Persisting Change

Why do behaviour change programmes fail to create **long-term** change for sustainable consumption?

Dushyant Manchandia

Supervisor

Oksana Mont

Thesis for the fulfilment of the
Master of Science in Environmental Management and Policy
Lund, Sweden, May 2021

LUND UNIVERSITY

iiiee
THE INTERNATIONAL INSTITUTE FOR
INDUSTRIAL ENVIRONMENTAL ECONOMICS

Acknowledgements

First of all, I would like to thank my family for being the support I needed to finish this thesis. I would also dedicate this work to my uncle, who was my mentor and my confidante and my niece whose infectious laughter has always motivated me to do more for future generations.

Next, I would like to express my gratitude to Oksana Mont, my academic supervisor for this thesis. Thank you for your clear guidance, your understanding of my odd working hours, and sharing things at completely inappropriate times, and of course your availability whenever I needed advice. This being my first experience of writing a thesis, it was great to have your support and responses to all my questions and frustrations with methodological approaches.

I would also like to thank the Sustainable Everyday Life team at the Finnish Innovation Fund, Sitra for their understanding of this thesis process. They are the kindest co-workers anyone can ask for, and their intelligence and creativity has rubbed off on me too!

Next, I would have to thank my flatmate, Susannah Littlewood. She has been a constant support over the last few months with all the stupid traditions that we have set up and tried to keep things interesting for us. Moreover, she has been a brilliant friend in hard times, and it has just been a pleasure to live with her! (I do not think this thesis would have been completed without her constant cheering)

Finally, I would also like to thank my 20 interviewees who took out the time from their busy schedules to engage in fruitful discussions and provide the knowledge base for this thesis.

Abstract

As we grapple with the existential threat of global climate change and biodiversity collapse, there is a growing recognition to address the ever-growing levels of consumption. There is an urgent need to clamp down on the excessive levels of lifestyle emissions fuelled by individuals in the developed world along with the growing middle class in the developing parts for us to have any chances of having a just transition to a carbon-neutral future. For this purpose, the concept of sustainable consumption is paramount. However, mainstream discourses on sustainable consumption have focused on techno-efficiency measures, which have failed to reduce emissions and resource consumption at the scale which is required. Thus, there is a requirement for reducing consumption at absolute levels. To tackle this consumption from individuals, several programmes addressing behaviour changing have been created and tested based on a variety of theories and disciplinary perspectives. Conventional programmes have focused on information provision or economic incentives as the method for changing behaviours succeeded by approaches based on behavioural economics. However, one thing has been common in these interventions/programmes and that is their short-term success. None of the programmes created has been able to create a lasting change in the behaviour of individuals and there is an urgent need for such programmes as we do not have to change behaviours, we have to make sure that the behaviours stay changed or the change is persistent. This study tries to explore some of the causes for the failure of behaviour change interventions and tries to explore how programmes that can create persistent changes in behaviour be designed. For the fulfilment of this aim, the thesis has followed a deductive approach utilising a literature review and qualitative interviews to dig deeper and understand the causes for failure of programmes addressing behaviour change and using that knowledge to see how better programmes with longevity as a focus be designed. The framework COM-B is utilised to structure the findings for designing better programmes. This paper presents a first attempt to structure the knowledge around Sustainable Consumption using the COM-B framework.

Keywords: sustainable consumption, behaviour change, durable, persisting, COM-B

Executive Summary

Global climate change and biodiversity collapse now pose a serious threat to our life on earth (United Nations Environment Programme, 2019). Averting this crisis while ensuring a just transition and keeping within the planetary boundaries requires a drastic change in the way we live, travel, eat, and consume things (Akenji & Chen, 2016). There is an urgent requirement to address the demographically and geographically uneven patterns of consumption for the fulfilment of major planetary and social goals (Ripple et al., 2017). Thus, the concept of sustainable consumption has gained popularity being recognised as a Sustainable Development Goal (United Nations, 2016). However, our present responses to reducing patterns of consumption have focused on techno-economic and information based behavioural change approaches which have failed to produce any significant dent in emissions and resource consumption (Jackson, 2009).

Conventional approaches to change behaviours have relied on information-based approaches, keeping within the neo-liberal economic framework. These approaches, addressing the rationality of people and providing information to address market failures have failed to create any long-term shifts in patterns of consumption. Approaches based on nudging on the other hand have their challenges of being implemented on a large scale and have been further criticised for libertarian paternalism. Multiple approaches for changing behaviour have been developed and tested, and while many of them have shown positive results in the short term, long-term persistent change is missing (Heiskanen & Laakso, 2019).

Thus, there is a requirement for programmes addressing behaviour change which can create persisting shifts in patterns of consumption to allow for a just transition (Fuchs & Lorek, 2005). Such approaches would identify behaviours not just as an antecedent of attitudes and values but would take into account the broader social context in which behaviours are framed (Moloney et al., 2010). This social context would include a thorough understanding of the social norms, infrastructures, policy climate, culture, technology, and business models. Creating this holistic picture can assist in creating converging approaches to changing behaviours that have the potential to create persisting change (Moloney et al., 2010).

Research questions and methodology

To address the problems mentioned above, this research aims to assist policymakers and practitioners in designing programmes that enable a long-term shift in behaviours and consumption patterns and make citizens an important actor in global climate mitigation programmes while changing social and cultural norms associated with consumption. To do so, it aims to answer the following research questions:

1. Why do behaviour change programmes fail to create long-term change for Sustainable Consumption?

2. How can programmes that can enable long-term changes in behaviour be designed?

The intended audience of the research is academics in the field of behaviour change and sustainable consumption in helping them develop the field further to enable lasting impacts in changing consumption patterns. Additionally, practitioners/behaviour change programme designers from a range of stakeholders such as civil society, non-governmental organizations (NGOs), and policymakers interested in the concept of sustainable consumption and encouraging citizens to live sustainable lifestyles within the planetary boundaries are also an audience of interest.

To answer the aforementioned research questions, the research follows a deductive approach. Methods of data collection for the research include a comprehensive literature review of academic and grey literature, which enabled in identifying preliminary causes for failure of programmes addressing behaviour change. The causes were then tested with 20 semi-structured interviews and further analysed with the Capability Opportunity Motivation – Behaviour (COM-B) framework to provide a framework for practitioners to design better programmes. The interviews were conducted over Zoom/E-mail with both academics and practitioners to have diversity in viewpoints expressed in the study.

Main findings

The findings show that five causes exist for the failure of programmes addressing behaviour in creating persisting change 1) lack of a holistic perspective which leads to undertheorising of behaviours 2) focusing on individual change over social change with group and community approaches 3) lack of engagement of target group both during the planning and implementation of the programme 4) evaluations focusing on outputs of programmes over outcomes or impacts and 5) short length of programmes along with a short length of evaluations. Specifically focusing on the aspect of longevity, it has been identified that long-term behaviour change is a slow phenomenon that would require 5-6 years to be solidified as a norm-based on multiple examples.

Henceforth, the research suggests that better programmes addressing behaviour change that creates persisting change can be designed by keeping the above in mind. To counter the undertheorising of behaviours and creating a complete picture of the behaviour to be changed, COM-B as a framework is suggested to programme designers. Its three components highlight three different aspects of behaviours including both internal and external factors allowing programme designers or practitioners to identify appropriate barriers and opportunities that may exist. Creating such a picture of behaviour would ultimately call for multi-stakeholder and multi-intervention techniques instead of one-shot campaigns done by a single stakeholder. Further to this, long-term planning cycles would be required which can allow for a longitudinal analysis of behaviours and assist programme designers in course-correcting the programmes, apply multi-intervention techniques, and better understand behavioural spillovers. It is further recommended to supplement the longitudinal analysis of the outcomes or impacts of the programme with impacts on the well-being of people since it has bearing on the persistence of change.

Finally, the responses of the interviewees are arranged within the COM-B framework as a means for creating better programmes. Capability in the framework is concerned with factors internal to the individual such as information, knowledge, and skills (Michie et al., 2011). Opportunity represents factors external to the individual such as financial resources, environmental context, social norms, and culture (Michie et al., 2011). Capability and Opportunity have a direct relation with Motivation, which consists of automatic and reflective motivation (Michie et al., 2011). Overview of the findings with the framework is given below –

- Capability – information, knowledge, and skills

- Opportunity – Costs and convenience; infrastructure, choice defaults, and choice architecture; Mainstreaming change – social contagion, social norms, and perception gaps

- Motivation – Intrinsic motivations – well-being, health, happiness, and identity; Creating moments of change – breaking habits with contextual changes.

Key recommendations for practitioners

Based on the above findings, the following key recommendations are presented to the following stakeholders:

For programme designers – It is recommended to use frameworks such as COM-B which can assist in creating a holistic perspective on behaviour and **focusing on multi-intervention and multi-stakeholder approaches**. Partnerships would be extremely important in the process. It is also recommended to create pro-social programmes and create an appropriate target group and increase engagement with them. Evaluations need to be paid more attention to and looking at outcomes and impacts for creating stronger evidence for change. It is also recommended to aspects of well-being in evaluations along with spillovers. Finally, more focus on long-term evaluations is required which would require long-term planning cycles which as understood from the findings is also dependent on resource issues.

For policymakers – Since the change would require multiple stakeholders and multiple intervention techniques, behavioural change for sustainable consumption need to be looked like a **policy package** instead of only information based or economic approaches. While there are merits in using nudging approaches, they do little to reduce consumption in absolute amounts and are required to be supplemented with other intervention techniques which can influence values and identity. Finally, long-term planning cycles are required to create persisting changes in this policy package.

Academic contributions and further research

This thesis contributed to further the research on the longevity of behaviour change for the domain of sustainable consumption by identifying potential causes for failure and recommending ways to design better programmes. The study highlights that programme's addressing behaviour change can benefit from long-time planning cycles and a holistic perspective on behaviour. Long-term planning cycles can help in creating long-term evaluations which have been lacking in the field of sustainable consumption and other pro-environmental behaviours. It is further highlighted that programme designers can benefit from using pro-social approaches and by putting more impetus into evaluations. Lastly, the research utilises COM-B as a framework that has not been used in the domain of sustainable consumption and creates only a very preliminary picture. Further research is needed on testing the findings highlighted in the paper. Finally, more research could be done on mapping specific sustainable consumption behaviours using the COM-B framework to identify barriers and opportunities specific to that behaviour.

Table of Contents

List of Figures

List of Tables

Abbreviations (if required)

Academy of Change (AOC)

Attitude Beliefs Context (ABC)

Behaviour Change (BC)

Capability Opportunity Motivation – Behaviour

Centre for Sustainable Consumption and Production (CSCP)

Intergovernmental Panel on Climate Change (IPCC)

Low energy demand (LED)

Organisation for Economic Cooperation and Development (OECD)

Sustainable Development Goals (SDGs)

Sustainable Consumption (SC)

Theory of Planned Behaviour (TPB)

United Nations (UN)

United Nations Environment Programme (UNEP)

United Kingdom (UK)

Value Belief Norms (VBN)

World Wildlife Federation (WWF)

1   Introduction

"We are jeopardizing our future by not reining in our intense but geographically and demographically uneven material consumption" —World Scientists' Warning to Humanity: A Second Notice (Ripple et al., 2017)

Our behaviours as individual consumers are having profound effects on the natural environment (Stern, 2000). Partly because of our consumption patterns, society is confronted with a confluence of challenges – including environmental degradation; pollution; climate change; and increasing social inequity (Menon & Menon, 1997). For us to stay within the safe operating space of planetary boundaries as defined by (Rockström et al., 2009), both decarbonization and dematerialization by a factor of 10 or more are necessary (Jackson, 2010). Furthermore, to keep within the 1.5-degree limit as prescribed by Intergovernmental Panel on Climate Change (IPCC) without the aid of emission technologies and fulfil various other sustainable development goals, a low energy demand scenario is required where the bottom-up transition in behaviours creates top-down structural changes (Grubler et al., 2018). These targets require changes in the way we consume things - of products, services, and infrastructure, from acquisition and use to disposal (Girod et al., 2014). It would require changes in social and cultural norms associated with goods and ownership (Girod et al., 2014).

Further, current projections for decarbonization of energy, combined with business-as-usual projections of growth in demand for goods and services are incompatible to limit global temperatures to 1.5 degrees above pre-industrial levels. The challenges associated with decarbonization are further exacerbated due to difficulty in decarbonizing certain sectors based on technological change alone. An example of such a sector could be aviation where biofuels offer a possible solution, but they challenge land use with other priorities like food production and biodiversity conservation. Similar barriers exist in agriculture, where methane-producing livestock cannot be decarbonized like conventional energy grids and would require a reduction in demand facilitated with a shift to vegan diets, particularly in middle- and high-income countries (Nicholos & Wynes, 2019).

1.1   Problem Definition

Focusing only on consumption patterns can result in a solitary focus on human behaviour as a cause of such actions (Moloney & Strengers, 2014). This requires us to place the 'problem' of human behaviour which leads to emissions in a wider context where social practices are undertaken. Norms and values shape practices, and so do infrastructures, institutional arrangements, and systems of governance (Moloney & Strengers, 2014). Therefore, transitioning to low carbon communities requires an understanding of practices and resultant emissions which occur in the community along with associated technologies, infrastructures, and institutions that shape the norms and actions in the community (Shove et al., 2012; Hargreaves, 2011; Moloney et al., 2010).

Moreover, there is a requirement of understanding the connections between the system concepts, their dynamics, a clearly defined pathway for transition, and the potential 'levers' to create action. Such 'levers' have been described by Moloney et al. (2010) as programmes or interventions designed to achieve practice or Behaviour Change (BC) in household behaviours. Interest in such programmes focusing on changing consumption behaviours especially energy consumption has gained considerable traction over the last two decades and are now of interest to policymakers and researchers to understand and influence the excessive consumption patterns of individuals (Evans et al., 2012; de Weerd & Degens, 2019).

With an ever-growing consumption in the developed parts of the world and a need for elevating people out of poverty from the developing world, there is a need for changing consumption patterns to achieve a just transition and successful decarbonization of economies (Ripple et al. 2017). The need for such a transition has popularized the concept of "SC" appearing as the 12th goal of the United Nations (UN) Sustainable Development Goals (SDGs) part of the Agenda 2030 (United Nations, 2021) and "Sustainable Lifestyles" which led to the formation of the "Good Life" goals for individuals (One Planet Network, 2016). However, SC in itself is not a new concept and the idea emerged in the 1980s which coincided with the rapid movement of the economic system towards the neo-liberal paradigm (Heiskanen & Laakso, 2019). A common belief in this paradigm was that the market can be utilized to solve all problems or externalities in pure neo-classical economic terms (Heiskanen & Laakso, 2019). Such approaches aim to correct behaviours through information provision – consumers lack information on the environmental consequences of their actions and thus providing information can help bridge this gap (Heiskanen & Laakso, 2019). Such initiatives have a low uptake as only a few people interested in the subject area end up engaging with the information (Heiskanen & Matschoss, 2016).

The recognition of the limitations of the Rational Choice Theory had created the foundations for the field of **Behavioural Economics**, which has quickly established itself as the new norm for policy interventions targeting behaviours (Heiskanen & Laakso, 2019). The underlying principle of this field is that our daily behaviours are based on less conscious or fast thinking and is thus prone to a host of biases which can be corrected by Nudging individuals in taking up desired behaviours (Kahneman, 2011). Nudges can be accomplished by simplifying and framing information, changing the physical environment, changing the default settings, and using descriptive social norms (Heiskanen & Laakso, 2019). Some individual nudges, specifically changing the choice defaults have proven to be quite successful (Pichert & Katsikopoulos, 2008). In a natural experiment 95-99% of individuals continued with green electricity when provided as a default rather than switching to high-carbon intensive electricity (Pichert & Katsikopoulos, 2008).

Another model which has grasped the imagination of policy makers is the **Social Marketing Model.** Developed extensively by the Department of Environment, Forests and Rural Affairs (DEFRA) of the United Kingdom (UK), this model seeks to identify and remove real contextual barriers through tailored messages on particularly segmented populations with a vision of creating new social norms and take up desired behaviours (DEFRA, 2008).

However, the aforementioned theories and models have seen small successes. Delivering programmes based on them on a large scale has either proven to be ineffective, requires great effort or is expensive (Heiskanen & Laakso, 2019). In their meta-analysis of programmes addressing BC and utilizing some of the above models, Osbaldiston & Schott (2012) found that none of the 253 programmes evaluated created a long-term or persistent shift in behaviours. Similar results were observed by Nisa et al., 2019 and Moloney et al., 2010. This has left the field and programmes associated with BC in limbo. While it is necessary to change behaviours, it is equally important that the change persists, and the behaviours become normalised in people's lives (De Young, 1993). The programmes created as of now have been relatively successful in changing behaviours over the short term, but the aspect of longevity has been missing which requires further research (Osbaldiston & Schott, 2012). Furthermore, the length of the programmes in themselves is short – in the three meta-analyses reviewed for this paper along with three standalone programmes, longevity was identified as an aspect for further research both in terms of programme implementation and evaluation (Staats et al., 2004; (Moloney et al., 2010; Osbaldiston & Schott, 2012; Allcott & Rogers, 2014; Burns & Savan, 2018; Nisa et al., 2019). Finally, there is a lack of cohesive definition for how long a

programme should be, to create a persistent change in behaviour, which of course would vary from one behaviour to the other (Osbaldiston & Schott, 2012). Hence, further research is needed towards the aspect of programmes addressing BC over the long-term and identify specific features of such programmes which hinders long-term change.

1.2 Objective and Research Questions

To address the problems mentioned above, this research aims to assist policymakers and practitioners in designing programmes that enable a long-term shift in behaviours and consumption patterns and make citizens an important actor in global climate mitigation programmes while changing social and cultural norms associated with consumption.

To achieve the above aim, the aspect of longevity in BC programmes is looked at along with how better programme can be designed. However, before we talk about *how* to design better programmes or interventions for sustainable lifestyles to creating lasting impacts, it is pertinent to ask the question as to *why* these programmes fail in the first place. Hence, the research aims to answer the following research questions: –

1. Why do behaviour change programmes fail to create long-term change for Sustainable Consumption?

2. How can programmes that can enable long-term changes in behaviour be designed?

1.3 Scope & Limitations

For this paper, no specific behaviour of focus is chosen which can fall within the broad set of behaviours for SC. Such a distinction is created to maintain the focus of the paper towards programmes addressing BC for SC. While creating the interview guide specific behaviours such as shifting to vegan diets and voluntary reductions in flying were considered as example behaviours for SC due to their high impact less regulatory and technological possibilities to reduce the impact (Nicholos & Wynes, 2019). There is extensive debate on the validity of individual behaviour with broader societal change in literature and while the research acknowledges the importance of broader structural/societal changes, BC is the same side of the coin and social mandate and broad-based public consent is essential for structural shifts to occur (Akenji & Chen, 2016). This is further justified to consider the "rebound effect" from individual actions, where historically carbon reduction efforts from increased efficiency have been offset by an increase in domestic consumption (Tan et al., 2019; Jackson, 2010). As per the Emissions Gap Report published by the United Nations Environment Programme (UNEP), a Low Energy Demand (LED) scenario shows the highest mitigation potential for limiting temperature rise within 1.5 degrees as compared to pre-industrial levels and showing strong confluence with multiple SDGs (United Nations Environment Programme, 2019). No geographic scope was chosen for the paper as the lack of longevity is a transboundary phenomenon as no examples exist within the domain of SC.

For understanding programmes addressing BC, 6 specific papers were chosen after a rigorous review of the literature. The papers fulfilled the specific criteria specified by the author which are further discussed in the Methods section and in general had discussions on the aspect of the longevity of long-term change. Literature specifically focusing on the aspect of longevity is particularly scarce, especially associated with programmes that seek to address long-term change, thus literature addressing the failure of BC was also considered.

1.4   Review and methodology

The research follows a deductive study design to answer the research questions. The deductive study design is useful for explaining regularly occurring social phenomena which have been discovered but not completely understood (Blaikie & Priest, 2019). As multiple pieces of literature have highlighted the challenge of creating persisting change yet with very few explanations on how that could be achieved, the deductive study design is used.

For the empirical part of the research, qualitative data collection and analysis methods would be used. Methods of data collection include a comprehensive Literature Review of academic and grey literature which enabled the identification of preliminary causes for failure of programmes addressing BC. This knowledge on causes of failure guided data collection through 20 semi-structured interviews performed through Zoom/Skype/Teams. To analyse the collected data and create recurring themes, preidentified causes for failure of BC programmes from the literature were used. Further, to answer RQ.2 the **Capability Opportunity Motivation – Behaviour (COM-B)** Framework was utilised to structure the ways provided by interviewees to create persisting change. The NVivo coding tool was used to assist the coding process for both RQ.1 and RQ.2.

1.5   Ethical Considerations

The project has been conducted with the support of the Sustainable Everyday Life team at the Finnish Innovation Fund, Sitra operating in Finland. Sitra was able to provide some contacts who are part of the movement on SC and BC. The author is part of the Sustainable Everyday Life team at Sitra, the conduct of the research, however, was not influenced by the organization or any of its members.

Ethical considerations for the research based on interviews and data collection. All interviews were voluntary and recorded and conducted with prior consent. Before the interview, the participants were informed of the goal of the research through an explanatory email and further, the goal was properly explained before the start of the interview. Lastly, interviewees were individually contacted and asked to verify the information and provided quotes within the thesis draft before its publication. The data collected in records and notes taken are stored electronically in the author's files and cloud, only accessible by the author.

1.6   Audience

The primary audience of the research is academics in the field of BC, SC, and sustainable lifestyles in helping them develop the field further to enable lasting impacts in changing consumption patterns. Additionally, practitioners/BC programme designers from a range of stakeholders such as civil society, non-governmental organizations (NGOs), and policymakers are interested in the concept of SC and encouraging citizens to live sustainable lifestyles within the planetary boundaries.

1.7   Disposition

Following the presentation of the challenges associated with excessive consumption and the need to change behaviour followed by the failure of BC programmes in creating persisting change, *Chapter 1* provides an overview of the research focus, scope and limitations, and relevant audience.

Chapter 2 describes the methodological route taken by the author for answering the research questions described in chapter 1. A rationale is provided for using a deductive study design and qualitative data collection and analysis methods. Finally, insight is also provided on the process used to collect and analyse literature.

Chapter 3 provides the literary basis for the research by starting from the broader notions surrounding the concept of SC. It proceeds with providing a historical representation of the concept of BC for SC and the evolution of the theoretical basis behind them. This is followed up with an analysis of specific literature on programmes addressing BC and causes for their failure. Finally, an overview of the COM-B framework is provided.

Chapter 4 gives an insight into the findings developed from the research process and proceeds to analyse the findings with the literature reviewed. The chapter describes the causes for the failure of programmes addressing BC, gives insight on discussions on long-term change, and connects the COM-B framework with the present discourses on programmes addressing BC provided by participants to create a complete picture of behaviour.

Chapter 5 presents an overview of the main findings of the research by comparing them with the research questions asked and critically reflects on the research process and the findings themselves. Reflections are made on the research questions, the methodological process, and the means of data collection discussing their limitations.

Lastly, *Chapter 6*, provides the main conclusions which can be drawn from the research process and provides recommendations for the variety of stakeholders identified as an audience for the research.

2 Methodology

The following chapter presents the methodology used to answer the previously identified research questions. Section 2.1 justifies the deductive approach taken for the research and Section 2.2 provides an understanding of the data collection and analytical methods used. The limitations of the specific logic of inquiry and data collection and analytical methods used are also briefly discussed in their respective sections.

2.1 Deductive Study design

Multiple methods and logics of inquiry exist to design social research including experimental design, case study design, longitudinal design based on inductive, deductive, abductive, or retroductive logic. The study uses an exploratory deductive study design to answer the two primary research questions identified. As Blaikie & Priest, 2019 highlight, the aim of using a deductive approach is to find an explanation for the existence of a particular social phenomenon the relevance of which can be later tested. The process itself can start from previously existing observations or hypotheses to deduce conclusions on the validity of the explanation and specifying cases where they hold or do not hold. The approach allows the selection of multiple possible propositions which could explain the social phenomenon and while it should be considered that there is little causality between the propositions and the phenomenon, it can show the association between them. However, as whole the propositions provide a possible explanation for the phenomenon (Blaikie & Priest, 2019).

A similar approach has been taken for providing possible answers to the identified research questions. Based on a preliminary literature review, it was identified that there is a lack of persistence in programmes addressing BC, specifically within the domain of SC (Osbaldiston & Schott, 2012; Nisa et al., 2019; Moloney et al., 2010), and there is a lack of possible explanations for this failure while it has been identified as an issue for future research (Osbaldiston & Schott, 2012). This was used to build the research questions themselves. Followed by this, a literature review was narrowed to understand the phenomenon of longevity further and why programmes failed. Since academic literature had little insight, the literature was further expanded to include analysis of programmes conducted in grey literature. These two sources were used to build the so-called "propositions" or the causes of failure for BC. To answer the second research question, a logical flow was assumed, i.e., causes for failure can be used to design better programmes that can create persisting change.

For the empirical component, and to test the validity of the propositions for the failure of programmes addressing BC, semi-structured interviews were used as the means of data collection followed by thematic analysis. The responses of the interview participants were coded based on the identified propositions and additional questions were asked for how better programmes can be designed. The entire list of questions is available in the interview guide in Appendix I. Finally, an analysis was conducted to test the responses with the literature reviewed. The entire research process is depicted in the figure below (Figure 1).
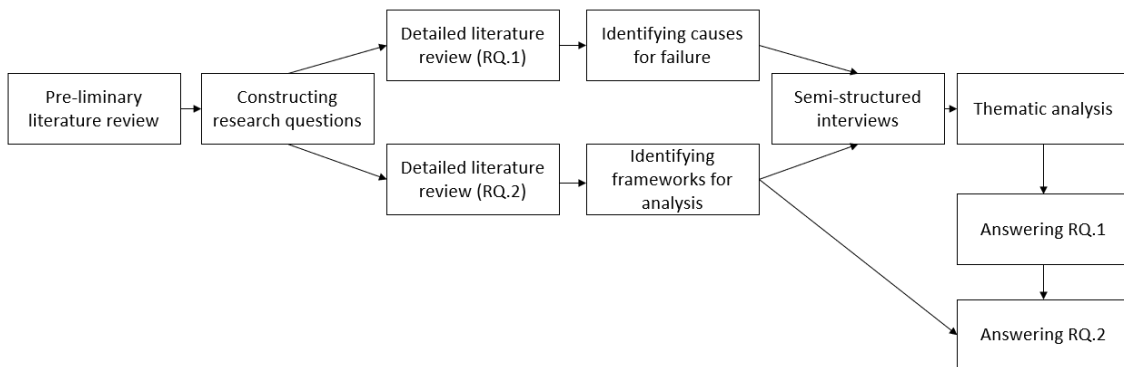
Figure 1 Research process followed by the author

Source: Own Illustration

A major limitation of using such an approach is as identified was that no confirming evidence can be provided due to a lack of quantitative estimates and only a logical argument of associations can be provided (Blaikie & Priest, 2019). The arguments presented in the study or the causes identified for failure are only tested qualitatively based on semi-structured interviews which are affected by the biases of participants (Blaikie & Priest, 2019) and would require quantitative testing of the propositions put forward in the research.

2.1.1   Defining key points for research –

Reliability and Replication

Definitions: "*Reliability is concerned with the question of whether the results of a study are repeatable*" (Bryman, 2012, p46)and "*to be sure that, if a later investigator followed the same procedures as described by an earlier investigator and conducted the same case study all over again, the later investigator should arrive at the same findings and conclusion*" (Yin, 2014, p36). The care of reliability and replicability, detail has been added to the methods section and the interview guides and coding structure have been provided (Appendix II). The research materials would also be made available on request.

Construct Validity

Definition: "*the question of whether a measure that is devised of a concept does reflect the concept that it is supposed to be denoting*" (Bryman, 2012, p47). For enhancement of construct validity, multiple sources of evidence were considered, and thorough consideration was given to existing theories and frameworks.

Internal Validity

Definition: "*Interval validity is concerned with the question of whether a conclusion that incorporates a causal relationship between two or more variables holds water*" (Bryman, 2012, p47). To strengthen the internal validity of the paper, a systemic literature review was conducted, and the COM-B framework was used along with due consideration given to multiple theories on BC. Along with this, the interviews were done with multiple stakeholders along with literature for triangulation and the interviewees' review of their quotes was done before publishing.

External Validity

Definition: "*External validity is concerned with the question of whether the results of a study can be generalised beyond the specific research context*" (Bryman, 2012, p47). The ensure external validity, the

study has been kept fairly broad to create ways to design better programmes for BC that can be utilised on any specific behaviour associated with SC and in a particular region.

2.2 Data Collection and analysis

2.2.1 Rationale for using a qualitative approach

Since the purpose of the study is to understand why programmes addressing BC fail for SC, a qualitative approach is prudent for such an initial exploration. Certain causes for the failure of programmes have been identified from literature which needs to be corroborated with the real-life experiences of programme designers in understanding why such a phenomenon exists. Thus, the findings and results of the study rely on the experiences of practitioners and academics engaged in the field of BC for SC. Such an approach would allow for testing the propositions identified in literature with practitioners and allow for testing their validity in practice environments. Further to this, as the phenomenon of long-term change for SC while is recognised (Osbaldiston & Schott, 2012; Nisa et al., 2019; Moloney et al., 2010; Burns & Savan, 2018; Staats et al., 2004; Allcott & Rogers, 2014) remains largely under-researched (Osbaldiston & Schott, 2012) justifying a qualitative research approach.

2.2.2 Literature Review

The literature review for the paper was built using academic and grey literature. Academic literature includes peer-reviewed journal articles, conference papers, and books on research portals such as the Lund University Library tool (LubCat), Scopus, Researchgate, and Google Scholar. The aims and objectives of the research influenced the keywords which were used to search literature in the aforementioned portals and the full list of keywords used are provided in Appendix III. Furthermore, additional references were identified from papers being researched to create a deeper understanding of the various concepts which may influence the research of the study.

The literature review was conducted to increase an understanding of the underlying concepts and theories for BC in the context of SC and generic pro-environmental behaviours; understanding the status quo for the aspect of longevity in BC programmes, and understanding the key reasons for the failure of BC programmes irrespective of the aspect of longevity. This thorough analysis allowed for a strong conceptual understanding of BC and the different inter-disciplinary dimensions concerning the concept. Figure 2 represents the structure of the Literature review as a funnel to narrow to the specific aspect of longevity. Due to a lack of available literature on the specific aspect of longevity, more general causes for the failure of programmes addressing BC were looked at to guide the research and create themes that can be used for data collection.

The first two parts of the Literature Review section (Figure 2) have been included in the section to create a literary basis around the concept of SC and the different types of SC that dominate the discourse. Bringing out this difference has been considered important as this invariably affects the design of the programme. To understand the programmes addressing BC, it was considered important to understand the present status quo of programmes. The purpose of this part was to understand key questions around the longevity of the programmes such as their length, length of evaluation, and criteria's for success.
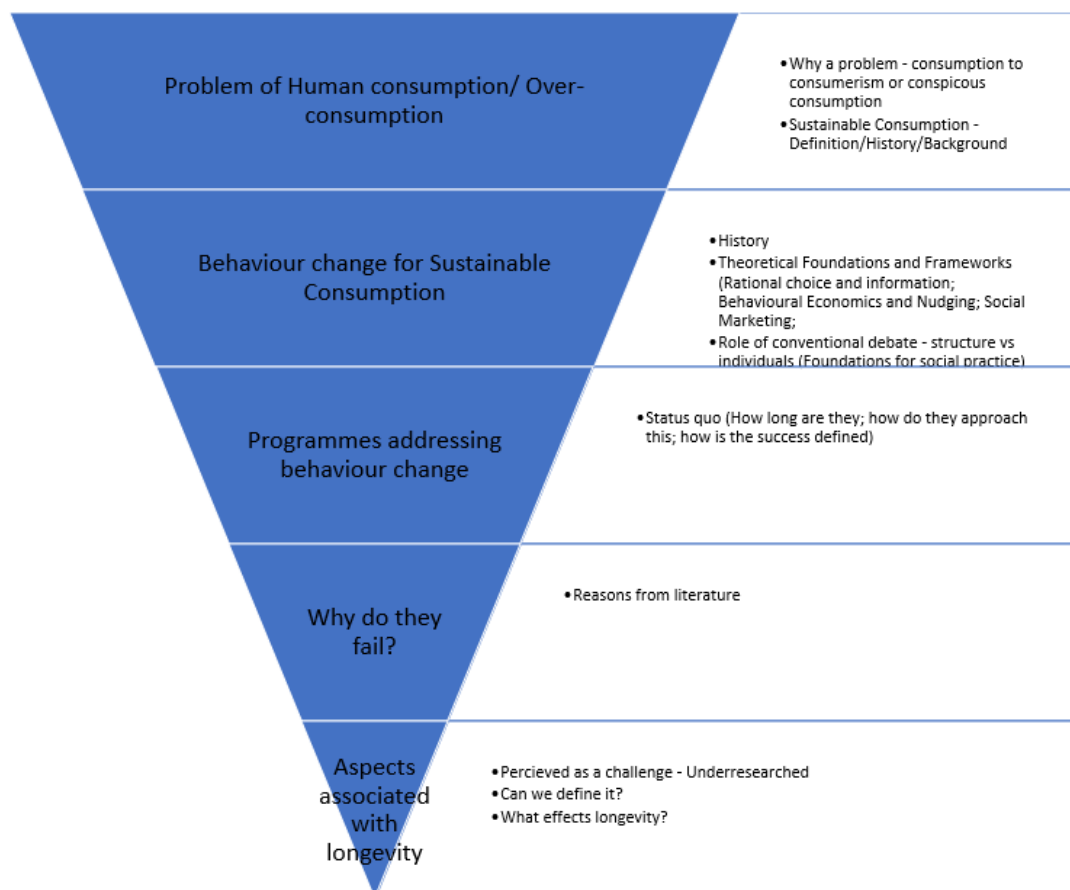
Figure 2 Literature review funnel

Source: Own Illustration

Six papers were chosen to understand the programmes addressing BC. Three meta-analyses were chosen, each of the papers reviewed more than a hundred studies and discussed the longevity or short-term nature of programmes. It was this specific focus because of which the papers were chosen. The other three papers chosen described standalone programmes focusing on different pro-environmental behaviours associated with SC. The programmes chosen either were designed for long-term change or focused on the long-term effects of the programme.

For grey literature, non-academic books on behaviour and climate change were consulted along with BC methodology manuals on best-practices from organizations such as UNEP, Centre for SC and Production (CSCP), Organization for Economic Corporation and Development (OECD), World Wildlife Federation (WWF), and the Government of UK. These literature sources were utilized to understand the methodologies conventionally used for understanding BC in the field of policymaking and understand the best practices, perceived causes for failures, and recommendations to design programmes/interventions focusing on BC.

To analyse data, a systematic review was conducted using three separate synthesis matrices. One for theories and concepts of BC with their disciplinary field, a second one for understanding the status quo for longevity, and a third matrix was created to understand the generic causes for failure of programmes addressing BC. As described by Dey, 1993, this was then followed by the three-step process for qualitative content analysis: **describing** the

process, concepts, and theories; **classifying** data based on different categories; and finally **connecting** different nodes to create a holistic picture. The process of completing the synthesis matrix was iterative as new literature was continuously identified throughout the thesis.

Finally, for answering RQ1, causes for failure of programmes addressing BC in creating persisting changes which was then used to create the interview guide and test the responses of the interviewees for analysis. **COM-B framework** was used as the framework for answering RQ2 based on the best practices identified by practitioners in the semi-structured interviews. The framework was used to structure the practices into the main three aspects to create a holistic picture of behaviour. Furthermore, since the framework itself has not been utilised to design programmes on BC for SC, it was the first attempt to create such a classification.

2.2.3 Semi-structured interviews

Semi-structured interviews were chosen as the means of data collection as in-depth interviews allow the researcher to get close to the social actors' accounts of social interactions, their meanings, and lived experiences within the phenomenon being studied (Blaikie & Priest, 2019). This was exceptionally important for the research, as it was important to understand the lived experiences of practitioners in designing BC programmes and implementing them as this could allow for an open discourse on the prospective failures of programmes in creating long-term change based on themes created during the literature review process.

Interviewees were selected based on their backgrounds and their experience with the field of climate and BC. The process of identifying actors and individuals to interview was supported by the thesis supervisor Oksana Mont along with suggestions and support from Markus Terho from the Sustainable Everyday Life team at the Finnish Innovation Fund Sitra. Furthermore, a few interviewees were kind to suggest further individuals who they thought would be relevant for the research. The interviewees were either a practitioner/programme designer for BC, academics with specialization in BC, and policymakers with experience in implementing programmes addressing BC.

The identified individuals were first contacted by a formal e-mail briefly explaining the purpose and the topic of the research and were largely conducted over Zoom between February and April 2021. A few interviewees could not give time for a formal interview over the internet however they did agree to answer the questions over e-mail. The questions were shared with such individuals in a word document over the e-mail. A detailed list of the interviewees is available in Annex I along with their organization, and date of interview.

The data collected from the process was then used to identify the specific causes for the failure of BC programmes and answer the other research questions identified in the objectives section of the research.

A complete list of participants is available in Appendix IV.

3   Literature Review

3.1   The challenge of human consumption

The challenge of human consumption poses a deep social and cultural dilemma to our society – on one hand, we have the perceived notions of comfort, development, and economic progress and on the other is the ever-growing existential threat of anthropogenic climate change and ecological collapse. The last hundred and fifty years of economic progress has seen the rise in both standards of living, and the growth in the aspirations of the middle class accompanied by a reduction in poverty and reduced mortality rates in certain parts of the world. However, this period has also seen a marked increase in environmental degradation, loss of critical bio-flora, accelerated species extinction, and rise in levels of carbon-di-oxide in the atmosphere (O'Rourke & Lollo, 2015; Jackson, 2009).

The early concerns of our limits to growth – based on the goal of infinite growth and consumption on a finite planet with limited assimilative capacities have now been expanded into the idea of limits of consumption-driven growth itself and its failure to fulfil human development and societal goals (O'Rourke & Lollo, 2015). While consumption-driven growth has resulted in increases in well-being, it has also led to the predominance of a host of lifestyle-associated diseases such as obesity, heart diseases, type 2 diabetes, and so forth. Further to this, the dominance of conspicuous consumption or consumption as a means to display social status or wealth is increasingly identified as a cause of stress and dissatisfaction (O'Rourke & Lollo, 2015). Rising levels in economic wealth coupled with the increase in the access of energy-intensive goods and services facilitated through growing neo-liberal markets and the ever-growing public relations industry (Jackson, 2009; Jackson, 2010)

There is also a strong component of inequality in the curve of growth that society has witnessed. As highlighted by the OXFAM report "Confronting Carbon Inequality" published in 2020, the richest 10% of the global population, roughly 630 million people, were responsible for 52% of the total global carbon emissions (Gore, 2020). The bottom 50%, 3.1 billion people, were responsible for just 7% of the total global carbon emissions. The distribution of emissions is further skewed towards the so-called "global north", with the bulk of the emissions coming from the affluent parts of the world, North America and Europe (Gore, 2020). The rising global middle-class, especially in India and China since 1990 have seen a huge jump in emissions while plenty of people in the countries still fail to make ends meet (Gore, 2020). Thus, meeting the societal goal of creating a more equal world within the bounds of planetary capacities requires a complete rethink of the meanings of development and economic progress, and exploring the potentialities of creating prosperity without consumption-driven growth (Jackson, 2009).

On the contrary, the status quo of our responses to environmental and resource crises have hinged on the idea of increasing efficiency and substitution (Jackson, 2009; Factor 10, 2000; Fuchs & Lorek, 2005). Referred to as "economic decoupling", the focus is towards the supply side - reconfiguring processes of production, redesigning goods and services, shifting business models - with the simple aim of making economic growth less dependent on material throughput through technological improvements (Jackson, 2009; Factor 10, 2000; Fuchs & Lorek, 2005). The necessity of supply-side actions remains uncontested, but such an approach misses a key aspect – the Jevons Paradox or rebound effects (Fuchs & Lorek, 2005). Though the terms have been used interchangeably, they have slightly different meanings (Fuchs & Lorek, 2005). However, for the sake of clarity and simplicity, they imply a causal relationship between an increase in consumption of a good or service offsetting the positive environmental gains made through efficiency (Jackson, 2009). An example of the Jevons Paradox or rebound

effects includes the effective rise in carbon dioxide emissions from fossil fuels despite declining energy and carbon intensities – 80% increase since 1970, 40% higher since 1990, the base year of Kyoto Protocol (Jackson, 2009). On a more local scale, the efficiency improvements in television sets and washing machines have increased savings per unit, which has meant people buy, even more, outstripping the gains made through efficiency (Akenji, 2014). In essence, the carbon reduction effects of increased efficiency have been offset by an increase in domestic energy consumption or an absolute increase in consumption of goods or services (Tan et al., 2019).

Such matters associated with efficiency and emissions are further complicated due to the dimensions of global trade. The neo-liberal nature of presently developed economies has meant a progressive shift in domestic manufacturing to developing parts of the world (Jackson, 2009). This has meant a considerable amount of resources, emissions, and environmental pollution being lost within global trade and failing to show up in the dominant method of tracking emissions, which is based on the production of goods and services instead of consumption (Jackson, 2009). While China and India would show up extremely high when measuring emissions based on the production of goods, both manufacturing nations are net exporters of emissions when global trade is accounted for (OECD, 2015). The Nordic countries of Sweden, Finland, Norway, and Denmark on the other hand, known for their environmental progress and a huge reduction in emissions based on production are net importers of emissions, with Sweden having consumption-based emissions 69% higher than emissions based on territorial production (OECD, 2015).

In consequence of these paradoxes within our response to environmental and societal goals, the need for addressing consumption patterns in industrialized economies has become paramount more than ever (Fuchs & Lorek, 2005). This means addressing and questioning the patterns of behaviour of individuals within the structures in which they exist (Fuchs & Lorek, 2005). It necessitates not only addressing the behaviour of individuals but also the inherent socio-technical structures where such behaviours are carried out, not creating a solitary focus on individual behaviour as the only cause of environmental and social problems (Moloney et al., 2010). It requires seeing individual changes in behaviour and structural changes as "sides of the same coin" (United Nations Environment Programme, 2019).

3.2   Sustainable Consumption

To address the deep societal dilemma of SC, SC was defined as a formal concept in 1994 at the Oslo Roundtable as "*the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of future generations*" (IISD, 1994, Section 1.2). However, the concept itself without a formal definition was loosely used in multiple global documents such as The Limits to Growth report from 1972 by the Club of Rome which called for the "*globe's people to establish status, derive satisfaction, and challenge themselves with goals other than increasing production*"; the United Nations World Commission on Environment and Development in the year 1987 calling for societal values that "*encourage consumption within the bounds of the ecologically possible and to which all can reasonably aspire*"; and UN Conference on Environment and Development in the year 1992 highlighting the role of unsustainable consumption patterns especially in industrialized economies (Fuchs & Lorek, 2005).

While its definitions have been both narrowed and broadened over the years since the definition from the Oslo Roundtable of 1994, today SC and Production is the 12th goal of the United Nations Sustainable Development Goals and has adopted the definition from the Roundtable of 1994 (Fuchs & Lorek, 2005; IISD, 1994; United Nations, 2016). SDG 12 has

created three key aspects for Sustainable Consumption and Production as a concept – decoupling economic growth from environmental degradation, increasing resource efficiency, and promoting sustainable lifestyles (United Nations, 2016). However, academic literature remains largely divided over the different facets of SC and the years has been largely defined by two broad notions – "weak SC" and "strong SC" (Fuchs & Lorek, 2005).

However, recognizing the need for clamping excessive consumption or conspicuous consumption can be traced back to the 19th century to scholars like Henry David Thoreau and Thorstein Veblen who were concerned with the damaging effects to society with the pursuit of consumption to signal social status (Akenji, 2014). While reports such as the "Limits to Growth" already talked about the need for reducing consumption to tackle resource scarcity, the notion of SC associated with environmental concerns was born out of the neo-liberal paradigm of governance and economic structures in the 1980s, wherein markets were considered the single solution to all societal problems (Heiskanen & Laakso, 2019). This gave way for green consumer guides, green marketing, and the ecolabelling schemes, such as the Blue Angel scheme from Germany which today certifies roughly certifies 10,000 products (Akenji, 2014). While, ambitious calls for reducing absolute consumption were common from 1970 onwards, specifically, since The Limits to Growth report, the accepted idea of SC came to be more in line with the dominant efficiency-focused neo-liberal economic paradigm less concerned with reducing consumption on absolute terms (Lorek & Spangenberg, 2014; Heiskanen & Laakso, 2019; Fuchs & Lorek, 2005).

The consequence of this form of SC, termed as "weak SC" or "green consumerism" has been an over-reliance on efficiency associated with growth, technological change, and substituting more harmful substances for less harmful alternatives (Akenji, 2014; Lorek & Spangenberg, 2014). Lorek and Spangenberg (2014) describe this approach as a "vicious circle" where short-term and incremental changes are offset by an overall increase in levels of consumption, i.e., the rebound effect as discussed before. "Weak SC" is typically associated with decoupling of growth of economies with resource use (termed as relative decoupling) without absolute reduction in the number of goods and services consumed (Jackson, 2009; Lorek & Spangenberg, 2014). This approach has received much criticism due to its inability to deal with the resource efficiency dilemma itself as limited available resources and limited assimilative capacities would mean green consumption or green consumerism would always be a "weak" form of SC (Fuchs & Lorek, 2005; Lorek & Spangenberg, 2014; Akenji, 2014).

On the other end of the spectrum is the concept of "strong SC" discussed in academic literature (Lorek & Fuchs, 2013). This form of SC challenges the status quo notions of technological change, efficiency, and substitution being enough on their own to solve social and environmental problems on a global scale and include reducing consumption of goods and services in absolute terms as part of the solution (Lorek & Fuchs, 2013). This concept goes beyond substitution and challenges the notions of why conspicuous excessive consumption is required in the first place as it fails to fulfil larger societal and ecological goals (Lorek & Fuchs, 2013). The proponents of this concept site that the fulfilment of societal goals such as equality within the developed and developing world cannot be fulfilled while keeping within the planetary boundaries unless exceptionally high levels of consumption in the developed world (Lorek & Fuchs, 2013; Lorek & Spangenberg, 2014). Along with this, the growing levels of consumption of the emerging middle class in the developing world would also need to be reduced to safe levels to create space for people to grow (Lorek & Fuchs, 2013; Lorek & Spangenberg, 2014). Questions on development, infinite growth, and human needs are common in this form and have questioned the larger narrative of institutions, the economic system, and society on these topics calling for radical changes side-lining it from the conventional policy and business agenda (Lorek & Fuchs, 2013).

However, valid concerns have been raised by the proponents of this more "radical" form of SC such as Jackson (2009) highlighting that to keep within the limits prescribed by IPCC, there would be a requirement of lowering carbon intensities by 130, which is essentially a factor of 100. It has been argued that such a drastic reduction in carbon intensities cannot be achieved by efficiency alone, and requires drastic reductions in the levels of consumption, or a more "stronger" version of SC (Jackson, 2009). It has also been highlighted that the rebound effects from this efficiency-focused weak version of SC limit benefits to 30-60% of theoretical potential and may end up shifting the environmental burden onto other environmental problems without addressing the root drivers (Jackson, 2009). Further to this, it has been pointed out that for a just transition, millions of people must be lifted out of poverty and due to limited planetary capacities and the limited ability of the atmosphere to absorb more carbon dioxide, there is a dire need for a stronger version of SC to create spaces for such a transition to happen (Lorek & Spangenberg, 2014). The table below (Table 1) differentiates between "weak" and "strong" SC through examples identified in the literature.

Table 1 Differences between "weak" and "strong" SC.

"Weak" SC	"Strong" SC
Shifting private vehicle use from fossil fuels as the primary fuel to electric vehicles.	More focus on public transport, and other active means of transport such as biking and walking.
Shifting to biofuels for aviation.	Reducing absolute levels of flying, more focus on frequent fliers as biofuels challenge for land-use with other priorities such as food production. Focus on travel alternates such as trains.

Source: Adapted from Nicholos and Wyne (2019)

3.3 Behaviour Change for Sustainable Consumption

The following section provides an introduction to the various theoretical dimensions which exist when it comes to changing behaviours for SC. This section has been looked at to understand the status quo and theoretical dimensions which have been used to design programmes addressing BC.

3.3.1 Rational Choice & Information Provision

The recognition for changing patterns of consumption, especially to address resource efficiency, gained ground during the 1970s because of the Gulf Oil crisis creating a shortage in the United States of America and the publishing of the Limits to Growth Report (O'Rourke & Lollo, 2015). The Oil crisis created a movement for energy efficiency initiatives targeted at citizens by changing their behaviour and taking up energy-saving practices (Jacobs, 2016). The BC was carried out through "information provision" initiatives (Heiskanen & Laakso, 2019) with President Carter himself appealing to the rationality of American citizens to turn down their thermostats by 2 degrees and using public transport to reduce a strain on the scarce resource (Jacobs, 2016). Ever since the crisis such initiatives have been a status quo for changing behaviours of individual citizens and are grounded in "Rational Choice Theory" (Heiskanen & Matschoss, 2016). This theory of changing behaviour comes from the

neoclassical economic belief of seeing individual citizens as rational actors who logically weigh the pros and cons of each decision and act within the bounds of individual self-interest (Heiskanen & Laakso, 2019). With a focus on this cognitive deliberation which people engage in, it was assumed that the only reason people engage in negative environmental behaviours is due to a lack of complete information on the causality of their actions (Heiskanen & Laakso, 2019). Thus, fulfilling this knowledge gap or "information asymmetry" can correct behaviours or market failures as they are assumed to be (Heiskanen & Laakso, 2019).

The dominance of these assumptions continued throughout the neo-liberal period where a religious belief in markets for solving environmental problems sought to fulfil the knowledge gap in individuals to change their behaviours (Akenji, 2014). A direct consequence of this was the prominence of green-consumer guides, energy-saving guides, eco-labels, and so forth (Akenji, 2014). With the introduction of the "Blue Angel" eco-label in Germany, eco-labels gained ground throughout the globe as an important instrument for filling the so-called knowledge gap in rational consumers to change their behaviours and covered a variety of products (Akenji, 2014). A similar approach was sought by civil society and non-government organizations where the focus has been providing information on the causality of actions to these individual consumers through imagery and guilt or doom messaging, appealing to their values and rationality to change their behaviours (Beattie & McGuire, 2018). Such an approach falls in well with the techno-efficiency driven approach as the autonomous individuals are given information on their choices and technological efficiency or substitution is used to facilitate the transition to a lower impact product (Moloney et al., 2010).

Such approaches have seldom created any long-term impact or change in people's behaviour and have come under immense criticism for their assumption of the cognitive decision making of individuals completely isolating it from the social context in which decisions are made (Shove, 2010). It has also been argued that apart from the social context, decisions themselves are emotional and learned responses rather than constant deliberation (Kahneman, 2011) and besides self-interest, other motivations such as altruism and social and moral norms are important considerations (Stern, 2000).

3.3.2 Attitudes, Values, Beliefs and Norms

The failure of purely providing information to change behaviours led to the application of models from the discipline of social psychology for changing and understanding behaviours targeting a variety of pro-environmental behaviours such as littering, energy conservation, water conservation, and so forth (Jackson, 2005). The most prominent of such models include the attitude-behaviour models (Ajzen, 1991; Ajzen & Fishbein, 2000) and the value-belief-norm models as described by Stern (2000). The attitude-behaviour models as described in the Theory of Planned Behaviour (TPB) is one of the most popular models for pushing people towards pro-environmental behaviours (Stern, 2000). The TPB postulates that the performance of a particular behaviour is based on the intention to perform a particular behaviour which in itself is based on three kinds of deliberations or beliefs (Ajzen, 1991).

The first of them is "behavioural beliefs" and refers to the perceived positive or negative consequences of behaviour and the evaluations of these consequences (Ajzen, 1991; Ajzen & Fishbein, 2000). The second one is the "normative beliefs" or the considerations regarding behaviours of respected individuals and social groups which combine to form a sense of social pressure or a subjective norm (Ajzen, 1991; Ajzen & Fishbein, 2000). The third type of deliberation or belief is the "control beliefs" which encompass the factors which can influence a person's ability to perform the behaviour (Ajzen, 1991; Ajzen & Fishbein, 2000). Together the relative power of each of these factors produces self-efficacy, or perceived control over behaviour as described by Bandura (1977) in his work on the theory of social learning (Ajzen,

1991; Ajzen & Fishbein, 2000). Finally, the more favourable the attitude towards behaviour and the subjective norm associated with it, the greater would be the perceived control of the individual and increase their intention to perform the behaviour (Ajzen, 1991; Ajzen & Fishbein, 2000). TPB is based on the logic of deliberation and expected utility out of every action that an individual performs which can be seen as an extension of the Rational Choice approach (Heiskanen & Laakso, 2019).

The Value-Belief-Norm (VBN) theory prescribed by Stern (2000) on the other hand extends the Theory of Altruistic behaviour by Schwartz (1977 and posits that individual behaviour to a certain extent may be rooted in altruistic and biospheric values and such a value-based logic for action may be based on values which do not take other into account such as curiosity, achievement, honesty, etc. The model itself bypasses the expected utility from an action by the use of norm-activation or personal norms which are said to create feelings of moral obligations in individuals to carry out altruistic actions. Such an approach was recommended by Stern (2000) as due to the longer time horizons and varying spatial horizons of environmental problems; individuals may not receive tangible benefits by the performance of a pro-environmental action and thus it would be pertinent to bypass the expected utility from the action.

As an extension for both TPB and VBN, Attitude-Behaviour-Context (ABC) model for pro-environmental behaviours was suggested as a means for engaging individuals. This approach recognizes external contexts which may either impede the performance of behaviour based on attitudes or may increase the likelihood of the performance of such behaviour. An implication from this model from a policy perspective has been the recognition of contextual factors such as cultural backgrounds, religion, educational capabilities, geographic location, income and constraints and opportunities coming from the policy itself such as infrastructure, taxes, regulations, incentive programmes, and so forth. Empirical studies on the theory itself have shown that the relationship between attitude-behaviour and context is U-shaped and they are strongest when the context provides strong or weak forces against pro-environmental behaviours. Some of these contextual factors which have a strong bearing on the attitude-behaviour relationship include the amount of effort, expense, or inconvenience required to change the target behaviour (Stern, 2000).

3.3.3 Strong hold of habits

Habits are recognised as an extremely strong variable in defining the success or failure of behavioural change programmes (Verplanken & Wood, 2006). The strong hold of habits has shown to be a strong predictor of the failure of BC programmes even when the right attitudes are present in individuals (Verplanken & Wood, 2006). Thus, understanding habit formation has an extremely crucial role to play in the design of any programme addressing BC for SC or lifestyles. Verplanken (2006) defines habits as a form of automaticity that develops in an individuals' response which becomes frozen under the stable circumstance. As per the theory on habit formation, when people perform an action people decide on the different variables that are involved in that action and the outcomes that would be achieved (Verplanken, 2006). As the action is repeated in relatively stable contexts, this deliberation in people's minds or their decision making recedes and the habit is henceforth cued by stable contexts (Verplanken, 2006). Within the context of SC, an individual who has a habit of driving even if there are inconveniences with driving such as highway closures and traffic jams (Verplanken & Wood, 2006).

Verplanken and Wood (2006) identify downstream approaches with changes in context along with upstream regulations as an efficient way of changing behaviours with a strong habitual linkage and such behaviours cannot be changed with information and awareness alone.

Context changes here refers to certain contextual changes which can occur in people's lives such as moving to a new city, starting a new job, getting a kind, and so forth which leave people open trying to new behaviours (Verplanken & Wood, 2006).

3.3.4 Behavioural Economics & Nudging

The recognition of the irrationality of human behaviour had put the field of changing behaviours in limbo (Heiskanen & Laakso, 2019). While tons of campaigns, ecolabels, and green guides already existed, a long-term shift in behaviours was yet to be achieved (Heiskanen & Laakso, 2019). However, the field was given a new lease of life thanks to research done by Daniel Kahneman, part of his ground-breaking book – "Thinking fast and slow" (Heiskanen & Laakso, 2019). Kahneman (2011) described two systems in the brain which form the basis of our decision making – System 1 which is fast and automatic based on intuition, driven by learned responses and System 2 which is deliberate, conscious, and slow. It was postulated that the bulk of our decision making and actions are driven by System 1 such as taking a shower, choosing the optimum means of transport, etc (Kahneman, 2011). System 2 on the other hand is used for more cognitive deliberations which require a greater effort (Kahneman, 2011). According to the insights of Verplanken and Wood (2006), around 45% of our everyday decisions are not reflected upon.

Based on these insights, Thaler & Sunstein (2008) coined the term "nudge". It was defined by the authors as any aspect of the decision environment *"that predictably alters people's behaviour without forbidding any options or significantly changing their economic incentives"* (Thaler and Sunstein, 2008: 8). Nudges thus focus on the choice architecture, more than the values and beliefs of people, where choice architecture is defined as the physical and informational structure of the environment where decisions are made and influences the decisions themselves (Lehner et al., 2015). Nudges have thus become an attractive tool for policymakers to correct the biased decisions made by individuals against their rational self-interest and have already found their use in the fields of public health and savings accounts as part of the work on Behavioural insights commissioned by the Government of (UK) (Lehner et al., 2015). This is achieved either by subconsciously influencing the behaviour of individuals by surpassing their cognitive biases and other heuristics to reduce an undesirable behaviour or promote a more desirable behaviour (Thaler & Sunstein, 2008). In practice, this can be achieved by the following 4 approaches –

Choice Defaults

Choice defaults are ways designed to work on the tendency of individuals to stick with the status quo choice which would require no effort from their end. They are applied in practice by changing the default option of a particular product or service and providing people with the option of "Opting Out" instead of "Opting in" to the option. Since Opting out of the new default position would require considerable efforts, people would rather stick with the new default unless they strongly disagree with it. An example of such alterations to "choice defaults" is the "Opting out" from Green Electricity instead of "Opting in" which has been proven to be successful as 95-99% of people kept the new Green electricity choice default (Lehner et al., 2015).

Social Norms Messaging

The social nature of human beings means that the behaviour of others or our belief of what is considered "normal" in society influences the actions we take or our behaviour. This is termed as the "herding bias" by behavioural economists (Thaler & Sunstein, 2008). Social norms messaging, or a salient and visible way to communicate with individuals about what is considered acceptable and normal, and this communication can increase the uptake of a

particular desired behaviour (Lehner et al., 2015). Plenty of examples exist for social norms messaging, with one of the most famous beings from Goldstein et al., (2008) who tried to increase the re-use rates of towels in a hotel. This was achieved by placing a sign "the majority of guests re-use their towels" which produced significantly better results than only information provided for environmental protection (Goldstein et al., 2008).

Changing the physical environment

The importance of the physical environment in framing the buying decisions of consumers has been an important strategy used by supermarkets over the past few years. Strategies such as nudging people to buy particular products by keeping them at the eye-level of the consumer, keeping certain products close to the cashier which is then sold more, etc. These are based on ways to steer unreflective behaviour by removing unnecessary information and preventing an information overload. Such strategies have also found their way for use in important areas such as food waste prevention in restaurants and canteens by reducing the plate size and increasing nutritional food intake by keeping fruits closer to the cashier. While contested by practitioners of social practice theory (discussed later), proponents of behavioural economics believe that changes in the physical environment are one of the major causes for an increase in biking rates in Germany, the Netherlands, and Denmark (Lehner et al., 2015).

Framing of Information

Due to our cognitive biases and limited attention spans, the way information is framed and presented to an individual has the potential to impact or alter or their decision, especially when the information can activate certain learned responses or values. A prime example of such an approach being used for pro-environmental behaviours is in providing energy information feedback where insights from behavioural economics have been used to structure the contents of energy bills. These insights include utilising easy to understand graphical information instead of hard-to-understand units such as Kilo-watt hours, providing peer consumption, and using norms such as smiley faces if the amount of energy consumption has decreased (Lehner et al., 2015).

3.3.5   Contemporary debate – individual vs structure - theories of practice, and socio-technical transitions

The theories for BC described above, from information provision to behavioural economics, are either cognitive approaches or draw from insights from psychology viewing individuals as consumers and isolated actors. Such an approach towards motivating SC, or even pro-environmental behaviours has increasingly come under stark criticism from specifically from the discipline of sociology. A key reason for such criticism is precisely viewing individuals as isolated actors and not embedded in a consumer society where norms, values, and habits are derived from them being part of this consumer society. It is further stated that consumer behaviours and attitudes are deeply entrenched within society and societal transitions are shaped not only by new technologies but also by new markets, infrastructures, and cultural meanings with varying degrees of interaction and power between individuals and institutions that foster such transitions. A direct implication of this criticism is that needs, desires, and practices that individuals engage in are outcomes of this sociotechnical change rather than being direct drivers of it, as indirectly implied in the theories of change which rely on attitudes (Shove, 2010; Hargreaves, 2011; Shove et al., 2012).

Extending this criticism to the concept of SC, and more specifically to the two different schools of thought on SC as described in the previous section – "weak" vs "strong" SC – shows a tension between the two notions (Akenji, 2014). Nudging and behavioural economics

as it seeks to shift choices made by individual consumers towards more environmentally friendly options without questioning the excessive levels of consumption in themselves place an over-reliance on consumer choices is and is prescribed more towards a weaker form of SC or green consumerism (Akenji, 2014). The ABC approach on the other does question excessive levels of consumption but falls short due to the attitude-action gap or value-action gap (Shove, 2010). Such a situation occurs when people do have the right attitudes and values, yet do not take actions in accordance with those values (Shove, 2010). Literature sights the presence of deep-seated habits, cultural norms, and infrastructural lock-ins and policies as a major cause for this (Shove et al., 2012).

With the identified failures of ABC, there has been a growing interest in the field of sociology on SC with the research on theories of social practice. This rise has been in parallel with the rise of behavioural economics on the other end. The notion of social practice in itself was postulated by Giddens, (1984) describing them as a basic domain for the study of social sciences. In this approach, habits and behaviours are not understood as an expression of values and attitudes and instead understood as the expression of understandable social phenomena. Attitudes, henceforth, are only considered as the tip of the iceberg and tries to go underneath to create and understand transitions. With "practice" as a single unit shared across society, it differs from the ABC approach which treats behaviour at a more individual level with only limited weight given to context. Thus, according to such an approach, if one were to alter the water and energy usage during laundry, practice theory would see laundry as a practice shared across the society and kept alive and continues to be normal so long as a considerable number of carriers continue to reproduce it. Such an approach would mean that meanings of normal are based on the continuous reproduction of practice by its carriers and behaviours in themselves have no separate existence and are sustained through ongoing reproduction (Shove, 2010; Hargreaves, 2011; Shove et al., 2012).

On this line of thought, theories of social practice define three core components for understanding said practices – Materials which includes objects, tools, and infrastructure; Competence which includes knowledge and embodied skills; and Meanings which includes Cultural conventions, expectations, and socially shared meanings. These three together comprise the reproduction and continuation of several high-carbon practices across the society and are interlinked with each other and thus changing them would require not only knowledge of these three components but also the interlinkages between different practices (Shove et al., 2012). While theories of social practice do present a holistic picture of behaviour, their inherent complexity has kept them away from the policy agenda (Jackson, 2005)

3.4 Programmes addressing behaviour change

For understanding programmes addressing BC, the following papers were looked at from the literature. The papers covered a mix of a meta-analysis looking at different types of pro-environmental behaviours and stand-alone programmes where longevity or persistence of behaviour was a consideration by the authors. Table 2 gives detailed information on the literature considered.

Table 2 Literature reviewed for programmes addressing BC

Title	Author/s	No. of programmes/data points covered	Theories/Frameworks/Tools
Transitioning to low-carbon	Moloney et al.,	An analysis of over 100 programmes	A mix of approaches such as commitment, feedback, group

communities – From behaviour change to systemic change: Lessons from Australia	(2010)	targeting behaviour change in different parts of Australia	workshops, community-based approaches, skill improvement, and so forth.
Environmental Sustainability and Behavioural Science – a meta-analysis of pro-environmental behavioural experiments	Osbaldiston & Schott, (2012)	253 Behavioural experiments showing results based on observed not self-reported outcomes	Choice architecture, prompts, justifications, instructions, feedback, rewards or incentives, social modelling, commitment
Meta-analysis of randomised controlled trials testing behavioural interventions to promote household action on climate change	Nisa et al., (2019)	83 studies providing a total of 144 sample estimates focussing on multiple behaviours specifically associated with climate change	Choice architecture, social comparison, feedback, norms messaging, information approaches, commitment
Effecting durable change – A team approach to improve environmental behaviour of the household	Staats et al., (2004)	Standalone analysis of the EcoTeam Programme focussing on 38 different household behaviours	Group setting, information, and feedback
The short-run and Long-run effects of Behavioural Interventions – Experimental evidence from energy conservation	Allcott & Rogers (2014)	Standalone analysis of the OPower programme in the United States of America	Social Norms messaging, Feedback
The Post-intervention persistence of energy conservation behaviours – An Evaluation of the Start Green	Burns and Savan (2017)	Standalone analysis of the Start Green Programme in Toronto, Canada	Community-Based Research techniques accompanied by peer mentoring, social norms, commitments, prompts, tailored information, barrier reduction materials

Programme			

Source: (Moloney et al., 2010; Osbaldiston & Schott, 2012; Nisa et al., 2019; Staats et al., 2004; Allcott & Rogers, 2014; and Burns & Savan, 2018)

As mentioned earlier, before understanding why long-term BC fails, or more precisely, why do programmes addressing BC fail to create long-term change, it is important to understand the status quo of BC programmes. Traditionally, longevity in itself hasn't been the most important criteria for programmes addressing BC which became abundantly clear from the three meta-analyses considered for the literature review, though it has been an area of further research in all of them (Moloney et al., 2010; Osbaldiston & Schott, 2012; Nisa et al., 2019). In the standalone programmes, either persistence of behaviour or longevity was a key aim (Burns & Savan, 2018; Staats et al., 2004) or a long-term evaluation of the programme was carried out to test for persistence (Allcott & Rogers, 2014).

3.4.1   Behavioural focus and general information

Moloney et al.; (2010) with their assessment of behavioural change programmes focusing on environmental behaviours looked at more than 100 programmes focussing on multiple pro-environmental behaviours in Australia, especially focusing on the states of Victoria and South Australia. Reducing energy consumption was the most common behaviour aimed at by the programmes with over 50% of the programmes focusing on it. However, Moloney et al., (2010) highlight there being a bias in the selection of programmes over the status of programmes and their focus. This was followed by programmes focusing on sustainable lifestyles aimed at individuals and households or entire communities, being a focus of one-fourth of the total programmes. The remaining programmes focused on resource efficiency, transportation, and water consumption. In terms of the target audience, 50% of the programmes focused on households with 10% of them specifically focusing on low-income households. Of the remaining, 30% focused on entire communities, around 10% focused on businesses, and the remainder of them were internal programmes focusing on government employees. The majority of the programmes were delivered by local and state governments, while non-governmental organizations were involved in around 20% of the programmes. A small percentage of programmes were also delivered through church groups, universities, and schools (Moloney et al., 2010).

The meta-analysis carried out by Osbaldiston & Schott (2012) covered 253 programmes focusing on multiple pro-environmental behaviours such as recycling, energy conservation both at home and public places, water conservation, and making efficient transportation choices. Programmes or literature before the year 1980 were excluded from the meta-analysis along with programmes that used self-reports of behaviours and instead focused on programmes where there was a possibility to measure programmes or behaviour in real-world settings (Osbaldiston & Schott, 2012). This was similar to the meta-analysis provided by Moloney et al., (2010) where the authors excluded programmes with self-reports of behaviours due to their deficiency in providing accurate information because of a host of biases. Lastly, only those experiments were included which were carried out as experiments creating a firm differentiation between a control group and treatment group for accurate evaluation (Osbaldiston & Schott, 2012).

In the meta-analysis carried out by Nisa et al., (2019), there was a firm focus on behaviours with direct relevance to greenhouse gas emissions and climate change and had a sample of 83 studies for the same. The behavioural focus of the studies was based on six different themes –

Energy consumption at home, transportation, consumption of animal products, food waste, water consumption, and recycling. Further segmentation of the different themes and what they entailed is provided in Table 3. The time scale of the published studies was between 1976 and 2017 and there was a firm recognition of the perils of self-reported data on programme evaluation and hence were excluded from the studies. Some important behaviours relevant to climate change such as air travel, adoption of renewable technologies, and electric cars were not part of either of the meta-analysis, which was attributed to self-reported data in those studies and the existence of studies in an experimental setup (Nisa et al., 2019).

Table 3 Themes of focus for programmes addressing BC.

Energy Consumption at home	Interventions targeting electricity or gas demand, purchase of energy-efficient appliances, consumption of renewable energies
Transportation	Analysis of air travel, private car use, use of alternates such as walking, biking, and public transportation
Consumption of animal products	Interventions targeting either reducing or avoiding meat and dairy products
Food waste	Interventions aiming to reduce the frequency of the amount of food waste
Water Consumption	Interventions targeting the amount of water consumed for example through time in shower or frequency of laundry
Recycling	Interventions targeting recycling of paper, plastic, cans, etc.

Source: Adapted from Nina et al., (2019)

Of the literature on standalone programmes looked at, the first of the programmes studied, the EcoTeam programme was a collection of intervention packages tested in the Netherlands and further tested in parts of the United Kingdom, however, the present analysis focuses on the Netherlands. The package initially started with a focus on an extensive list of 93 household behaviours which were narrowed to 38 based on feedback received from the participants as they were tired of filling extensively long questionnaires. The behaviours focused on the broad themes of energy conservation, water consumption, dietary habits and food waste, repair habits, and transportation. The programme started with 445 people which was reduced to 150 by the end of the second phase of the programme where a very limited correlation was seen between non-responsiveness and socio-demographics. There was also a recognition of the self-selection bias which may exist in the evaluation results as the participants of the programme were already better at pro-environmental behaviours than the representative sample of the Dutch population. The gender ratio of the programme was heavily skewed towards female participants as the participants were recruited through several women organisations (Staats et al., 2004).

The second of the three programmes considered, the Start-Green Programme, was initiated in the city of Toronto at an off-campus student residence close to the University of Toronto with approximately 700 housing units. The residence was largely inhabited by graduate students with approximately 60% of the respondents being international students coming from 60 different countries. The programme was divided into different intervention behaviours with each behavioural theme being a focus theme for a month of the intervention. The themes for the programme were energy conservation and water consumption with

extremely focused household behaviours such as reducing the use of air conditioners, increasing insulation, reducing the use of hot water, reducing the length of the shower, and so forth. Approximately 301 student residents made public commitments as part of the programme and 329 responded to at least one of the surveys. The overall reach of the programme was higher, with approximately 600 adults and children being exposed to the material of the programme as spouses and children of several participants were part of the group activities in the programme (Burns & Savan, 2018).

The final programme looked at has been the focus of multiple evaluations carried out since its inception in the year 2009. The programme which specifically focuses on behaviours associated with energy conservation was started by an American Company OPower which tied up with utility or energy companies in various states – 47 utilities in 21 states were already part of the programme by 2010 – and is recognized as one of the largest randomized control trials with almost 6 million participants. The focus of the programme was on individual households and their energy consumption habits. For the selection of participants for the experiment, multiple criteria were used depending on the region however certain common criterions included households with sufficient energy bill history to create a baseline and households with single-family homes. A rigorous effort was made to divide the selected households into experiment and control groups to not tarnish the results of the trial (Allcott & Rogers, 2014).

3.4.2 Strategies applied for changing behaviours and programme design

From a theoretical perspective on BC, neither the meta-analysis by Osbaldiston and Schott (2012) nor by Nina et al., (2019) chose to identify a concrete theoretical approach with which to conduct the analysis. The meta-analysis conducted by Moloney et al. (2010) on the other hand was extremely critical of the techno-economic framework for understanding the complex relationship between behaviours and technology and instead chose to work with a socio-technical framework which was used to develop their analysis. A socio-technical framework recognizes the relationship between emerging technologies and the social context in which they emerge and the impact that has on behaviours and postulates that changing attitudes without including the behaviour steering aspects of technology would fail to change behaviours (Moloney et al., 2010). Based on this, the framework includes five main dimensions – framing behaviour and social practices, beyond barriers and constraints, approaches to agency and empowerment, need for dynamic systemic changes, and paths through learning and integration (Moloney et al., 2010). Further detail of the dimensions is provided in the table below (Table 4).

Table 4 Framework for understanding behavioural change programmes.

Framing behaviours and social practices	Focuses on the assumptions which are made about the behaviour and its motivations. Recognition of intrinsic and extrinsic values which are targeted by programmes and focus on intrinsic values such as personal growth and community. Finally, recognition for understanding the relationship between social context or social norms and their interplay with technology leads to focus on the standards which dictate notions of cleanliness, convenience, etc.
Beyond barriers and constraints	Understanding barriers to BC which exist and must be addressed to create a successful change in behaviours. These barriers include – willingness to act, habitual behaviours, norms and habits, convenience, cost – financial and transactional, psychological effects – long time scale of environmental problems, lack of agency – perceived control over a behaviour or situation (Winefield, 2005). Also, important to understand the entanglement between different barriers and habits themselves to

	successfully change them.
Approaches to agency and empowerment	Sense of agency is an important psychological factor that hinges on internal factors such as education, income, social status and external factors such as institutional and regulatory context. Also, includes how well a programme incorporates other stakeholders to change external contexts and focuses on the collective nature of the social context.
Need for dynamic systemic changes	The programmes step away from the "blame the consumer" approach and recognize the institutional and social context which may be hindering change in both planning and delivery.
Paths through learning and integration	Recognizing the importance and value of social learning in communities and identifying 'system-binding agents' who can coordinate between grass-root action and top-down policy support.

Source: Adapted from Moloney et al., (2010)

The intervention techniques as identified by the three different meta-analyses were largely similar even though different classifications were used by the authors. Some of the most common techniques identified include commitment, feedback, informational approaches, choice architecture, and so forth (Moloney et al., 2010; Osbaldiston & Schott, 2012; Nisa et al., 2019). Moloney et al., (2010) in their analysis also include techniques such as home audits and retrofitting as effective techniques for changing behaviours with the assumption that such changes make people more mindful of the change especially when it comes to home audits (Moloney et al., 2010). Further, they also include sustainable housing development policies keeping in with the socio-technical approach for understanding BC (Moloney et al., 2010). A complete classification of intervention techniques utilised by the various programmes in the three meta-analyses is provided in the below table (Table 5).

Table 5 Intervention techniques utilized by various behaviour change programmes.

Moloney et al., (2010)	- Audits – mostly for programmes addressing energy efficiency. - Capacity building – education, skill-building, training, supply of material and equipment. - Commitments – target setting, sign-ups, pledging. - Education – engaging with people through workshops, group discussions, and forums. - Equipment/appliance change – replacement of energy-wasting appliances. - Energy infrastructure – shifting from coal to renewable energy. - Sustainable housing development – focusing housing and overall new development on efficiency and sufficiency.
Osbaldiston & Schott (2011)	- Convenience - Altering choice architecture, prompts or non-informational reminders. - Information – Justification or why to perform a behaviour, Instructions or how to perform a behaviour. - Monitoring – Feedback, rewards, and incentives. - Social-psychological processes – Social modelling, commitment.
Nisa et al. (2019)	Information – conveying tips for energy consumption, provision of in-home displays, energy labels, statistics on climate change.

	• Appeals – requests, pleas, or appeals based on humanitarian values such as social responsibility.
	• Engagement – changing psychological processes through goal setting, implementation intentions, commitments, and mindfulness towards climate change mitigation.
	• Social Comparison – comparative feedback concerning close friends, neighbours, colleagues, and other citizens.
	• Choice architecture – removing external barriers or increasing access to low-carbon behaviours by altering the structure of the environment in which decisions are made.

Source: Adapted from Moloney et al., (2010); Osbaldiston & Schott (2012); and Nisa et al., (2019).

Of the first programme looked at, **EcoTeam**, employed three specific intervention techniques for BC (Staats et al., 2004). This included the use of a group setting for social support and discussing pro-environmental behaviour, information provision through a workbook, and feedback which was imparted to each group periodically on the progress of the group in terms of savings made based on the theme of the month (Staats et al., 2004). The themes of the programme are discussed in the previous sub-section. In terms of the design of the programme, each EcoTeam or group comprised of 6-10 people who usually knew each other from another social group such as church group, friend groups, or membership to a similar club (Staats et al., 2004). Each of the groups was supposed to meet once a month to discuss their personal experiences related to pro-environmental behaviour and talk about their achievements and progress made (Staats et al., 2004). The idea of creating supportive social environments to enable change was mentioned by De Young (1996) and Dwyer et al., (1993) recognized it as a condition that was rarely met in creating programmes addressing BC.

The workbook created for the programme was used for providing information to the groups and also note and measure the change based on specific indicators which varied with the theme while also providing information on challenges associated with the particular theme and what actions can be taken to prevent it. The participants in each meeting also decide which actions they intend to perform from the workbook and in the next meeting would report on their experiences with the actions they intended to take while also reporting based on the suggested metrics. Feedback was provided to the groups at the end of each theme and at the end of the programme post which they are also provided detailed feedback based on the results of the larger programme and periodic newsletters (Staats et al., 2004).

The **Start-green programme** also employed a mix of intervention techniques to create BC in their target audience. This mix included public commitments, tailored information about the target behaviour for each month, prompts, GHG reduction kits for various behaviours to reduce barriers, and a community approach. The community aspect of the programme was facilitated through community meetings and focus group discussions. Furthermore, participants were encouraged to collaborate which was encouraged through the recruitment of volunteers for each floor to keep in contact with neighbours. The volunteers would also encourage the participants to with their commitment, install and use the kit contents, plan engagement activities, distribute prompts, and gather feedback throughout the intervention. The community approach was inculcated in the programme to encourage and enforce positive social norms and also create social support systems (Burns & Savan, 2018).

The final programme looked at for the review, **OPower programme** in the United States of America (USA), focused on the technique of feedback by sending monthly/quarterly Home

Energy Reports to participants and combining it with social comparison, descriptive norms, and injunctive norms (Allcott & Rogers, 2014). When it comes to the design of the Home Energy Reports, each of them is comprised of two main components. The first was the Social Comparison component, which acted as the descriptive norm, and showed the energy consumption of the particular household concerning 100 geographically proximate houses with similar house characteristics (Allcott & Rogers, 2014; Allcott, 2011). The characteristics considered in the process included square-footage of the house along with the type of heating used in the house (Allcott, 2011). The report also utilized injunctive norms in this component, by categorizing the household as "Great", "Good", or "Below Average" (Allcott, 2011).

The second main component of the report was the Action-Step module which provided energy conservation tips to the household (Allcott & Rogers, 2014; Allcott, 2011). These energy conservation tips were based on the historical energy consumption of the households along with demographic characteristics and provided information on both improving the stock of the house with energy durable goods, insulation, etc. and use of the present stock of appliances (Allcott, 2011). The frequency of the Home Energy Reports shared to the households varied between monthly, bi-monthly, and quarterly to test out the effects of varying frequencies on the experiment group (Allcott, 2011). In a few programmes, letters were sent each month for the first several months with a lower frequency after that (Allcott, 2011). The frequency of the letters sent were subject to the utility, type of sample and learnings from previous experiments (Allcott, 2011).

3.4.3 Programme evaluation and results

When it comes to understanding the evaluation and results of the programmes, the meta-analysis provides little insight on how the specific programmes were evaluated (Osbaldiston & Schott, 2012; Moloney et al., 2010; Nisa et al., 2019). However, they do provide insights on what are the challenges with the evaluation process which would henceforth be discussed at a later part in this paper (Osbaldiston & Schott, 2012; Moloney et al., 2010; Nisa et al., 2019). The specific sub-section would focus on the evaluation process of the three standalone programmes and the methods used by them to justify the success of their programmes.

The EcoTeam programme followed a process of combining surveys with measurement data as a means of analysis. After each month which would also be the end of each specific behavioural theme, participants would get together with the group and have a discussion on their experience with the particular theme and take an account of a behavioural commitment if they made any. Based on the theme of the month, physical measurements would be taken to record progress for the programme in the workbook. For example, for the waste month, the waste for the entire group is weighed to record progress. At the end of the programme, all the data is compiled together which is sent to a central database for the region and feedback was provided to the groups based on the amount of savings realized and information is also provided for the savings realized by the entire programme. The surveys are conducted at three different points in the programme with the first one done to establish a baseline for behaviours and also comparing it to the behaviours of the control group. Finally, the participants are also provided with a newsletter from the programme organizers every three months (Staats et al., 2004).

The Start-Green programme on the other hand relied completely on self-reports and surveys for evaluating the programme and report results. The authors attributed this to practical complexities in gathering energy use and other associated data and cited that it would have been better to compare the self-reported data with an actual physical measurement of the different themes. Nevertheless, four surveys were administered by the programme designers for the programme where the first survey which was answered by 7% of the student residents

was done to identify the unique barriers that were preventing residents to engage in energy conservation behaviours. The next three surveys were done during the duration of the programme with the first one done at the beginning to create a baseline, the next one at the closing of the programme, and a final follow-up survey done to measure the durability of behaviours and was done seven months after the completion. The three surveys done during the duration of the programme (baseline, closing, follow-up) had a similar set of questions with the following core themes - behavioural, perceived behavioural importance, perceived family norms, perceived behavioural convenience, and generalized conservation decision making. The change in implicit attitudes along with the changing norms especially concerning family expectations along with other behavioural and attitudinal measures to report the results of the programme (Burns & Savan, 2018).

Finally, the Opower programme did not have any physical engagement component with the citizens and results were reported through the means of physical measurements of energy consumed by the households. At the beginning of the analysis, the billing data for the previous year for all households were accumulated to create a baseline for energy consumption. To supplement the analysis and increase its validity, data was also collected on heating and colling days to understand the temperature variations to explain any uncertainties in the consumption of energy over the evaluation period. The energy consumption for each month was recorded through the electricity meter of each house and recorded by the utility company staff. The presence of the infrastructure made a long-term analysis of the programme possible (Allcott & Rogers, 2014).

3.5 Why do programmes addressing behaviour change fail in creating long-term change?

While BC has been a growing field for fostering pro-environmental behaviours and changing patterns of consumption in individuals, large and long-term change is yet lacking (Hargreaves, 2011). Thus, it becomes pertinent to ask questions on where it is going wrong and analyse the situation to create a better understanding and revive the discourse on SC. Through a review of the literature, this part of the paper seeks to answer this question. The cause for failure identified are preliminary causes and multiple other causes may exist which may not have been identified.

3.5.1 Lack of holistic perspective on behaviour

As highlighted by the proponents of social practice theory there is a clear lack of holistic perspective on BC especially concerning SC (Shove, 2010; Hargreaves, 2011). Over-reliance on rational choice-based approaches has meant an extremely high weightage given to attitudes and beliefs over context and structure which also have a huge role to play in the discourse on SC (Heiskanen & Laakso, 2019; Hargreaves, 2011; Shove et al., 2012). As highlighted by Moloney et al., (2010), excluding the dynamic relationship between behaviours, values, norms, structures, and regulations will always create an incomplete picture of the behaviour to be changed thus more care need to be given to how barriers and opportunities associated behaviours are theorized.

The same challenge is extended to the design of programmes themselves. As highlighted by Gynther et al., (2012) in their review of the BEHAVE project dealing with energy efficiency behaviours, the programmes designed did not take into account the latest scientific theories or evidence and even when they did, they were only partially applied. Hargreaves (2011) also highlights that the design of programmes is based on a common-sense understanding of behaviour which in itself is dominated by the rational choice paradigm creating only a very shallow picture of the behaviour to be changed. Further to this, Gynther et al., (2012) also site

there being a clear disconnect between the goals and processes of the programmes they looked at.

This is further elaborated in the "*What the most influential NGOs working on climate change and sustainability have to say about BC*" report carried out by the Center for SC and Production (Strube & Nicolau, 2018). In a survey of 46 NGO participants across Europe, one of the reports found that over 50% of the NGO's did not utilize insights from theories and frameworks on BC or did not utilize them in a consistent way leading to under-theorisation of behaviours (Strube & Nicolau, 2018). Thus, there is immense potential for the application of evidence-based knowledge in this regard to create a clearer picture of the behaviour to be changed (Michie et al., 2011). Michie et al., (2011) also highlight that interventions targeting BC are largely designed without evidence with very limited analysis of the targeted behaviour and are largely based on common sense models of behaviour. Even when models or theories are chosen, they seldom cover the range of possible influences on the particular behaviour creating an incomplete picture (Michie et al., 2011).

3.5.2 Individual change vs social change

A common theme that has emerged in literature is the value of community or group approaches over approaches excessively focused on individuals as a single unit using intervention techniques such as social comparison. It is contended that fostering extrinsic values such as the acquisition of material goods, social status, financial success, and image only offer a partial solution and can only go so far (WWF, 2008). It is further pointed out that since the goals of campaigns are focused on extrinsic motivations through small changes and it becomes increasingly difficult to make people adopt significant changes to their lives (Thomas & Sharp, 2013). Thus, a focus on values more intrinsic to people such as being part of a community is contented to be a much better approach.

As highlighted before that the behaviours of individuals do not come up in a social vacuum, and thus there is immense potential in utilising approaches that seek to create social or community-driven intervention techniques where social learning and norms play an extremely important role (Moloney et al., 2010). As contended by Jackson (2005), social learning offers an interesting opportunity to the SC discourse as it can allow 'unfreezing of previous behaviours and raise them to new ones which are known to be more effective in supportive social environments. However, what audiences are chosen for the programme and what approaches are chosen are important considerations in this process (Moloney et al., 2010).

Moloney et al., (2010) further note the importance of community-driven approaches by highlighting that community-based programmes which adopt more integrative approaches and take into account the institutional and technological context are likely to be more successful. Such programmes have the benefit of being able to identify locally specific barriers which may be systemic or due to lack of agency and design the intervention techniques accordingly. Further, these such programmes have the potential to increase the sense of agency in people due to the presence of socially supportive environments and challenge social norms on a wider level instead of the level of a solitary individual. This could also have an impact on the longevity of achieved change due to a focus on social norms, participatory, and collaborative learning (Moloney et al., 2010).

Two of the programmes considered in the previous section – EcoTeams and Start-green – utilized approaches that utilized multiple variants of group approaches and were able to show relative levels of success in their associated contexts (Staats et al., 2004; Burns & Savan, 2018). While the length of the programmes and long-term evaluations would be questioned later in

the paper, both programmes nonetheless showed positive results attributed to such approaches.

3.5.3   Lack of target group participation and understanding

Ways to include the target group in the design and planning phase and further making them active components of the programme than just test subjects in an experimental setup has long been recognized as a valuable approach to increase the persistence of changing behaviours (Burns & Savan, 2018). This has been extremely common in the field of public health, where community-based research programmes, much like Eco-Team (Staats et al., 2004) and Start-Green (Burns & Savan, 2018), have shown an increase in overall self-efficacy of participants and make the change more durable (Staats et al., 2004; Burns & Savan, 2018). Moreover, changing the collective social and material system of lives would require the involvement of the very participants whose lives would be affected to provide a degree of empowerment, ownership, and collective control (Moloney et al., 2010).

This however has been lacking in multiple programmes, most of which treat participants as passive role-players with the levels of engagement being extremely low (Moloney et al., 2010). This is further exasperated as most programme designers paid very little attention to understanding the target group better or having segmentation approaches to create a target group, which as per a report by CSCP, more than 40% of NGO's either didn't know or did not engage in (Nicolau & Strube, 2019). Segmentation approaches, common in social marketing and community based social marketing approaches consider the fact that populations are not homogenous, and the same approach cannot work for a variety of different populations (French, 2017). Thus, understanding the audience and creating a segmenting the population where the target group can be engaged has been considered extremely beneficial (Moloney et al., 2010).

3.5.4   Programme evaluation – a case of false success

Most programmes that seek to change behaviours largely rely on self-reports of citizens (Moloney et al., 2010; Nisa et al., 2019; Osbadiston & Schott, 2011) and outputs of the programme like the number of people reached instead of the actual behaviours changed (Strube & Nicolau, 2018). Self-reports are known for their notoriety in creating a false case of success for the programmes as self-reports especially done during the programme or right after the programme leads the results open to bias from the participants (Moloney et al., 2010; Osbadiston & Schott 2011). Further to this, focusing the evaluation of programmes on output indicators instead of the impact created which in this case would be the change in behaviour or practices, creates little evidence for replication of programmes (Strube & Nicolau, 2018) in other areas and leaves the programmes open to the attitude-action gap (Moloney et al., 2010).

As also highlighted by a study conducted by the Academy of Change (AOC) surveys, evaluation was a weak component for most programme designers, as limited access to resources meant that effective evaluations are largely ignored. Further to this, evaluations, in general, are restricted to questionnaires instead of further face-to-face interactions and other means of empirically measuring change (Gynther et al., 2012; Strube & Nicolau, 2018). Considering the programmes reviewed before, while Start-Green only relied on questionnaires for evaluation purposes with little impetus given to greater levels of interaction (Burns & Savan, 2018), Eco-Green did try to combine questionnaires with an empirical component such as measuring the weight of waste produced (Staats et al., 2004).

The Opower programme on the other hand used energy bills as a way to measure change by also taking into account the seasonal differences (Allcott and Rogers, 2014). However, as Moloney et al., (2010) highlight, relying on energy bills alone gives very limited information

about actual practices and behaviours of participants. Osbaldiston & Schott (2012) also highlight the need for having an empirical component to show the actual environmental impact saved or positive impact created from the changing behaviours and not just the behaviour which can allow programme designers to focus more on behaviours that can create a higher impact.

3.5.5 Aspect of longevity

Through the identified literature, the aspect of longevity can be observably seen to have four different aspects – defining longevity, length of the programme, length of the evaluations, and funding and resources. A challenge associated with this already exists in literature and corresponding programmes addressing BC as there is only a minimal distinction between short-term and long-term BC (Osbaldiston & Schott, 2012). The differentiation becomes paramount as we don't only need the behaviours to change for one-shot approaches but a more apt solution to the multiple environmental and social problems requires the behaviours to stay changed for good (De Young, 1993).

Defining longevity

There seems to remain great ambiguity on how a concept such as long-term change can be defined in literature which is reflected in the scarce definitions or even on attempts to do so. An interesting case that has emerged from literature not explicitly focusing on long-term BC, but BC, in general, is the Cool Biz programme in Japan. Initiated in 2005, the programme set to reduce the consumption of energy in public offices by a mix of approaches such as raising awareness, fixing temperature of heating/cooling appliances, and promoting different clothing styles by promotion through high-ranking officials altering the norms associated with dressing up for work. As per poll estimates, in 2005 less than a third of respondents supported such a change which rose to 47% in 2007 and up to 57% in 2009. By 2011, the adoption and acceptance of the programme had risen to 62%, clearly showing a slow change over 5-6 years (Shove, 2016), which could be one definition for the amount of time it may take for norms and behaviours to change enough to be adopted by a large mass of the population.

Yet, scarce research on the topic means that questions remain around this topic and further research on the long-term effectiveness of BC can greatly support the magnitude of changes required to avert dangerous levels of warming and other problems associated with the environment and social development.

Length of programmes

In the three different meta-analyses reviewed for this paper covering programmes addressing BC since 1976, each of the papers identified short durations of the programmes and their subsequent evaluations (Osbaldiston & Schott, 2012; Moloney et al., 2010; Nisa et al., 2019). On average, the meta-analysis by Nisa et al., (2019) highlighted that the mean duration of the programmes was 64 days with a median of 7 days and Osbaldiston and Schott (2012) sight that most of the experiments or programmes covered by them monitored the behaviour on average from 2 to 8 weeks. This creates a huge challenge, as it becomes impossible to know which of the actions or behaviours are sustained over a period once a participant leaves the programme (Moloney et al., 2010).

The standalone programmes considered for this section on the other hand had a longer duration than the average length of the programme mentioned above (Staats et al., 2004; Allcott and Rogers, 2014; Burns & Savan, 2018). While all three programmes showed positive results during the length of the programme, only a longer-term evaluation much after the programme ends can validate the actual long-term effectiveness (Staats et al., 2004; Allcott and

Rogers, 2014; Burns & Savan, 2018). The OPower experiment which lasted two years showed a gradual decline in the effects of the programme over the two years and more of the positive effects were attributed to the change in the capital stock of the households such as increased insulation, replacing bulbs with LEDs, etc. instead an actual reduction in consumption of energy (Allcott and Rogers, 2014).

Short-term evaluations

Programmes that seek to create a behaviour change seldom plan for a long-term evaluation of the programme (Osbaldiston & Schott, 2012; Moloney et al., 2010; Nisa et al., 2019). None of the programmes evaluated in this paper had a post-intervention evaluation plan for long-term analysis of change in behaviours and such an approach has the potential to create the illusion of false success when it comes to changing behaviours over a longer-term (Osbaldiston & Schott, 2012; Moloney et al., 2010). This further becomes extremely relevant due to the inter-connectedness of many everyday behaviours which can lead to both positive and negative spillovers which are seldom identified due to the short evaluations (Moloney et al., 2010).

The maximum evaluation carried out of the standalone programmes was 2 years for the OPower programme which showed decay in the effect of the treatment subsequently (Allcott and Rogers, 2014). As also highlighted by Nisa et al., (2019), of all the studies looked at, only 15 studies evaluated measured any lasting changes in behaviour. In the Start-Green Programme where the focus was on longevity, there still lacks evidence for change in behaviours as the post-evaluation was carried out 7 months after the programme and success were attributed to change in implicit attitudes (Burns & Savan, 2018).

Funding and Resources

As noted by Gynther et al. (2012), it must be noted that limitations due to funding and resources for programmes addressing BC restrict the opportunity to carry out longer-term evaluations as the programmes are also competing for funding from other areas. This becomes even more clear based on the report published by Environmental Funders Network "Where the green grants went – 7" analysing the global dispersion of green grants along with various environmental domains (Green Funders Network, 2019). As per the report, the theme of consumption and waste, covering the majority aspects of BC, received the lowest amount of grants, only 0.2% of the total grants, allocated to various themes (Green Funders Network, 2019).

3.6   How to create a holistic picture of behaviour – Capability Opportunity Motivation-Behaviour (COM-B) framework

As mentioned in the above sub-section, undertheorizing of behaviours is a huge challenge for programmes addressing BC (Strube & Nicolau, 2018). Furthermore, the over-dependence on approaches that only seek to provide information or raise the attitudes have been heavily criticized for their ignorance of the socio-technical context, social and institutional norms, habits, and regulations (Moloney et al., 2010). Moreover, attitude driven models have only given an incomplete picture of the behaviour to be changed restricting the change created by programmes addressing BC to be short-term (Osbaldiston & Schott, 2012; Moloney et al., 2010; Nisa et al., 2019).

Nudging and approaches centred on behavioural economics on the other hand have received criticism for their lack of scalability (Heiskanen & Laakso, 2019) and creating only restrictive approaches which do not go far enough to change underlying consumption patterns (Akenji, 2014). Finally, while social practice theory has been praised for its comprehensiveness, it has been criticized for its complexity which has reduced its potential to be transformed into

effective approaches (Jackson, 2005). Thus, there is a requirement of more holistic frameworks which can help understand the behaviours better and provide practitioners with an arsenal of intervention techniques based on the identified barriers and opportunities (Michie et al., 2011).

Keeping the above in mind, the Capability Opportunity Motivation – Behaviour (COM-B) framework, a holistic framework with its three different components, has been chosen as an appropriate way to visualise behaviours and create effective means for intervening and changing the desired behaviours. Originally designed for BC interventions in the field of public health and clinical medicine, the framework was created after covering the essential components of 19 different frameworks which can help programme designers understand different factors which can influence a particular behaviour and use them to create informed interventions which can create an evidence base for further replicating them. The framework recognises behaviour being an antecedent of both internal and external factors and thus recognises both need to be considered based on the behaviour being targeted to create effective change (Michie et al., 2011).

The framework postulates that any particular behaviour is guided by the capability of the individual to perform the behaviour, the opportunity the individual has for performing the behaviour which can create the motivation to perform the behaviour. While capability and opportunity directly affect the motivation to perform a behaviour, they can also be influenced by capability or opportunity alone, which would depend on the behaviour of focus (Michie et al., 2011). A representation for the model is depicted below (Figure 3).
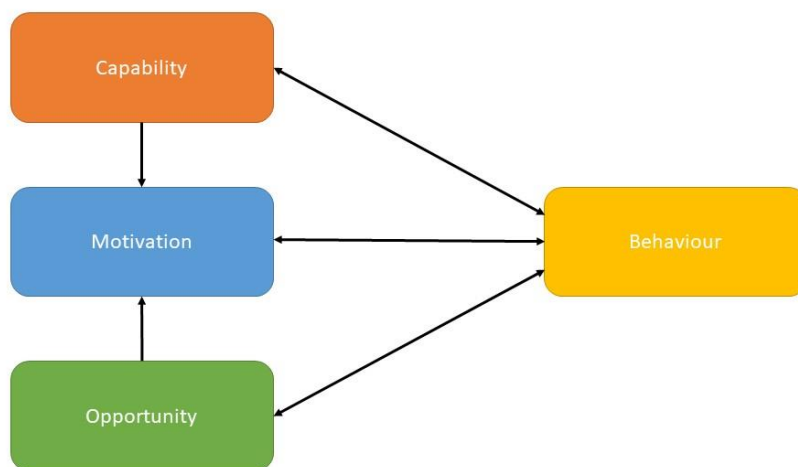
Figure 3 Capability Opportunity Motivation-Behaviour.

Source: Adapted from Michie et al., (2011)

According to the framework, Capability represents the processes that are internal to the individual and is further subdivided into the individuals' psychological and physical capability to perform a behaviour such as having the pre-required knowledge of how behaviour is performed. Opportunity is defined as the factors associated with behaviour that lie outside the control of an individual such as social norms, financial situations, etc. and is further subdivided into Physical and Social Opportunity. Finally, Motivation represents the mental processes of the individual which guide the behaviour such as the hold of habits, emotional

responses, self-efficacy, etc. The Motivation component of the framework is also further subdivided into Automatic Motivation and Reflective Motivation. Each of these components with their further sub-components is defined in the table below (Table 6) (Michie et al., 2011).

Table 6 Components of COM-B framework.

Capability	Physical Capability	Skill, abilities, or proficiencies acquired through practice
	Psychological Capability	Capacity to engage in necessary thought processes – Knowledge, memory, attention, decision processes, behavioural regulation
Opportunity	Physical Opportunity	Environmental context (infrastructures) and resources (financial resources)
	Social Opportunity	Social and cultural influences – norms, social pressures, conformity, words and concepts that makeup or world, social comparisons
Motivation	Automatic Motivation	Emotions, reinforcements with rewards or penalties, habits
	Reflective Motivation	Involves evaluations and plans – beliefs about capabilities (self-efficacy) and consequences, goals, identity, intentions, roles, optimism

Source: Adapted from Michie et al., (2011) and McDonagh et al., (2018)

To create a strong link with policies and intervention techniques, the framework based on their analysis further provides a list of both which can be utilised by either programme designers or policymakers to evaluate the behaviour and apply the technique or policy which would be appropriate. The overall framework is henceforth popularised as the "Behaviour Change Wheel" with the core components or the sources of behaviour – Capability, Opportunity, Motivations – the intervention functions, and the Policy categories. The latter two are further elaborated and explained with the below table (Table 7).

Table 7 Intervention and policy techniques from COM-B and Behaviour change wheel.

Intervention/Policy	Definition	Examples

Intervention Techniques		
Education	Increasing knowledge or understanding of the problem	Providing information to promote vegan foods
Persuasion	Using communication to induce positive or negative feelings or calls for action	Using imagery to stimulate physical activity
Incentivisation	Creating an expectation of reward	Using prize draws to stop a habit such as smoking
Coercion	Creating an expectation of punishment or cost	Raising the price of a commodity to reduce its consumption
Training	Imparting skills or teaching a skill	Driver training to propagate safe driving, teaching repair as a skill
Restriction	Using rules to reduce the opportunity to engage in a behaviour or to increase the opportunity to engage in the target behaviour. Could also include social rules.	Prohibition of alcohol to people under a certain age, meat-free days in organisations
Environmental Restructuring	Changing the physical or social context	
Modelling	Providing an example for people to aim or aspire to	Using TV scenes or personalities to promote a target behaviour
Enablement	Increasing means/reducing barriers to increase capability or opportunity (beyond training for capability and environmental restructuring for the opportunity)	Behavioural support services to encourage a particular behaviour (smoking cessation)
Policy Approaches		
Communication/Marketing	Using print, telephonic, or broadcast media	Conducting mass media campaigns

Guidelines	Creating documents to recommend or mandate a practice. Includes changes to how a service is provided.	Treatment protocols in the case of public health
Fiscal	Using the tax system to increase or decrease the financial cost	Increasing duty, carbon taxes on fuels
Regulation	Establishing rules or principles of behaviour or practice	Voluntary agreements on advertising
Legislation	Making or changing laws	Prohibiting the sale or use
Environmental/Social Planning	Designing or controlling the physical/social environment	Using town planning to promote activity – bike lanes
Service Provision	Delivering a service	Establishing support services in workplaces and communities.

Source: Adapted from Michie et al., (2011)

The multitude of the measures – intervention techniques and policy approaches – need not be applied in isolation, but the successful changing of behaviour would require a mix of intervention techniques and policy approaches based on the behaviour to be changed. This would in-effect mean that the successful programme to address a change of behaviour would also include a variety of different stakeholders and a single stakeholder alone may not be able to take care of the variety of measures that may be required to change a behaviour (Michie et al., 2011).

4   Findings and Analysis

The purpose of this section is two-fold – firstly to structure the findings from the interviews based on the themes from the Literature review section and secondly to validate the findings by analysing and comparing them to the literature. At the onset, the paper set out to answer two major research questions –

- RQ1. Why do behaviour change programmes fail to create long-term change for Sustainable Consumption?

- RQ2. How can programmes that can enable long-term changes in behaviour be designed?

For RQ1, because of the absence of considerable frameworks which discuss longevity or long-term behaviour change, the findings are structured based on the themes or classifications which came up in the literature review section of the paper. For RQ2, data has been structured and analysed by utilising the COM-B framework which seeks to look at change from a more holistic perspective not just dependent on policy changes or driven by attitudes. Thus overall, the findings and analysis for the paper follow a deductive structure.

Thus, the section answers these questions based on the responses of the interviewees, complemented by a thematic structuring of their responses.

4.1   Why do behaviour change programmes fail to create long-term change for sustainable consumption?

The longevity of BC when designing and implementing programmes, in general, was considered as a very complicated notion by all interviewees and an angle which many of them had not considered. Even when they had specifically thought about it, they faced difficulties due to a lack of research, especially in the SC domain. The quote by Participant 10 highlights this well.

"We have previously conducted a literature study where we have investigated other behavioural initiatives and tried to see long-term effects. We could then see that very few efforts had looked at the longer perspective, which has meant that we were unable to draw any conclusions."

In general, there was a strong recognition from the interviewees that such a change which is long-term and carries across generations would not be possible without the change in background infrastructures and policies, and campaigns alone would seldom deliver such a change (Participant 1; Participant 2; Participant 4; Participant 5; Participant 6; Participant 8; Participant 9; Participant 10; Participant 11; Participant 12; Participant 13; Participant 14; Participant 18; Participant 19). This was also expressed in the literature surrounding BC and SC, where it was highlighted that a solitary focus on attitudes that campaigns largely focus on cannot deliver a push towards SC without considering the infrastructure, policies and norms which affect behaviour (Moloney et al., 2010; Akenji, 2014; Shove, 2010). Participant 11 also pointed out the need to keep "systems change" and "policy change" separately from each other. The policy change could merely imply stronger top-down policy approaches which have failed to show a considerable decrease in emissions or at least the scale at which are required for fulfilling our climate ambitions (Participant 11). The proponents of "strong" SC from literature such as Jackson (2009) and Akenji (2014) have highlighted the failure of achieving emissions reductions even with stronger top-down policy initiatives since 1990. "Systems change" on the other hand should be taken more in terms of change in attitudes, values,

institutional practices, social norms, regulations, technological and business model innovation, and culture which are intermingled with one another and would require a mix of top-down and bottom-up approaches across various stakeholders as also highlighted by Moloney et al., (2010) and Akenji & Chen (2016).

Keeping the above in mind, multiple participants yet highlighted the importance of bottom-up change and the role it plays in the longevity of change (Participant 5; Participant 7; Participant 8; Participant 13; Participant 17). Citing from personal experience from a programme in Spain, one of the Participant 5 highlighted that even though the political change threatened the existence of one of the initiatives they were working on, grassroots movement and bottom-up shift in values made sure the change would sustain. Participant 13 also highlighted that when people have an understanding of the problem they have solved, it is more likely for the change to persist because then the change is working for them as it would build on people's existing agency as also noted by Participant 5. Moloney et al., (2010) highlight the same and Verplanken and Wood (2006) also highlight that an optimum way to break deeply entrenched habits is through bottom-up changes along with changes in context.

4.1.1 Lack of holistic perspective on behaviour

Behaviour needs to be understood from a more holistic perspective for the change to be more long-term (Shove et al., 2012; Hargreaves, 2011; Moloney et al., 2010). Such a holistic perspective would include getting a full picture of people's everyday lives, their routines and practices, their values, cultural and social norms, and their attitudes and experiences (Moloney et al., 2010). This was also widely understood by multiple participants who highlighted the need for not just understanding the target behaviour, but also how the target behaviour may influence another behaviour in people's lives (Participant 14; Participant 16). Thus, seeing a behaviour as a solitary act carried out by people in isolation without recognising the complex interconnections the behaviour may have with other aspects of their lives is a common weakness of programmes addressing BC embedded in the design of the programme as Participant 16 highlighted. This in turn shifts focus on the standalone barriers which need to be overcome for the short-term success of BC programmes (Participant 16).

Henceforth, such a holistic perspective would ultimately require the programmes to understand the wider context which would also include regulations, technologies, and policies within their respective context as Moloney et al., (2010) cite. Based on the responses of the interviewees, the two most important themes came up which were the challenge of undertheorising of behaviours and barriers and the importance of multi-stakeholder and multi-pronged approaches to BC. The latter comes from the field of public health where programmes with a mix of interventions and multiple stakeholders have shown success (Michie et al., 2011) but has not been largely discussed in the literature reviewed for this paper. However, the Participants did also highlight the pitfalls of solitary focus on behaviour and the extremely important role of infrastructures and policy (Participant 1; Participant 2; Participant 4; Participant 5; Participant 10; Participant 11; Participant 14; Participant 16; Participant 19). As Moloney et al., (2010) highlight that while a single programme may not be able to achieve all the changes, having a careful understanding of the context nevertheless supports programme designers in choosing the appropriate approach.

Undertheorising behaviours and barriers to behaviour change

When it comes to designing programmes that can create a long-term change in behaviours, a major issue as pointed out by multiple interviewees was undertheorising of the behaviours which need to be changed which creates a very shallow picture (Participant 7; Participant 9; Participant 16). As per Participant 9 and Participant 16, this in practice means that programme designers very rarely use any concrete frameworks or theories for understanding behaviours

and the understanding is based on common sense notions of what the behaviour entails. As Strube & Nicolau, (2018) highlighted, that more than 50% of programme designers surveyed did not utilise any theory or framework for the design of the programme and understanding the behaviour and Michie et al., (2011) highlight a lack of theory-driven analysis in the process. As Participant 7 highlights, this potentially leads to the propagation of false beliefs about behaviour like making people try the behaviour once or for a short period will lead to the formation of a new habit. As Verplanken and Wood (2006) highlight is an incorrect understanding of how habits can be broken. Thus, this undertheorising implies that right from the design phase of the programme false assumptions dominate the entire process.

Further to how behaviours are analysed and understood, multiple participants highlight the persistence of certain assumptions associated with how the programmes are implemented and the approaches that are used (Participant 4; Participant 7; Participant 9). These assumptions include the rational choice understanding of behaviour which means that the implementation of the programmes hinges upon providing more information to people as Participant 7 highlighted. This common misconception that fulfilling the knowledge deficit among people would allow them to make informed choices and change their behaviour has plagued behavioural change approaches for a very long time (Heiskanen & Laakso, 2019; Shove, 2010). Information-based approaches ignore the intricacies and complexities of everyday life and seldom work on changing behaviours for a longer period especially when the issue to be resolved is more structural (Moloney et al., 2010; Heiskanen & Laakso, 2019). This was highlighted well by Participant 7 with the below quote.

"First of all, we tend to think we just need to tell people, and, you know, often the information alone is not going to do it, particularly if there's a structural issue that needs to be addressed."

However, Participant 4 also highlighted that while addressing structural barriers are important, this does not mean information campaigns should not be used at all. They should instead be complemented with other approaches by having a more complete picture of the behaviour.

Another common assumption on behaviour based on the model of rational choice which persists and hinders long-term behaviour change is the use of economic incentives as cited by Participant 7 and Participant 14. Participant 14 highlighted that economic incentives may be successful if the required change in behaviour is a one-time action, such as investing in better insulation. For repeated actions, on the other hand, the economic gain or incentive would need to be constant and removing the incentive which had initially made the targeted action attractive would switch the behaviour back to the default action (Participant 7). While such approaches provide quick results post-intervention analysis confirms that the behaviour reverts to the default state as soon as the incentive is removed (Katzev & Johnson, 1984). This was well summed up in the below quote by Participant 7.

"And that's fine if you can continue giving people that reward indefinitely. But otherwise, you're not setting yourself up for success, because you don't have the right mix without the incentive. And as soon as you take the incentive away, well, it's no longer an attractive proposition for people."

Multi-pronged and multi-stakeholder approaches

As discussed at the beginning of this section, programmes addressing BC are seldom able to consider the different barriers that exist and hence are restricted to single stakeholder initiatives. This was common in the different meta-analyses reviewed for this paper as most programmes were carried out by single stakeholders instead of a group of stakeholders instead (Osbaldiston & Schott, 2012; Moloney et al., 2010). Even the standalone programmes were carried out either by researchers or civil society organisations or private corporations in the

case of Opower with very little support from other stakeholders which may have a bearing on the different behaviours which were looked at (Allcott and Rogers, 2014; Staats et al., 2004; Burns & Savan, 2018).

This opens up interesting assumptions on the validity of standalone programmes themselves, as Participant 8 highlighted with the example of smoking, a common behavioural issue which we have been relatively successful in dealing with. They cite that smoking cessation did not happen only through campaigns, rather through multi-stakeholder and multi-pronged approaches which worked together removing barriers and creating new opportunities for change. This was backed up by several other interviewees, who highlight that a holistic understanding of behaviour would ultimately require multiple stakeholders to be present through different parts of the programme (Participant 1; Participant 4; Participant 7; Participant 14; Participant 16; Participant 18; Participant 19). This in effect means that instead of designing standalone programmes, the focus should be on creating a mix of interventions part of a single BC programme acting on different barriers and constraints with "*behaviour at the heart*" as put by Participant 19. Such an approach would require partnerships with various stakeholders such as local municipalities, governments, businesses, and other civil society organisations themselves to deliver a long-term change (Participant 8).

Multiple participants highlighted that smoking cessation did not happen due to one-off BC campaigns and rather involved multiple campaigns and interventions from different parts of the society which enabled a shift in the norm associated with smoking (Participant 4; Participant 8; Participant 14; Participant 16; Participant 19). The approaches used conventional learnings from psychology such as attitudes and values which was combined with other things people care about such as health, wellbeing, and effects on others (Participant 7; Participant 8). This required peer-to-peer educational initiatives with more traditional top-down advertising campaigns which enabled a shift in social norms and a growing recognition of the effects of passive smoking driving the conversation from rational self-interest to shared responsibilities (Corner et al., 2019). Such multi-pronged and multi-stakeholder approaches allowed a shift in attitudes associated with smoking as a habit and Participant 16 defined it as a great example of "*doing it together in different areas of society and political organization*".

Another great example of such holistic approaches as highlighted by Participant 11 was from Finland. As they cited that Finland had a problem with rising cases of cardio-vascular disorders and a cause which was identified for this was the high intake of saturated dairy fat and salt and a low intake of vegetables in the diet leading to high blood cholesterol levels and blood pressure levels (Puska & Ståhl, 2010). During the same period, Finland had an extremely strong dairy industry which was loved and supported by the population, hence a transition to a different diet was harder to achieve (Participant 11). As part of the North Karelia Project, a holistic strategy to change behaviours and norms together involved a multitude of stakeholders and different intervention approaches (Puska & Ståhl, 2010). These approaches as pointed out by the participant included campaigns with the public, nutritional planning with schools, other catering institutions and businesses, and advertisement campaigns for individuals (Puska & Ståhl, 2010) which highlighted the need for supporting the dairy farmers in this transition which played on the existing values in people (Participant 11).

Moreover, Participant 11 described it as being the perfect example of a "just transition" as the dairy farmers were supported through financial and technical means to transition to growing berries and through campaigns aimed at individuals it was made sure that the industry and the dairy farmers at large would not suffer. Such a multi-stakeholder approach allowed the buy-in from the society and successfully helped in changing people's behaviour and reducing the rate

of cardio-vascular diseases in the country while being fair to everyone (Puska & Ståhl, 2010). The participant described the approach with the following quote –

"So that's still a case study that I mean, it's really old now. But it's one that I still think is very useful to show that we can do this kind of holistic transition."

Other aspects discussed by participants strongly associated with such multi-stakeholder approaches included the important role of partnerships with supermarkets and retail shops which are the site of a majority of simple consumption habits and also have a bearing on other areas such as food waste (Participant 2; Participant 4; Participant 16). An example provided by Participant 2 specifically associated with programme implementation included the strong role supermarkets and vendors, or other places where people shop could play during campaigns to promote environmentally better products. As they highlighted, such an approach wouldn't outrightly alter the choice architecture without consent while still providing people with more highlighted choices. However, Participant 7 pointed out that while this is required, it has to be made sure that the change lasts for a longer period to as to prevent people from going back to their previous habits which would be discussed later.

4.1.2 Individual changes vs social change

As discussed extensively by Staats et al., 2004 and Burns & Savan (2018), using community-driven approaches rather than approaches focused on individuals have a huge potential for creating durable change in behaviours. This was also affirmed by multiple participants who found extreme merit in pursuing change where groups of people are engaged together instead of separate individuals and social norms play a huge role (Participant 2; Participant 7; Participant 8; Participant 13; Participant 16).

One of the most important reasons which Participant 13 highlighted in favour of more community-driven approaches was reinforcement. As they pointed out that change in many ways is a life-long dynamic process and sometimes people lose focus or motivation or get busy, and in those scenarios having a group of people work together towards a goal allows that reinforcement to happen more positively. Further to this, Participant 7 highlights that personal connection and peer-to-peer communications have been extremely important aspects in the field of marketing. Thus, using community-driven approaches where such forms of personal connections and peer-to-peer opportunities already exist and capitalising on those networks can create persisting change. Such peer-to-peer opportunities with social support with other top-down approaches were highlighted as the reasons for smoking cessation. Such approaches allowed to creation of new social norms associated with smoking which were frozen by regulations. Jackson (2005) also contends that pro-social approaches are more in line with theories on social learning which provide opportunities to de-freeze old habits. Breaking old habits requires the behaviour to be raised to discursive consciousness which is known to be more effective in supportive social environments (Jackson, 2005).

Another important aspect associated with community-driven approaches as highlighted by Participant 2 was the values people experienced in such settings. As they pointed out that such approaches foster values in people for community and broader social concerns and the presence of a community act as a reminder of those values. Fostering these values which are more intrinsic to people are more successful in creating positive spillovers in behaviours (Thomas & Sharp, 2013). Focusing on intrinsic values fosters non-materialistic goals which people have raising concerns for broader social and environmental concerns and raising the probability of engaging in more environmental behaviours (Thomas and Sharp, 2013). Closely associated with this, as Participant 20 highlighted, that the future economy which is to be based on sharing of resources cannot be fostered by focusing on approaches which use social

comparison and status. As Thomas and Sharp (2013) and WWF (2008) highlight, that while appealing to extrinsic values such as status and savings is beneficial to encourage specific behaviours such as ownership of an electric car, it strengthens extrinsic individual values which work against people engaging in more pro-environmental behaviours. This is also in line with the goals of a stronger form of SC where the focus is more towards absolute reduction in resources over mere consumption of the less harmful option.

As an example of social approaches to BC, Participant 4 highlighted that one of their most successful recent approaches or campaigns has been cloth-swaps. They pointed out that their cloth swaps provided people to carry out social interactions and which allowed them to engage with people who were not otherwise motivated by environmental values. Participant 9 highlighted that pro-social approaches such as cloth swaps provide people with a new context for carrying out an otherwise common practice of going to a shopping mall for acquiring clothing. They added that the social experience of cloth swaps has the potential to make people engage in second-hand clothing more because of social norms and social learning. Participant 7 also highlighted that people inherently value positive social experiences which are provided by activities such as cloth swaps and fosters pro-social values in people. To foster engagement with participants and within participants and change values associated with consumption, such pro-social approaches were also utilised by the Start-Green programme as highlighted by Burns & Savan (2018) which they show to be better for durability.

Finally, as Participant 16 highlights, the limited resources available to most programme designers means that the possibility for a long-term connection with participants is generally not possible. In such scenarios, engaging with entire communities and other social groups allow the change to persist within groups and communities even after the programme ends due to the solidification of shared norms. Further, since the groups and communities in which people chose to engage stay with them for longer periods, sometimes throughout their lives so the possibility of the durability of change is maximised (Participant 16). Moloney et al., (2010) affirm such an approach due to similar reasons. They further highlight that community-driven or more social approaches have the added advantage of understanding wider-systemic barriers in a better way and can lead to local systemic changes as they allow communities to shape their context (Moloney et al., 2010).

4.1.3   Making a case for deeper engagement with participants

"[..]people need to be aware of the change themselves for the change to be more permanent. Hence, I do not believe in mere "behavioural nudges" if they are not accompanied by a change in beliefs, mental models and routines, too."

The above quote by Participant 18 highlights the importance of having wider participation of the target group or people in the design of the programme and not just as passive participants in the process of change. Further elaborated on by Participant 14, as they highlighted that mere participation in processes such as citizen assemblies and community decision making processes not only increases the awareness but is also willing to change hence are extremely powerful. (John, 2018) highlight that while nudges are a great tool, both their legitimacy and persistence can be increased with higher engagement with citizens and feedback. This goes against the conventional notions of nudging where citizen participation is minimal, such as the OPower programme (Allcott & Rogers, 2014).

Another interesting perspective on the participation of people was mentioned by Participant 5. In an initiative, they were a part of, multiple stakeholders including government officials, social groups, and people together to decide on common indicators for the pre- and post-evaluation of an initiative. Such deliberative democracy processes as they identified increased

the understanding of people's lived experiences for the programme designers and also resulted in wider cross-sectoral collaboration. They further highlighted that such processes allowed people to maintain a certain sense of autonomy as decisions weren't simply imposed from the top-down (Participant 5). Moreover, changing the collective social and material system of lives would require the involvement of the very participants whose lives would be affected to provide a degree of empowerment, ownership, and collective control (Moloney et al., 2010).

As Participant 13 also highlighted, their programmes had benefited from engaging people more instead of bland lectures through group approaches and discussions and even going as far as to celebrating with people or participants through tree-planting drives once the programme ends. As they noted, such an approach made people want to participate again and widen their knowledge and also the group of people they engaged with. Programmes adopting such approaches with a more engaging approach through discussions, workshops, skill-building seminars have the potential to create greater levels of learning and engagement, however, due to short-term evaluations their effect seems difficult to assess (Moloney et al., 2010). Nonetheless, they remain important ways to approach change as highlighted by both the Eco-Teams programme (Staats et al., 2004) and the Start-Green programme (Burns & Savan, 2018). Both of the programmes reported positive results and utilized more engaging and participatory approaches (Staats et al., 2004; Burns & Savan, 2018).

Another important aspect associated with the target groups was an improper selection of the target group or creating a common approach for everyone highlighted both in literature (Moloney et al., 2010) and Participant 7 and Participant 16. As highlighted in the literature, populations are not homogenous, and thus broad approaches which treat citizens in this way seldom create a change. As also highlighted by Strube & Nicolau (2018), only a very small percentage of programme designers utilized approaches such as segmentation. Segmentation can help better understanding the status quo for different groups of people and in turn, this better understanding can help create better approaches to change behaviour (French, 2017). This was also echoed by a couple of participants who highlighted that in the present status quo of BC programmes, very limited attention is paid to approaches such as segmentation (Participant 7; Participant 16).

Both the participant's highlight that segmentation is an extremely important process in the design of the programme to understand the different values, motivations, and habits people may have even within the same region (Participant 7; Participant 16). And keeping such an approach would also help the programme designer in understanding what approaches can work for what segment of people and where can we expect pushback from people which has an implicit bearing on the longevity of BC. Participant 1 also highlighted that while deeper engagements with the target group and segmentation were something they had not engaged in for now but were in the process of creating ways to implement them in their programmes due to their importance. The below quote by Participant 16 highlights the importance of segmentation and understanding the audience.

"So developing actual insights to understand how people behave and why I think gives us a chance to develop more effective interventions later on, that are suited to meet the actual needs of that case."

4.1.4 Evaluating not just outputs, but also outcomes

Multiple participants highlighted that challenges exist with how programmes are evaluated (Participant 5; Participant 7; Participant 8; Participant 16). As Participant 7 and Participant 16 highlighted, most evaluations today rely on simple output indicators such as the number of people reached by the programme, the number of workshops done, and so forth. These indicators described as output indicators by the participants, tell very little about the behaviour

change, if any, from the programme. There was a clear suggestion to differentiate between outputs and impacts. Impacts here would be the actual change in behaviour created by the programme along with the measure of environmental impact associated with the programme. This is very much in line with the research done by AOC, who found that most programmes relied on output indicators instead of impact indicators to evaluate the programme (Strube & Nicolau, 2018).

Literature also highlights challenges associated with evaluations even when impact indicators are used, as evaluations mostly rely on self-reports based on questionnaires as was the case with one of the programmes (Start-Greene) discussed before (Burns & Savan, 2018). This is very much in line with responses from multiple participants who mentioned relying on self-reports for evaluation of programmes (Participant 1, Participant 2, Participant 3). However, they also understood the limitations of such an approach and instead wanted to expand the evaluation process to also include deeper interviews with participants supplemented with surveys and questionnaires on attitudes and values. As Gynther et al., (2012) suggest, programmes can benefit from supplementing questionnaires with post evaluation interviews to provide a deeper insight from a participants' perspective which was also a suggestion made by Participants 5 and 14.

Several participants also highlight best practices that must be used by programme designers to evaluate a programme effectively (Participant 7; Participant 8; Participant 14; Participant 16). These include a combination of self-reported data with qualitative aspects such as values and attitudes measured through interviews and questionnaires along with quantitative aspects which can be used to measure the environmental impact from the programme. Participant 16 also highlight the need for having a control group to measure the results against, a practice common in Randomized Control Trials, such as the OPower programme (Allcott and Rogers, 2014) and also implemented in the Eco-Teams programme (Staats et al., 2004). As Moloney et al., (2010) also highlight, that only relying on quantitative information or self-reports can only create an incomplete evaluation of the programme as thus the evaluation should include information on actual practices of the programme participants.

Participant 14 further suggest programme designers also inculcate information associated with behavioural spillovers in the evaluation process which can be done through studying multiple behaviours even if they weren't the target behaviour of the programme. This could assist in understanding the linkages between different behaviours which can assist the programme designers themselves in understanding the effects of the programme and provide information on rebound effects (Participant 14). The programmes and literature reviewed for this paper provided little information on the spillover of behaviours that may have occurred in the programmes and thus was not discussed extensively. However, as Participant 14 suggests, evaluating based on spillovers can provide a deeper picture to programme designers and can only benefit the design of the programme.

Participants 5 and 14, also highlight the importance of measuring well-being associated with the behaviour and social-demographic differences in the programme. Well-being as an indicator was considered important as if a particular behaviour increases well-being for the participants, there are higher chances for the persistence of the changed behaviour (Participant 5). Social-demographic indicators on the other hand can help in understanding the effects of the programme in different social groups and especially the impact the programme may have on low-income groups to keep climate justice within the discourse of future programmes (Participant 5). Again, such indicators have traditionally not been considered to be part of evaluations of programmes addressing BC as was observed from the various programmes looked at in the literature review.

Finally, Participant 5 also pointed out the importance of having the target group engaged in both the pre and post evaluation of the programme along with other stakeholders relevant to the behaviour. This comes from their own experiences from a programme also discussed in the above section. As mentioned before, including multiple stakeholders in the process through deliberation and discussion provided interesting insights to the programme designers and also fostered cross-sectoral collaborations and the knowledge of participants themselves. Both of these factors – cross-sectoral collaborations and knowledge – have a bearing on the persistence of the changing behaviour, and thus could be an interesting aspect to be considered by programme designers. This was again an aspect not discussed in the literature reviewed for this paper. However, as suggested by John (2018), higher engagement and feedback has potential positive influences on the behaviour to be changed.

4.1.5 The puzzle of longevity

Keeping in with the themes discussed on longevity in the literature review section, the aspect of longevity was discussed with the participants based on four main themes – defining longevity, length of programmes, length of evaluations, and funding and resources. In general, there was a consensus among several participants that longevity was not something they had outrightly considered from a programme design perspective, or also from the perspective of changing behaviours (Participant 1; Participant 2; Participant 4; Participant 5; Participant 10). As Osbaldiston & Schott (2012) also highlighted in their meta-analysis, there is no distinction made between short-term and long-term change from a programme perspective. Participant 10 also highlighted that previous research conducted by them on the aspect of longevity and what it could mean from a programme perspective only provided very limited results.

Defining Longevity

Multiple participants highlighted that change which is persistent and involves deep changes in the recorded attitudes and values of people along with social norms of the larger populace is a slow ongoing process and takes a long time for people to move into (Participant 3; Participant 4; Participant 7; Participant 8; Participant 14; Participant 16; Participant 19). Several participants identified that such a change would approximately take 5-10 years for people to move into (Participant 3; Participant 4; Participant 7; Participant 8; Participant 14; Participant 16), and Participant 8 took the example of attitudes associated with smoking as a good example for this. They pointed that attitudes and values associated with smoking changed over 5-10 years and did not happen overnight, or over 6-8 weeks. Participant 4 further highlighted that it took them at least 3 years to make many citizens understand the value of the behaviour and it was only after that there was a considerable adoption and capillarity of the target behaviour. As Shove (2016) also highlighted, the change in people's attitude and acceptance of the Cool Biz programme in Japan was a long-term process. It took 5-6 years for the change in dressing style to become a common practice and be accepted by a larger mass of the Japanese populace including private organisations which were otherwise not the target group for the programme (Shove 2016).

Participant 19 also highlighted that while the typical length associated with the establishment of recycling as a habit was 66 days, that would only be from the perspective of one individual and the change for a considerable mass of society would be a long process. This is an important distinction which could be made between short-term and long-term, where the short term could mean changing for a small target group whereas long-term change could imply a change in attitudes and values of a considerable mass of people or the social norm associated with a behaviour. Such a distinction is lacking based on the literature reviewed, as also highlighted by Osbaldiston & Schott (2012).

Length of Programmes

From a practitioner perspective, there was a clear consensus that the programmes in which they were engaged were too short, and persistent change would take a much longer time to happen, especially since the habits and behaviours are deeply inter-mingled in people's lives (Participant 6; Participant 7; Participant 8; Participant 13; Participant 16; Participant 18). Most participants identified the length of the average programme as being 1-2 years where the implementation was for an extremely short period – 6-8 weeks. The rest of the time is attributed to the planning, design, and evaluation phase which as identified by the participants is an extremely limited period to come up with a programme of substance.

This is very much in line with the various meta-analysis reviewed for this paper, where Osbaldiston & Schott (2012) highlight an average length of the programme the implementation period of the programme as 6-8 weeks and 64 days for Nisa et al., (2019). However, it must be noted that none of the literature provides an insight into the total length of the programme as a whole and not just the period of implementation. Participant 13 also highlighted that in the review of their programmes, citizens have highlighted that the duration of the programme was too short for them to properly engage with the multitude of target behaviours. The length of the programme in this case was 30 days.

Short-term evaluations

A major challenge highlighted by interviewees concerning shorter timescales was their inability to have longer-term evaluations which would enable them to fine-tune the programmes or interventions and create longer connections with people. This is a concern as shorter time scales have meant that there is very little time to create a connection with the target group, gather credible data on BC and course-correct the programme. This short-termism has meant that the available evidence is based on what works for a shorter period such as a few weeks, and credible evidence which can form the basis for replication for creating persistent change is largely absent (Participant 1; Participant 3; Participant 7; Participant 8; Participant 13; Participant 13; Participant 19. As also described in the literature, programmes addressing BC seldom plan for a long-term evaluation (Osbaldiston & Schott, 2012; Moloney et al., 2010), and only 15 of all the studies looked at by Nisa et al., (2019) had a long-term evaluation plan.

Participant 7 highlighted that even when the length of the implementation of the programme is short, long term connections and evaluations can help practitioners understand the implications of the programme on a deeper level and create effective mitigation strategies. This becomes more paramount in the case of social and environmental challenges with their direct implications on the well-being of people and due to their inherent complexities with people's everyday lives (Moloney et al., 2010). Such an approach would also better help understand the spillovers in different behaviours and where positive and negative spillovers occur (Participant 14. It was pointed out that sometimes change in people's behaviours is a long-term process and may not effectively show up when evaluations are done only a few weeks after the programme and may even show negative results and is highlighted well with the below quote by Participant 14. The following is concerning a programme studying driving and low-traffic neighbourhoods.

"There are some interesting examples where you sometimes don't see effects. Or you see maybe negative effects in the short term. So actually, at the moment, where we're looking at low traffic neighbourhoods, as an example of what a lot of local authorities within the UK are trying to implement and trying to encourage walking and cycling within cities [..] Now, the evidence is patchy, but it does seem like sometimes you can see kind of people will then spend a lot longer driving around. And so, the distance that they are driving increases, and this is often a short-term thing. But over like two, three years, you see, the traffic drops and car ownership drops. But if you measured it in this in the space of like a few months, even you would see this is not something you want to keep and it has gone wrong, but actually, it's a longer-term effect."

There was no mention of spillovers in the literature reviewed for this paper but Moloney et al., (2010) do highlight the need of having longer-term evaluations for understanding the impacts of the programme on other areas of the lives of the participants.

Funding and resources

A major cause identified by participants for the short duration of programmes and evaluations carried out by them was the limited availability of funding and resources. Limited funding and resources and very little interest from investors creates very little incentive for programme designers to carry out these longer-term evaluations which can better help understand BC as a social phenomenon and create replicable programmes. This was an aspect also identified by Gynther et al., (2012) who highlighted that most programmes are plagued with limited access to funding due to competition from other areas as was also highlighted by Green Funders Network, (2019).

Finally, other aspects associated with funding and resources as identified by participants could be divided into two broad categories – internal and external. The external aspect included changes in governments that were funding the programme as new governments focus on leaving their mark which creates shorter planning cycles (Participant 7; Participant 8; Participant 12). Participant 8 highlighted that successful changes for SC would require the programmes to be passed down by governments much like public health initiatives such as the Change4Life programme from the Government of the U.K (McManus et al., 2018).

Internal aspects recognised by one of the participants was working with volunteers who might lose interest in the programme due to a focus on a similar theme for a long period. The latter inadvertently meant that the non-governmental organization in question had to develop bursts of programmes on different themes which was possible for them due to being an established organization which may be harder for grassroots organizations (Participant 4).

"So, what we've done is to come back to the same theme several times. But we've had other themes in between, because our activists, you know, you have to repackage every year, otherwise, they feel like we've done this. And when we feel that, then we're reaching out, we barely reach the general public."

4.2   Designing programmes with a long-term focus

When it comes to looking at a long-term picture and long-term planning cycles, most of the interviewees had interesting examples to share where a long-term picture benefited in successfully rectifying socially and individually harmful behaviours. These examples ranged from smoking cessation to dealing with challenges associated with public health such as obesity and increased heart attacks in the population. All these behaviours were looked at from an inter-disciplinary perspective and stakeholders played different roles which enabled a transition away from them or reduced their social desirability ultimately leading to strong regulations or legal mandates. The quote below by Participant 7 provides a brief introduction of what a long-term picture on BC could be like against short-term one-shot campaigns.

"The only problem comes is that's all you do, you just do random, short term campaigns. And that's a good way to waste lots of money, and not having a, you know, an impact. But if a campaign is part of a series of campaigns, and it's good examples in the field of smoking cessation, here, globally, is that those burst continuous bursts, burst, right, burst rest, first rest of campaigns, they tend to be, you know, quite effective"

Before discussing the examples, a key insight was provided by Participant 7, who highlighted that while we can and we should take learnings from how we were able to deal with behaviours such as smoking, we should keep in mind that all behaviours are different and should be seen as different social and behavioural phenomena. Learnings should be based on

the methodology of how a particular behaviour was changed instead of treating two behaviours the same and applying similar means for changing them. They specifically highlighted the difference between smoking and alcohol as being completely different behaviours carrying different social connotations and what specific approaches may have worked for smoking may not work for alcohol, however, the methodology would be similar (Participant 7).

4.2.1   Long-term planning cycles

As discussed in the previous section and also highlighted by literature, programmes addressing BC have been plagued by short-term focus from the length of the implementation of the programme to the length of evaluations. This has been attributed to the short-term planning cycles, identified as 1-2 years on an average by multiple participants, for the entire programme. As highlighted by Shove (2016) and also validated by multiple participants, persisting BC is a long-term process of 5-10 years which would require long-term planning cycles (Participant 3; Participant 7; Participant 8; Participant 14; Participant 16; Participant 19).

These longer-term planning cycles would mean more focus given to carefully creating the aims, goals, and objectives of the programme and paying extreme importance to create a full picture of the behaviour to be evaluated and creating segmenting approaches (Participant 7; Participant 8). However, the most important component would be the possibility of creating a long-term connection with the participants for longitudinal post-intervention analysis (Participant 7; Participant 8; Participant 16). Such an analysis would allow a better understanding of behavioural spillovers and course correction of the programme if required, which seldom happens, as identified by Participant 14. As highlighted by Moloney et al. (2010); Osbadiston & Schott, 2012; Nisa et al., (2019); and Burns & Savan (2018), long-term post-intervention analyses have been severely lacking in existing programmes. Programme designers can benefit from such an analysis in creating stronger programmes that can be replicated by modifying the context (Moloney et al., 2010).

Multiple participants highlighted smoking cessation as a good example that has benefited from long-term planning cycles (Participant 1; Participant 2; Participant 3; Participant 6; Participant 7; Participant 8; Participant 14; Participant 16; Participant 17; Participant 18; Participant 19). Many interviewees were quick to point out the close similarities between climate change and smoking, where the presence of well-funded lobby group made it harder to convince people on the need and relevance of making change (Participant 1; Participant 4; Participant 16; Participant 17; Participant 19). Even with such external forces acting against the change, long-term planning cycles allowed practitioners and policymakers to work on a range of tools that would make the change possible, allowing proper diffusion of programmes across different segments of the population (Participant 8). This was highlighted by Participant 8 with extensive experience with working on interventions associated with smoking behaviours.

"But, you know, there are some examples from the smoking field, long term programmes of action, using a full mix of intervention."

Such an approach ultimately allowed the norm associated with smoking to switch, wherein once it was considered cool and hip to smoke, it started being considered a dirty habit and became socially unacceptable to smoke (Participant 1). It was also pointed out that the focus on the direct health benefits and not detriments allowed this diffusion and norm switching which allowed smoking rates to drop worldwide, especially in the developed parts of the world (Participant 1, Participant 5). A quote from Participant 1 summarizes this perfectly.

"And so, and then, like, we're forcing norms now, it's like a witch hunt, really, smokers today, like, it's not a social thing anymore. It's a disgusting thing. It's like, then then we had the health benefits, and then we have, how it affects others and why it's needed."

Another programme highlighted by Participant 8 where this long-term planning approach has greatly helped in creating persistent changes is from the United Kingdom from the field of public health. From smoking cessation to obesity control, insights from social and behavioural sciences have been used by the National Health Services of the Government of the United Kingdom (McManus et al., 2018). These initiatives have spanned across decades and transitioned from different governments and allowed practitioners and policymakers to have a long-term strategy with a mix of interventions and programmes (McManus et al., 2018). The programme today known as the Change4Life programme was initiated in 2009 as a programme to deal with childhood obesity and has used a host of different ways to interact with various stakeholders using learnings from the previous programme on smoking cessation (McManus et al., 2018). As was also highlighted by the participant that this may not be the perfect programme, but a long-term vision has allowed better planning, management, and thorough evaluation.

The case of Finland highlighted by Participant 11 has also benefited from a long-term strategy in creating a persistent change in behaviours. As pointed out before, Finland had a problem with rising cases of cardio-vascular disorders a cause which was identified for this was the high intake of saturated dairy fat and salt and a low intake of vegetables in the diet leading to high blood cholesterol levels and blood pressure levels (Puska & Ståhl, 2010). During the same period, Finland had an extremely strong dairy industry that was loved and supported by the population, hence a transition to a different diet was harder to achieve (Puska & Ståhl, 2010). However, a long-term strategy of five years (1972-1977) on a shorter scale as part of the North Karelia Project, and a much longer national transition over the next 20-30 years allowed Finland to successfully change the dietary habits of its citizens and further helping parts of the dairy industry to transition to berries while also keeping intact the national identity Finns were proud of (Puska & Ståhl, 2010).

The following cases highlight well the importance of keeping a long-term strategy and planning cycles and the benefits they can deliver in creating persistent BCs even when the inherent behaviours are complex and deeply entrenched in people's lives and part of their existing value systems.

4.2.2 Holistic focus – the false choice between policy change and behaviour change

"So, this policy change, needs to be underwritten by a broader systemic change that includes people's values and their practices and their norms and their behaviours and the infrastructure."

The above quote by Participant 11 highlights the prime importance of moving away from the false dichotomy between policy and BC that exists in environmental and climate change discourse as also highlighted by Akenji and Chen (2016) and (United Nations Environment Programme, 2019). As pointed out in the quote and echoed by many other interviewees (Participant 6; Participant 8; Participant 9; Participant 14; Participant 16), there exists a complex relationship between norms, infrastructures, policy, technologies, and behaviours and dealing with our existing social and environmental problems requires holistic approaches which are converging rather than diverging (United Nations Environment Programme, 2019). This was also a theme touched upon in the literature review section which has shown that even with progressive top-down policy approaches, there has been a continuous rise in

emissions and biodiversity loss over the past thirty years (Jackson, 2009). This was well explained by Participant 8 with the below quote.

"But generally, long term multicomponent strategy, based on what people support. If you try and put in place, an alcohol ban, or a smoking ban, or ban or anything that people the population don't support. It's not gonna work."

Henceforth, addressing the production side without addressing the consumption side or addressing the consumption side without addressing the consumption side would only deliver negative consequences. As Participant 11 highlighted, *"so if we go in one direction, you have riots in the other direction, or collapse of the global economy"* thus a greater need for coordination between the two is of absolute importance as also affirmed by (United Nations Environment Programme, 2019) UNEP (2019). Furthermore, as pointed out by Participant 19, *"you can create the most wonderful new product or new service or new policy measure, whatever. But if you don't get citizens to do it, or support it, it doesn't matter how good it is"*.

However, as also highlighted by Participant 16, while in theory it is easy to say and makes sense there is a greater need for showing how such things interplay with each other and can support broader systemic changes. Some of the examples shared in the previous section do highlight how converging approaches can support broader systemic transitions with individual transitions and change in policy approaches and is well supported by the leverage points to intervene in a system (Meadows, 2008). Especially when it comes to longevity, multiple interviewees highlighted the need for change to start from bottom-up as it starts from peer-to-peer norm shifts and builds to create movements that are solidified by converging top-down policies with little conflict in society (Participant 11; Participant 14; Participant 17; Participant 19). As Moloney et al., (2010) also highlight, while bottom-up approaches create persistent changes, ultimately changes in broader practices and policies would be required to solidify these changes.

With social and environmental problems being influenced by values, paradigms, and habits, Participant 17 highlighted the theory of "Viral Change" by Herrera Leandro which identifies two dimensions of change – vertical which is more institutionalized and horizontal which is more bottom-up and peer-to-peer and relies on norm shifting social spreads of information. The horizontal change comes in the first phase according to the theory and creates lasting changes once solidified by the vertical change (Herrero, 2008). Specifically referring to the climate crisis, Participant 14 highlighted the need for stepping-up BCs backed by stronger regulatory approaches.

"how long do we have to get to net-zero emissions. And then ideally, you'd want a sort of ratcheting up - kind of a gradual, starting with softer measure, bringing in support to enable people but then, at some point, then make the hydrocarbon options much less attractive, maybe even unavailable. And then like, and sort of regulation comes in at that later stage too"

Understanding social context

Since the purpose is to create a holistic picture of behaviour, multiple participants pointed out the need to create a deep understanding of the audience and their associated context during the design of the programme (Participant 7; Participant 8; Participant 9; Participant 11; Participant 16; Participant 17). Focussing on the social context while the intervention is being planned can allow the programme designer to better understand the barriers and opportunities that may occur for people. This would help them in understanding what type of intervention or programme would be more successful for the target population and identified the stakeholders who should be engaged in the programme for longevity. While not specifically in

the context of longevity, Moloney et al., (2010) identified this as an important step when the programme is being designed.

Understanding of the social context was also considered of prime importance for the adoption of a successful programme to a different region (Participant 2). Adapting a successful programme to a different region would require understanding the local context for that region and can open up more opportunities from a programme design perspective (Participant 2). This would allow the programme designers to focus on interventions or programmes which would be culturally and socially resonant for the particular region and trigger changes that make sense to people in the context and also give them feedback based on that context (Participant 2; Participant 16).

A couple of participants highlighted interesting cultural examples which would be important to consider if a particular intervention were to be designed on a particular set of people. Participant 11 for reducing meat consumption highlighted the cultural practice of offering meat as a part of hospitality for your guests and even when you wouldn't have it on your own in Islam and it is considered as a sign of respect to serving meat to the guests. This presents interesting knowledge to have from a programme designer's perspective which could be a huge potential cultural barrier in the success of a programme that would focus on reduction in meat consumption on the target audience. Participant 13 highlighted a similar case for the Roma Community in Hungary. They pointed out that in the community it is a social expectation to have a nice heated house when you have guests over in the winter which has implications for the energy consumption of their household and presents an interesting social norm that needs to be challenged but important information to have for someone designing an intervention.

Participant 16 suggested complementing understanding of the context further with segmenting audience highlighting the lack of homogeneity in population and having a segmented approach can benefit the programme. It can further help in enhancing citizen or target group engagement and assist in coproducing solutions lack of which was a specific challenge highlighted by Strube & Nicolau (2018) and Gynther et al., 2012 for the failure of programmes to produce long-term change. Participant 8 also highlighted the lack of segmentation in multiple programmes addressing BC which in effect means that a singular approach is used for non-homogenous groups of people instead of a mix of approaches that have the potential to be more successful. Social marketing and Community based social marketing approaches have benefited from segmenting populations as they have allowed programme designers to influence specific attitudes, beliefs, and behaviours among specific parts of the population (French, 2017). The following quote from them highlights this well.

"Populations are not homogeneous, they are differentiated, so you need to have a segmented approach. Now, what that means, of course, is you have to do your research, to understand the different sub-segments of the population, how you might engage them, what they might value, what they would push back against."

4.2.3 Capability-Opportunity-Motivation Framework

The COM-B framework with its further subdivisions between psychological and physical capability, social and physical opportunity, and automatic and reflective motivation has the potential to offer interesting insights to programme designers in terms of barriers and opportunities for a given population (Michie et al., 2011). Since the framework includes multiple facets not limited to attitudes and values or only environmental factors but a host of other factors such as cultural and social norms and habits and intrinsic motivations, it can allow a holistic understanding of the behaviour (Michie et al., 2011). Further segmentation can assist in employing a multitude of approaches based on the different segments of the

population and also broadening the scope of places where interventions can be targeted (Participant 16). Lastly, creating a holistic picture can also allow programme designers to identify which stakeholders should be included in the programme to increase longevity (Participant 8).

The framework was also recommended by several participants as a holistic means for understanding the interconnections between the different parts of individual behaviour and the external environment (Participant 3; Participant 5; Participant 16). A solitary focus on either one of them would always create an incomplete picture or undertheorizing of the behaviour to be changed, which was already identified above is a factor for a failure of programmes in creating a long-term change (Michie et al, 2011). The quote below by Participant 16 sums this up well.

"I think broadening our scope of the places to intervene. And then looking if people have the opportunity to engage, the motivation to engage the capability to engage with what you expect them to do."

Capability

Capability as described by Michie et al., (2011) includes factors that are internal to the individual and is further divided into physical and psychological Capability. While physical capability covers aspects of knowledge and skills and psychological capability covers the ability of the individual to engage in necessary thought processes, memory, and attention (Michie et al., 2011).

- Information, Knowledge, and Skills

While providing information alone is not considered the best way to change behaviours (Heiskanen & Laakso, 2019) it still forms an essential component of most programmes that try to change behaviours and has been the most commonly used approach historically (Osbaldiston & Schott, 2012). This was also the case with most people who were interviewed, however, many of them highlighted that while information alone is not enough, the way information is conveyed is extremely important to change behaviours (Participant 1; Participant 4; Participant 16; Participant 20). This is evident from this quote by Participant 16.

"[..]and it could be maybe that information is important, but then we have to convey it in the right way. So, is the right information being conveyed? And what you say and how you say it, that's also the whole framing story, how to use language to say and do you emphasize the environmental gains or the emphasize the individual gains do you emphasize community gains."

A typical approach used by most participants in this provision of information and knowledge was not merely specifying the problem and the need for action but providing know-how on what could be done and what could the people specifically do to solve the problem (Participant 1; Participant 13; Participant 16; Participant 19) even if it would be on a symbolic level (Participant 4). Further to this, the focus has been on providing information more positively and making changes more aspirational as it was perceived as a better way to get more buy-in from people ((Participant 1; Participant 4; Participant 16; Participant 20). While this did not part of the original literature review for the paper, additional literature was looked at for the validity of such approaches.

This is has received considerable focus from environmental psychologists, as repetitive research has shown that leaving people with a problem and no solution which they can act upon or leave them with no hope that they can solve a problem which is termed as self-efficacy leads to denial or learned hopelessness. This has been a common thread in multiple

campaigns trying to raise awareness on climate change as messages of doom and gloom without actionable steps has led to denial on part of individuals. Denial in this case being a psychological concept defined by Sigmund Freud as a defence mechanism that protects the ego, or the concept of 'I' against perceived threats (Beattie & McGuire, 2018; Stoknes, 2015).

As Beattie and Mcguire (2018) highlighted concerning a campaign from WWF campaign from 2009, the campaign was successful in creating a vivid picture of the devastating possibilities of climate change, however, providing no information on what people can do to prevent such a situation has a potential to create learned helplessness or denial. Here learned helplessness could be defined as feelings of helplessness arising when information is given on events that cannot be anticipated and avoided (Beattie & McGuire, 2018). However, Beattie and Mcgiure (2018) also highlight that fear or guilt appeals can work if there are direct threats to health and well-being with concrete actionable steps which would increase the self-efficacy and response efficacy which is that the advocated behaviour would indeed make a difference. The following quote from Participant 1 highlights their approach to information and knowledge provision.

"*And we don't believe in shaming, we believe in inspiration. We are trying to do this a lot by spreading information and inspiration. And so, what we do is that we spread tips and advice on how you as a consumer can become more sustainable. We answer the question how, and we spread those tips in social media and more in-depth on our website.*"

Another common theme when it comes to the provision of information and knowledge when it came to campaign or programme design was creating messaging that did not tell people what to do and rather allow them the free will that they can make a difference by acting on their preferences (Participant 1). However, a precursor for such a situation is that the audience or the target group first should be provided with a thorough understanding of the problem at hand and their choice or action or preference would make a difference building on the concept of response efficacy described above (Beattie and McGuire, 2018). It was also highlighted by Participant 7 that the information provided should resonate with the individuals and should feel personalized to them where segmentation can play an important role in creating such tailored information. The role of tailored information has been an important recommendation in many interventions or programmes trying to change behaviours and was also used in the OPower programme (Allcott and Rogers, 2014). Finally, Participant 9 also highlighted the need for creating checklists for certain behaviours where there is a logical flow of steps that occurs each time the action is taken.

When it comes to the way information is provided and campaign slogans and messaging, a few participants had important insights on what they feel works better. For example, Participant 1 highlighted the importance of words and language as being important in helping to make people associations and connections which is linked with priming theory and social constructivism. Hearing the same word multiple times in connection to an issue can lead to shorter brainwaves being created as an association is established with the word or phrase which has the potential to change norms in association to how something is perceived in effect changing behaviours (Participant 1). This has been described in Priming theory (Hoewe, 2020). Participant 3 highlighted the importance of context-specific messaging which is more granular as also affirmed by Moloney et al., (2010), and Participant 4 emphasized the importance of having a clear idea of the short-term and long-term goals in messaging. This was an aspect not highlighted in the literature reviewed for the paper. For example, they noted that campaigns and messaging being extremely populistic one year and being complex the next year can already put people away (Participant 4). Thus, consistency between short-term messaging and long-term problems and goals is extremely paramount. This is summarized well in the following quote.

"It has to be consistent with your long-term goal. So, you can't be populistic one year and then be more complex the next because like a boycott of red wine in France, for instance. It's very hard to back up from a boycott message."

Finally, Participant 13 emphasized the importance of having this long-term vision in the design of the programme and campaign and making sure that the information is provided to people for a longer period instead of one-off information campaigns. They also focused on the need for making this information more vivid and attractive and changing the format of information so that it keeps the people engaged in the programme. Furthermore, specifically for imparting the necessary skills, they emphasized the importance of face-to-face workshops and training for participants. A similar approach to creating the right skills in participants was utilised by the Start-Green programme which was deemed to be successful (Burns & Savan, 2018) and also affirmed by Moloney et al., (2010).

Opportunity

From a programme designer's perspective, the focus should be first on understanding the number of opportunity citizens or target group has to engage in a particular behaviour and then on how that opportunity can be enhanced through the implementation of the programme. As per the COM-B model, opportunity can be further divided into a physical opportunity which includes aspects such as financial resources, regulations, and infrastructures (convenience) and social opportunity which includes social and cultural norms, language, and the words that make up our world (Michie et al., 2011)

- **Cost and convenience**

Economic incentives or costs have been criticised in literature (Moloney et al., 2010; WWF, 2008), and from multiple interview participants (Participant 7; Participant 8; Participant 14; Participant 16). These incentives nonetheless have an important role to play especially for people where motivations or environmental values are largely absent. As pointed by multiple interviewees (Participant 1; Participant 10; Participant 12) cost still plays an extremely important role in changing behaviours extremely fast or creating instant impacts (Asensio & Delmas, 2015) though challenges with longevity remain as discussed previously (Moloney et al., 2010).

Participant 1 also highlighted that individuals do not see the environmental problems occurring right in front of them however the economic reward they would experience would be at this moment. They highlighted that the cost factor combined with the added motivation derived from social status associated with using environmental goods and services in certain areas is also an important factor to consider. Limitations exist to both cost and social status as motivation from a programme designer's perspective as highlighted by Thomas and Sharp (2013) and by Participant 7 who highlights that for economic incentives to be long-term they need to be combined with other intervention techniques. It is still an important approach nonetheless (Participant 7). The quote (below) from Participant 1 emphasizes this notion well.

"What you're saying with the environmental changes, but I'm not seeing it, it's not in front of me. But what I do can see is like, if I pick this option, I get more money in my wallet right now. And I can also brag about how good it is for the environment. And of course, that will do it right away."

Another major extrinsic motivation emphasized by several participants was convenience. There was a clear agreement that *"it has to be easy to do the right thing"* as participant 10 put it. Participant 4 also highlighted that due to hectic schedules, it is not easy for most people to keep everything top of their mind and if the right thing to do becomes the easier thing to do,

we can have more people taking up pro-environmental behaviours. However, as pointed out by Participants 2 and 7, the convenience of part of a BC programme needs to continue till people have enough time to create habits and this is something the programme designer would have to think about. It also needs to be noted that the factor of convenience also hinges on the environment external to the individual and would require partnerships with relevant stakeholders. Such approaches are important tools available for programme designers to shift people to more green types of consumption but may have a limited approach for a stronger version of SC (Heiskanen & Laakso, 2019).

- **Infrastructures, choice defaults, and choice architecture**

Multiple participants mentioned the important role infrastructures play in both framing behaviours and the role they can play in fostering SC behaviours and create persisting changes in consumption habits (Participant 9; Participant 12; Participant 14; Participant 18). As Shove (2010), Hargreaves (2011), and Moloney et al., (2010) highlight, infrastructures and technologies play an essential role in the formation of social practices and changing certain aspects of the infrastructure can create new frames which can allow new practices to emerge. This was also echoed by Participant 14 as they highlighted that it is important for a programme designer to understand the infrastructural context such as what kind of houses people live in and what kind of technologies and goods they have access to.

Keeping such a macro-approach can also help the programme designer in understanding the barriers which would most certainly hinder any changed behaviour, and as Participant 14 highlighted, having infrastructure which is conducive to change can increase the motivation of people to create new habits. A common example of this highlighted by Participant 12 and Shove (2010) is the transformation of the Netherlands into a bike-friendly country. Creating infrastructures such as bike paths and redesigning the city around this new form of infrastructure made biking a fun, easy, and convenient thing to do (Participant 12). This meant that even people who were not otherwise motivated to the bike were able to reconfigure their life for other motivations such as health, fun and rewarding activity, health, and so forth (Participant 12). Thus, infrastructural changes can and do play an extremely important role in the change process and can be used to make harder behaviours more convenient thus increasing the motivation of people to engage with them (Participant 12). However, it was pointed out that in certain cases changes in discourse can start a movement and create motivations for cycling even without proper infrastructure, which Participant 5 highlighted was the case of Belgium. While the design of the cities in Belgium is not very conducive to cycling people have been more motivated to take up cycling as an option during rising awareness on environmental matters (Participant 5).

Participant 14 highlighted similar changes in the design of houses which can promote multiple SC behaviours at the same, which are very much in line with the structural changes proponents of social practice theory have mentioned (Shove, 2010; Hargreaves, 2011). They highlight that having new houses with simple cupboard spaces where residents can dry their clothes can allow people to dry their washing efficiently without using heavy appliances. But since most houses do not provide that space, people are forced to rely on the already existing normal practice of using tumble dryers. Similar examples for mention for the design of cities, much like the example for Amsterdam mentioned above where infrastructures can allow people to adopt low-carbon behaviours without much hassle (Participant 14).

Choice defaults and choice architecture which originate from theories on nudging and are described extensively by Thaler and Sunstein (2008) were other ways described by several participants in increasing the opportunity for people to change behaviours. Much like

approaches focusing on economic incentives, nudging approaches too have received considerable criticism for reasons such as libertarian paternalism and not going far enough to solve the problems associated with consumption (Heiskanen & Laakso, 2019). As Heiskanen & Laakso (2019) and Akenji (2014) highlight, such approaches are suitable to shift patterns to greener forms of consumption but do not go far enough to reduce actual amounts of consumption. As Participant 6 also highlighted, mere nudges need to be accompanied by shifts in values and beliefs for change to be deeper and long-term.

Nonetheless, they still are an important approach available to programme designers, specifically to increase the convenience for people to engage in certain behaviours or change the default option completely (Participant 12; Participant 19). As was highlighted in the example from Germany where changing the default option to green electricity has shown to be extremely successful (Lehner et al., 2015). Changing the choice architecture on the other hand was mentioned as a very important way to break deeply entrenched habits (Participant 7; Participant 8; Participant 9) as also highlighted by Verplanken and Wood (2006). As Participant 8 highlighted, that simply changing the topography can break existing learned behavioural patterns and new patterns can then be formed in their place with the changed architecture. Choice architectures have been successfully utilised by supermarkets by getting people to buy certain products and can be utilised on the other hand to highlight greener products (Participant 2). To also assist a shift in values, this change in the choice architecture can be accompanied by awareness-raising campaigns as mentioned by Participant 2.

- **Mainstreaming change – social norms, social contagion, perception gaps**

Social norms form an extremely important part of any campaign seeking to change behaviours (Moloney et al., 2010) and multiple participants highlighted their usefulness in fostering SC behaviours (Participant 1; Participant 3; Participant 5; Participant 11; Participant 12; Participant 16; Participant 19). Thus, designing the messaging of the programme which takes into account the value of social norms can increase the adoption of new behaviours as highlighted by Participant 16 and Participant 16. Participant 19 highlighted that simple messaging which shows that participants can either do a bit better to be part of the norm, for recycling, in this case, helped in increasing recycling rates for their programme.

Such an approach with norms messaging was also utilised by the OPower programme, however, it was highlighted that there are considerable chances for rebound effects with households who are better than the social norm ((Allcott & Rogers, 2014). But as Allcott (2011) highlights, this rebound effect can be counteracted by also showing an injunctive norm by affirming the behaviour of the people doing better. This was achieved in the OPower programme by putting a "happy" face on the energy reports of households doing better than the social norm to highlight the injunctive norm (Allcott, 2011). As Participant 19 highlighted, due to segmentation approaches, the norms approach was only utilised for households who were below the social norm and not for households already recycling well.

Participant 16 also highlighted the importance of dynamic and static norms and the role they can play in catalysing change in behaviours. Static norms show the current state of behaviour in the society and dynamic norms show how the behaviour is changing (Sparkman & Walton, 2017). As they highlighted, that simply using messaging which shows that the norm is changing for particular behaviour can increase the rate of adoption of a particular behaviour. The role of dynamic and static norms is well highlighted by Sparkman and Walton (2017) who were able to show a decrease in the consumption of meat and reduction in the use of water through multiple experiments utilising dynamic norm messaging. However, as Sparkman and Walton (2017) cite, the experiments were only short-term and more long-term evaluations

would be required to test their persistence. Nonetheless, dynamic norms still provide an interesting opportunity for programme designers to create more social opportunities for people.

Furthermore, as Participant 11 highlights, the longevity of BC can be achieved by filling in the perception gap that people have. As they highlight, due to perception gaps most people believe that other people do not take enough actions for the environment which also reduces their motivation to take more actions. Dynamic norms in this case can help bridge this perception gap and help shift the norm allowing more people to take up SC behaviours (Sparkman and Walton (2017).

As discussed before, using community or more pro-social approaches have an extremely important role in amplifying and creating persisting change (Moloney et al., 2010). Social norms play an extremely important role in such pro-social approaches and can help foster positive norms as the change comes from the bottom-up as highlighted by Participant 18. As highlighted by Participant 8, social approaches also benefit from social role modelling, and the close contact with other people provides opportunities for meaningful engagements which people value. The role of social modelling in such approaches has also been highlighted by Jackson (2005) as being extremely beneficial in creating persisting change.

However, as Participant 11 and Participant 12 highlighted, not everyone can be expected to be the early adopters and go against the norm due to fear of social rejection. Thus, it becomes extremely important to look for people who are already more open to change or catalysers, who Participant 12 described as key-holders of the community. The people who are key-holders shape norms that other people follow and focusing change on them can create faster changing of norms (Participant 12). Faith leaders as highlighted by Participant 3 can play an important role in fostering positive social norms. Based on their own experience of working with faith leaders, they highlighted that faith leaders hold key positions within their respective communities and are well trusted and hearing messaging coming from them can have an impact on social norms (Participant 3).

Participants 2 and 16 also describe the role social groups typically overlooked in BC programmes can play in scaling up BC which is also persisting due to group enforcing social norms. Groups such as sports clubs are places where large numbers of people are engaged and play an important role in people's life (Participant 2). Furthermore, these groups also have a certain level of legitimacy attached to them and social recommendations work more when they come from places that are trusted by people (Participant 2; Participant 7; Participant 8). Participant 2 highlighted this based on the example, of a Finnish Ice hockey team that went carbon neutral and is now trying to foster pro-environmental habits such as biking, going vegan, and not bringing plastic to games.

Motivation

Motivation according to the COM-B framework can be fostered by either increasing the capability of the individual or increasing their opportunity to engage in a behaviour. Motivation can be further divided into automatic motivations which depict habits, impulses, emotional responses, and innate dispositions and reflective motivations which depict self-efficacy, identity, optimism, and beliefs about consequences (Michie et al., 2011). Multiple aspects for increasing motivation by increasing capability or by increasing opportunity are already described in the above sections. The following sections focus on aspects otherwise not mentioned such as values and beliefs which form the core of reflective motivation along with the important role of habits.

- Intrinsic Motivations – wellbeing, health, happiness, identity

"I think where some of the interventions are economic, they tend to focus on extrinsic motivations rather than intrinsic. And then those can be quite superficial. And so particularly when you know, the incentive is removed, then people revert to their old ways of acting, whereas intrinsic motivations and the longer term."

The above quote by Participant 14 is an important insight when it comes to persisting change which is long-term and needs to be accounted for. Intrinsic motivations such as values of community, belonging, health, happiness, well-being and so forth as being of prime importance as they can help in getting people to take on more sustainable lifestyles. This would involve making such lifestyles appear more enjoyable and aspirational making people want to do them more for their reasons as emphasized by Participant 7.

While already discussed before, focusing messaging based on shaming or guilting people into changing behaviours was considered an extremely detrimental approach causing more harm than good. Participant 8 highlighted that people intrinsically want to be good and do good things and shaming them ultimately reduces their motivation to engage with a programme or intervention. This was further elaborated with the concept of Confirmation bias, or the notion that people stick their views and existing beliefs and thus engaging them would require first understanding the value system of your target audience and their intrinsic motivations. They highlighted that challenging existing beliefs without understanding the value systems would ultimately lead to "backfire effects" which is a psychological phenomenon where people end up believing in their existing beliefs more even when challenged with correct information (Swire-Thompson et al., 2020).

Based on their experience with BC for child immunization, Participant 8 highlighted the need for creating a new narrative for people who were hesitant to get their children vaccinated based on their value system which in this case was the safety of their children and being good parents. They highlighted such a shift is only possible by first understanding these inherent values of the target audience, affirming their values which in this case was that people were good parents who would do everything to protect their children, affirming this notion and not criticizing them and then creating a new narrative based on their existing beliefs which can create a lasting change (Participant 8).

The importance of other intrinsic values such as health and well-being was considered extremely important by a couple of interviewees (Participant 5 and 14). While Participant XX highlighted that people were more likely to engage in SC or lifestyles if it were to benefit their health and overall well-being as the general notion associated with sustainable lifestyles has been a loss of comfort or mostly associated with a reduction in quality of life. This was echoed by Participant 14 as they measured aspects associated with well-being with their participants as they felt it was an important motivator for people to engage in sustainable lifestyles or SC.

Participant 14 further emphasized the importance of first getting people to try behaviours and linking them to intrinsic values or belief systems, or their identity or sense of self. Creating such connections and providing a stable context in which such new behaviours can be carried out which would require other stakeholders to be part of the programme design can aid in achieving persisting changes as they can provide an opportunity for people to create new habits. Participant 2 also highlighted the importance of keeping a "global identity" as an important piece in programme design due to these problems being more global and requiring greater cooperation spanning across national and regional boundaries.

Another extremely important dimension associated with intrinsic values highlighted by participants was the need for reflection to be incorporated in campaigns and also inculcating these values within people. Participant 1 concerning this highlighted that they tried to have this incorporated in their campaign as a way to reflect more on their purchases over striving to live a perfectly sustainable lifestyle. The purpose of such an approach was to allow people to not get overwhelmed and rather have more conscious decision making involved in their consumption habits and have their developing curve. Participant 2 also emphasized the need for the power of reflection to go into motivations that are deeper to people such as the sanctity of life and a sense of self and purpose which as discussed before were highlighted by Participant 14 also as a means for persisting change. Participant 13 tried to incorporate this in their programme by providing self-audit questionnaires to their participants where the questions were framed in a way to make people reflect more.

Based on these themes, there is a relatively new field of literature focusing on the role of mindfulness in fostering SC habits and bridge the attitude behaviour gap. While a meta-analysis conducted by (Fischer et al., 2017)found 7 programmes or interventions which focused on this approach, a recent study conducted by (Geiger et al., 2020) on a sample of 60 university students and 71 staff members found little correlation between the two. However, there was an increase in well-being in the student sample and reduction of materialistic values in both the samples and this direct effect on materialistic and well-being values have the potential to influence consumer behaviour in the long run (Geiger et al., 2020).

- Finding or creating moments of change – Breaking habits and lock-ins with contextual changes

Participant XX highlighted the importance of habits and the relatively less attention they have been given in the literature, programmes, and interventions concerning BC. Several participants discussed the importance of habits in BC and the crucial impediment they serve in breaking the cycle and grip they hold on SC behaviours (Participant 2; Participant 4; Participant 5; Participant 7; Participant 8; Participant 9; Participant 14; Participant 16). Thus, breaking habits, or de-freezing an old behaviour and replacing them with a new behaviour was an important point of discussion in the interviews. Apart from habitual lock-ins, interviewees also discussed the importance of structural lock-ins which lock people into high consumption behaviours.

As emphasized by Participant 4, it's harder for people to keep everything at the top of their mind unless the behaviour becomes an integral part of their life, thus it is easier for the motivation to fade and people to fall back into their known behavioural patterns. Thus, understanding the structure and context in which the individual or groups of individuals are part of becomes extremely important. Participant 16 highlighted the need for this by giving an example of how to introduce people to more vegan food choices. They highlighted the importance of first getting people to experience the behaviours, vegan food choices in this case, and creating this into a habit by hooking this onto the organizations where people work or study, or the groups they are engaged in, or things or values which are closer to them. Choosing such an approach where the behaviour is hooked on to groups or organisations already part of people's daily lives provides the reinforcement of behaviour in places that are known to people and allows them to create new habits (Participant 16).

Keeping longevity in mind, and their own experience with working on a programme which worked to create BC in people, Participant 5, highlighted the importance of understanding the patterns of consumption where people are locked into due to infrastructures, social context, or habitual patterns. They emphasized the need for changing either the context or the

structure which can make it easier for people to engage in SC behaviours. (Shove et al., 2012) has highlighted the important role of understanding societal lock-ins can play an important role in designing successful interventions which can create persisting change. The following quote by them underscores this well.

"*making change easy and making change possible [..] when we started out looking also at what locks people into the behaviour, well, it's the way our societies are shaped in a way, and if we can make change easier for people then, social norms start changing and you start shifting approaches and getting these breakthroughs and changing broader societal patterns.*"

Several participants mentioned changing the context as an important means for changing habitual lock-ins in individuals which could be a starting point for changing behaviours (Participant 2; Participant 7; Participant 8; Participant 9; Participant 14). One of the most mentioned examples of changing contexts that leaves people more open for making changes emphasized by interviewees was when they were moving houses (Participant 7; Participant 14). Participant 7 highlighted that people who move houses are already in the middle of renegotiating multiple habits like transportation choices, shopping choices, and so forth and thus getting people in the middle of this transition when they are open to changes could be an interesting way where a contextual change can change behaviours. Another interesting contextual change that leaves people more open to change was having a kid as described by participant 14. Thus, looking at the timing of an intervention that can coincide with other such contextual changes in people's lives can be an interesting avenue that can be explored by programme designers to assist people in creating new habits. As Verplanken and Wood (2006) highlight, finding or creating moments of change is an extremely effective way to break deeply entrenched habits.

While the changes discussed above were more big in the lives of people themselves, Participant 9 also discussed another interesting way were changing the context of how an activity is performed can trigger changes in people's behaviour. Participant 8 also highlighted that activities like cloth swaps provide people with a completely new context and give them the opportunity to still have other values they can gain like social interactions, a sense of social purpose, while also having access to a new piece of clothing for them. This provides an interesting avenue that can be explored by programme designers to foster the sharing economy by using insights from social psychology by targeting the values and beliefs which people already have and provide them with a new context to express them (Participant 8).

Structure or infrastructure, another important aspect described for changing behaviours or breaking habits has been discussed extensively in the section on the opportunity which is in line with Michie et al (2011), who highlight the role increasing structural opportunity can play in breaking habits.
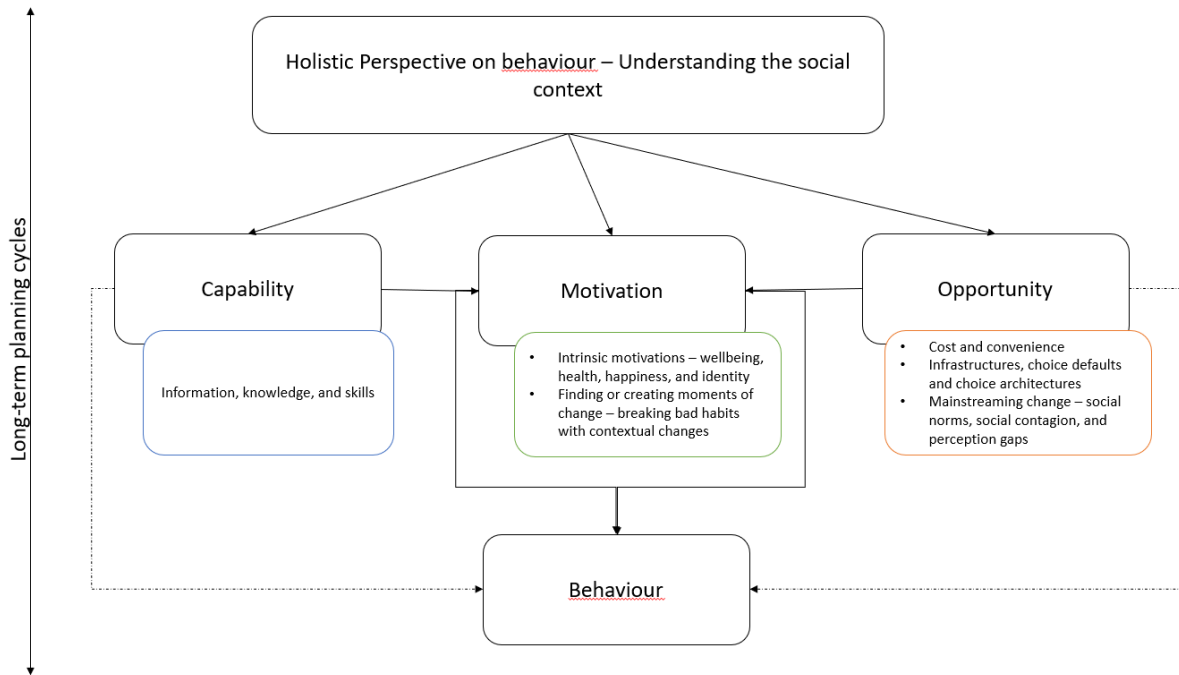
Figure 4 Summary of findings

Source: Own Illustration

The figure above (Figure 4) summarizes the findings from this section. It explains the need for having long-term planning cycles combined with using a holistic perspective on behaviour and understanding the social context well. COM-B is considered as the framework to understand the context and further the themes generated from the interviews are structured into the three components of the framework. The themes provide focus areas within each component which can be used by programme designers to first understand and then create the interventions accordingly. The figure provides a very preliminary description of the COM-B framework in the domain of SC with potential for additions and research which would be discussed later. Long-term cycles in the figure would include a focus on the length of the programmes and the length of evaluations.

5 Discussion

The purpose of this thesis has been to investigate the aspect of long-term behaviour change. Specifically, the paper tries to investigate why programmes that seek to change behaviours fail to create long-term change for sustainable consumption and how can we design better programmes or interventions which can create long-term changes. For the fulfilment of this objective, the following research questions were chosen, as also mentioned in Chapter 1.

RQ1. Why do behaviour change programmes fail to create long-term change for sustainable consumption?

RQ2. How can programmes that can enable long-term changes in behaviour be designed?

The findings were analysed against current literature on sustainable consumption and behaviour change, highlighting the research's contribution to pre-existing knowledge. A discussion on the importance of the findings is presented in this section both for practitioners (programmes designers, policymakers) and academic researchers. Further, the limitations of the research's methodological and practical approaches are presented.

5.1 Overview of findings and their significance

5.1.1 (RQ1) Why do behaviour change programmes fail to create long-term change for Sustainable Consumption?

Having conducted a literature review on reasons for failure to create long-term change, five causes were identified. They were then put to test with practitioner interviews and analysis.

Lack of holistic perspective on behaviour

Using common-sense understanding of behaviour for designing programmes addressing behaviour change has substantially reduced the tools and opportunities available to programme designers which may have the potential to create persisting change (Michie et al., 2011). This common-sense understanding has resulted in a solitary focus on attitudes and beliefs which have typically resulted in approaches based on rational choices such as information provision or economic incentives which have severely restricted the potential for creating long-term (Heiskanen & Laakso, 2019). Thus, a holistic perspective on behaviour change can help the programme designers in designing better programmes. Such a holistic perspective would not only consider the factors internal to the individual such as knowledge, information, skills, habits, and values, but also external factors such as infrastructures, policy background, technology, business models, social norms, and cultural norms.

Having such a holistic understanding of behaviour can be greatly increased by using various models from the field of behavioural sciences which have shown relative success in the field of public health. One such framework, COM-B has been used for analysis in this paper and can assist programme designers in creating a holistic picture of the behaviour to be changed. Furthermore, a holistic perspective would eventually call for **multi-stakeholder approaches with a mix of intervention techniques** working together to address multiple barriers instead of standalone programmes coordinated by only researchers or civil society organisations alone. Such approaches have again been extremely successful in the field of public health, such as the successful transition of dietary habits of Finnish citizens during the 1970s and smoking cessation as discussed in the paper.

Individual changes vs social change

The value of social learning and social support is extremely important for achieving persisting changes in behaviour (Jackson, 2005). Thus, community-driven approaches, or approaches targeting social groups, or pro-social approaches in general have the potential to create persisting changes for SC over individual-focused approaches. Social norms play an important role in such approaches. Furthermore, the added aspect of engagement with peers supports peer-to-peer communication which has been very successful in marketing and smoking cessation.

Shorter lengths of programmes have meant that the opportunity for the change to be reinforced is extremely limited. **Using such approaches can benefit programme designers as communities and social groups stay together for a longer period, much longer than the duration of the programme allowing the change to be reinforced sufficiently creating shared norms**. Community driven approaches have also been preferred over individual social comparison or social status-driven approaches. Such approaches may show a short-term changes in behaviour. However, they foster materialistic values in people reducing their willingness to act for larger social or environmental goods.

Lack of target group understanding and understanding

Programmes that engage the target group more and create more opportunities for discourse and discussion can increase the durability of the change created. This engagement should not be restricted during the implementation of the programme but instead during the planning and evaluation phase too. Engagement during the planning phase can provide deeper insights into the lived experiences of the group which can benefit the programme designers in understanding the barriers and opportunities associated with the behaviour at a deeper level and make people more aware of the change process. Furthermore, engagement during the evaluation phase of the programme can benefit the programme designers in improving the scalability of the programme. Also, since the paper recommends multi-stakeholder approaches, evaluations by bringing different stakeholders together can enhance the understanding of the participants of the programme along with the different stakeholders which can aid in propelling wider systemic changes.

Finally, it is also extremely relevant to create a target group for the variety of interventions to be implemented within the programme. Since populations are non-homogenous, approaches such as segmentation can benefit the programme designers in designing based on the different segment groups instead of a broad strategy for a wider population. Thus, such a segmented approach that creates actual insights on a variety of target groups to engage with can have implications on the durability of the BC programme.

Programme Evaluations

Evaluations have typically depended on measuring outputs of the programme such as a number of participants or number of workshops implemented with small questionnaires from participants (Nicolau & Strube, 2019). These questionnaires rely on self-reported attitudes of the participants which are notorious for creating false notions of success as questionnaires right after or during the programme may lead participants to give positive responses but would have little to no bearing on the durability of the change. Thus, the evaluation of programmes must be done based on outcomes and impacts. These outcomes and impacts should be a mix of qualitative and quantitative aspects also including the positive environmental impact created from the programme.

The evaluation of qualitative impacts should not rely only on questionnaires but should also be supplemented with face-to-face interactions and having a control group for which the data could be measured would add to the evaluation process. Further to this, studying multiple

behaviours during the evaluation to understand behavioural spillovers can only help the programme designers more and create important learnings in case negative spillovers were spotted. Finally, measuring aspects associated with well-being and health can benefit the programme designers in understanding durability as an increase in well-being or other aspects valued by the participants can have implications on the durability of the change created.

Aspect of Longevity

Insights associated with longevity in this paper covered four broad aspects – defining longevity, looking at the length of programmes, short-term evaluations of programmes, and resources and funding.

- Defining longevity – BC which is persistent and involves not only change in attitudes but also associated values, beliefs, social norms, and habits is a slow process and takes a long time for people to get into. Differentiation needs to be made between changing the habits, attitudes, beliefs, and values of a single person and carrying out the process for a larger mass of society or change in social norms. While the former may happen quickly, the latter would also involve changing social norms and would take upwards of 5-6 years. This was the case with the Cool Biz programme in Japan, where it took 5-6 years for the change to become normal or the new norm (Shove, 2010) and smoking cessation was again a slow change with happened over 5-10 years (Corner et al., 2019). While the time is taken may vary from behaviour to behaviour, and this definition may not be held as a firm definition for longevity, it does give a good indication of how long it can take for behaviours to change.

- Length of programmes – Programmes associated with BC are extremely short and do not allow enough time for designers to create change is viral. As we talked about when defining longevity, persistent BC is a slow process taking about 5-6 years whereas programmes normally are much shorter – 1-2 years on average as described by the interviewees. 1-2 years here is the entire length of the programme including the design and planning phase, implementation phase, and the evaluation phase. The implementation period for the programmes is much shorter. While not all behaviours would require long-term implementation periods, but behaviours that are deeply entrenched in people's lives would certainly require longer implementation periods.

- Short-term evaluations – Shorter timescales for programmes have meant that longer evaluations that can observe the changes in behaviours or longitudinal evaluations are missing. This has meant that while research and evidence exist for short-term changes in behaviours, evidence for techniques and interventions which can create persistent changes are missing. Henceforth, **programmes addressing behaviour change can benefit from longer-term evaluations** as BC on a larger scale is a slow process and longer-term evaluations can allow programme designers to course-correct which can help in creating persistent changes. This also forms one of the most important findings of the paper as long-term evaluations were not found during the literature review for this paper.

- Funding and resources – Competition between civil society organisations for funding along with the field of BC and consumption being underfunded has meant that programme designers seldom have the resources to carry out programmes that can create persistent changes. Further to this, little interest from investors in longitudinal evaluations means there is little incentive for programme designers to carry them out. Shorter election cycles also mean that new governments typically reverse the changes

made by previous governments creating little possibilities for longer-term evaluations. However historic programmes in public health which have been passed on from governments like the Change4Life programme in the United Kingdom are good examples of programmes that have benefited programme designers in improving the design and intervention package of the programme.

5.1.2   RQ2. How can programmes that can enable long-term changes in behaviour be designed?

Long-term planning cycles

As discussed before, short-term planning cycles can seldom create a persistent change in behaviour, and programmes focusing on BC for SC have been plagued by this short-term focus. Changing behaviour is a slow process with multiple influences and would require longer-term planning cycles to deliver successful and persistent change. As highlighted in most examples shared in the paper, persistent changes took around 5-6 years, even more in some cases, which is higher than the average length of the programmes observed. Hence, one-off campaigns can seldom deliver change, and persisting change would require a mix of interventions within the same programme which would require longer-time planning cycles.

Thus, longer-term planning cycles can allow programme designers to plan the programme better, create stronger longitudinal analysis and thorough evaluations, course correct the programme if required, understand spillovers better, and create programmes that can reach a wider audience which can help in shifting norms. Successful examples highlighted in this paper such as the Change4Life programme in the UK, smoking cessation, and the case of Finland were all programmes that have required longer-term planning cycles. The initial period for the case in Finland was for 5 years for a smaller region and the length of the programme was extended further to then reach a wider audience across the entire nation. This presents an interesting example of how longer-term planning cycles can assist in achieving persistent changes in behaviour even when the behaviour itself is tied to values close to people. The need for long-term planning cycles is another important finding of this paper as the author was not able to find any programme having a long-term evaluation plan.

Holistic focus – false choice between policy change and behaviour change

In environmental discourse, there is exists a conflict between BC and policy change (United Nations Environment Programme, 2019). However, broader systemic changes cannot take place without societal buyin and individual solutions alone cannot solve systemic collective challenges. Thus, there is a need for more holistic approaches which understand this complexity and create interventions and programmes which can converge the two themes to create broader systemic changes. Such holistic approaches would ultimately require multi-stakeholder and multi-pronged approaches as mentioned in the thesis before. Building bottom-up peer-to-peer intervention strategies and combining them with top-down policy approaches can help create effective and persisting changes in behaviours creating the background for further systemic changes.

Taking such a holistic perspective from a programme designers' perspective would require a thorough understanding of the social context in which the programme is supposed to be implemented. This holistic picture would not only require an understanding of the individual context – attitudes, values, beliefs, and skills – but also the broader social context – infrastructures, policies, social norms, cultural norms, technologies, and business models. Creating a complete picture of the behaviour being targeted through such an approach and also understanding how the behaviour connects with other behaviours can greatly help

programme designers inappropriate barriers and opportunities which could help in designing programmes with multiple stakeholders to create persisting change.

Capability-Opportunity-Motivation Framework

To create such a holistic picture, the Capability-Opportunity-Motivation framework has been suggested. The three different components of the framework cover both internal and external factors affecting a behaviour and help programme designers in creating a complete picture of the behaviour to be changed (Michie et al., 2011). The capability in the framework links to internal factors such as information, knowledge, and skills, while the opportunity links to factors external to the individual such as infrastructures, policies, social norms, and culture (Michie et al., 2011). These two together work towards creating motivation, which covers the mental processes of the individual, which in turn changes behaviour (Michie et al., 2011). While the framework is increasingly being used in the field of public health, the literature surrounding its use in the field of SC has been lacking. Thus, this paper forms a first attempt to combine the two domains.

- **Capability** – While information approaches have received criticism, they are still an important tool available for programme designers. It is however important how the information is conveyed which can increase the capability – information, knowledge, skills – of the participants. From a designer's perspective, it is important to see if the information being conveyed is the correct information and the way it is framed is also of utmost importance. Images of doom and gloom or fear and guilt appeals without actionable steps will only shift people into denial limiting their capability. Such an approach has direct consequences for self-efficacy or their belief whether they can solve the problem being presented. They may be successful only if the challenge being presented has direct consequences on the health and well-being of the participants, which is rarely the case with environmental problems and provides clear actionable steps which the participants can take to solve the problem.

  Thus, information which is more personalised, aspirational, is consistent, provides a thorough understanding of the problem, and is relevant for the participants social context can have implications for the durability of the changing behaviour. Further to this, the importance of words and slogans which make the campaign have a role to play as hearing the same word multiple times about an issue creates shorter brain waves. This can allow participants to create a link between the action and its effect, which can help in changing the behaviour. Finally, the information provided through face-to-face interactions or in discursive/discussion settings would be a better approach along with skill-building workshops which have the potential for participants to increase not only their knowledge but also self-efficacy.

- **Opportunity** – Increasing the opportunity to carry out a behaviour or decreasing the opportunity to carry out another behaviour form an important component of any programme addressing BC. Concerning opportunity which comprises physical opportunity focusing on environmental factors and social opportunity focusing on social norms, three main points have been discussed. Associated with physical opportunity, cost and convenience are important ways to increase or decrease the opportunity for a behaviour. However, specifically approaches associated only with costs have received criticism for failure to create persisting change unless the incentive is continuous. They are still important but should be combined with other techniques which can also affect the inherent values or identity which can create persisting changes.

Also associated with physical opportunity, infrastructures and choice defaults have an extremely important role in the persistence of the behaviour. Changing the infrastructure which can in itself change the default option for people, or specifically changing the default option can provide interesting ways to change behaviours. Such infrastructure changes could include the ways houses are designed by providing extra spaces for drying clothes can help in people shifting from dryers to manual drying of clothes. Changing the choice architecture, such as changing the design of retail stores again becomes an interesting way to change behaviours. It must be noted that such changes are good options for shifting consumption to greener forms, an absolute reduction in consumption would also require supplementing these changes with changes in beliefs through other intervention techniques. Unless people are aware of the change, behavioural nudges such as the ones described above can only go so far. They nonetheless form important ways to increase opportunities for people to carry out SC behaviours.

Finally, increasing social opportunity forms an important aspect for shifting behaviours for SC. Changing social norms is extremely important to mainstream such behaviours and would be important for any programme designer aiming to create persistent changes. Changing perception gaps of people would be extremely important for this, where using simple static and dynamic norms messaging can play an extremely important role. Furthermore, social norms messaging through social comparison have already been considerably discussed, however, approaches hinging on social comparison and social status have implications on the longevity of change as discussed in the paper.

Community approaches or change is driven through existing social groups on the other hand are important tools available to programme designers which can change social norms and would also benefit from social learning. This could also involve otherwise overlooked social groups such as religious institutions and sports clubs which already involve a large group of people sharing norms. Lastly, programme designers could also benefit from looking for people who could be seen as leaders or keyholders of the communities and groups, such as faith leaders or other notable citizens who are already trusted by people which can help in amplifying change.

- **Motivation** – While increasing or decreasing the capability and opportunity of people has a direct bearing on the motivation of people to engage in behaviour, and most of the ways to increase or decrease motivation have been discussed before. Yet, certain factors associated with motivation have an important role in the persistence of change created. The importance of understanding habits and the role they play in changing behaviours has been largely underplayed. Habits that belong to the automatic side of motivation need to be broken before they can be replaced with a new behaviour to create changes that persist. While, changing the infrastructure is of course an interesting way to break habits which have been discussed in the opportunity part, finding windows of opportunities where people are more open to change is another interesting opportunity to break habits from a designer's perspective. These windows of opportunities could reach people during major life changes such as changing jobs, having a kid, or moving to a new city. This is interesting information from a programme designer's perspective to create interventions targeted at these people for SC behaviours.

Another interesting way to break deeply entrenched habits could be through providing a new context for carrying a similar behaviour in a setting that can minimise the

environmental impact. Clothes swaps are an interesting example of such a contextual change where people are allowed to buy a new piece of clothing but in a completely different context which has a lower environmental impact. Also, clothes swaps which are social events increase the social opportunity for people to engage in similar behaviour in a completely different context. Finally, events such as clothes swaps also capitalise on other motivations that people such as social interaction, doing good, etc. while also getting a new piece of clothing while the environment gets the benefit.

Intrinsic motivations are an important factor to consider for any programme addressing BC. Intrinsic values such as well-being, concern for their community, health, happiness, and self-identity belong to the reflective motivation part of the framework. While extrinsic motivations such as cost and convenience do provide short-term successes, the persisting change would ultimately have to target intrinsic motivations. Thus, making sure the behaviours look aspirational and linking them to these intrinsic motivations, particularly well-being and health can create persisting changes. Traditionally SC behaviours are linked to loss of comfort, hence highlighting the value they add to people's lives is of prime importance. Focusing on aspects of health and well-being can benefit programme designers in creating persisting changes. Further, creating opportunities either socially or structurally where people can try a behaviour and linking them to people's identity or sense of self can create persisting changes and even break deeply entrenched habits.

Finally, focusing on the power of reflection or getting people to reflect on their behaviour can help in increasing the durability of change. Designing interventions that can get people to reflect on their consumption habits and allowing them to develop their own positive or growth curve can have implications for longevity. Reflection can again help programme designers to tap into deeper motivations of people which can help create persisting change. Such approaches could include face-to-face interactions and questionnaires and self-audits designed specifically to make people reflect more. Based on reflection, there is a rise in programmes focusing on the power of mindfulness to foster SC habits. While early studies haven't shown extremely positive results, it has shown a decrease in materialistic values and increase in well-being which has potential implications for SC.

The results of this paper are a first attempt at using the COM-B framework in the field of SC and provides broad strokes and intervention means which can be further developed and used to design interventions focusing on a specific behaviour or a group of behaviours. However, long-term programme cycles with longitudinal evaluations would be key to not only expand the research basis but also create persisting changes.

5.2 Critical Reflections and further research

5.2.1 Methodological reflections

Research questions

The longevity of BC or questions around it might not be a recent phenomenon but the research on the topic is extremely scarce, especially in the domain of SC. Even if calls for BC and reducing consumption have been growing, and multiple papers have recognised the short-term nature of the programmes as a challenge, research specifically focusing on the aspect of longevity is extremely scarce. Research instead has focused on various models for BC, and which can work better with very little distinction of the short-term and long-term change. This has led the author to research the longevity of BC from an intervention design perspective and

asking why do programmes fail and how can better programmes be designed. From the onset of this paper, no specific behaviour was chosen as a focus by the author. This was a conscious decision to look at the basic building blocks of programmes instead which can be replicated for a variety of behaviours instead of focusing on a specific behaviour. However, the author completely understands that the strategy for behaviour would vary based on the behaviour. Further to this, no specific geographic scope was chosen for the programme since the lack of long-term change for SC is a transboundary phenomenon, also explained by the geographical diversity of interviewees and their interest to speak on the topic, it was considered pertinent to not put geographical limits on the study.

Limitations of using interviews

Using interviews as the only source of data collection comes with its limitations, affecting the reliability of the results. The perception of interviewees and their inputs are filtered through their views, and their interest in the outcomes of the study might have influenced their responses (Blaikie & Priest, 2019). Since most of the interviewees were programme designers from academia or civil society organisations that usually lack funding, this might have influenced their responses. Furthermore, Blaikie & Priest (2019) note that the interviewees may not articulate their views completely which might have compromised the author's ability to create fair comparisons between literature and the interviewees' data.

The interviewees selected for the study, the disciplines they represent, and their profession should be kept in mind while interpreting the results of the thesis. Also, while the interviewees have played important role in designing programmes or interventions on BC, the author recognises that the study could have also benefited from a policy perspective that was missing. The input of policymakers would have added an extra dimension to the study as getting their perspective on how they view both BC and SC would have added more strength to the findings. As the thesis itself contends higher engagement with the target group in programmes addressing BC, the author realises that potentially having contact with individuals who have participated in programmes addressing BC would have provided a deeper insight on where the programme failed for them. Finally, in the process of conducting interviews, the author realised that the time allocated per interview was a bit short and the results would have benefited from slightly longer interviews.

5.2.2 Further research directions

Based on the findings, this section outlines the directions for further research which can benefit BC for SC. Firstly, the study gives a very preliminary analysis for the failure of programmes addressing BC further research is still required on the aspect of longevity and how can long-term change be created for SC. Further research can also look at the role of each of the individual factors identified in this paper or look for new factors which may have been missed out. Explorations on the validity of creating longitudinal evaluations for programmes addressing BC, and the length of the programmes would also be interesting research directions to create a deeper understanding. Getting the perspective of individuals would also benefit research around SC and BC.

This paper also presents a first approach in literature to use the COM-B framework for SC and provides a very preliminary analysis of the topic. Further research can map barriers and opportunities for behaviours that have a high impact on SC such as flying, and adoption of meat and dairy-free diets to assist programme designers in creating holistic interventions. As the paper also discusses specific dimensions described by participants in different parts of the COM-B framework, further research can also look at the evaluation of the validity of specific approaches such as the role of identity in breaking habits and creating persisting change.

Finally, field-testing the COM-B framework for behaviours relevant to SC is another interesting area for future research associated with the topic.

6 Conclusions

6.1 Main findings

The objective of this research has been to investigate the failure of programmes addressing BC in creating long-term change for SC and how can better programmes be created which can create long-term change. For this purpose, the paper has taken a deductive methodological approach to first look at the literature to identify the causes leading to this failure and identifying COM-B as an appropriate framework for creating long-term change. The causes identified from the literature were tested with semi-structured interviews to take a practitioner perspective and create recommendations for practitioners and academia.

The findings show that programmes addressing BC have suffered from undertheorising of behaviours which they are seeking to change which has created a partial picture of the behaviour to be changed. To address this, there is a requirement to use a better framework which can assist practitioners in better understanding the behaviour. This would ultimately mean that the new programmes would ultimately be used multiple interventions and involve multiple stakeholders instead of relying on single approaches. The research also identifies moving towards pro-social or community-driven approaches which seek to create bottom-up movements for change where social norms play an important role.

There is also a need for larger engagement of the target group in the programme through more interactive programme designs where individuals are more than passive participants in an experiment as it has been identified that people need to be aware of the change for it to be long-term. Further to this, programme designers can benefit from approaches such as segmentation to better understand the target group and create more targeted interventions for different groups. There is a need to also have better evaluations that focus on the outcomes and impacts of the programme over outputs. The outcomes and impacts would combine qualitative measurements through face-to-face interactions preferably combined with questionnaires and an analysis of the environmental impact created from the programme. Finally, as longevity is a core aspect for this paper, it is identified that behaviour is a slow-long term process and short programmes with evaluations right after the programme can say little about the longevity of the change. Thus, programmes can benefit from long-term planning cycles with longitudinal evaluations over 5-6 years which can help programme designers understand the process of change better and also include aspects of well-being in evaluations.

Since holistic frameworks which are easy to understand and can assist programme designers in creating a holistic picture of the behaviour to be changed have been lacking, the research has also attempted to utilise the COM-B framework from the domain of public health. The framework is yet to be utilised in the domain of SC and based on the semi-structured interviews, the framework can help to understand the process of change better. Creating a holistic picture of the behaviour to be changed is paramount to create persisting change as it can help in identifying appropriate barriers and opportunities and not rely on common sense understanding of behaviour. Based on the framework, Capability would involve approaches to which seek to increase the information, knowledge, and skills of participants with a lot of attention paid to how the information is conveyed. Opportunity would involve a focus on the infrastructures and choice defaults which have a role in breaking habits and creating more social opportunities by capitalising on pro-social approaches. Finally, motivation would include intrinsic motivations such as well-being, health, sense of self, and identity and the value of breaking habits by providing new contexts or utilising windows of opportunities.

6.2   Recommendations

Based on the above findings, recommendations are created for practitioners and academia.

6.2.1   For Practitioners

The study constitutes the first step into rethinking BC as a long-term process by creating a differentiation between short-term and long-term change and specifically highlights important areas which can be improved from a programme design perspective.

For programme designers – It is recommended to use frameworks such as COM-B which can assist in creating a holistic perspective on behaviour and focusing on multi-intervention and multi-stakeholder approaches. Partnerships would be extremely important in the process. It is also recommended to create pro-social programmes and increase engagement with the target group and create an appropriate target group. Evaluations need to be paid more attention to and looking at outcomes and impacts for creating stronger evidence for change. It is also recommended to aspects of well-being in evaluations along with spillovers. Finally, more focus on long-term evaluations is required which would require long-term planning cycles which as understood from the findings is also dependent on resource issues.

For policymakers – Since the change would require multiple stakeholders and multiple intervention techniques, behavioural change for SC need to be looked like a policy package instead of only information based or economic approaches. While there are merits in using nudging approaches, they do little to reduce consumption in absolute amounts. Finally, long-term planning cycles are required to create persisting changes in this policy package.

6.2.2   Academic contributions and recommendations for further research

This thesis contributed to further the research on the longevity of BC for the domain of SC by identifying potential causes for failure and recommending ways to design better programmes. The study highlights that programme's addressing BC can benefit from long-time planning cycles and a holistic perspective on behaviour. Long-term planning cycles can help in creating long-term evaluations which have been lacking in the field of SC and other pro-environmental behaviours. It is further highlighted that programme designers can benefit from using pro-social approaches and by putting more impetus into evaluations. Lastly, the research utilises COM-B is a framework that has not been used in the domain of SC and creates only a very preliminary picture. Further research is needed on testing the findings highlighted in the paper. Finally, more research could be done on mapping specific SC behaviours using the COM-B framework to identify specific barriers and opportunities.

Bibliography

Ajzen, I. (1991). *The Theory of Planned Behavior.* https://www.dphu.org/uploads/attachements/books/books_4931_0.pdf

Ajzen, I., & Fishbein, M. (2000). Attitudes and the Attitude-Behavior Relation: Reasoned and Automatic Processes. *European Review of Social Psychology - EUR REV SOC PSYCHOL*, *11*, 1–33. https://doi.org/10.1080/14792779943000116

Akenji, L. (2014). Consumer scapegoatism and limits to green consumerism. *Journal of Cleaner Production*, *63*, 13–23. https://doi.org/10.1016/j.jclepro.2013.05.022

Akenji, L., & Chen, H. (2016). *A Framework for Shaping Sustainable Lifestyles—Determinants and Strategies.* https://www.oneplanetnetwork.org/sites/default/files/a_framework_for_shaping_sustainable_lifestyles_determinants_and_strategies_0.pdf

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics*, *95*(9–10), 1082–1095. https://doi.org/10.1016/j.jpubeco.2011.03.003

Allcott, H., & Rogers, T. (2014). The Short-Run and Long-Run Effects of Behavioral Interventions: Experimental Evidence from Energy Conservation. *American Economic Review*, *104*(10), 3003–3037. https://doi.org/10.1257/aer.104.10.3003

Asensio, O. I., & Delmas, M. A. (2015). Nonprice incentives and energy conservation. *Proceedings of the National Academy of Sciences*, *112*(6), E510–E515. https://doi.org/10.1073/pnas.1401880112

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295X.84.2.191

Beattie, G., & McGuire, L. (n.d.). *Consumption and climate change: Why we say one thing but do another in the face of our greatest threat.* 46.

Blaikie, N., & Priest, J. (2019). *Designing Social Research.pdf.*

Bryman, A. (2012). *Social Research methods (4th ed.).* Oxford University Press.

Burns, S., & Savan, B. (2018). The Post-Intervention Persistence of Energy Conservation Behaviors: An Evaluation of the 'Start Green' Program. *Sustainability*, *10*(3), 809. https://doi.org/10.3390/su10030809

Corner, A., Graham, H., & Whitmarsh, L. (2019). *Engaging the public on low-carbon lifestyle change.* https://cast.ac.uk/wp-content/uploads/2020/01/CAST-briefing-01-Engaging-the-public-on-low-carbon-lifestyle-change-min.pdf

de Weerd, H., & Degens, N. (2019). Putting the Long-Term into Behavior Change. In M. Gentile, M. Allegra, & H. Söbke (Eds.), *Games and Learning Alliance* (Vol. 11385, pp. 71–81). Springer International Publishing. https://doi.org/10.1007/978-3-030-11548-7_7

De Young, R. (1993). *Changing behaviour and making it stick—The conceptualization and management of conservation behaviour.* https://deepblue.lib.umich.edu/bitstream/handle/2027.42/66636/10.1177_00139165 93253003.pdf?sequence=2&isAllowed=y

DEFRA. (2008). *A Framework for Pro-Environmental Behaviours.*

Dey, I. (1993). *Qualitative Data Analysis—A User Friendly Guide for Social Scientists.*

Dwyer, W. O., Leeming, F. C., Cobern, M. K., Porter, B. E., & Jackson, J. M. (1993). Critical review of behavioral interventions to preserve the environment: Research since 1980. *Environment and Behavior*, *25*(3), 275–321. https://doi.org/10.1177/0013916593255001

Evans, D., McMeekin, A., & Southerton, D. (2012). *Sustainable Consumption, Behaviour Change Policies and Theories of Practice.* 17.

Factor 10. (2000). *Factor 10 Manifesto.* 15.

Fischer, D., Stanszus, L., Geiger, S., Grossman, P., & Schrader, U. (2017). Mindfulness and sustainable consumption: A systematic literature review of research approaches and findings. *Journal of Cleaner Production*, *162*, 544–558. https://doi.org/10.1016/j.jclepro.2017.06.007

French, J. (2017). The Importance of Segmentation in Social Marketing Strategy. In *Segmentation in Social Marketing: Process, Methods and Application* (pp. 25–40). https://doi.org/10.1007/978-981-10-1835-0_3

Fuchs, D. A., & Lorek, S. (2005). Sustainable Consumption Governance: A History of Promises and Failures. *Journal of Consumer Policy*, *28*(3), 261–288. https://doi.org/10.1007/s10603-005-8490-z

Geiger, S. M., Fischer, D., Schrader, U., & Grossman, P. (2020). Meditating for the Planet: Effects of a Mindfulness-Based Intervention on Sustainable Consumption Behaviors. *Environment and Behavior*, *52*(9), 1012–1042. https://doi.org/10.1177/0013916519880897

Giddens, A. (1984). *The constitution of society.*

Girod, B., Vuuren, D., & Hertwich, E. (2014). Climate policy through changing consumption choices: Options and obstacles for reducing greenhouse gas emissions. *Global Environmental Change*, *25*. https://doi.org/10.1016/j.gloenvcha.2014.01.004

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research*, *35*(3), 472–482. https://doi.org/10.1086/586910

Gore, T. (2020). *Confronting Carbon Inequality: Putting climate justice at the heart of the COVID-19 recovery.* 12.

Green Funders Network. (2019, June). *Where the Green Grants Went—Patterns of UK Funding for Environmental and Conservation Work.* https://www.greenfunders.org/wp-content/uploads/2019/06/WTGGW7.pdf

Grubler, A., Wilson, C., Bento, N., Boza-Kiss, B., Krey, V., McCollum, D. L., Rao, N. D., Riahi, K., Rogelj, J., De Stercke, S., Cullen, J., Frank, S., Fricko, O., Guo, F., Gidden, M., Havlík, P., Huppmann, D., Kiesewetter, G., Rafaj, P., … Valin, H. (2018). A low energy demand scenario for meeting the 1.5 °C target and sustainable development goals without negative emission technologies. *Nature Energy*, *3*(6), 515–527. https://doi.org/10.1038/s41560-018-0172-6

Gynther, L., Mikkonen, I., & Smits, A. (2012). Evaluation of European energy behavioural change programmes. *Energy Efficiency*, *5*(1), 67–82. https://doi.org/10.1007/s12053-011-9115-9

Hargreaves, T. (2011). Practice-ing behaviour change: Applying social practice theory to pro-environmental behaviour change. *Journal of Consumer Culture*, *11*(1), 79–99. https://doi.org/10.1177/1469540510390500

Heiskanen, E., & Laakso, S. (2019). *Editing out unsustainability from consumption: From information provision to nudging and social practice theory*. Edward Elgar Publishing Ltd.

Heiskanen, E., & Matschoss, K. (2016). Consumers as innovators in the electricity sector? Consumer perceptions on smart grid services. *International Journal of Consumer Studies*, *40*(6), 665–674. https://doi.org/10.1111/ijcs.12280

Herrero, L. (2008). *Viral Change: The Alternative to Slow, Painful and Unsuccessful Management of Change in Organisations*.

Hoewe, J. (2020). Toward a theory of media priming. *Annals of the International Communication Association*, *44*(4), 312–321. https://doi.org/10.1080/23808985.2020.1815232

IISD. (1994). *Oslo Roundtable on Sustainable Consumption and Production*. https://enb.iisd.org/consume/oslo004.html

Jackson, T. (2005). Live Better by Consuming Less?: Is There a "Double Dividend" in Sustainable Consumption? *Journal of Industrial Ecology*, *9*(1–2), 19–36. https://doi.org/10.1162/1088198054084734

Jackson, T. (2009). *Prosperity without growth: Economics for a finite planet*. Earthscan.

Jackson, T. (2010). Prosperity without Growth? – The transition to a sustainable economy. *Journal of Cleaner Production*, *18*(6), 596–597. https://doi.org/10.1016/j.jclepro.2009.07.001

Jacobs, M. (2016, May 15). *What Happens When You Try to Wean America Off Cheap Oil*. The Atlantic. https://www.theatlantic.com/politics/archive/2016/05/american-oil-consumption/482532/

John, P. (2018). *How Far to Nudge? - Assessing Behavioural Public Policy*.

Kahneman, D. (2011). *Thinking, fast and slow*.

Katzev, R. D., & Johnson, T. R. (1984). Comparing the Effects of Monetary Incentives and Foot-in-the-Door Strategies in Promoting Residential Electricity Conservation. *Journal of Applied Social Psychology*, *14*(1), 12–27. https://doi.org/10.1111/j.1559-1816.1984.tb02217.x

Lehner, M., Mont, O., & Heiskanen, E. (2015). Nudging—A promising tool for sustainable consumption behaviour? *Journal of Cleaner Production*, *134.* https://doi.org/10.1016/j.jclepro.2015.11.086

Lorek, S., & Fuchs, D. (2013). Strong sustainable consumption governance – precondition for a degrowth path? *Journal of Cleaner Production*, *38*, 36–43. https://doi.org/10.1016/j.jclepro.2011.08.008

Lorek, S., & Spangenberg, J. H. (2014). Sustainable consumption within a sustainable economy – beyond green growth and green economies. *Journal of Cleaner Production*, *63*, 33–44. https://doi.org/10.1016/j.jclepro.2013.08.045

McDonagh, L. K., Saunders, J. M., Cassell, J., Curtis, T., Bastaki, H., Hartney, T., & Rait, G. (2018). Application of the COM-B model to barriers and facilitators to chlamydia testing in general practice for young people and primary care practitioners: A systematic review. *Implementation Science*, *13*(1), 130. https://doi.org/10.1186/s13012-018-0821-y

McManus, J., Constable, M., Bunten, A., & Chadborn, T. (2018). *Improving people's health: Applying behavioural and social sciences to improve population health and wellbeing in England.* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/744672/Improving_Peoples_Health_Behavioural_Strategy.pdf

Meadows, D. H. (2008). *Thinking in Systems: A Primer.*

Menon, A., & Menon, A. (1997). Enviropreneurial Marketing Strategy: The Emergence of Corporate Environmentalism as Market Strategy. *Journal of Marketing, 61(1), 51–67.* https://doi.org/10.1177/002224299706100105

Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, *6*(1), 42. https://doi.org/10.1186/1748-5908-6-42

Moloney, S., Horne, R. E., & Fien, J. (2010). Transitioning to low carbon communities—from behaviour change to systemic change: Lessons from Australia. *Energy Policy*, *38*(12), 7614–7623. https://doi.org/10.1016/j.enpol.2009.06.058

Moloney, S., & Strengers, Y. (2014). 'Going Green'?: The Limitations of Behaviour Change Programmes as a Policy Response to Escalating Resource Consumption. *Environmental Policy and Governance*, *24*(2), 94–107. https://doi.org/10.1002/eet.1642

Nicholos, K., & Wynes, S. (2019, March 20). *Changing Behavior to Help Meet Long-Term Climate Targets*. World Resources Institute. https://www.wri.org/climate/expert-perspective/changing-behavior-help-meet-long-term-climate-targets

Nicolau, M., & Strube, R. (2019). *Accelerating change towards the sustainable behaviours that really matter – with NGOs and beyond!* https://www.aochange.org/wp-content/uploads/2019/09/AoC_final_report_Round1.pdf

Nisa, C. F., Bélanger, J. J., Schumpe, B. M., & Faller, D. G. (2019). Meta-analysis of randomised controlled trials testing behavioural interventions to promote household action on climate change. *Nature Communications*, *10*(1), 4545. https://doi.org/10.1038/s41467-019-12457-2

OECD. (2015). *Carbon Dioxide Emissions embodied in International Trade*. https://stats.oecd.org/Index.aspx?DataSetCode=IO_GHG_2015

One Planet Network. (2016, March 10). *Sustainable Lifestyles and Education*. One Planet Network. https://www.oneplanetnetwork.org/sustainable-lifestyles-and-education

O'Rourke, D., & Lollo, N. (2015). Transforming Consumption: From Decoupling, to Behavior Change, to System Changes for Sustainable Consumption. *Annual Review of Environment and Resources*, *40*(1), 233–259. https://doi.org/10.1146/annurev-environ-102014-021224

Osbaldiston, R., & Schott, J. P. (2012). Environmental Sustainability and Behavioral Science: Meta-Analysis of Proenvironmental Behavior Experiments. *Environment and Behavior*, *44*(2), 257–299. https://doi.org/10.1177/0013916511402673

Pichert, D., & Katsikopoulos, K. V. (2008). Green defaults: Information presentation and pro-environmental behaviour. *Journal of Environmental Psychology*, *28*(1), 63–73. https://doi.org/10.1016/j.jenvp.2007.09.004

Puska, P., & Ståhl, T. (2010). Health in All Policies—The Finnish Initiative: Background, Principles, and Current Issues. *Annual Review of Public Health*, *31*(1), 315–328. https://doi.org/10.1146/annurev.publhealth.012809.103658

Ripple, W. J., Wolf, C., Newsome, T. M., Galetti, M., Alamgir, M., Crist, E., Mahmoud, M. I., Laurance, W. F., & 15, 364 scientist signatories from 184 countries. (2017). World Scientists' Warning to Humanity: A Second Notice. *BioScience*, *67*(12), 1026–1028. https://doi.org/10.1093/biosci/bix125

Rockström, J., Steffen, W., Noone, K., Persson, Å., Chapin, F. S., Lambin, E. F., Lenton, T. M., Scheffer, M., Folke, C., Schellnhuber, H. J., Nykvist, B., de Wit, C. A., Hughes, T., van der Leeuw, S., Rodhe, H., Sörlin, S., Snyder, P. K., Costanza, R., Svedin, U., … Foley, J. A. (2009). A safe operating space for humanity. *Nature*, *461*(7263), 472–475. https://doi.org/10.1038/461472a

Schwartz, S. H. (1977). Normative Influences on Altruism11This work was supported by NSF Grant SOC 72-05417. I am indebted to L. Berkowitz, R. Dienstbier, H. Schuman, R. Simmons, and R. Tessler for their thoughtful comments on an early draft of this chapter. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology* (Vol. 10, pp. 221–279). Academic Press. https://doi.org/10.1016/S0065-2601(08)60358-5

Shove, E. (2010). Beyond the ABC: Climate Change Policy and Theories of Social Change. *Environment and Planning A: Economy and Space*, *42*(6), 1273–1285. https://doi.org/10.1068/a42282

Shove, E. (2016). *Steering by accident: Unintended governance strategies in action*. http://www.demand.ac.uk/wp-content/uploads/2016/03/DEMAND2016_Full_paper_42-Shove.pdf

Shove, E., Pantzar, M., & Watson, M. (2012). *The Dynamics of Social Practice—Everyday Life and how it Changes*.

Sparkman, G., & Walton, G. M. (2017). Dynamic Norms Promote Sustainable Behavior, Even if It Is Counternormative. *Psychological Science*, *28*(11), 1663–1674. https://doi.org/10.1177/0956797617719950

Staats, H., Harland, P., & Wilke, H. A. M. (2004). Effecting Durable Change: A Team Approach to Improve Environmental Behavior in the Household. *Environment and Behavior, 36*(3), 341–367. https://doi.org/10.1177/0013916503260163

Stern, P. C. (2000). New Environmental Theories: Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues, 56*(3), 407–424. https://doi.org/10.1111/0022-4537.00175

Stoknes, P. E. (2015). *What We Think About When We Try Not To Think About Global Warming: Toward a New Psychology of Climate Action.*

Strube, R., & Nicolau, M. (2018). *What the most influential NGOs working on climate change and sustainability have to say about behaviour change.* https://www.aochange.org/wp-content/uploads/2018/03/AOC_Survey_Results.pdf

Swire-Thompson, B., DeGutis, J., & Lazer, D. (2020). Searching for the Backfire Effect: Measurement and Design Considerations. *Journal of Applied Research in Memory and Cognition, 9*(3), 286–299. https://doi.org/10.1016/j.jarmac.2020.06.006

Tan, X., Wang, X., & Zaidi, S. H. A. (2019). What drives public willingness to participate in the voluntary personal carbon-trading scheme? A case study of Guangzhou Pilot, China. *Ecological Economics, 165,* 106389. https://doi.org/10.1016/j.ecolecon.2019.106389

Thaler, R. H., & Sunstein, C. R. (2008). *Nudge: Improving decisions about health, wealth, and happiness* (pp. x, 293). Yale University Press.

Thomas, C., & Sharp, V. (2013). Understanding the normalisation of recycling behaviour and its implications for other pro-environmental behaviours: A review of social norms and recycling. *Resources, Conservation and Recycling, 79,* 11–20. https://doi.org/10.1016/j.resconrec.2013.04.010

United Nations. (2016). About the Sustainable Development Goals. *United Nations Sustainable Development.* https://www.un.org/sustainabledevelopment/sustainable-development-goals/

United Nations. (2021). *Transforming our world: The 2030 Agenda for Sustainable Development | Department of Economic and Social Affairs.* https://sdgs.un.org/2030agenda

United Nations Environment Programme. (2019). *The emissions gap report 2019*.

Verplanken, B. (2006). Beyond frequency: Habit as mental construct. *British Journal of Social Psychology*, *45*(3), 639–656. https://doi.org/10.1348/014466605X49122

Verplanken, B., & Wood, W. (2006). Interventions to Break and Create Consumer Habits. *Journal of Public Policy & Marketing*, *25*(1), 90–103. https://doi.org/10.1509/jppm.25.1.90

WWF. (2008). *Weathercocks & Signposts*. https://wwfint.awsassets.panda.org/downloads/weathercocks_report2.pdf

Yin, R. K. (2014). *Case Study Research: Design and Methods (2nd ed., Vol. 5)*. Sage Publications.

Appendix I – List of Interview Questions

Q1. Can you please describe your work and the work of your organization?

Q2. Have you been a part of designing an intervention or campaign that tries to influence behaviour?

Q3. What do you think are the factors or elements in programme design that affect behaviour change?

Q4. More precisely, and within the focus of my study, what do you think are the factors that affect the longevity of behaviour change and need to be accounted for in the programme design phase?

Q5. And is there a difference between the length of the programme and the desired length to change behaviours permanently?

Q6. Are there specific mechanisms/interventions in campaigns for de-freezing an old behaviour and freezing a new behaviour?

Q7. In literature, there is no cohesion as to the definition of long-term when it comes to behaviour change, and of course, this means that there is no cohesion on when the right time is to stop a programme. How do you define long-term behaviour change?

Q8. Sociology of consumption debates the role of individual behaviour change vs social or community-based approaches for behaviour change where social norms play an important role. In your experience what seems to work better especially when we want to focus on longevity?

Q9. Can targeting behaviour change in social groups to which people subscribe to (sports clubs, etc) be a valid approach for creating a long-term shift taking into account the importance of social norms and peer-support/peer pressure? Is this something that you have attempted to do? If *yes*, how was it accomplished and was it successful?

Q10. Alcohol and smoking prevention campaigns have been good examples of creating long-term behaviour change. What do you think has made them so successful and what learnings can we then apply to long-term behaviour change for sustainable behaviours?

Q11. When designing a programme are the latest research taken into account and are there mechanisms in the organization for collecting the latest advancements in research and practice?

Q12. Since I assume the goal of the campaigns/interventions your design is to create sustainability which is a long-term change in society and requires persistent transformation, so how do you go about achieving it? Is the focus on incremental changes through a step-wise approach?

Q13. What are your views on achieving change strategically – through the multiplication of many campaigns, through scaling up, or is there something that you have come across in your experience which works?

Q14. How often do you try to include the target group in your campaign design and planning? How is that facilitated and what is the purpose of such an inclusion?

Q15. How do you assess the effectiveness and efficiency of the campaigns you design? What 'indicators' are used? Is there any indicator for measuring the longevity of the programme or the longevity of the behaviour change being targeted by the programme?

Q16. The academic literature is heavily divided over the validity of individual behaviour change delivered through conventional practices and there is an increasing focus on using a more sociological approach that takes into account the social practices of individuals. Have you come across this approach? If *yes,* how do you think this influences the programme design for long-term behaviour change?

Bonus Questions –

Lack of finances/funding

Q. Assuming an ideal world where financing would not be a problem, what would it take to design a programme which can create a long-term shift in behaviours? Is it even possible?

Structural changes

Q. For certain lifestyle choices, such as vegan food choices, even with the availability of regulation and presence of goods and services, behaviour change would still be required as our idea of free society restricts heavy regulations on people's life. Can there be ways when we create ways where both behaviour and structural changes reinforce each other and enable persisting shifts?

Appendix II – Coding structure

Addressing long-term change	C1 – Theories on behaviour – holistic
	C2 – Individual vs social
	C3 – Target group engagement
	C4 – Evaluations
	C5 – Longevity C5.1 – Definitions C5.2 – Length of programmes C5.3 – Length of evaluations C5.4 – Funding and resources

COM-B	C1 – Capability C1.1 – Information, knowledge, skills
	C2 – Opportunity C2.1 – Physical Opportunity C2.2 – Social Opportunity
	C3 – Motivation C3.1 – Automatic Motivation C3.2 – Reflective Motivation

Appendix III – Keywords

For academic literature, different combinations of the below keywords were used on LubCat, Scopus, and google scholar-

"Behaviour change" "Sustainable consumption" "Durability" "Longevity" "persistence" "pro-environmental behaviours" "behaviour change programmes" "sustainable lifestyles" "persisting" "durable"

For grey literature, reports by UNEP, CSCP, UN, Sitra, IGES, and other relevant organisations were searched on google. Reports were searched with the keywords -

"sustainable consumption"; "behaviour change" and "sustainable lifestyles"

Appendix IV – Interview Participants

Key	Profession	E-mail or zoom interview	Country
Participant 1	Practitioner	Zoom	Sweden
Participant 2	Practitioner	Zoom	Sweden
Participant 3	Practitioner	Zoom	Indonesia
Participant 4	Practitioner	Zoom	Sweden
Participant 5	Practitioner	Zoom	Belgium
Participant 6	Practitioner/Academic	E-mail	Finland
Participant 7	Practitioner	Zoom	Canada
Participant 8	Practitioner/Academic	Zoom	UK
Participant 9	Practitioner/Academic	Zoom	USA
Participant 10	Practitioner – Policymaker	E-mail	Sweden
Participant 11	Practitioner/Academic	Zoom	UK/Denmark
Participant 12	Practitioner/Academic	Zoom	UK
Participant 13	Practitioner	Zoom	Hungary
Participant 14	Practitioner/Academic	Zoom	UK
Participant 15	Practitioner/Academic	Zoom	Germany
Participant 16	Practitioner	Zoom	Germany
Participant 17	Practitioner/Academic	Zoom	Belgium
Participant 18	Practitioner/Academic	E-Mail	Finland
Participant 19	Practitioner	Zoom	UK
Participant 20	Practitioner	Zoom	Finland