategies to describe the circular economy, with variations in the number of R strategies that each framework uses. Circularity strategies seen from a socio-ecological and socio-economic lens differ from Life Cycle Assessment (LCA) or techno-ecological approaches to the circular economy, where the focus may be on technical aspects of resource efficiency or material flows through the value chain. These approaches differ, for example, in their focus on design; production and remanufacturing; distribution; consumption, use, and repair; collection; and recycling. The social science literature more commonly uses R-behaviours of refuse, reduce, reuse, repair, and recycle, to assess and analyse the relevant practices, barriers, and interventions related to the circular economy (e.g. Geiger, Steg, van der Werff, & Ünal, 2019).

Previous research into circularity strategies within the production chain has identified socio-institutional change as more important in the refuse, rethink, reduce, reuse, and repair strategies (Potting et al., 2017). As depicted in Figure 1, the further down the production chain of the framework, the more reliant solutions are on technology and changing business models.

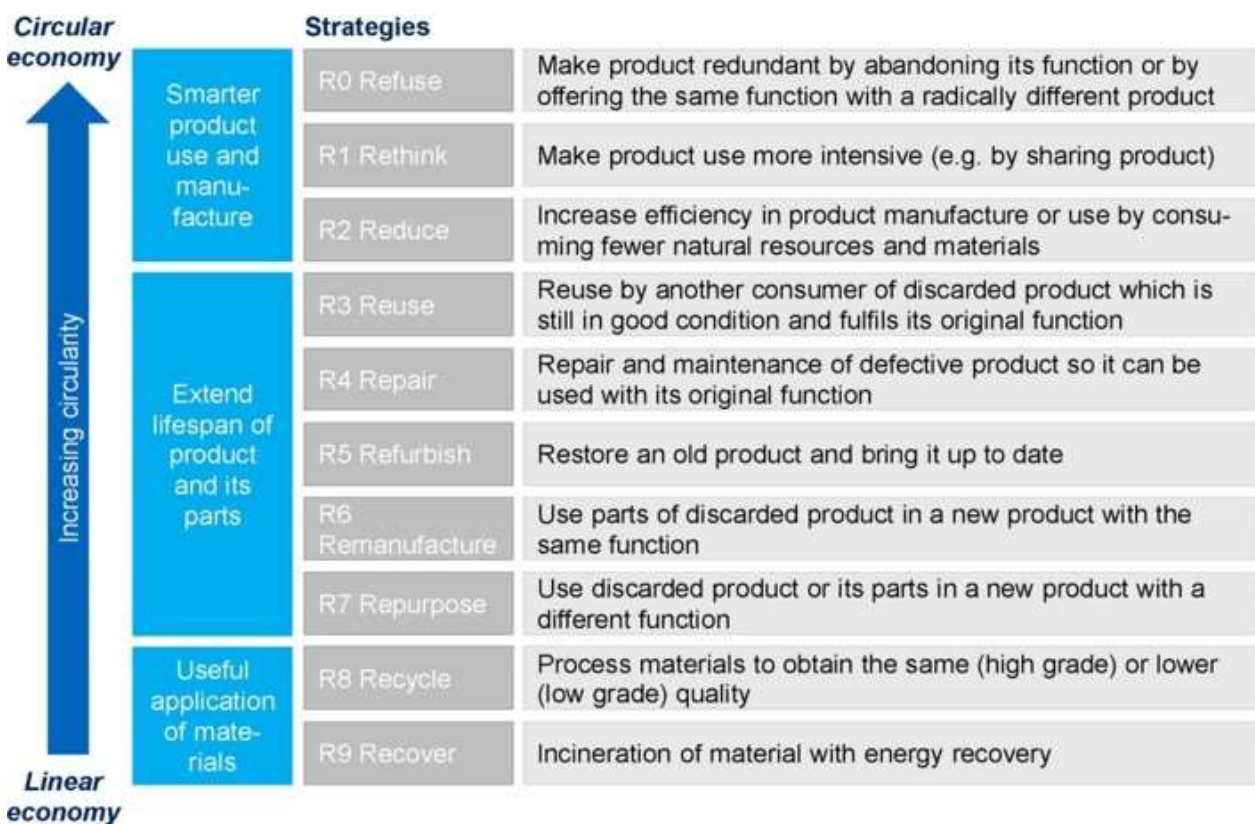


Figure 1 Circularity strategies within the production chain in order of priority

Source: Kirchherr et al. (2017); Potting et al. (2017)

However, it is unclear which specific 'R strategies' are most often addressed in social science theory and behaviour change interventions, and what interdependencies may exist across the different R strategies that guide consumer behaviours on a circular economy pathway. It may be that a narrower set of R-behaviours need to be used to best describe the focus of social and behavioural enablers for the circular economy. This literature review addresses this lack of clarity and identifies the most useful R strategies of the circular economy that could be addressed through behaviour change initiatives.

## 2.2 Social and behavioural theories for explaining social practices

**Social practice theory** is frequently used by sociologists to explain social practices undertaken in society, using three main components to holistically describe the range of factors from which these practices emerge. These components include materials, meanings, and competences. The strength of this theory is that it provides a broad and rich collection of factors to explain social practices and posits that each of these components need to be addressed to achieve a cultural shift to more sustainable social practices (Sahakian & Wilhite, 2014; Shove, Pantzar, & Watson, 2012).

**Social psychology theories** also incorporate a range of factors to explain behaviour, though these theories often are less holistic, trading off parsimony for comprehensiveness. Such theories identify social, economic, behavioural, psychological, demographic, and/or cultural factors as impacting people's 'green' or pro-environmental consumption behaviour. These theories most typically apply to reducing, reusing, and recycling behaviours, commonly referred to as the '3Rs', and can be related directly to consumption behaviours around plastic. The strength of social psychology theories is that they often provide empirical evidence as to the effects of different interventions on a behaviour (Kurz, Gardner, Verplanken, & Abraham, 2015).

For this review we have drawn from the strengths of both sets of theories to identify barriers, success factors, and enablers in our discussion of programs that have been undertaken in India, and to identify potential strategies that could be used to increase the circularity of plastic. Social practice theory and socio-psychological theories can complement each other and together provide a comprehensive approach to understanding underlying factors and a range of possible solutions that are relevant to the R-behaviours (Breadsell et al., 2019; Nash et al., 2017). Our analyses consider the motivations, drivers and barriers from the perspective of the end user or consumer of plastic products. This includes examination of purchase choices, disposal practices, presentation of materials for recycling, reuse and repair, and avoidance behaviours. These specific consumer actions may be undertaken by individuals, households, businesses, industry, and/or government consumers.

### 2.2.1 Social practice theory

Social practice refers to the everyday routine activities that comprise day to day living and formed through three interconnected elements: materials, competences, and meanings. *Materials* refers to the technologies, tools, infrastructure, or material objects used in performing the practice; *competences* refers to the skills or knowledge needed to carry out the practice; and *meanings*

refers to the values, social norms, attitudes, feelings, and symbolic meanings associated with the practice (Breadsell et al., 2019; Nash et al., 2017).

A change in practice results from a change in one or more of the three elements. For example, practice change can occur through changing a technology or introducing new technologies, or using education and training to change skills and competence to carry out the practice, or alternatively changing the meaning or social norms related to the practice. Thus, practices are viewed as dynamic and evolve from broader societal changes in how a practice is understood, organised, and performed at a societal level, rather than focusing on behaviour of the individual (Hargreaves, 2011; Nash et al., 2017). Social-psychological theories use interventions that often overlap with social practice theory, particularly interventions aimed at changing attitudes or social norms or for improving skills and competences (Breadsell et al., 2019). However, social practice theory also addresses changes to technology or the material and structural aspects underpinning a practice, which is argued can achieve longer lasting change than some of the social-psychological approaches (Breadsell et al., 2019). Nevertheless, some behaviour change approaches, such as community-based social marketing, incorporate assessing and removing barriers as a critical and early step in designing and implementing any behaviour change program (McKenzie-Mohr & Schultz, 2014), and these barriers can include technological, material and structural elements.

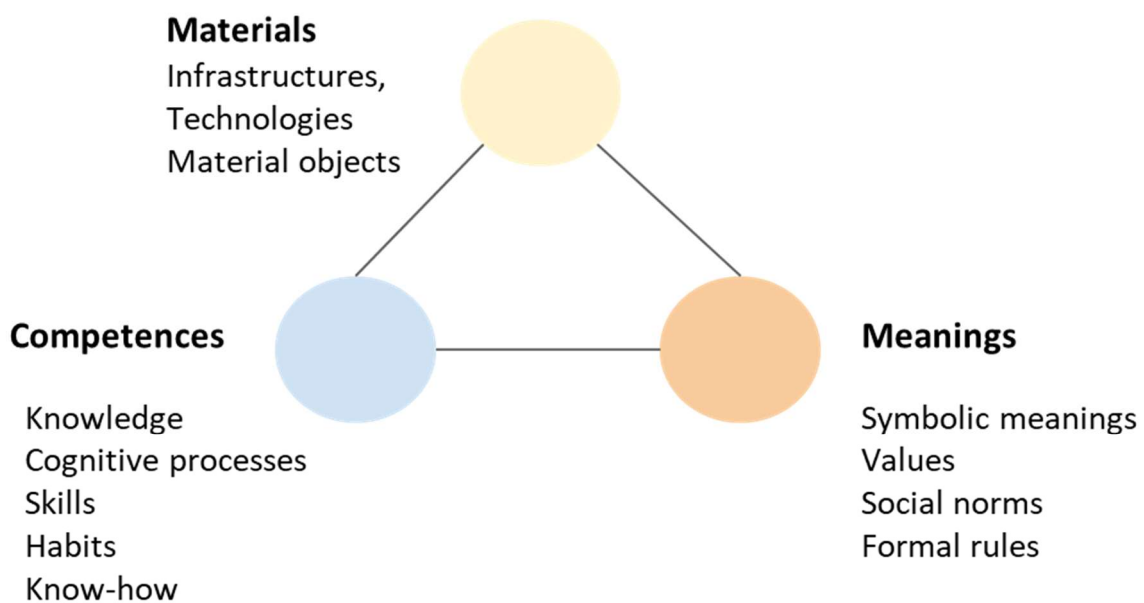


Figure 2 Three interconnected elements of social practice theory

Sources: Sahakian and Wilhite (2014); Shove, Pantzar, and Watson (2012).

### 2.2.2 Social psychology theories

Different socio-psychological theoretical frameworks have been used to investigate the drivers underpinning the R-behaviours in relation to plastics and to identify possible interventions. These drivers can be grouped in various ways: into individual factors and external factors (Li et al., 2019); into motivational factors, contextual factors, and habits (Steg & Vlek, 2009); and into internal and external factors (Kedzierski et al., 2020). This section describes some of the commonly used

theoretical frameworks in the literature to investigate drivers, motivations, barriers, enablers and implications for policy, programs, and other interventions.

The Knowledge, Attitude, Practice (KAP) framework has been used widely to investigate a range of household recycling activities, including source separation of plastics (Babaei et al., 2015). This framework refers to knowledge as an awareness or understanding of facts and information about a topic obtained through a range of mechanisms including experience, education or learning. Attitude is an overall perception towards something, and practice is an action based on the underpinning knowledge and attitude (Babaei et al., 2015). In this framework, knowledge is a key determinant of attitude and, in turn, attitude is a key determinant of a practice or behaviour. It is common for researchers to add a range of variables into the KAP framework to improve its explanatory power in determining behaviour.

Similar to the KAP but with additional socio-psychological constructs, the Theory of Planned Behaviour (TPB) has often been used to examine factors driving intentions and behaviour associated with waste management (Si et al., 2019) including the consumption of plastic and the purchase, use, recycling and disposal of plastic. Additional variables are also commonly added to the TPB's core constructs of attitudes, social norms, perceived behavioural control, and behavioural intentions to improve its explanatory power. Researchers have drawn variables from cultural theories (Sreen et al., 2018), organisational theories (Jain et al., 2020), and norm-based value frameworks (Khan et al., 2019) to identify the most salient factors influencing R-behaviours and outcomes. Some of these studies have been undertaken in India, although there are few theory-driven empirical investigations targeting the Indian context or the different types of plastic consumed (Jain et al., 2020; Si et al., 2019).

## 2.3 Typology of interventions

From a social-psychological perspective, interventions for behaviour change that support pro-environmental outcomes, or the sustainable use of resources, can be categorised in various ways. For example, such interventions can involve education and awareness, outreach and relationship building, social influence, nudges and behavioural insights, or incentives (Abrahamse & Steg, 2013; Grilli & Curtis, 2021; Steg & Vlek, 2009). In a review of interventions and success factors, Grilli and Curtis (2021) found that education and awareness and social influence interventions were reported most frequently in studies. They suggest this prevalence could reflect the ease of implementation and cost-effective nature of these types of interventions when compared to other initiatives such as incentives, which are more expensive to deliver. In their review, they found all types of interventions to be effective, and reported success was highest in the waste disposal and recycling domain. Outreach and relationship building, and incentives, were found to have the highest success rates (>80%), followed by social influence interventions (78%), and nudges (75%), with education and awareness interventions (66%) reporting the lowest rate of success (Grilli & Curtis, 2021). Though not categorised as social influence interventions in the Grilli and Curtis (2021) study, it could be argued that outreach and relationship building can also be considered a form of social influence.

Interventions based on social influence approaches rely on the phenomenon that our behaviour is affected by what other people do and what other people think (Abrahamse & Steg, 2013). Social influences can include social norms that are incorporated into information or feedback

mechanisms to provide the person with information about what other people are doing or that other people approve or disapprove of a certain activity. Social learning and modelling, social networks, public commitment making, social comparison, and feedback about a group’s performance are also examples of different social influence approaches that have been used to encourage and support resource conservation behaviours such as recycling and other waste avoidance behaviours (Abrahamse & Steg, 2013; Grilli & Curtis, 2021; McKenzie-Mohr & Schultz, 2014).

Choosing the most appropriate intervention has been identified as fundamental to success and should be based on the specific objective to be achieved, available resources, and the target population (Grilli & Curtis, 2021). However, it is unclear which types of interventions provide long-term effects, or indeed if the effects will be maintained after the intervention discontinues (Abrahamse & Steg, 2013), which is a common criticism of socio-psychological approaches (Breadsell et al., 2019). In turn, this suggests that longer-term monitoring of interventions is needed to understand the effect of interventions over time, and if and when their impacts fade.

### 2.3.1 Aligning types of interventions to social practice theory

To summarise the various types of interventions and to align them to social practice theory we have mapped the various intervention types to the three components of the social practice framework. We have drawn from research that has further categorised types of interventions into three broad categories: social, technological, and knowledge-based (Breadsell et al., 2019), to create a platform that broadly aligns with the three components of the social practice framework (meanings, materials, and competence). Table 1 shows the different types of interventions and their alignment to social practice theory.

**Table 1** Types of interventions mapped to the three elements of social practice theory

SOCIAL PRACTICE CONCEPT	CHANGING MEANINGS	CHANGING MATERIALS	CHANGING COMPETENCE
<b>Category of interventions</b>	Social interventions	Technological interventions	Knowledge-based interventions
<b>Examples of interventions</b>	<p>Social norms, social learning, modelling, social networks, social comparison, public commitments, feedback, goal setting, targets, outreach and relationship building, incentives, rewards, nudges, fines, bans, regulations</p> <ul style="list-style-type: none"> <li>Individual or group-based programs can be very effective but are expensive and often difficult to scale up to large groups</li> </ul>	<p>Equipment, product design, alternative products, greener product choices, devices that provide feedback, automated solutions, location of recycling centres, improved collection systems</p> <ul style="list-style-type: none"> <li>Improved convenience, easier to perform, less effort, cheaper, more accessible</li> </ul>	<p>Awareness programs, education programs, skills training, guidelines, prompts</p> <ul style="list-style-type: none"> <li>Broad-based programs can reach many people at once but may be less effective if they lack tailoring and targeting to either specific behaviours or specific demographic segments</li> </ul>

*Note:* Products encompasses packaging.

### **2.3.2 The importance of identifying the behaviour to be changed**

Identifying the specific behaviour to be changed has been cited as the most important first step of any behaviour change intervention (Grilli & Curtis, 2021; McKenzie-Mohr & Schultz, 2014; Steg & Vlek, 2009) and should reflect the behaviour(s) that create the most impact on the problem being addressed. Implementing a behaviour change program that focuses on behaviours that are easier to change, but which have only minimal impact on the problem, is a wasted use of often scarce financial and human resources needed to run the program (Grilli & Curtis, 2021). This suggests that best practice interventions would consider a range of target behaviours and gather information about their likely impact before settling on a specific behaviour to target.

## 3 Factors underpinning R-behaviours

### 3.1 Drivers and enablers of R-behaviours

#### 3.1.1 Enabling changes in habits

Habits are largely driven by convenience and the environmental context. Habitual behaviours are performed automatically with minimal cognition. Habits can relate to decision making as well as actions. People can use routines and heuristics in the choices they make and in the way they go about making decisions, especially for a product that they may not put excessive value on, or an action that is performed frequently or at speed. Changing habits and ensuring that the change is long lasting often requires mental or cognitive effort and a change in the environmental surroundings (Kurz et al., 2015). For example, when a person moves to a new house it is an opportunity to change their routine for how they dispose of recycling. Raising awareness through a campaign and providing a convenient solution to the new behaviour that is required will help the person consciously implement an alternate strategy. A combination of information, incentives and alternatives have been found to be effective in changing behaviours, for example switching from store provided plastic carry bags to own cloth bags (Gupta, 2011). Feedback mechanisms, targets, and other incentives can help maintain a person's motivation for a new routine until the new behaviour becomes embedded into a more desirable habit. Providing low-cost alternatives are key – low cost in terms of time, effort, convenience and money.

#### 3.1.2 Environmental consciousness and environmental awareness

Environmental consciousness and awareness have been identified as contributing to a person's intentions to purchase products that are considered 'green'. Green purchasing behaviour includes behaviours that support buying products that can be recycled, that use environmentally friendly packaging, and are considered environmentally friendly (Fatah & Khan, 2016; Kautish et al., 2019). Research studies of young consumers in India found that increasing levels of environmental consciousness lead to increasing green purchase intentions (Kautish et al., 2019) and beliefs that a person's actions can have a positive effect on the environment are also important for green purchasing behaviour. Yet a person's perception that they are in control of their eco-friendly purchase choices (perceived behavioural control) was not found to predict green purchase behaviour (Kautish et al., 2019).

Environmental involvement, a factor that reflects a level of concern and support for environmental protection activities, has also been found to underpin a person's intention for green purchasing behaviour (Fatah & Khan, 2016). Moreover, increased recycling intentions also correlate with increased green purchasing intentions (Kautish et al., 2019). Researchers suggest that increasing young people's awareness and consciousness about the environment will lead to increased purchasing choices of products that are better for the environment.



### **3.1.3 Reuse behaviours**

Reuse of an object is potentially an underutilised approach for improving waste management of plastics in developing countries, where reuse behaviour outweighs recycling behaviour in terms of environmental benefits (Kedzierski et al., 2020). Case study research in developing countries has shown that waste is understood as having value and as a source of income (Yukalang et al., 2018) or as a commodity (Moore, 2012), which would potentially drive opportunities for greater reuse of objects. However, promotion of reuse behaviours as a way for reducing plastic waste and pollution has been under-investigated, particularly in developing economies (Kedzierski et al., 2020) such as India. Increasing knowledge and understanding of reuse practices could potentially provide an innovative approach for improved waste outcomes for plastic.

### **3.1.4 Disposal attitudes and practice**

Long-standing social trends towards hiding our waste (Moore, 2012) have created a deeply ingrained 'out of sight, out of mind' attitude towards discarding our objects, particularly if there is a sensory component driving emotions such as 'disgust' (Kedzierski et al., 2020) or a 'yuck factor' that results from a perception of being unsavoury to sight and health. Moreover, if people are unaware or underestimate the impact on the environment and if there are no consequences for poor disposal, or if consequences are deemed trivial, then dumping of plastic in natural environments may result (Kedzierski et al., 2020). Researchers have also described disposal of waste as habitual (Heidbreder et al., 2019) and that disposal of plastic directly into the natural environment or the urban fringe of towns and cities is an example of habitual behaviour developed through conditioning over years of removing from sight and immediate environment that which is undesirable (Kedzierski et al., 2020).

In India, the 'yuck' factor is potentially exacerbated and reinforced by India's caste system. Plastic waste, which is often mixed with food and experienced as wet waste, is also perceived to be connected to the people who collect and sort the waste. These rag pickers and garbage collectors often manually segregate garbage and are considered 'unclean' in many parts of the community. Improvement in work conditions and systems for increasing home-based segregation of waste will help to improve the quality of jobs for manual waste collectors and lead to broader benefits within communities.

### **3.1.5 Perceived benefits of undertaking R-behaviours**

When individuals perceive there are benefits associated with R-behaviours, they are more likely to undertake the behaviour. These benefits include local or individual benefits such as commercial gain, or improvement in a company's image, as well as broader societal benefits such as environmental benefits or reducing landfill (Jain et al., 2020). Both avoidances to purchase and discard behaviours are modulated by a cost-benefit balance – between individual costs (of immediate individual impacts) and perceived societal and environmental benefits (Kedzierski et al., 2020). Incentives such as immediate economic benefits have been found to balance the perceived risks and nudge the conversion of attitude to practice behaviour (Akshaya Vijayalakshmi, 2019).

### **3.1.6 Risk perception and associated behaviours**

The perception and degree of risk is identified as a nudge for behaviour change at both individual and organisational levels. Risks may be individual, for example related to health concerns, or across society and environmental with longer-term public health or economic impacts, and elicit different responses. Eight drivers for risk taking behaviours have been identified (Syberg et al., 2018). 1. Voluntariness – where a person is likely to accept a given risk if the exposure is voluntary rather than superimposed. 2. Controllability – risks that are perceived as not under our control and are more worrying for the person. 3. Knowledge – increased degree of familiarity associated with the risk is easier to accept. 4. Timing – a gradually induced risk is easier to accept than a rapid imposition. 5. Severity – a risk that impacts more people is seen as more dangerous. 6. Benefit – risks associated with benefits are easier to accept. 7. Novelty – new issues or technologies are considered riskier than older, maybe more dangerous but known, options. 8. Tangibility – how tangible and real and direct are the risks to the perceiver as opposed to being distant and abstract. Each of these risk perceptions guides how an individual or even an institution (industry or municipality) may behave in the context of managing plastics.

The behaviours of consumers, industry and municipalities can be linked to the perceived degree of risk associated with the use or (mis)use of plastics, as seen in their reported responses, ranging from shifting of responsibility and demand for action from another stakeholder and suggesting options and solutions (Satnam Singh, 2018), to looking for collaborative solutions (Bandela, 2018), leadership and collaboration for change (The Consumer Goods Forum, 2020; Ellen MacArthur Foundation, 2017) and innovations in product and process (Haas et al., 2020). In recent times, increased use and disposal of Single Use Plastics and e-commerce resulting in increased packaging waste have been responses to health risks perceived by individuals emanating from the COVID pandemic (Vanapalli et al., 2021).

### **3.1.7 Social norms and social influences**

Social influence refers to the impact that other people have on our behaviours, such as effects from what other people are doing or what other people think, both of which can affect an individual's behaviour (Abrahamse & Steg, 2013). Social influences can also encompass social norms, social learning, and social comparison and all have been shown to have an impact on conserving resources, including recycling of plastic waste (Heidbreder et al., 2019). Group feedback mechanisms where information about what other people are doing can be used to facilitate R-behaviours (Abrahamse & Steg, 2013). In addition, social influence can be particularly effective in increasing the uptake of behaviours that are externally visible and undertaken in front of others, as well as in behaviours that are less observable (Abrahamse & Steg, 2013).

Research in developing countries has shown that people are more likely to return and recycle plastic if those who are important to them are also motivated and encourage them to do so, such as family and friends (Khan et al., 2019). However, how much a person identifies with a group (social identity), the cohesion of that group and other group identity factors may affect the degree to which social influences shape an individual's behaviour, suggesting that interventions based on social influences will need to be targeted (Abrahamse & Steg, 2013).

### **3.1.8 Emotional cues and a sense of moral obligation**

Willingness to pay for alternatives and avoidance of using potentially harmful objects (single-use plastics) were seen to be most influenced by the emotion of guilt. 'In particular, the main finding of the network analysis was that guilt appears to be the best predictor of people's willingness to pay more for a water bottle made of bio-based plastic instead of conventional plastic' (Zwicker et al., 2020). This strategy has been used for a long time and people find ways to avoid such emotions, especially in climate change intervention campaigns. While it does seem to be effective in changing people's behaviours, this is short-lived. People do not like to feel negative about themselves for they perceive this as manipulation. On the other hand, increased awareness and availability of more sustainable options, leading to positive emotional cues, have been found to create behaviour shifts (Gupta, 2011).

### **3.1.9 Cultural factors**

Cultural values have been shown to impact green purchasing behaviour in India. Strong cultural collectivism has been linked to behaviours that provide broad societal benefits and help a society to fare better. Even though India has been described as comprising various subcultures each with their unique values, beliefs and norms (Sreen et al., 2018), collectivism values have been found to drive positive views about purchasing green products in India. Similarly, the cultural values of a man-nature orientation where individuals believe in the importance of living in harmony with nature have also been found to underpin green purchase choices in India (Sreen et al., 2018).

### **3.1.10 Situational factors – convenience, access to recycling**

A range of situational factors can support and enable improved R-behaviours, such as convenience, which has been shown to be a significant influence on the way plastic is consumed (Heidbreder et al., 2019). It underpins people's use of plastic bags (along with low prices), and choices people make regarding products packaged in plastic, especially in food packaging.

### **3.1.11 External interventions: incentives, targets, regulatory measures, bans**

Regulatory measures can be used to change plastic consumption practices and improve waste outcomes. Taxes on plastic packaging, bans, and enforcing product labelling that outlines environmental impacts or recycling instructions are all examples. Experimental research has shown that if industry incentives are too weak to stimulate their uptake of strategies to mitigate problems from plastic packaging, for example the use of product labelling, then government regulatory measures are needed rather than relying on self-regulation or voluntary commitments, if such measures are to be effective (Friedrich, 2020).

There are concerns that despite these initiatives, one long lasting impact from COVID-19 could be that the temporary relaxation of mechanisms such as bans on single-use plastic, combined with mistrust over the hygiene of recycled products, could result in a slowing down of the behaviour change needed to reduce plastic consumption and improve plastic recycling (Vanapalli et al., 2021). Specific policies and interventions may be required to address these issues post-pandemic.

### **3.1.12 Industry initiatives to support consumer behaviours**

Communication regarding the sustainability of a product or packaging nudges the adoption of the product by consumers (Boz et al., 2020). Industry initiatives for design changes in products, core materials or supportive waste management services have been found to influence consumer mind shifts, especially of the aspirational middle class who have created growing demand in the food, beverages and hospitality industries. These design initiatives, when coupled with environmental and health messages, have potential to deliver stronger impact. Examples of airlines and railways moving away from plastic cutlery and cups to bio-degradable materials, changes in hotel chain policies to move from free miniature soap and shampoo bottles to re-fill dispensers, changes in packaging materials by e-commerce companies and take-back policies for PET bottles and cans have seen complementary consumer responses (Gupta, 2019).

## **3.2 Impediments and barriers of R-behaviours**

### **3.2.1 Barriers related to meanings**

#### **Perceived costs: time, effort, lack of convenience, and money**

Perceptions that there will be costs incurred in terms of time, effort, lack of convenience, and money will tend to be a negative driver of R-behaviours. These costs could relate to collection and source sorting of plastic waste in preparation for recycling, costs associated with transport, or mechanisms for ensuring quality control of recycled materials in the case of C&D waste (Jain et al., 2020). A lack of willingness to pay more for a product that is more environmentally friendly has been shown among Indian consumers (Yadav & Pathak, 2017) and suggests the importance of creating awareness of other benefits of the product such as environmental benefits, in order to motivate consumers to purchase a product that is recyclable or that can reduce plastic waste.

#### **Perceived lack of control to undertake the behaviours**

Studies have shown that when a person believes a behaviour is too difficult or remains outside of their control, they are less inclined to undertake the behaviour. This concept is included in a range of theoretical frameworks and represents actual barriers external to the person that may impede behaviour, such as no collection services for recycling, or perceived barriers that are internal, such as lack of knowledge and awareness, or lack of ability to undertake the behaviour. This concept is referred to as perceived behavioural control in the TPB theoretical framework. Perceived Consumer Effectiveness (PCE) is identified as a control factor and denotes to the extent to which individuals believe that their actions make a difference in solving environmental problems (Kautish et al., 2019). This has also been referred to as Perceived Effectiveness of Environmental Behaviour (PEEB), which reflects the perception of effectiveness of an individual action within a larger societal or environmental context (Fatah & Khan, 2016).

#### **Disconnect between perceptions of the individual's risk and environmental or societal impacts**

A disconnect between direct individual health impacts and larger environmental impacts has been shown to be a barrier in responsible disposal behaviours. Even when the impact of plastics in the environment is known and intellectualised, this does not elicit the same degree of 'yuck response' as it is still far removed from the everyday life of users of plastic and by not feeling its impact,

users restrict their management efforts to a minimum (Kedzierski et al., 2020). This type of psychological limitation factor has also been found to limit behavioural change in the context of climate change.

### **3.2.2 Barriers related to materials and infrastructure**

#### **Lack of opportunities to purchase recycled products or products with less plastic packaging**

Research has shown that consumers feel they have limited choice in purchasing goods that would reduce plastic waste (Rhein & Schmid, 2020). For example, products that come with unnecessary packaging or food that is wrapped in plastic. Similarly, a lack of access to goods made from recycled content where access is reduced due to price or availability.

#### **Lack of opportunities to recycle plastic**

Lack of opportunities to recycle plastics can range from situational factors at the micro level such as not possessing a bin, and the type of home or home ownership, through to system level factors such as the lack of a collection system or recycling services within a neighbourhood. Living in rental accommodation or apartments has been found to be associated with lower recycling than in situations where people are home owners or living in a single-family house (Geiger et al., 2019). Distances from a recycling facility and the size of a neighbourhood have also been reported to affect recycling rates, with closer proximity to a recycling station and smaller size neighbourhoods both associated with increased recycling (Geiger et al., 2019). However, studies that report this type of research have usually been undertaken in western or developed countries. In the Indian context, the lack of infrastructure related to waste collection and recycling has been described as a major challenge facing the waste management system, along with a lack of expertise to operate waste management facilities (Kumar et al., 2017).

Different types of plastics, even in segregated wastes from domestic, commercial and other sources, have very different end of life processing options. For many such as multi-layered plastics and single-use flexible packaging and carry bags, the options are limited to opportunities as infill material in road construction or incineration as fuel replacement in waste to energy or cement plants. The lack of recycling opportunities stems from the extremely mixed and distributed nature of this waste, from limited technical options, and from downscaling of value. A lack of benefits is perceived with respect to resource replacement in either energy production, road construction or replacement product manufacture and weight-based transportation charges for this high-volume low-weight waste category. This results in an unviable business case for both collectors and recyclers, leading to much of it being littered or disposed of in landfills (Rathi, 2019).

#### **Infrastructure and systemic gaps in the waste management value chain**

Source separation of waste coupled with segregated collection and transportation have been identified as the weakest links in the waste management chain. The former is the most 'individual behaviour linked' and the foremost step in the process (Bhattacharya et al., 2018). A lack of structural mechanisms in the interface between households and municipal collection systems is a major disincentive in household segregation. A report by the Central Institute of Petrochemicals Engineering & Technology (CIPET) observes that in smaller Indian towns, waste is deposited by residents at kerbside/community garbage bins which are picked up by municipal trucks and transferred to the disposal site. In larger cities, house-to-house collection systems have been adapted where residents deposit their waste with a contractual or municipal

crew who collect it from houses using hand carts or tricycles. If waste collection processes are not seen to respond to or amplify individual efforts at segregation, households are less motivated to segregate at this level.

### **3.2.3 Barriers related to competence**

#### **Lack of awareness of the benefits of green consumerism and R-behaviours**

Education plays a significant role in increasing awareness of the benefits of undertaking R-behaviours, including both social and environmental benefits. Creating increased awareness will in turn lead to more positive attitudes, which will help drive internal motivations for undertaking the behaviours. However, it is also important to include messaging about individual responsibility and how to undertake the actual behaviours that are needed (Moss, 2021; Rhein & Schmid, 2020) especially if ‘fear’ appeals are being used where the emphasis is on ‘threats’ or problems to the environment. In such cases there is risk that people will perceive the problem as too great and assume they have no agency in changing the outcome.

#### **Increased complexity due to multi-criteria decision making**

Consumer dilemmas in choice making are enhanced when multi-criteria choice making is presented. This is called the value-action gap, when expressed preferences for environmentally friendly or socially responsible lifestyles do not translate into related purchase behaviours, creating an ‘attitude-behaviour’ difference. Thus, for the consumer, sustainability of packaging becomes another criterion to consider along with quality, performance, and price while purchasing, for example selecting concentrated detergents versus non-concentrated ones, and choosing six packs of soda cans held by glue versus plastic rings in the crowded canned soda market. This is likely to reduce choice for sustainable packaging or sustainably packaged products. A category wide shift in sustainable packaging is suggested to enable consumers to integrate sustainability into purchasing decisions. This implies targeting all, or at least the most popular, companies across the whole category of products for shifting to sustainable packaging (Boz et al., 2020).

## **3.3 Demographic differences in R-behaviours**

This section presents a summary of differences based on various demographic characteristics and demonstrates the importance of understanding the target segment of any given intervention so that initiatives can be tailored to that segment to achieve maximal impact and the most desirable outcomes. Even though research indicates that demographic factors are often less important than motivational factors or external barriers affecting behaviour, it may still be effective to tailor material within larger interventions to address these differences.

### **Age**

Older people tend to be more likely to undertake reusing, reducing, and recycling behaviours related to plastic consumption, and to support campaigns for reducing single-use plastic bags (Heidbreder et al., 2019). This finding is contradicted by experimental studies in India where the older generation were found to be more resistant to change through ‘environmental messaging and even larger public health messaging’. It may be that older people are willing to engage in such

behaviours for reasons other than environmental or health impacts (e.g., being frugal). Conversely, children and young adults were found to be more amenable to influence from environmental health and personal and societal health concerns, and to the impact of 'peer influences' both locally and in the connected world, from global peers (Fatah & Khan, 2016).

### **Gender**

Women have reported higher frequency of undertaking consumption practices consistent with reducing plastic waste than men (Gupta, 2011; Singh & Mathur, 2019). Women demonstrate more practices of reusing, recycling, and reducing plastic and are more willing to substitute for plastic bags (Heidbreder et al., 2019). Women make most purchasing decisions for home products in India and are more influenced by social pressures when it comes to green purchasing choices than men (Gupta, 2011; Sreen et al., 2018).

### **Education**

Higher levels of education have been associated with increased support for getting rid of plastic bags and avoiding plastic consumption (Heidbreder et al., 2019).

### **Employment status**

Homemakers indicated lower levels of undertaking waste reducing behaviour with plastic products, compared to other employment types (Singh & Mathur, 2019).

# Part B Examples from India

This section documents a review of three different groups of programs for improving a range of consumer behaviours important for the circular economy of plastics.

- Programs and initiatives for increasing consumer awareness in India of plastics pollution and management.
- Industry initiatives to increase consumer awareness and behavioural change.
- Knowledge platforms for creating, storing, and disseminating information.





## 4 Programs and initiatives for increasing consumer awareness in India of plastics pollution and management

This section provides examples of programs and initiatives undertaken in India that were focused on increasing consumer awareness of plastic pollution, and/or educating consumers on how they could help mitigate and manage the plastic waste problem. These programs can be grouped into five main categories: national announcements, media programs, civil society programs, local government programs, and school and educational programs. Each program category faces specific challenges and provides valuable lessons in identifying gaps and opportunities for future campaigns aimed at improving consumer behaviour through increased awareness and education.

### 4.1 National announcements

#### Phasing out single-use plastics

On October 2, 2019, Indian Prime Minister Narendra Modi announced India's intent to phase out single use plastics (SUPs) by 2022. His announcement, made on the banks of the Sabarmati river on the symbolic day of the 150th birth anniversary of Mahatma Gandhi, was a follow-up of the 'major announcement' on this issue during his address to the nation on India's Independence Day on August 15th, that year (Kaur, 2019). The announcement was a reiteration of the Indian government's public commitment to this effect in 2018.

The issue of plastic pollution was raised at the national level during the celebration of World Environment Day (June 5) 2018, hosted by India with the Global theme, 'Beat Plastic Pollution'. During these celebrations, the Government of India, through its Ministry of Environment, Forests and Climate Change (MoEFCC), announced the phasing out of single-use plastics by 2020, though this target was later revised to 2022 (Press Information Bureau Government of India, 2018).

#### Challenges

The announced phasing out of single-use plastics, however, was a dilution of an anticipated complete ban on single-use plastics, influenced by objections from industry, especially those who use multi-layered packaging for their food and condiments, and who risked losing sales in the absence of any imminent packaging alternatives. These objections were supported by industry bodies such as the Federation of Indian Chambers of Commerce and Industry (FICCI), which raised concerns of multi-factorial impacts on the industry including increases in product prices, which could make low price products such as sachet shampoos, detergent pouches, and biscuit packets unviable with the additional expense of shifting to alternative packaging. Currently, these products enable first-time consumers to experience products at affordable prices and serve the growing rural markets. The other challenge posed to a complete ban on SUPs was imminent job losses of around 0.45 million across 10,000 firms in the plastic manufacturing industry, and revenue losses to the food processing industry of around INR 90,000 crore (about AUD 16.1 billion) (Bhushan,

2019; Das, Aparajita; Akamsha, Bipin; Singh & Gaur, Gaurav; Dutta, 2019; Kaur, 2019; Nikhil Bhandare; Gowri Sundaresan; Shilpa Gupta, 2019).

## 4.2 Media programs for creating awareness

In 2018, while the complete SUP ban was rolled back, the Government of India introduced a slew of measures to address the growing concern about SUP in the waste stream. The most significant of these was an increased large-scale awareness campaign on the issue. Promoted by governments at central and state levels, and city municipalities, media houses picked up the increasing concern about SUPs and published data in various forms about the environmental impacts of SUPs, trends in plastic use, and management of plastic waste. This also included information regarding types of plastics in popular use and in waste streams, along with public education measures undertaken by civil society organisations.

### Challenges

A broad scan of media reports – print, TV and online – demonstrated the extensive and wide variety of information available on almost all facets of plastic pollution, consumer trends, and waste management efforts. However, it is unclear how effective these media campaigns have been, how they affect consumer attitudes and behaviour, and whether the campaigns are more effective for certain demographics. To our knowledge, there are no publicly available evaluations or assessments of the short-term or long-term impacts of such programs.

### Multi-media approaches to awareness campaigns

- Print and online versions of almost all national and regional newspapers carry media articles on single-use plastic, including prominent national dailies such as The Hindu, Business Standard, Economic Times, Times of India, and the Telegraph.
- A long-running television campaign has been the NDTV-led 'Greenathon' and 'Banega Swasth India', which has been televised since 2014 and is currently in season six. It features talk shows, telethons, competitions, short documentaries, reports of civil society action and runs as a constant reminder of environmental impacts for its audience. As part of its environmental awareness programming, the show links health and well-being with a wide variety of issues including plastic waste management (NDTV, 2020).
- Celebrities, politicians, and everyday citizens have all been used as spokespeople to create awareness about plastic waste as an environmental concern, and public awareness has grown rapidly.
- In addition, news reports brought to the fore local initiatives in schools for raising concerns on plastic waste, as well as community efforts and youth activism in raising EPR implementation concerns with industry.

## 4.3 Civil society programs

Civil society initiatives have been at the forefront of creating awareness on waste management, especially for solid wastes and plastics in particular, and pre-date the government's active efforts by more than two decades. Civil society groups have been very active not only in public and school

education and awareness programs but also in direct action on ground and in partnerships with municipalities and corporate houses. These initiatives are often supported by multi-lateral and bilateral organisations. Civil campaigns are visible not only in metro cities but also in tier II<sup>1</sup> and tier III<sup>2</sup> cities and census towns (Ministry of Home Affairs, 2011; Planning Tank.com, 2021), as well as villages. The programs target a wide range of sectors within society including school children, waste pickers, municipal government bodies, and the public.

- One of the earliest programs was the seven-year-long CLEAN India Program run by Development Alternatives (DA) from 2005–2012, which reached 72 cities and towns through grassroots partnerships between schools and civil society groups. Modelled on a 4A approach, of Assessment, Awareness, Action, and Advocacy, the program aimed to build awareness and knowledge through participatory assessment involving motivated students and grassroots civil society actors to design and run environment management actions for their local contexts (Gumber & Jacob, 2006; Development Alternatives, 2007).
- The Centre for Environment Education (CEE) has been a leader of environmental education, especially for youth at school and university levels. Their ‘hand-print’ program focused on informed positive actions to reduce ‘ecological foot-prints’ (Centre for Environment Education, 2007) reaching out to young people in schools and universities with messages and training for environmental awareness and action.
- The Centre for Science and Environment (CSE) is a leader in environmental assessment reporting and awareness, addressing issues that concern consumers, industry and policy onto one platform. Through their regular ‘State of Environment Reports’, the *Down to Earth* magazine and ‘Green Schools’ with *Gobar Times* magazine for children, they have regularly brought good science to the broader public.
- Organisations (Chintan in New Delhi, and Hasiru Dala in Bangalore) are working with waste pickers to demonstrate community-based waste management models while also creating public awareness about municipal waste and plastic issues. Chintan works to build capacities of waste-pickers, organise them and connect them with public sector programs. Hasiru Dala, meaning ‘Green Force’, works across the south Indian States of Karnataka, Andhra Pradesh and Tamil Nadu. It works for the economic and social rights of waste pickers and their families and has organised waste pickers to provide environment management services in metro cities as well as small and medium towns. Both these organisations, as part of the Alliance of Indian Wastepickers, are at the forefront of advocating for waste-picker rights and designing community-based waste management service models.
- In addition, there are organisations that work with municipalities to improve governance and management of waste such as Janagraha, Bangalore, All India Institute for Local Self Governance, and ICLEI South Asia. TERI and Development Alternatives (also partners in this research) have been active in policy research and education of Government bodies and municipalities in action-research formats.

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<sup>1</sup> Population of 50,000 to 99,999 (Census of India, <https://censusindia.gov.in/2011census/PCA/A4.html>).

<sup>2</sup> Population of 20,000 to 49,999 (Census of India, <https://censusindia.gov.in/2011census/PCA/A4.html>).

### Youth activism to increase industry's extended producer responsibility

An extremely popular youth activism initiative, as a consequence of children becoming aware of the production – marketing – consumption links of plastic-based packaging, led to highlighting industry EPR compliance. School students in the state of Tamil Nadu collected over 20,000 empty wrappers, 505 of which came from the popular biscuit and packaged cake and bread brand Britannia, and mailed these back to the company with a letter:

*'We are happy with the taste and quality of your products, but unhappy with the plastic packaging. We want to ensure a safe environment for our future generations and minimize our plastic footprint. We have decided to collect used plastic wrappers of your products and send them to you for safe disposal. Please help us savour your products without guilt, by introducing eco-friendly packaging.'*

The students were supported by the municipal commissioner of their city of Thoothukudi, Alby John Varghese, who sent a supporting letter to the companies reminding them that according to a 2016 law, producers, importers, and brand owners – not municipalities – are responsible for collecting plastic waste left by their products. The mass-wrapper mailing was a 'grand success' in generating publicity (Burrows, 2018). In a similar manner 5200 school students in the city of Dehradun, supported by the District magistrate and a local civil society organisation, Gati, in 2019 collected over 300,000 plastic wrappers of various packaged food and sweets weighing over 555 kg for 'Plastic Wapsi' (Return Plastic) and worked with the Indian Institute of Petroleum who converted the plastic waste into diesel (Vidya, 2019).

### Challenges

This review of civil society initiatives shows the long-standing activities that have been undertaken by civil society groups to build awareness of waste management in both the broader public and school children. However, there appears to be a lack of data on the impact of these initiatives on waste behaviour over the short or long term. To our knowledge, there have been no systematic evaluations of civil society interventions that can provide information about long-term sustainability and success factors, or about the specific challenges of awareness and education on plastic waste management issues programs. Another challenge for these types of initiatives is the capacity for civil society programs to conduct measurement and/or evaluation of their own programs, due to scarcity of resources and a general lack of waste-related data available to them. Grassroots-level civil society programs often complement and/or implement public programs, and are therefore driven by outputs mandated by the government program or scheme. Systematic evaluations of public programs at macro levels have a challenge of attributing causality of behaviour shifts to micro-level interventions.

## 4.4 Local and state government programs

Even before the slew of bans that followed the Prime Minister's announcement in 2019, the need for sustainable management of plastic waste was already being raised by many state and municipal governments in association with civil society and multi-lateral and bilateral organisations. Many state governments too had been leading through public awareness programs and supportive regulatory measures. By March 2019, 18 States and Union Territories (Andhra

Pradesh, Arunachal Pradesh, Assam, Chandigarh, Chhattisgarh, Delhi, Goa, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka, Maharashtra, Odisha, Sikkim, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal) had already taken initiatives and imposed some kind of ban on plastic manufacture, stock, sale, or use of plastic carry bags (MoHUA GoI, 2019).

The programs in Himachal Pradesh are particularly relevant as the state has the longest running polybag and single-use plastic bans in the country, with subsequent impacts on consumer and retail behaviours. The Himachal Government's Sustainable Plastic Waste Management Plan implemented by the Department of Environment has been running since 2009. Its first stage was focused on removing plastic waste and using it in roads. This approach was found to be the most economical solution at that time, producing savings in road manufacture and using plastic without cleaning. Other activities followed including a public campaign, alternative options developed for collection and recycling infrastructure, and public audits (MoHUA GoI, 2019).

### **The Swachh Sarvekshan creating local improvements**

Nationally, the Government of India has introduced the Swachh Sarvekshan (or Cleanliness Survey) to nudge city municipalities to improve their waste management interventions on various fronts. The survey was initiated in 2016 and covered 73 cities; by 2020 the survey had grown to cover 4242 cities. It is claimed to be the world's largest urban sanitation and cleanliness survey and uses a competitive approach to encourage improvements and change in the participating cities.

The survey has been instrumental in fostering a spirit of healthy competition among towns and cities to improve their service delivery to citizens and towards creating cleaner cities. Moreover, it thus encourages large-scale citizen participation and creates awareness amongst all sections of society about the importance of working together towards making towns and cities better places to live in.

Plastic waste management is targeted in the survey (NDTV; PTI, 2020b) and cities report on various initiatives that they are experimenting with, ranging from neighbourhood level segregation, to involvement with Producer Responsibility Organisations (PRO), use of Extended Producer Responsibility (EPR) models, changes to Material Recovery Facilities (MRFs), and waste-to-energy strategies (NDTV; PTI, 2020a).

The annual survey has managed to mobilise people, resources and authorities in an effort to prove that their city, of all cities in India, is the cleanest and that sustainable practices, both by citizens and ULBs, are being encouraged and promulgated. The Ministry of Housing and Urban Affairs (MoHUA) is now in the process of conducting the sixth edition of the survey to rank all cities under Swachh Bharat Mission-Urban (SBM-U) with the Quality Council of India (QCI) as its implementation partner (MoHUA GOI; QCI, 2021).

### **Challenges**

The local and state government run programs have delivered a range of initiatives which integrate awareness, education and behaviour change messaging aimed at improving consumer behaviours related to plastic. However, data is often not available to understand the impact or effectiveness of the awareness and education aspects in the success or shortfall of the achieved results. Increased understanding of the factors underpinning the effectiveness of the programs would help

in future planning and decision making regarding scaling up or extending programs to other municipalities, or in targeting certain types of behaviour or segments of society.

## 4.5 School and educational programs

There is a plethora of education programs regarding waste management in general, and plastic waste management in particular, in the country. Besides the curriculum at school and college level in mandatory environment education courses, many online and offline courses are operated by civil society organisations. Quite a few of these programs are sponsored by corporates and industries as part of their Corporate Social Responsibility (CSR) mandates or specifically to complement their EPR implementation, especially in cases where the industry has committed to shifting to reduced virgin or zero plastics in their products and packaging.

The long-running systematic school education programs concerned with environmental sustainability and waste management now include plastic waste concerns and are run primarily by two education centres. These are the Centre for Environment Education – called Eco-Schools India (CEE, 2021) – and the Green Schools program of the Centre for Science and Environment, which is one of the longest running environment education programs for school children (CSE, 2021). These programs have a defined set of tools, experiential activities and programs that are integrated into school curricula to systematically address scientific understanding, environmental impacts and management strategies for plastics in the environment. However, they do not address social issues in the plastics chain adequately. Other civil society initiatives that do address both social and environmental concerns do not target school children.

Educational curricula in India, from kindergarten to university and research studies, are guided by the National Policy for Education. This is updated from time to time, with the current version known as the New Education Policy 2020. The policy has, over the years, mandated age-appropriate environmental education and mentioned specific challenges at particular times, notably climate change and the Sustainable Development Goals as areas of study (National Education Policy 2020, 2020) (Sujata Kumari, 2021). Waste management and plastics management is systematically taught through grades III to XII in text books published by the National Council for Education Research and Training (NCERT, 2021). The Environmental Education, Awareness and Training (EEAT) scheme of the Ministry of Environment, Forest and Climate Change (MoEF&CC, 2021) is a central sector scheme running since 1983. Its aim is to promote environmental awareness and mobilise student participation for environment conservation. It has five components, one of which targets waste management and the concept of reduce, reuse, recycle, and recover behaviours, along with pollution control.

The Annual Status of Education Report (ASER) is the largest participatory survey and reporting on the educational outcomes at primary school level conducted in India. Besides the core 'reading, writing and arithmetic' skills assessment, ASER also includes sectoral knowledge assessments from time to time, which include environmental and water, sanitation and health (WASH) knowledge as well. Although, it is limited at the moment to rural schools, its scope could be enlarged in both coverage and sectoral knowledge to include aspects of waste management, specifically plastics, in the survey (ASER Centre, 2021).

## Eco-Schools India

Eco-Schools India is part of the larger global Eco-Schools program implemented through the Foundation for Environment Education network in over 60 countries. It started with targeting students at the primary school level, for classes 1 to 5 (6–11 years old). Subsequently, it was introduced at the middle school level, i.e., classes 6 to 8, beginning with the core theme of ‘Waste Management’ in April 2020.

The Eco-Schools Waste Management Programme (EcoWaM) aims to involve middle school students across the country to create leaders, having the awareness, knowledge, commitment and potential to meet the challenges of waste management in their spheres of influence (Madsen, 2020). The program has integrated environmental issues into curricula with tested pedagogy, resource materials, and teacher training.

The programs enable students to connect daily situations with the SDG framework. The ‘Litter-less schools campaign’ initiated in 2011 within the Eco-Schools program deals with core issues related to plastic waste, citizen responsibility and action. It engages and educates children and young people on the issue of litter and waste and encourages them to make positive choices. The campaign is a joint initiative of MARS Wrigley Foundation and the Foundation for Environmental Education. The Centre for Environment Education (CEE) is the national operator for the campaign in India.

## The Green Schools programme

The CSE managed Green Schools programme is an environmental education program aimed at subtly sensitising students to the environment through hands-on and thought-provoking activities through a ‘learning by doing’ approach. The program employs a citizen science approach for its environment management system and audits the consumption of natural resources within school campuses through students, helping schools become good environmental managers by deploying pragmatic solutions to reduce wastage of precious resources.

## Challenges

A range of education programs are undertaken to improve awareness about plastic waste management, and many of these are well established, forming components of a broader environmental education curriculum. Though these programs have been long running and are considered successful, understanding the extent of their success through some form of outcome data would be beneficial for decision making about future programs. Enlarging the scope of the ASER survey could be explored as a possible route for outcome mapping of education regarding plastics management.

## 4.6 Knowledge platforms for creating, storing, and disseminating information

The literature search revealed a variety of platforms and sources of information and knowledge that were targeted to different audiences and stakeholders. These could be categorised broadly into seven categories: (1) data portals managed and maintained by the Government of India, (2) knowledge portals managed by educational institutions and civil society under the direction of the Government of India, (3) independent information and knowledge portals managed by civil society and think tanks, (4) Knowledge portals of technical research and development agencies, (5) knowledge portals of industry associations, (6) knowledge portals managed by national and international multi-partner programs and global consultancy firms, and (7) knowledge portals of the UN and other multi-lateral agencies. Appendix A provides examples of each of these types of knowledge portals.

While a wealth of information and knowledge is available across these different portals, we find a gap in the availability of comprehensive information in one place, especially for the public at large. In order to address this gap, the Government of India produced a very comprehensive and easy to comprehend report in 2019 (MoHUA GoI, 2019) targeted towards the general public, municipalities, industry and entrepreneurs, that described all aspects of plastic value chain – polymer varieties, production of various types of plastics and their uses, environmental impacts and ongoing initiatives by the government, municipalities, research institutes and popular civil society interventions. It includes case studies of many promising and successful pilots and even some long duration plastic waste management experiences. This report also provides some potential models for EPR that companies may adopt. It is a useful knowledge resource that has been cited and used extensively by media houses in their awareness programs. It is interesting to note that the report also refers to ‘reuse’ as a specific option besides refusing and recycling. This is important because most management strategies been studied in this report gloss over or do not mention the reuse of plastic products, even packaging, a characteristic very common in Indian households.

### Challenges

Educational information for children, such as the knowledge portals of CSE and CEE (Green Schools and Eco-Schools initiatives) provide very comprehensive information. However, the education material treats plastic as mainly a waste management issue. Links between the chemistry of plastic, the utility of plastics and the responsible use and management of plastics are lacking. This is also reflected in the knowledge materials available from the Environment Information portal (ENVIS) of the Ministry of Environment Forests and Climate Change,<sup>3</sup> where the concept of ‘circularity’ of resources is not addressed.

## 4.7 Gaps and opportunities in consumer awareness programs

Most of the material accessed in this literature review was in the English language. All Government of India awareness material is available in at least English and Hindi; much is also

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<sup>3</sup> <http://envis.nic.in/>.



translated into the other national languages of India. Almost all of the grassroots civil society information about waste management and plastic wastes is in regional languages accessible to the public at large. However, this research has not been able to access the full variety of information available across all languages. It would be useful to conduct a detailed study of the variety of awareness and educational material being brought out regularly and assess the scientific accuracy and prioritisation of concerns (refuse, reduce, reuse and recycle) that are being addressed and the stakeholders to which these are being directed.

A major gap in the communication is 'what constitutes single-use plastic and non-recyclable or low value packaging' (Kaur, 2019). There is a lot of confusion across domestic and commercial consumers regarding plastic characterisation. Even in the campaign materials, and educational and awareness materials, SUPs are broadly understood as flexible polythene bags less than 50 micron in thickness, cutlery, and flexible packaging. The fact that MLP packaging, styrofoam food carriers, and non-woven bags (among other products) also constitute single-use plastics is not widely recognised. In fact, polymer-based non-woven carry bags are among the most problematic, as most users perceive these as cloth. While these are used multiple times, they typically end up in landfills rather than being recycled.

Another gap relates to available knowledge materials, including training materials that address plastics in the environment from a circular economy perspective. Some material has emerged recently, mainly in the portals of civil society think tanks, multi-partner large global programs, UN agency portals and industry portals. The concept of circular economy with context-specific social, environmental and public health examples and outcomes is not available for the general public or even to school students.

Finally, a major challenge is the lack of outcome data and systematic assessment of the effectiveness of awareness, education and behaviour change communication with respect to shifts in consumer behaviour to purchase and disposal of plastic products, especially SUPs and packaging. Methods employed to assess behaviour change outcomes from other pro-environmental behaviour domains could be adapted and built into monitoring frameworks of awareness programs that complement plastic waste management interventions in the future.

## 5 Industry initiatives

This section examines the relationships between industry initiatives that promote consumer awareness of sustainable management of plastics in the value chain designed to nudge responsible plastic consumption and disposal behaviours. Two types of industry stakeholders are addressed in this section: those that **produce** single-use plastic packaging materials<sup>4</sup> for other industries or for domestic and retail consumers; and those that **use** plastic packaging material for their products, such as the food and beverages, hospitality, and e-commerce sectors. The Government of India's phased ban on single-use plastics impacts both these industry actors.

Such companies have addressed the issue of public awareness regarding sustainable plastic packaging, safe disposal, and recycling in three main ways:

1. Creating awareness through announcements of corporate commitments to reduce plastic waste and shifting to more sustainable packaging alternatives.
2. Providing consumer information regarding types and recyclability of product packaging.
3. Supporting public awareness and action initiatives through corporate social responsibility (CSR) efforts including sponsoring school-level educational initiatives.

### 5.1 Creating awareness through announcements of corporate commitments

Industry changes to more sustainable packaging products and action on Extended Producer Responsibility (EPR) are being built into public outreach initiatives which aim to elicit active participation by consumers. Such an exercise also builds their brand and mitigates the risk of dips in sales that industry perceives as they shift to new packaging or add on the costs of collecting and recycling wastes. The specific examples of Flipkart and Bisleri are useful to understand the strategies and methods being employed.

In November 2019, the e-commerce marketplace Flipkart announced a new initiative to create awareness among consumers on the proper disposal of plastic packaging, and to make them active participants in its sustainability agenda. Flipkart announced that it aimed to move towards 100 per cent recycled plastic consumption in its supply chain by March 2021. As part of this initiative, Flipkart conducted a pilot project to collect plastic packaging back from consumers at selected hubs and send it for recycling and reuse. Under the program, Flipkart sent out invitations to consumers asking them to voluntarily hand over plastic packaging to 'Flipkart Wishmasters' for its proper disposal, at the time of product delivery. The collected packets were sent to registered vendors to ensure responsible disposal to avoid ending up in landfill. Wishmasters were provided proper training in explaining the various facets of this initiative to consumers to ensure high participation. This industry-first initiative aimed at inspiring people to actively contribute towards

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<sup>4</sup> For example: Bharat Milling Industries. NASHIK - 422003, INDIA., Akar Shrink Packs. NASHIK - 422113, INDIA., Vardhman Polyfilms. AHMEDNAGAR - 414111, INDIA., Deejay Plastics Pvt. Ltd., K.S. Fabricators. SOLAN - 173205, INDIA., Vivaan Flexi Pack Pvt. Ltd., BIs Polymers Ltd. DELHI - 110001, INDIA., Aristo Plast. MUMBAI - 400063, INDIA.

the proper disposal of plastic packaging and become Green Ambassadors (Deccan Chronicle, 2019).

Similarly, the bottled water giant Bisleri initiated 'Bottles for Change', a program aimed at creating change around plastic consumption and recycling through awareness and education of citizens about the importance of recycling plastic. Bisleri partnered with Mumbai-based NGO Parisar Bhagni Vikas Sangh (PBVS), Sampurna Earth, a social enterprise and market leader in the waste management segment, as well as Dalmia Polypro Industries Ltd., a recycler of post-consumer waste associated with plastic agents/kabadiwala groups in Mumbai. The plastic collected by 'Bottles for Change' was crushed into fine flakes, which were then used to create products such as fabric, handbags, window blinds, urban furniture, etc. Bisleri funded the project internally. The program included awareness sessions and citizen workshops as an integral part, followed by linking to a 'channel' whereby plastic agents could collect plastic waste from various stakeholders. Products created from the recycled plastics, such urban furniture, have been prominently placed, and also advertise Bisleri's intent to address EPR in its value chain. A mobile app for Mumbai introduced in 2019 links citizens with nearby plastic agents so they can hand over clean plastic. The plastic agents then sell the used, clean plastic to recyclers. The app is reported to have been downloaded by 5000+ people across Mumbai (Urvi, 2019).

The three key components of the revised Plastic Waste Management rules (1. Extended Producer Responsibility (EPR), 2. Phasing out of manufacture and use of non-recyclable multi-layered plastic, and 3. Reuse of plastic), impact actions on plastic waste management as well as industry-led awareness campaigns. A study of India's top 200 companies by IIM Udaipur and Futurescape, reported in *The CSR Journal* (Kasmin, 2018), found programs being initiated for the first and third components, but no programs were disclosed for phasing out multi-layered plastic. An analysis of corporate social responsibility spending related to plastic waste in 2018 (Kasmin, 2018) indicates how companies are moving towards both innovation in product/packaging design (or indicating their intent to do so) and responding to EPR rules and engaging actively with municipalities and consumers to develop systems for responsible management of packaging or return into the supply chain.

Company disclosures are related to the various reduce, reuse and recycle initiatives that they are planning to take or have started for managing plastic used in their products (mainly packaging) as part of EPR fulfilment. In 2018, *The CSR Journal* listed several companies that had disclosed tangible targets for the responsible management of plastic packaging of their products that include take-back and recycling initiatives directly or through collaboration with PROS and municipalities (Kasmin, 2018).

## 5.2 Providing consumer information on type and recyclability of product packaging

Labels on products and packaging materials are mandated to indicate their compliance with the standards and regulations of the land or global standards if the product is meant for global markets. Labels have also been seen as a means to influence consumer decisions regarding purchase and post-use disposal or management of products and packaging materials. With respect to management of plastics in the environment, labelling is required to represent safety standards,

especially in the health, food and beverages sectors. Eco-labels carry necessary information including certification of the environmental impact of the product during its lifecycle and guidance for disposing of the product post-use. However, consumers often face confusing, contradictory or misleading information that results in exacerbating rather than stemming the rates of plastics leaking into the environment (United Nations Environment Programme & Consumer International, 2020).

The UNEP-10 Year Framework Programme has developed 'Guidelines for Providing Product Sustainability Information' (UNEP, 2017). This is global guidance on enabling and empowering responsible consumer choices. The Guidelines are divided into two types: (1) 'Fundamental Principles' that include reliability, relevance, clarity, transparency and accessibility, and (2) 'Aspirational Principles' that include the three dimensions of sustainability, behaviour change and longer-term impact, multi-channel and innovative approach, collaboration and comparability. The Guidelines target the 'providers of information – the product developers and the private sector who sell the products' but can also inform users of information (consumers); the regulators of information (the public sector); and watch dogs (civil society organisations that check the quality and veracity of the claims).

In the case of plastic-based products and packaging, we presume that any label, whether generic or 'eco', which indicates recyclability, biodegradability, and so on would necessarily follow the Fundamental Principles, since these are compliance related. More importantly, it is the Aspirational Principles that we are concerned with to understand whether these have any impact on consumer behaviours. A study involving over 40,000 purchase decisions by consumers in different categories and regions, (O'Rourke & Ringer, 2016) suggests that sustainability information on products had an impact only on those few consumers who were purpose-driven, and already aware and looking out for such information on product labels; such sustainability information on product labels had no impact on mainstream consumer behaviour. Kumar and Kajapriya (2020) corroborate this finding through an empirical study in Tamil Nadu, India, identifying that it is mainly young adults who are driven to purposeful purchasing due to their higher awareness of environmental and health impacts. These authors also reported that the chasing arrow (indicating recyclability) and the energy star (indicating energy efficiency) are the most recognisable of such labels.

A report published by Unilever based on a survey of 20,000 consumers in five countries, subsequently substantiated by Accenture (Daren, 2017), revealed that purpose-led consumers, those interested in seeking 'sustainable' products, were rising in emerging economies, with one in five of the people surveyed saying they would actively choose brands if they made their sustainability credentials clearer on their packaging and in their marketing. A third of the consumers in the survey were buying brands based on their social and environmental impact. This finding indicates that 'trust in brand' is a major factor in consumers' choice with respect to the information provided on the label. In turn, it is thus quite unlikely that general consumers would follow through on the traceability and/or transparency of eco-labelling claims on products, and would instead simply trust these claims provided they come from trusted brands. Thøgersen (2002) found that trust, understanding what the eco-label stands for, credibility of the eco-label, and the environmental values of the consumer were all factors, amongst others, that influenced consumer behaviours.

While retail consumer choices are significantly dependent on brand trust, or on labels if the consumer is already aware of the potential environmental impact of their choices, the same is not the case with institutional and public procurement. These purchases, especially if under scrutiny of ‘auditors’, require legitimate tendering processes with product specifications that may include environmental impact information. However, there is now significant pressure on public procurement processes, including in India, to integrate Life Cycle Assessment (LCA)-based environmental and social impact information in their procurement procedures. Across different central government ministries, primarily led by the Ministry of Environment, Forests and Climate Change, the NITI Aayog, and State governments, there are now concerted efforts to integrate sustainability in public procurement of goods and services. These influences on public and institutional procurement are expected to have flow-on impacts on private and retail purchases.

### 5.3 Supporting public awareness and action initiatives through CSR

India’s Corporate Social Responsibility (CSR) laws mandate that high net worth companies spend two percent of their average profit on environment and development initiatives. A review of the public records of such initiatives relating to waste management reveals that companies are directing funds towards awareness in two ways: (1) some projects have awareness built into action initiatives, e.g. (Smita, 2020a); (Smita, 2020b); and (2) only a handful of corporate funds are directed towards pure awareness programs. This pattern is also reflected in the CSR spends of 2018 reported in *The CSR Journal* (Kasmin, 2018) which notes that very few companies report CSR projects that are focused mainly on ‘Consumer Awareness for plastic waste management’ even though the issue resonates with the Government’s Clean India Mission. In a notable exception in 2017–18, Mahindra & Mahindra were listed as reporting significant spend to raise awareness about the ill effects of plastic on health and marine life.

In 2018 and 2019, we saw corporate support for beach clean-up drives or neighbourhood or heritage site clean-up drives, and we also saw a spurt of company-led events as part of employee engagement strategies (HDFC, HUL, etc.) generally around international days such as World Environment Day or Earth Day. In 2019 and continuing in 2020, we saw a growing number of corporate engagements as part of multi-partner initiatives such as the AEPW, UNEP-plastic countermeasures, etc. being led in India through the GIZ, UNEP, UNDP, etc. A very small number of corporate funds are directed towards systemic education and awareness initiatives directed to children and youth in schools or universities.

Many companies provide support to community-based initiatives in waste management. These programs often include a strong awareness and education component. They may include end-to-end action from reduction to segregation, and connections with recycling and upcycling or end of life management. These programs are almost always in partnership with local civil society organisations, and are of varied scale, from neighbourhood level to whole city or targeting a specific source such as railways or commercial establishments. Cases in point are award-winning initiatives run by Chintan and its Safai Sena (cleanliness army) for four railway stations of the city of Delhi where they manage collection, segregation and material recovery facilities (Doval, 2019; Wangchuk, 2019), EXNORA’s Zero Waste Management (ZWM) project, supported by PepsiCo as part of its corporate social responsibility program on solid waste management, which provided waste management services to over 0.45 million people across Tamil Nadu, Andhra Pradesh and

Haryana (Pepsico-Corporate Social Responsibility, n.d.) and Hasiru Dala (discussed above). Most of these are in cities, but a few rural examples are seen, especially in Southern India.

An example of CSR support in community-based waste management in rural areas is the 'EnteEdakkad' – an end-to-end waste management project. It is supported by Air India Express under its CSR Scheme and implemented by Mathrubhumi Printing & Publishing Co Ltd. in Kerala (Smita, 2020b).

What the CSR projects reveal, in addition, is that companies involved in the manufacture of polymers in the plastics value chain do not spend on plastic management issues under their CSR spends, while companies that are intermediary users of packaging materials have been found to support civil society groups or municipalities through CSR funds in management of plastic waste and awareness regarding the same.

## 5.4 Gaps and opportunities in industry initiatives for supporting consumer awareness and behaviour change

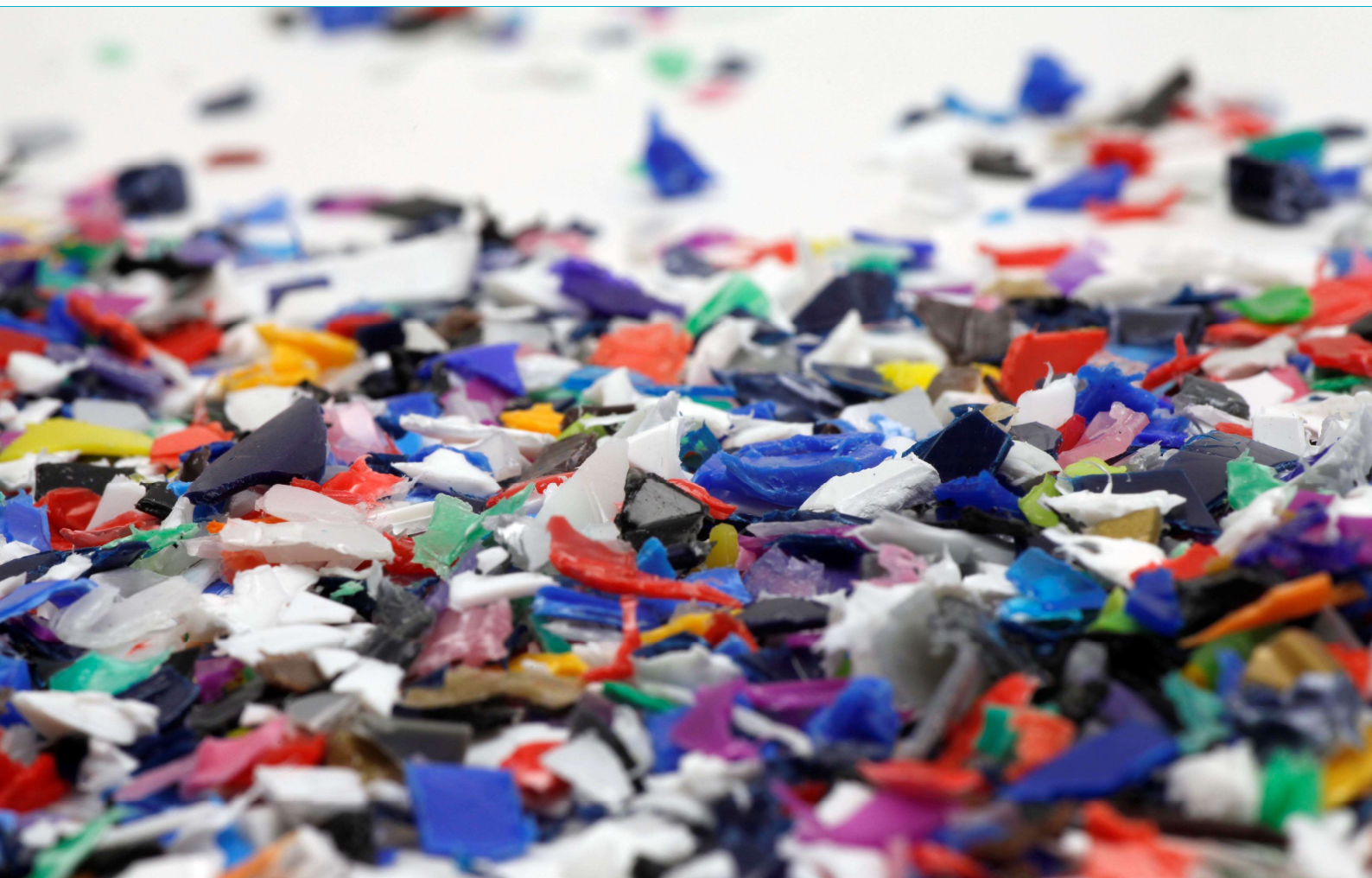
With respect to industry-consumer linkages for awareness creation, the key gaps are that industry awareness programs are mainly connected with their own efforts to manage plastics as mandated by EPR routes and not very much inclined to put out information purely for public awareness. In that sense there is a potential leadership space available for companies. While many companies work with multi-partner programs to support plastic waste management issues, these efforts are still pilots and small in scale, and use the CSR route to do so. There is very little information or support for educational initiatives for plastic management in the environment across the value chain by industry.

Again, the industry most actively engaged in any form of awareness, whether for EPR fulfilment or only for public awareness, only includes intermediary companies who use plastic packing in their products. Polymer manufacturers did not appear to be engaged in consumer awareness even if they are now producing bio or compostable packaging. It must also be noted that all of the awareness focus (or the majority of it) is targeted towards urban and largely tier I and tier II cities. Educational and awareness initiatives by corporates and citizen engagement with industry efforts on this issue are largely absent in smaller cities, towns and rural areas. In addition, there is a lack of data, with measures of impacts or outcomes from the initiatives also generally missing.

# Part C Summary of findings and conclusions

The preceding analyses of India's initiatives to increase awareness, information, and education about plastic waste, combined with insights from the academic literature, have identified a range of gaps and opportunities for further exploration. These gaps and opportunities are summarised in this section and represent potential initiatives and ideas that could be included in the roadmap to enable the increased circularity of plastic through more sustainable consumption practices from a range of consumers.

The first part of this section summarises gaps in knowledge of consumers regarding plastic waste management in India. These provide prospects or areas for further investigation. The second part describes opportunities. These opportunities have emerged from weaknesses identified in the types of initiatives that have been undertaken to date in India or as possible initiatives that have been underutilised in the Indian context. These initiatives may have been reported in other parts of the world as approaches to improving sustainable plastic consumption, or from other resource conservation domains, yet could be applied to tackling plastic waste. In either case, these initiatives have been overlooked or underutilised as interventions that could be used in India for enabling behaviour change towards a circular economy for plastics in India. These opportunities also provide avenues for further exploration as to their possible use in the roadmap.



## 6 Gaps and opportunities

### 6.1 Overall gaps

Broadly, the diversity of initiatives outlined above leads us to some general conclusions regarding the state of behavioural interventions relating to promoting a circular economy of plastic:

- Many specific initiatives have been trialled, by different organisations, with samples of specific groups of people, in specific locations and contexts, with reference to specific products.
  - When an initiative is effective, it is hard to draw conclusions about how much of this outcome is due to the initiative itself, and how much is due to some other factor like the location or timing, or the specific product, community or context involved.
  - In addition, there is not yet a clear picture of which sorts of initiatives are most likely to be effective with what types of people, products, and locations.
  - The fact that many different companies are involved in promoting their own interventions may mean that community understanding of these efforts is reduced by overlap and confusion, and/or that different initiatives are crowding out each other in their competition for people's engagement and attention.
- Many initiatives seem to rely primarily on raising awareness of corporate activities (probably a direct consequence of corporations' drive to build their own brands while complying with regulations about environmental spending), and/or on informing consumers through labelling. Neither of these approaches alone is likely to result in behaviour change, since information/awareness alone is generally not enough to change behaviour, especially when that behaviour is fairly habitual and routinised.
- Most initiatives that have been trialled have at best anecdotal or indirect information about their impacts, rather than careful and controlled measurements of outcomes before and after the initiative. It is difficult to know, therefore, how effective these interventions are, and thus to judge which should be expanded and which should be altered or abandoned.
- Research has demonstrated a number of specific techniques that can be used alone or in combination to help promote changes in behaviour. However, some of these techniques have seen more common use in India, while others have been generally ignored.

More specific conclusions are outlined below.

#### **Research focuses on urban settings and less on rural contexts**

Many studies have been conducted using samples involving urban, educated participants, such as student populations, resulting in a lack of data related to the consumption practices of rural citizens, the underprivileged, or older consumers (Singh & Mathur, 2019).



### **Lack of research involving the informal and emerging SME sectors**

Industry related research has usually involved participants from the organised and formal sectors of industry and excluded participants from informal sectors. This has been the case in research related to C&D plastic waste (Jain et al., 2020). Start-ups and social enterprises dealing with plastic waste management are seen as a key stakeholder group. Many have emerged in recent years, and these are being supported and motivated through global collaborative platforms such SEED<sup>5</sup> and national programs under the Atal Innovation Mission and Start-up India. A search through the websites of some of these indicates that ‘consumer awareness’ has been built into the business plans of emerging start-ups in the waste management arena as market development and market positioning strategies. This is different from the large industry initiatives that are introducing consumer awareness as part of their image changing strategy and information regarding changes in their packaging and EPR compliance. This area needs more research and can inform business strategies of packaging industries introducing alternatives to single-use and short-term non-compostable plastics.

### **Lack of understanding about the role of women in ‘green’ purchasing and other R-behaviours**

Gender is important for household consumption decision making in India, but few studies target women in their research. This means that factors driving women’s decisions about green purchasing, recycling and disposal of plastic waste and the barriers obstructing these behaviours are not well understood.

### **Some types of plastic consumption behaviours are under-researched**

Cultural behaviours related to reuse and extending the use of a product for alternative uses once its active life is over are a significant factor in developing countries. This is highly under-researched, reflected in both strategic recommendations for policy and industry, where recycling and re-processing find higher mentions and solutions rather than solutions that would extend the life of the product and resource. This lacuna could well be a result of global scientific research on behaviours being carried out by the richest countries and probably reflects their needs (recycling rather than reuse) (Kedzierski et al., 2020).

### **Temporal impacts on changing habits of plastic consumption are not understood**

The social and behavioural theories discussed in this report provide us with a reasonable framework to guide the design of programs for directing consumer behaviours towards responsible management of plastics (Kurz et al., 2015). However, the retention of those behaviours over time, especially in the event of turbulence such as the present COVID 19 pandemic, is less understood. The dilution of waste management rules and the increased hygiene perceptions of using disposable utensils and plastic-packaged foods, as well as increased online purchasing, have led to a major increase in single-use plastic and packaging material use. This is in addition to the bio-medical plastics used such as PPE kits and surgical masks, the use of which is much abused. Consumer behaviours have seen major regressive shifts, a phenomenon that needs further investigation (Narain, 2020; Vanapalli et al., 2021).

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<sup>5</sup> <https://seed.uno>

### **Measuring tools are not designed for the Indian context**

Scales and measures used in research don't necessarily reflect the issues of the Indian context. Many research studies draw their measures from studies that have used elicitation processes undertaken in western or developed countries. This means the measures may not reflect the most salient issues for India and important underlying factors may not be examined. Reliable and validated scales for researching emerging economies are needed (Kautish et al., 2019).

### **There are few analytical studies that evaluate the outcomes of interventions**

How effective are information and awareness campaigns? How do information cues included on packaging, such as the recyclability of the package or guidance on recycling and disposal, affect consumer purchase choices and the recycling and disposal behaviours of consumers? It is suggested that providing consistent, tangible information is key to motivating consumers to switch to more sustainable packaging. Examples of voluntary carbon-foot printing (UK), How2Recycle labels, and EPR fees linked to packaging disposal are cited that guide consumer decision making in a meaningful manner (Boz et al., 2020). However, a systematic assessment of how effective and long lasting the impact of communication and information is on the behaviours of consumers and what may cause them to lapse back to unsustainable behaviours has not been conducted. Related to this issue is the broader problem of poor data capture, tracking, and quantification of plastic consumption, including all aspects related to waste, recycling, and disposal behaviours.

## **6.2 Opportunities**

This section uses social practice theory as a framework for grouping the various opportunities that have been identified for enabling improved consumption of plastics. These opportunities are aimed at improving purchasing choices, switching or substitution away from non-recyclable products, reuse, recycling, and disposal of plastics including reduction in littering. Opportunities are aimed at improving skills and competences; influencing underlying attitudes and social norms; and addressing physical or material barriers that in combination support increased circularity behaviours.

### **Some general conclusions:**

- New trials (and ongoing trials) should have careful definition of target outcomes, and measurements of these outcomes should be taken both before and after these trials. Such an approach provides much more specific and detailed data about the impacts of these initiatives – such data is necessary to build a clear overall picture of what sorts of initiatives will work best in what settings.
- If an initiative has been demonstrated to work in a specific context or area, it would be valuable to see if the same approach could be successful in a different context or area. Either the new attempt is successful, which provides reassurance that the initiative is generalisable, or the new attempt fails, which indicates that something about the new context requires a different approach.
- There is potential for social influence, social modelling and emotion to be used more than they are currently, either to develop new interventions or to enhance existing interventions.

- Could existing initiatives (that are known to be effective) be combined, expanded, generalised, simplified or extended? Such approaches could introduce substantial improvements through gains in efficiency and reductions in complexity for industry, regulators, and end-users.

## **6.2.1 Social meanings, attitudes, and motivations**

### **Opportunities to nudge social norms and use social influences to support the R-behaviours**

#### **Reduce the yuck factor to improve attitudes towards waste disposal and recycling**

Reducing the yuck factor associated with wet waste and the current work conditions of waste pickers could result in improved waste disposal attitudes and related behaviours. Understanding how these perceptions relate to attitudes and practices of littering could provide opportunities for improving recycling and disposal behaviours including source separation at home.

#### **Utilise social influencers to champion green purchasing, recycling, and waste disposal behaviours**

Many social media groups have sprung up in support of living greener and more sustainable lifestyles. However, opportunity exists to understand if their reach and effectiveness can be enhanced through knowledge support and ensuring they have access to correct information.

#### **Incorporate a wider use of emotional cues into sustainable consumption messaging**

Research has shown that both positive and negative emotional cues can generate behavioural responses that support more sustainable consumption, though the change to people's behaviour appears to be dependent on the type of emotion that is triggered. Opportunity exists to identify if an integrated design of initiatives can be used to create behavioural shifts in the Indian context.

#### **Use targets and feedback mechanism to increase incentives for R-behaviours**

Targets and feedback mechanisms along with incentives and rewards could be used to incentivise source separation, improve collection systems, and support recycling initiatives and correct disposal of recyclables. These mechanisms could be provided at the household level, community level, or within groups such as schools, universities, or workplaces. Technology could be incorporated into feedback and reward systems using smart devices and apps and integrated with 'smart' recycling stations. An integrated approach with a data collection system would help to provide cities and municipalities with much needed waste management and recycling data.

#### **Empower consumers with a sense that their actions can make a difference**

Through designing behaviourally targeted communication products, show consumers how their individual actions can make a difference. By focusing information on where waste is going, the consequences of circular and non-circular behaviours, the actions they can take, and the changes as a result are all examples of ways to support an increased sense of self-efficacy and agency.

## 6.2.2 Material and infrastructure aspects

### Opportunities for enabling greener purchasing choices and other R-behaviours

#### Facilitate a category wide shift in sustainable packaging

A category wide shift to sustainable packaging would help to reduce complexity in product choices and make it easier for the consumer to integrate sustainable choices into their purchasing. Targeting industry sectors through industry associations for such a shift would be a possibility.

#### Extend industry initiatives to focus on rural areas, smaller cities, and towns

Awareness campaigns undertaken by industry are typically undertaken in urban areas and opportunity exists to broaden the initiatives to areas beyond tier I and tier II cities. Identify potential opportunities for industry initiatives in rural areas, smaller cities, and towns through CSR or industry-municipality-civil society partnerships for infrastructure and EPR systems.

#### Support behaviour shifts through targeted infrastructural mechanisms in the interface between households and municipal at collection systems

Ensure that semi-formal and formal collection systems are in sync with the segregate- collect-recycle message and the waste collection process amplifies individual efforts of segregation.

## 6.2.3 Skills and competences

### Opportunities for augmenting consumer awareness and education programs

#### Improve the targeting of information provided in consumer awareness programs

Opportunity exists to improve the quality of information and the targeting of consumer awareness programs, particularly those programs delivered by civil society and those provided in regional languages. Ensuring information targets a particular behaviour and is communicated in a way that is directed towards appropriate demographic or stakeholder groups is important for the intervention to be as effective as possible.

#### Extend SUP information initiatives to include interventions for addressing all types of single-use plastic

Not all types of SUPs are addressed in information campaigns. Styrofoam packaging, multi-layered plastic packaging, and polymer-based woven carry bags are often not included in information campaigns or education programs. Opportunity exists to improve public understanding about all types of SUPs and strategies for mitigating their use.

#### Utilise industry to support broader educational initiatives about waste and recycling of plastic

Current industry awareness programs are concerned mainly with managing their extended producer responsibility in relation to specific products. Opportunity exists for industry to contribute to raising public awareness more generally about sustainable waste management practices for plastic and providing support for initiatives across the value chain.

#### Polymer manufacturers could potentially support education programs

Polymer manufacturers that produce plastic materials do not appear to undertake any initiatives that support the recycling or correct disposal of plastics. Rather, industry initiatives in this area are

mainly undertaken by companies who use plastic packaging for their products. Opportunity exists to identify the types of programs and appropriate consumer segments that polymer manufacturers could support in an effort to drive more circular plastic consumption.

### **Opportunities to extend the effectiveness of knowledge platforms**

#### **Establish a one stop shop for public information about plastic waste and the 3 Rs**

Even though there is extensive information available across a range of knowledge portals there is no 'one stop shop' that provides comprehensive information in one place and that is suitable for the broader public. Opportunities exist to provide a portal with comprehensive information to the general public on all aspects related to the sustainable consumption of plastic. Strengthening the ENVIS portals with up-to-date credible, scientific and easy to understand information regarding management of plastics in the environment, in different languages, would make them popular with NGOs, schools, universities, think tanks and municipalities.

#### **Develop information and communication products specific to improving circularity for plastic**

There is a lack of available information about the circular economy concept that is targeted for the general public or school students. Opportunity exists to provide information that focuses on circular economy and the behaviours needed to support increased circularity of plastics in the Indian context covering specific social, environmental, and public health information for a range of audiences. This type of information is currently not available. Potential audiences include children, young consumers, urban and rural consumers, retailers, city municipalities, and product manufacturers.

## 7 Next steps

### Research aims for phase 2

The aims of the next phase of research are three-fold:

1. To test the assumptions and conclusions made in this report by gathering information that addresses knowledge gaps, challenges, and opportunities for increasing social and behaviour change relating to plastic waste in India.
2. To gather information on the enablers needed to support expanded, augmented, or additional measures needed for fostering social and behaviour change.
3. To identify the implications and priorities for the National Roadmap.

### Research design: A qualitative research study

The next research phase will use a qualitative social research design to collect data from key informants using in-depth interviews, small group discussions, and/or roundtables. The target stakeholders include people working within intervention programs, people overseeing intervention programs, and people funding intervention programs. As well as targeting plastics-based interventions, we will consider drawing on people involved in other interventions conducted in India for behaviour change that are not related to plastics but target other changes at the individual or business level.

- The study will investigate opportunities for enabling behaviour change by identifying factors that:
  - influence social meanings and attitudes,
  - address material and infrastructure aspects, and
  - improve skills and competences.
- We will also explore opportunities for **tailoring and targeting initiatives** to maximise impact on R-behaviours.
- In addition, stakeholder interviews will also address **program implementation** issues such as:
  - What **evidence** is available as to the program's effectiveness?
    - What do stakeholders consider to be evidence, what sorts of programs do stakeholders think are most (and least) effective. Evidence may exist but it is not in the public domain.
  - What **scale(s)** are most and least effective for interventions? Scale refers to the area at which the intervention is targeted – for example, regional, city-wide, neighbourhood-based, etc.?
    - Is there a scale at which interventions work best? Is there a scale where interventions don't work at all? Why do stakeholders have these views about best

and worst scale – is it because they have tried and some things don't work, or is it that no-one has tried?

- What **areas/locations/communities/behaviours** are not yet being targeted by interventions?
  - Why not? In these questions we are looking for 'low-hanging fruit' – are there things we could target by expanding or translating an existing program into a new domain or behaviour or type of community? It's important to look for reasons why no-one has tried this yet – what are the barriers, pitfalls to avoid?

## Proposed research plan

An initial planning phase will confirm research participants, recruitment methods, and refine the interview questions and protocol. We will also obtain ethics approval. Once ethics is approved, we will recruit participants and collect our data using interviews, small group discussions, and roundtables. Data will be analysed, and findings reported with implications included in the National Roadmap. It is anticipated this study will take approximately eight months to complete.



Figure 3 Qualitative study: Proposed research phases

## A demonstration project

Following the qualitative research study, we aim to design, implement and conduct a demonstration project which uses social/behavioural enablers to promote behaviour change relating to plastic waste in India. Broadly, the process used here is to use material from this review and from the qualitative study to select and test the effectiveness of an intervention that is augmented with social influence methods and/or other mechanisms that are underutilised so far in the Indian context.

For example: Designing and testing the role of communication, and its supporting material infrastructure in shifting purchase and disposal behaviours of an entire segment of population in a selected ward/neighbourhood and/or an intermediary industry segment (e.g., hotel chain/ food and beverages delivery chain).

# Appendix A Examples of different types of knowledge portals

## 1. Government of India platforms

MoEFCC/ CPCB and SPCB websites, MCA – *directed to industry, researchers, civil society, PROs, entrepreneurs, municipalities and media*. These provide information on policies, rules, and regulations, guidelines for industry and waste generators. They also provide updated data and trends.

## 2. Government supported platforms managed by civil society and research agencies

ENVIS Centres – *directed to researchers, schools, general public and media*. These provide analysed information, collated reports and awareness materials.

## 3. Knowledge platforms managed by civil society and think tanks

TERI, Development Alternatives, CSE, CEE, CEEW, WRI, WWF, ORF, CPR, ICLEI – directed to researchers, other civil society organisations, media and policy makers. Some are directed to youth and school children depending on the target groups an organisation is mandated to work with. These provide analytical reports and blogs, success stories, training resources, and analysed issue and policy briefs.

## 4. Knowledge Portals of technology research and development agencies

TIFAC, CSIR Laboratories – directed to other researchers, industry and government. These constitute technical reports, technology solutions, scientific information on plastics and technical data on management and strategies.

## 5. Knowledge platforms of national and international multi-partner programs and global knowledge consultancy firms

World Economy Forum, AEPW, Ellen MacArthur Foundation, Circle Economy, McKinsey etc. – *directed towards researchers, media, national and global policy making, investors, funders and industry*. These provide analysed reports on global and national trends and suggest scenarios based on trends. They also make recommendations and suggest pathways for industry, policy and financing bodies for future.

## 6. Knowledge portals of industry associations

FICCI, CII, etc. – directed to government bodies mainly but also media as the voice of industry and their own industry members to create awareness about new trends and to build capacities. These are mainly annual updates, regular newsletters, and have annual awards on issues. They also provide analysed reports on topical issues, issue specific conference proceedings, sponsored research reports and training and capacity building materials



## **7. Knowledge portals of multi-lateral agencies**

UNEP, UN-Habitat, UNIDO, the World Bank and others – directed to national and global policy makers for sustainable development action and supports, researchers, civil society and major groups such women, LGBTQ, indigenous societies, youth, economic and trade blocs, such as the G-20, G-77, ASEAN, media etc.

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**For further information**

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