Transitioning beyond single-use plastic drinks cups: An emergent social marketing case study in Scotland

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1.0 Problem generation and intervention aims

The focus of this intervention was litter, specifically marine litter in the form of plastic. 8million metric tons of global plastic waste enter the ocean from land-based sources each year (Morales-Caselles et al., 2021) killing 1 million sea birds and 100,000 sea mammals, turtles, and fish (Keep Britain Tidy, 2023). Much of this plastic pollution and litter is created by the food and beverage industry. In Argyll & Bute, the project's location, Marine Conservation Society (MCS) data (2022) shows significant eating/drinking litter collected on its beaches of which 91% is plastic. Eating 'on the go' has grown exponentially (Dorn and Stöckli, 2018; Janssen et al. 2018) accelerated by Covid restrictions (Chenarides et al., 2021) and alongside coffee culture (Ferreira et al., 2021) single-use plastic is embedded in our global consumption behaviour.

In the 3km radius around the Scottish town of Buteville[1], the project site, the MCS predicts there will be almost 1,000 single-use cups littering the shore each year. The frequency and volume of cup litter has risen sharply in Argyll & Bute since 2015 (see Figure 1). Plastic cups were only recorded from 2016 onwards but have become the most frequent type of cup recorded since. MCS Beachwatch (2022) surveys estimate a minimum of 255 cups on the Buteville area beaches at any given time, or around 960 cups a year; however, these estimates are conservative as they do not capture all sites. The reasons for such high levels of litter have not previously been studied in the town, but it is likely litter is exacerbated by the seasonal ebb and flow of the transient tourist population. The resident population almost trebles during peak tourism periods, local services struggle to empty bins and these overfull bins lead to further litter as wind, seagulls and other animals spread detritus across the town and beaches. Additionally, most takeaway packaging in Buteville does not get separated for recycling, and industrial composting is not available in the area, so the waste ends up in landfill, intensifying the environmental damage and proving costly to the local government (a process that will be banned from January 2025). The SPO's intention was to reduce the cost - climate and financial - of this by stopping litter at source by reducing the town's reliance on single-use cups. If the intervention was successful, it could reduce the single use plastic litter blighting the town and beaches, protecting the beauty and wildlife of the location for locals and visitors. It could also potentially provide a financial benefit to local businesses who could spend less on single-use cups and waste management and reduce the work of the local council dealing with refuse.

Insert Here Figure 1: Single-use Cup Litter Argyll & Bute.

(Source: Marine Conservation Society, 2022)

Recent research has acknowledged that comparing the environmental performance between plastics and reusables is challenging since it is difficult to conduct an effective and objective comparison (Cottafava et al., 2021). Factors such as washing techniques, technology used (hand vs dishwasher), composition materials (steel, plastic, paper, or china), journeys and number of uses per cup all need to be considered in any comparison calculations, as such specific context is a critical aspect when analysing reusables vs single plastics usage. (Cottafava et al., 2021). While recognising the need for greater life cycle analysis to facilitate comparison between single-use and reusable products (Paspaldzhiev et al., 2018), science and policy increasingly favours reusable over disposable cups for reaching net zero targets (Poortinga et al., 2019). One solution is to replace single-use with reusable cups but changing consumer behaviour towards reusables has proven challenging (Tarabashkina et al., 2022), with success primarily achieved by social marketing interventions in limited controllable contexts. One study in a 'closed' context at an

[1] Buteville is used as an anonymisation of the actual town name.

Australian university examined students' intentions to use a reusable cup, aiming to identify predictors of behaviour (Novoradovskaya et al., 2020). Age, intention to reuse a cup, and environmental values were elicited as predictive of reusable cup choice, as was habit, but this study only examined intention not actual behaviour. Poortinga et al., (2019) in their rapid review of single use cup studies using a charging strategy, identified evidence from (among other organisations) a trial at a Scottish hospital offering incentives such staff loyalty cards and free reusable cups to offset an additional £0.10 single use cup charge; drinks sales in reusable cups increased from 1% to 43% between August and September 2018. Camacho et al., (2021) suggested a template for a rental reusable cup model at ecodisco music venues, claiming environmental and financial benefits could be realised, while offering solutions to identified pre-trial industry barriers such as up-front costs, extra work for staff and a lack of storage. However, results from actual implementation were untested. Cities such as Freiburg in Germany have introduced reusable cups as an alternative to takeaway disposable cups (Loschelder et al., 2019), meanwhile UK universities such as Brighton (MyCup, 2023) and Birmingham (Duncan, 2021) have trialled their own reusable cup initiatives. Other initiatives, for example at the University of York, have focused on making sure that single-use coffee cups are separated for full recycling (University of York, 2022). While the uptake of reusable cups in these trials has increased, the widespread use of disposable cups remains stubbornly entrenched (Poortinga and Whitaker, 2018).

This study moves beyond primarily closed context studies and examines the phenomenon in an open, 'whole town' everyday setting. We assess a community social marketing project in a Scottish coastal town negatively impacted by single-use food plastic litter and marine pollution. Here the intervention sought to encourage the use of reusable coffee cups, in turn generating less plastic waste. The intervention (detailed below) included promotions and PR to encourage the use of renewables and a supply of free reusable coffee cups given to participating cafés /takeaways which were sold at a discounted cost to consumers.

We sought not only to examine the outcome of this intervention and whether it has successfully altered behaviour, but also to examine, via a Context-Mechanism-Outcome (CMO) framework process evaluation, the key elements that led to the outcomes of the intervention, both positive and negative, including the role of the SPO in the network of activities. In doing so the paper makes several contributions. Firstly, we make a practical contribution as the project provides a live case study in a whole community setting, integrating multiple stakeholders, of an intervention to encourage use of reusable coffee cups in a non-controllable, non-experimental environment in juxtaposition to previous research interventions in this area. Secondly, we provide a theoretical contribution, assessing both the outcome and process of the intervention using Pawson and Tilley's (2004) realist evaluation theory – Context Mechanism Outcome framework. Our final contribution is methodological (Bergh et al, 2022) where we demonstrate the process of using citizen science 'messy' data collection, a technique involving multiple, fragmented sources from a range of stakeholders, an approach frequently used and valued in conservation studies (Dobson et al., 2020; Rambonnet et al., 2019). While less common in social science and humanities, the challenges to data collection faced by many researchers during Covid-19 has focused attention on the possibilities of messy data to deliver unexpected and positive outcomes for communities and researchers (Gratton et al., 2020) as well as democratising science and advancing its responsibility towards society (Tauginienė et al., 2020). Salk (2020, p.413) has called for a "trans-disciplinary embrace of messiness to accelerate…… [research] progress." Dobson et al., (2020) note that messy data has advantages, including the potential for low cost, easy access, high volume, and real-world relevance, and can often be the only source of information about the phenomenon being studied. The approach represents co-creative platforms for community voice and stakeholder involvement providing insights and advantages over more structured data gathered by traditional scientific research (Follett and Strezov, 2015). On the negative side Dobson et al., (2020) acknowledge such data is vulnerable to inescapable forms of biases that are challenging to mitigate. Yet if social science is to contribute to the resolution of climate change and sustainability challenges, it is

likely citizen derived messy data will increasingly feature in our future research and learning how to work with it is important.

2.0 Working with stakeholders

The current study was part of a group of projects directed to support climate change and funded by a government community science grant. A community of practice was formed between the project groups to share practice and exchange knowledge, meeting online and in person throughout the project delivery. While this community did not directly influence the project it provided support, training and expertise that had an indirect influence on the intervention. The Social Purpose Organisation (SPO) – a charitable environmental social enterprise in Buteville was a facilitator – led the trial and received the funding for the project. Within the SPO the trial was led by a Beaches and Marine Litter Project Education Officer (BMLPE), a co-author of this paper, and the individual who through ad hoc consultation with volunteers, businesses, and local people identified the critical problem of the plastic litter impacting on the local community, and the change that was needed. They took ownership of and directed the process of bringing about the desired change to reusable cups and identified and built relationships with all the collaborating stakeholders involved, some of whom were new contacts, others existing contacts from past projects. The BMLPE was supported by the small team of SPO staff, but they were largely focused on other projects. It should be noted that the project lead's employment contract was limited to school term times, reducing availability to promote the trial in the summer holiday weeks from Jul until mid-August. The BMLPE worked directly with several café/takeaway small businesses, as the primary target audience, to promote the intervention, providing them with free reusable coffee cups and supporting any issues they had. 5 agreed initially to be involved, with a few joining later; in total the BMLPE approached 23 businesses to seek their involvement. Both the BMLPE and the small businesses communicated via promotions and face to face discussions with the consumer participants, who were encouraged to choose reusable cups. Communications directly to consumers, as a secondary target audience, included posts and leaflets to staycation initiatives and holiday accommodation and a social media campaign. Additionally, the BMLPE and the SPO attempted to work closely with a range of other local stakeholders including government and local schools etc., as collaborators, but the responses were often non-existent with very little practical help or tangible support forthcoming. Communications were sporadic and promised support never materialized such that the process was entirely driven by the SPO. Only the local high school actively participated in planning a scavenger hunt to support the trial, and the local newspaper provided a start-and-end of project story.

Bringing the community's problems into academic scope through this 'outside-in' process (Scott and Mende, 2022) to address the environmental and social challenges, the BMLPE was supported throughout by two UK based academics as passive observers (Creswell and Creswell, 2017), both of whom had prior social marketing experience. The academics did not design the intervention, or delivery, but joined several weeks in to guide, troubleshoot and provide advice and support, drawing on empirical research in this field and their own knowledge. The intervention represents an unusual practitioner-academic collaboration, one that is different to those normally led by academics conducting research 'on' practitioners. We all shared the goal of wanting to reduce single-use plastic; our perspective as academics was research-led and we knew that the rigour of the intervention design and data collection did not follow research conventions we would have chosen had we been leading this from the outset. However, the SPO officer had a pragmatic agenda to work with the resources and limitations they faced. We all pulled together to make the best of the situation, so while we came at this with different perspectives, we had a shared goal.

Finally, many of the stakeholders acted as informants for evaluating the success of the intervention as discussed below. The structure of the project teams and network can be seen in Figure 2.

Insert Here: Figure 2: Project team and network.

(Source: Authors)

3.0 Process and timeline

Figure 3 illustrates the project timeline and key activities. The project broadly followed, although not strictly, the five steps of community-based social marketing suggested by McKenzie-Mohr and Schultz (2014): (1) selecting the behaviour to be targeted; (2) identifying the barriers and benefits to the behaviour; (3) designing a strategy using behaviour change; (4) piloting the strategy with a small group within the community; (5) evaluating the results.

Steps 1-3 were dealt with simultaneously in the planning and set up stage (planned for April/May 2022 but delayed until June 2022). Behaviour selection (Step 1) had taken place prior to the project start, as noted above, and focused on litter in the locality and reducing this at the point of sale through encouraging consumers to choose reusable cups. In Step 2 evidence was collected about the scale and types of litter via a call out on Facebook to post litter pictures and locations, discussions with beach clean-up volunteers and discussions with local waste management facilities and the local community. It was clear that benefits to the local community would be reduced litter, reduced need for volunteer litter collections and a more pleasant and clean environment. In terms of barriers to taking part in the intervention for the local businesses, worries about hygiene and a risk of losing custom were key. No data was formally collected on potential barriers to them taking part, due to a lack of resource, although the evaluation, see step 4 and discussion in section 4.0 below, notes what emerged during the trial.

During these initial steps, the project lead canvassed businesses in the town face to face and by email, and initially recruited 5 local businesses selling takeaway hot drinks to participate in the trial. Later in the trial further businesses joined in and agreed to gather data, although did not sell the donated reusable cups (see below).

Insert Here: Figure 3: Project details and timeline.

(Source: Authors)

After the planning and set up stage (Step 3) the actual trial went as follows (Step 4). Each participating small business was given a supply of reusable coffee cups[2] which normally retail for £11.95 but the businesses were asked to sell these at the reduced price of £4. At the outset, the local council offered to sponsor the inclusion of a 'Love Buteville' logo on the cups in partnership with BID4Buteville. However, discussions became protracted, and as the launch date of the trial passed without agreement from the council, and only sporadic communications from them, the project lead supplied the cups without any logos. Businesses were also given the option to place their own brand logo on the cups for a fee, but none took up the opportunity as costs were prohibitive.

The businesses were encouraged to prioritise reusable cups – either by sales of the Ecoffee Cup® or allowing people to fill their own reusable cups. At the request of the BLMPE officer and businesses a reusable cup script was co-designed with the academics to support the staff and help manage their interactions with customers when it was suggested they buy a cup. The trial was supported promotionally both off and online, including social media posts with the straplines 'Join the Trial' and 'Have you got your cup today?' Leaflets and posters were produced and circulated to the local businesses and other partners including links to staycation initiatives and holiday accommodation. All the promotion materials and the social media campaign were designed and delivered by the project lead,

[2] The SPO secured a donation of 2500 reusable cups from Ecoffee Cup®. Ecoffee Cup® cups are a composite of natural fibre, corn starch and a plant-based resin, materials that are not scarce and do not require environment compromising farming (Ecoffee Cup®, 2023).

who also worked with Buteville High School to develop a Scavenger Hunt[3] to promote the trial, with each participating business used as a scavenger 'clue' site, and a feature in The Buteville Times newspaper highlighted the trial in June. The BMLPE officer undertook multiple discussions with local businesses and stakeholders helping to educate and inform stakeholders and participants about how recyclable different container choices were and held discussions regarding waste and recycling policies with the local council. The trial ended in September 2022. Stage 5 (evaluation) is contained within section 4.0 of this paper.

The evaluation of the intervention (see section 4.0) relied on data collection throughout the trial and was designed into the process. Much of the data collected was citizen science derived 'messy data' (Dobson et al., 2020). Methods that generated data in the trial included conventional secondary data e.g., beach litter survey data; waste statistics, and more "creative and socially innovative formats" (Tauginienė et al., 2020, p.4), often enabled by personal mobile devices, sometimes placing the citizen in the role of researcher. Table I outlines the data which was available to aid analysis.

Insert here: Table I: Citizen Science Messy Data Sources.

Data collection was designed and conducted by the project leader, supplemented by interaction with the academic advisors, and occasional support from SPO colleagues. At the beginning of the trial, the project lead provided each participating business with a selection of reusable cups, a copy of the customer 'script' and a set of tally charts on which they could record drink sales. The businesses were asked to record sales of reusable Ecoffee Cups®; sales of single-use cup drinks and sales of drinks in customers' own reusable cups. Self-reflections and personal experiences recounted by stakeholders were captured in field notes and emails. Audio-recordings were not made due to meetings taking place ad hoc and in situ within the busy retail establishments requiring the team to be unobtrusive as business owners dipped in and out to serve customers. Data collection had to be tempered by participant, stakeholder and volunteer availability, staff turnover, customer volumes and remnants of Covid-19 restrictions. The five businesses who initially agreed to take part were asked to complete a questionnaire prior to and after the intervention and were visited by the BMLPE officer and the academics to discuss experiences during the trial.

In addition, some data was collected from a further three businesses who contributed to the trial part way through. For example, B4 estimated their sales rather than keeping accurate records on the tally sheets, and those businesses that had not initially joined the trial, and so did not receive any Ecoffee Cups ® (marked by *** in the table) were given only the pre-intervention questionnaire to complete that had more general questions about reusable cups and waste.

Insert here Table II: Participating Businesses.

4.0 Impact process and outcomes

To assess the impact at not just the outcome, but also process level, we used a realist evaluation framework which focuses on the circumstantial aspects of what works, for whom and when (Pawson and Tilley, 2004) using a CMO framework (*Context, Mechanisms, Outcomes*). The context includes elements such as interpersonal/social relationships, technology, economic conditions, location, demographics material, resources, rules, and systems (Pawson and Tilley, 2004). Mechanisms reflect interactions between human agents, the intervention, and structures (Lacouture et al., 2015). We followed de Souza's (2013, p. 149) "elaboration approach" which is focused on context in terms of *structure* with mechanisms including roles/positions, practices, resources and processes, *culture* with mechanisms connected to ideas/propositional formulations about structure, culture, agency and relations, *agency* with mechanisms related to beliefs and reasons for action or non-action and *relations* with mechanisms including mechanisms connected to duties/ responsibilities, rights and power. Each

[3] A form of treasure hunt.

aspect of the framework applied to our case is discussed below and a summary can be seen later in Figure 5 (with links to each element indicated in the text[4]).

4.1 Context

There was a reliance on and a need to understand the waste and recycling infrastructure which was managed by the local council for both consumers and businesses involved (CS1). A number of stakeholders highlighted the lack of recycling bins/compostable waste bins in the area well as problems with a lack of waste bin collections to manage the high season litter 'hot spots.' Traders, while acknowledging support for segregated bins, were frustrated by the waste situation generally (CS2). Stakeholders were eager to do the right thing but found council attitudes and constraints difficult to overcome (CC5). Due to Buteville's classification as 'Rural' (NRS, 2023), the council is not obliged to provide a composting collection. Consequently, many items that could, if of a particular type, be industrially composted/recycled are instead incinerated (CS4). Several traders had not been aware of this prior to the trial, had invested in compostable single-use cups, only to find out they were incinerated. Additionally, the council did not provide recycling bins automatically for commercial firms, and costs to access these were prohibitive for many of the small businesses struggling for financial survival. Ultimately, the lack of sustainable infrastructure to recycle/compost single-use cups was a problematic backdrop for the intervention (CS1, CS2, CR3, CS4). As the BLMPE Officer stated:

> *Due to a combination of the processing system being unfit for purpose, so many different ways things can be disposed of (landfill, compost, recycle, EFW…), and customer/public confusion over how to dispose of things properly, along with a lack of consistent labelling, the whole system just does not work.*

Despite the trial and its outcomes, no change in Argyll & Bute council waste behaviours have been instigated in the town.

Traders noted that the rural, northern location of the town meant they faced surcharges compared to cities for deliveries of most sustainable alternatives from small suppliers, or deliveries were unavailable as the area was considered too remote (CS4, CA4). Such structural industry barriers (CS3) meant the options available for both reusables and more sustainable single-use cups were limited and often costly, further reducing the capacity for the town's traders to switch to more sustainable alternatives.

Several consumers and traders fed back regarding the reusable cup which had been sourced for the trial (CS5). Some flaws with the cup design were noted including its rigidity making it difficult to carry, no locking lid and coffee/tea stains building up inside the pale coloured cups with suggestions made for a cup with a screw top or a with a collapsible design. Additionally, many cups had cracked during transit, delaying the delivery to businesses, and businesses with little storage struggled with the stacked unboxed cups sticking together, making them difficult to separate, particularly when in a hurry and trying to serve customers (MA5). There was also a mixed response to the pattern designs on the cups. Overall, this undermined the cup sales and utility in certain situations.

Timing also had a significant impact as the trial took place across the peak summer tourist season in Buteville with traders noting that almost 90% of their trade in this period is tourists (CS6, CC2, CR4). This transient population posed particular problems for the use of reusable cups with B6 noting:

> *A large portion of our customers are tourists and often don't want to buy a cup when on holiday. And/or they don't have their usual keep cups as they are away from home.*

[4] The following abbreviations are used for the first letter C=Context, M=Mechanism and O=Outcomes, and for the second letter S=Structure, C= Culture, A=Agency and R=Relations (see also Figure 5).

These often-one-off consumers, did not allow traders to build up the message of reusables, or have time to undertake a proactive discussion as they could have done with local regulars in the low season, making it difficult to track refillable behaviours (CS6, CC2, CR4, CA4):

> *In terms of workflow, throughout the summer months we are at maximum speed, and this would slow us down massively. (B6)*

Treating all customers as a homogeneous target proved a barrier to success in this intervention. However, even targeting the local population may have been difficult as Buteville contains mainly small firms employing only a few people and has no large employer commuter trade as in cities so the volume of sales from regulars is low (CC4).

The post-Covid timing of the intervention also threw up challenges. The town was embarking on its first tourist season free from government Covid restrictions in two years and remnants of Covid guidance remained embedded in the community (CC2). Some traders refused to take part in the intervention citing health/hygiene/safety concerns and they had worries that customers would perceive their café negatively if they were seen to be accepting reusables (CC1, CC3, CR1, CR2) and a number joined late in the trial. There was a prioritisation that income be given precedence over environmental goals and B5 speculated that it was "*too scary to be bold*". Additionally, several cafés (B5, B6 and B7) noted how their customers would forget the reusable cups they had at home, while others carried cups but would forget to use them.

The trial was affected by other post-Covid context shifts, including broken and fragmented relationships (CR2). A thriving volunteer community of litter pickers and coastal clearance helpers had dispersed during Covid, leaving few citizens to draw upon to help reinforce and highlight the trial. And finally, while the BLMPE did an exceptional job of visiting the businesses and supporting them, the timing of the trial coinciding with their contract breaks and illness, meant that the effectiveness of that SPO staff member's earlier personal interactions was limited, and momentum was lost (MS1).

It became clear through the trial and discussions between stakeholders that the businesses involved suffered from a lack of agency (CA1). Committed to sustainable change for the town, many businesses had sought to secure sustainable single-use cups, but it emerged 'wish recycling' by business owners and consumers was prevalent (CA1). Many had not realised that their efforts were undermined by the inadequate local waste collection and separation strategy. B7 uses Vegware (www.vegware.com) single-use cups but was dismayed when they discovered from the project leader that they were only biodegradable if put through industrial composting, a facility unavailable locally (CA1, CA3, CA4).

While business owners were enthusiastic about sustainable solutions this did not always mean that their staff were as engaged (CA5, CA6). There was a lack of staff awareness about how they could influence customer behaviour to improve sustainability. Although a script was provided, staff needed training to know how to use it and feedback suggests the script was rarely, if ever, used (CA5). Although some regular staff were proactive, staff shortages and high staff turnover meant engagement on sustainability with customers was inconsistent (CA5). Additionally, the lack of consistent business participation produced inconsistent data: companies signed up to the trial but forgot to collect data; others operated outside the trial but also promoted reusables; late arrivals did not collect data; while others were not participating in the official trial but did collect sales data (CA6).

One aspect that did seem to bolster agency was the academic advisors' involvement which the project lead stated had a halo effect providing a sense of external legitimacy and encouraged participants that their efforts were valued and seen (CA7, CR5).

4.2 Mechanisms

Several mechanisms, especially ones that did not work well, hindered the trial in different ways. Firstly, the project lead worked on a term time only contract meaning that they were not available at key points (MS1, MA1). Their role as a critical gatekeeper and central figure could not be carried out consistently when outside term-time contract hours and during a period of illness. The businesses were unclear who to contact in their absence, and temporary cover staff were overwhelmed with their own roles (MS1, MA1) and relationships were not sustained (MR1). This lack of continuity also led to a lack of consistency in, and control of, promotional mechanisms (MA1) such as posters not being displayed where intended, and lack of funds reducing what had been planned. An intended social media hashtag logo (#reusebuteville) never appeared on the cups and without stronger social media support and skills, no joined up social media campaign was ever linked to the trial (MA1, MA2). However, in comparison, word of mouth was particularly influential (MR4) especially when enacted through social groups.

As noted above, relationships with the council were weak and problematic throughout the trial with this mechanism breaking down in many ways (MS2, MC1, MR2). Attempts to contact the local council were hindered by councillors working virtually and even the dedicated contact person for environmental matters was constantly unavailable (MS2, MC1, MR2). This lack of response/financial support caused a significant delay to cup distribution and local branding was abandoned. This meant that cups were received late, with many of the initial stocks arriving broken, causing extra work (MS1, MA1):

> *... the cups arrived early last week and took quite a bit of sorting out (big learning curve)...We had quite a few damaged cups which we weeded out – over 300 cups – so some businesses got a slightly smaller number of cups than requested. (SLO team member)*

In-café mechanisms of how cups were managed, used, and cleaned also affected the trial. There was a general uncertainty about what could/should be offered in terms of discounts/incentives for reusables and whether cups could be cleaned before use (MS4, MC2, MC3, MS4, MR3). Many of the businesses did offer incentives such as discounts and/or washing but did not promote them. Findings suggested that there was low awareness generally that cafés were willing to clean reusable cups for customers (MS4, MC2, MS4, MR3). Discounts for reusables varied across participating businesses including 50 pence off, 10% discount, and even no discount, but all agreed selling the Ecoffee Cups® at a reduced cost was considered "*very reasonable*" (B7). The same inconsistency was evident in how participating companies displayed the trial promotion materials and cups (MA1, MA4, MR3). It appeared that most businesses were waiting for the consumers to make the first move while consumers were uncertain of what could be requested, creating an impasse between them.

As noted above the general lack of understanding/awareness of the waste processes meant that these mechanisms caused confusion and uncertainty amongst the businesses (MS3). There was significant frustration at the lack of composting service for Vegware single-use cups. Previous centralised collections of cups in the town by Vegware had been stopped and not reintroduced post-Covid, and B7 cited this as a critical factor:

> *... we do use Vegware though this seems futile when there's no proper recycling facility - this is something I think should be a main priority as surely this would be the most effective way of dealing with the waste. Changing consumer behaviour takes a long time, and it seems to me that many businesses have already made the change they need to make by using Vegware. At least half of the take away cups we serve are disposed of in bins at our premises so it would be really easy for us to facilitate change if we could get them over the final hurdle that is getting them to an actual recycling facility.*

It also emerged that continuing uncertainty about where the local waste ends up was reducing motivation in the town to try to do more about litter and disposal behaviour. For example, despite being a busy port and ferry terminal, the town had no facilities at the harbour for people coming off ferries to recycle (MS3; MA3, MR3).

Finally, a lack of hospitality staff had a significant impact on the trial, cited as a Covid (and Brexit) legacy, particularly affecting promotion/consistency in the businesses:

> *... our…move to takeaway was because of recruitment difficulties, we literally couldn't get staff (an issue being faced all over the country). B7*

This was exacerbated by high staff turnover, leading to those working in cafés often not being trained or aware about promoting either reusables or the trial (MS5, MA5).

4.3 Outcomes

In total, 129 reusable Ecoffee Cups® were sold in the trial. Use of Ecoffee Cups® (see Figure 4) while increasing in weeks 7-16 of the trial, as did the use of other reusable cups, reduced significantly towards the end of the trial (OS1, OS2). Overall, reusable cup use accounted for 2% of cups recorded during the trial; 98% were single-use. While the results of the trial, purely judging by sales of reusable cups and their use is disappointing, the project did deliver greater meaning to locals in their advocacy for reusables use and potential promotion, as well as raising awareness amongst businesses and consumers.

Insert here Figure 4: Trial Cup Use by Week.

(Source: Authors)

Businesses became more informed about the waste processes in operation and what happened to the products they sold, allowing them to make educated decisions about the cups they choose to sell (OC1, OC2, OA1, OA2). All the participant businesses intend to continue to sell and promote reusables. The peer network across the town was bolstered by the trial and the SPO was encouraged and engaged with the other stakeholders in the community of practice. Both these meant a good foundation was laid for further interventions (OR1, OR2), but joined-up efforts by customers, businesses, and local councils to prevent litter will be required.

Insert Here Figure 5: Context Mechanisms Outcomes.

(Source: Authors)

The evaluation contained here was as much about understanding the process, and what went wrong and right, as it was about highlighting the outcomes. The intervention has given significant feedback and cause for reflection in terms of what is needed, both for successful interventions and future research in this area. This follows Pawson and Tilley's (2004) approach to focus on lessons we *can* learn, in terms of what did or did not work, for whom, in what circumstances and how (Gregory-Smith et al., 2017). Table III contains an overview of practical recommendations and future research grouping similar aspects by CMO, many of which relate to the social marketing benchmark criteria of segmentation, audience insight, customer experience and marketing mix (Suggs and Speranza, 2020). Our findings reinforce the growing understanding that future research proposals to tackle sustainable and regenerative challenges require an interdisciplinary approach, one that encompasses perspectives such as engineering, waste management, marketing, HRM, supply chain management etc. They also suggest that when studying community sustainability, an inclusive and co-creative approach is needed if we are to understand behaviour change in context.

Insert here Table III: Practical Recommendations and Future Research.

The context of the intervention, being rural and coastal, had a significant effect on the outcomes and these contextual issues show how generic interventions and communications are less effective, and more targeted social marketing is needed, treating tourists and locals with different strategies, such as bespoke cup branding, or site-specific incentives, for example, at ferry points where island commuters and tourists represent prime refillable cup consumers. Context and consumer specific analysis pre-trial would help identify the different habits and behaviours and drive a more tailored programme of interventions for targeted audiences. For example, a deposit scheme reusable cup offering at the ferry café would possibly engage more local commuter interest and overcome the reluctance to buy another reusable cup. Several businesses suggested distributing reusable cups to school children, to capture customers early. They cited the appetite for regularly filling water bottles in schools and locally, but not reusable cups.

Additionally, had there been time to consider segmentation prior to the trial, the profiles of the different users, and user preferences could have been examined and more bespoke approaches taken. In this case tourists and locals could have been segmented, but other target groups, for example schools, may be appropriate in further interventions. Among other tactics, potential future interventions could segment by use of reusables, such as walkers or island commuters. There is also the potential to trial single-use discounts and taxes, or reusable deposit schemes, currently being tested in the Ditching Disposables trial by Transition Stirling (https://www.transitionstirling.org.uk/ditching-disposables).

5.0 The ethics of impact

The impact of this research was defined and examined from the perspective of the SPO – one that collaborates with a range of community stakeholders – but we must recognise that as an environmental charity it perceives impact through its own lens and perspective, which may have potential biases and reflects only a partial picture of the complex issue studied. A key aim of the grant funding for the intervention was the prioritisation of community stakeholders over researchers, giving them voice to design projects, choose research partners and allocate resources. This reversed the traditional dominant power relationships and was intentionally more supportive of equitable relationships. With the trial led by the SPO, and inclusive consultation undertaken in the town, the community was empowered to define the intended social impact in their terms, and while the impact of the intervention on reusable uptake was less than hoped, its value has resonance for the future.

In delivering impact, we had to be mindful that participation was voluntary, so had to live with the incomplete messy data, and respect the businesses who were grappling with their own ethical perspectives, such as escalating costs versus environmental damage, or discomfort around forcing customers or staff to engage, however worthy the cause. Delivering impact while avoiding jeopardising the economic survival of the businesses was paramount, so providing free cups for discounted sales ensured more vulnerable participants were not excluded.

This was an opportunity for a bottom-up approach to sustaining their community, rather than top down; the results have led us to question our assumptions of their needs and abilities as the infrastructure barriers thwarting their engagement and behaviour change were revealed. Stakeholders were wrestling with their individual ethical perspectives on the impact of them banning single-use cups (e.g., social and environmental benefits would be realised, but post-Covid livelihoods and business survival could be negatively impacted if sales dropped).

Inclusion of the BLMPE officer as co-author has ensured academic representation of the intervention was transparent, and ownership of the intellectual property remains with the SPO. Going forward, while the intervention was time-bound, as researchers we remain engaged and committed to support the SPO and track future impact. Findings from the trial are now informing a second reusable cup trial within the region, and a knowledge exchange workshop – 'Rubbish Summit' - has fed back findings to the

community and delivered a consultation dialogue to a wider audience that may have more influence to bring to the contextual barriers identified in the trial.

6.0 Summary and Conclusions

Despite the best efforts of the SPO and collaborative partners, the impact magnitude, scope, intensity, and duration of this intervention was limited, and the level of disruption of the unsustainable behaviour – plastic cup litter - relatively minor. However, the time allocated for impact to gain a foothold was perhaps unrealistically short, intensive reinforcement was not possible, and resources to commit to driving behaviour change inadequate. A greater focus on the earlier stages of the intervention design, with co-creation between the stakeholders might have overcome some barriers to the project's success. But findings suggest the intervention has succeeded in switching perceptions of how unsustainable single-use cups are – even best practice versions – in reality, and the seeds of knowledge and understanding planted by the intervention within the community around reusable and single-use cups may encourage behaviour and policy change in the future. Our article demonstrates how small community grants can foster impactful collaborative partnerships between an SPO and researchers, facilitate knowledge-exchange beyond the initial remit, and provide a catalyst for possible future impact and outcomes.

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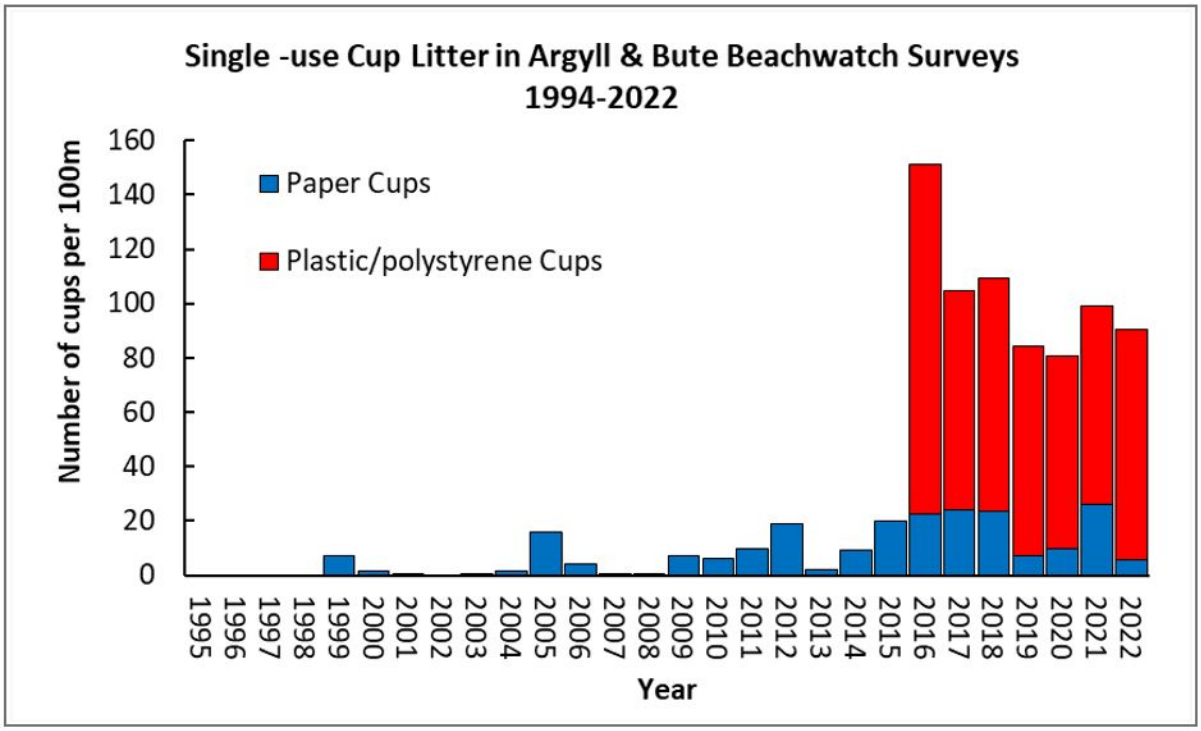
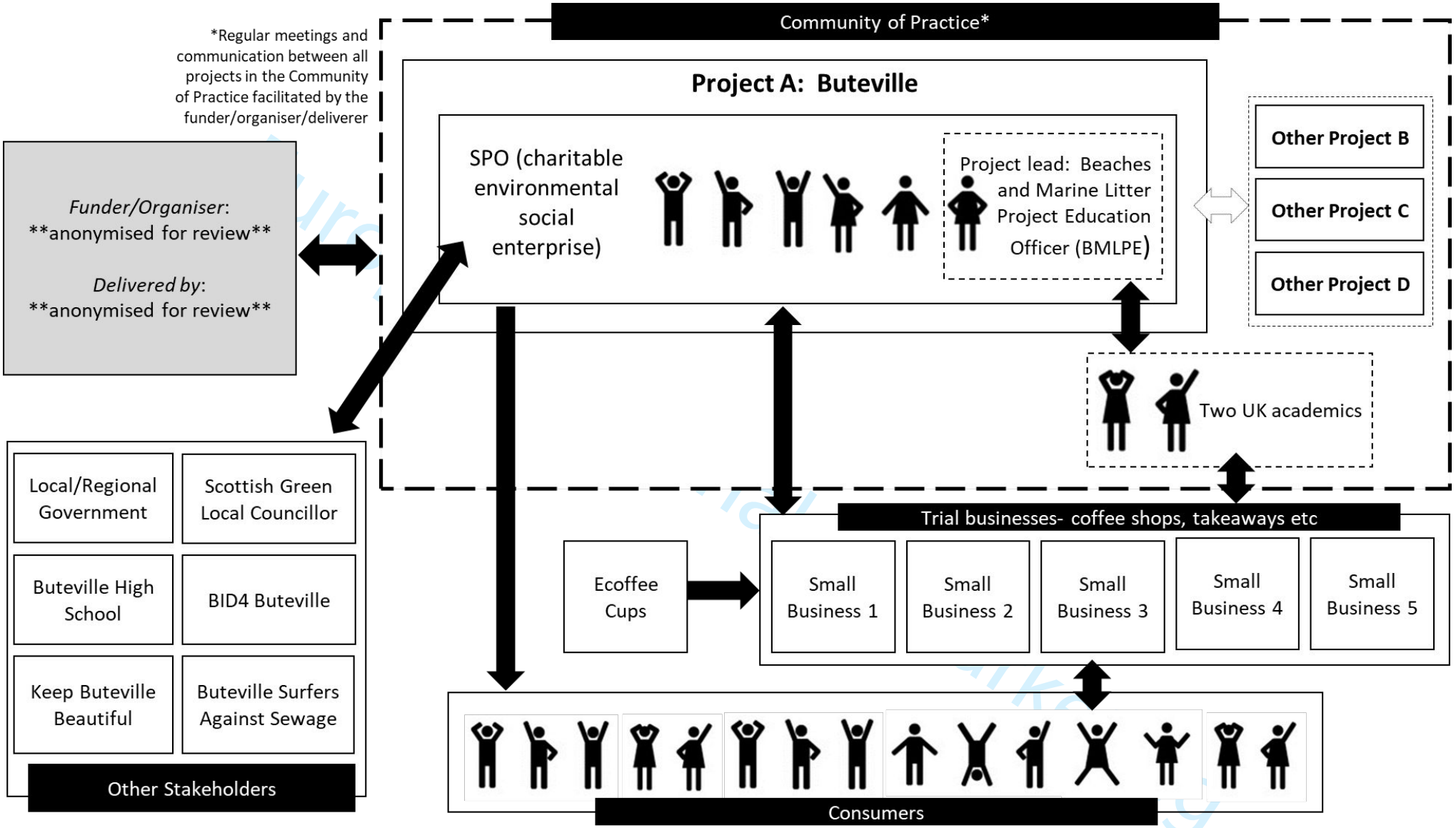


Figure 1: Single-use Cup Litter Argyll & Bute.

(Source: Marine Conservation Society, 2022)


Community of Practice*
*Regular meetings and communication between all projects in the Community of Practice facilitated by the funder/organiser/deliverer
Project A: Buteville
SPO (charitable environmental social enterprise)
Project lead: Beaches and Marine Litter Project Education Officer (BMLPE)
Other Project B
Other Project C
Other Project D
Two UK academics
Funder/Organiser: **anonymised for review**
Delivered by: **anonymised for review**
Local/Regional Government
Scottish Green Local Councillor
Buteville High School
BID4 Buteville
Keep Buteville Beautiful
Buteville Surfers Against Sewage
Other Stakeholders
Trial businesses- coffee shops, takeaways etc
Ecoffee Cups
Small Business 1
Small Business 2
Small Business 3
Small Business 4
Small Business 5
Consumers

April 2022	May 2022	June 2022	July 2022	August 2022	September 2022

Small Business Recruitment

Identification and recruitment of academics

Pre-Trial meeting – online & Pre-intervention questionnaire

Visit by academic

Trial PR – 9th June 2022

The [redacted] Times

Post-intervention questionnaire & collection of tally sheets

Visit by academics

Planned Planning and Set Up

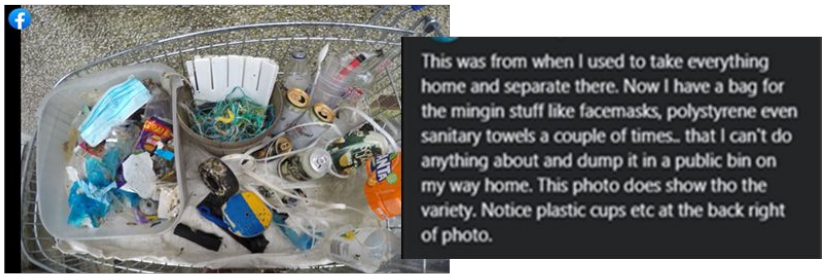
Planned Trial

Actual Planning and Set Up

Actual Trial*

Evidence collection

Call out for litter information, Facebook posts (see below), discussions with shop owners and community



2500 Ecoffee® cups provided free to participating businesses – retailed at £4

Trial Promotion

NB: Location identifiers have been greyed for the review process

* During the trial the lead researcher made regular (face to face/online) contact with the businesses and other stakeholders.

Citizen Science Data	*Source*
Fieldnotes (taken throughout trial)	Visits to participating businesses; local High School Environmental and Art group meeting; street and beach location visits; in situ meetings between BLME officer and academic advisors. Notes from informal conversations between all stakeholders.
Facebook and Instagram posts	General public; beach clear-up and litter picking volunteers.
Business meeting notes	BLME Officer
Interviews with key personnel	BLME Officer
Tally Sheets	Participating businesses
Pre-and-post intervention questionnaires	Participating businesses
Trial photographs	SPO/BLME Officer; General public, academic advisors.
Comments from public launch event	General public; High School; Buteville Charities Day visitors.
Emails	Participating and non-participating businesses; public and third sector organisations; volunteers; trial team; academics.
Post-trial discussion and reflections	BLME Officer (including an interview with the BLME officer)

Table I: Citizen Science Messy Data Sources

Business Pseudonym	*Retail type*	*Pre-Intervention questionnaire*	*Tally Sheets*	*Post Interventions questionnaire*
B1***	Sit in/takeaway	Yes - 6/9/22	No	No
B2***	Sit in/takeaway	Yes – 7/6/2022	No	No
B3***	Sit in/takeaway	Yes – 23/9/22	Yes – Jan 22 to Sep 22	No
B4	Mobile Takeaway	Yes – 6/9/2022	No – Sales estimated from memory	Yes – Nov 22
B5	Takeaway	Yes – 13/9/2022	Yes - 1st Aug to 31st Oct	Yes- 27/10/22
B6	Sit in/takeaway	Yes – 7/6/2022	No – Sold 10 Ecoffee® cups.	Yes 31/10/2022
B7	Sit in/takeaway	Yes 9/6/2022	Yes – 13th June to 23rd Sep	Yes – Oct 22
B8	Sit in/takeaway	Yes – 7/6/22	Yes – 6th June to 10th Sept	Yes – 28/9/22

Table II: Participating Businesses

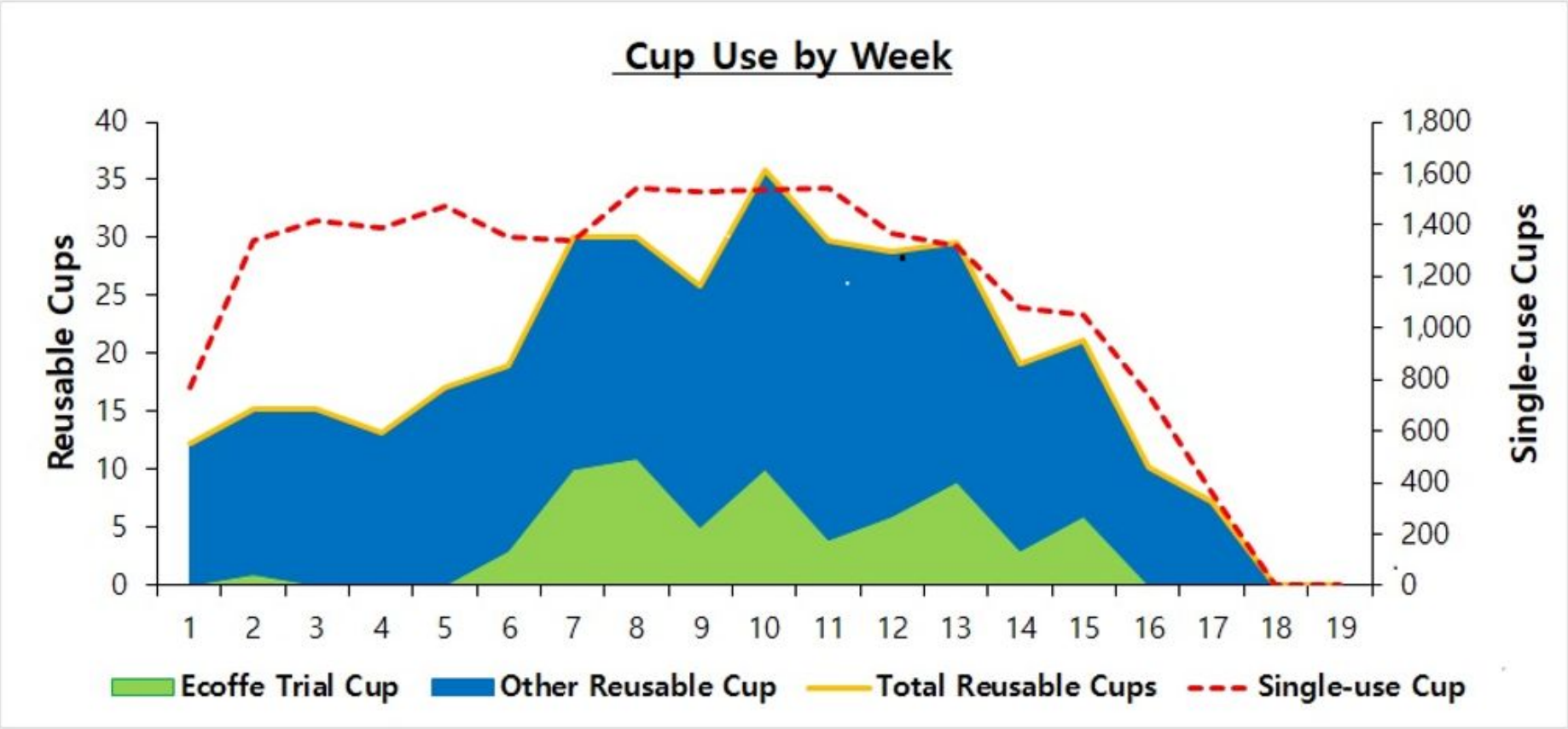


Figure 4: Trial Cup Use by Week (Source: Authors)

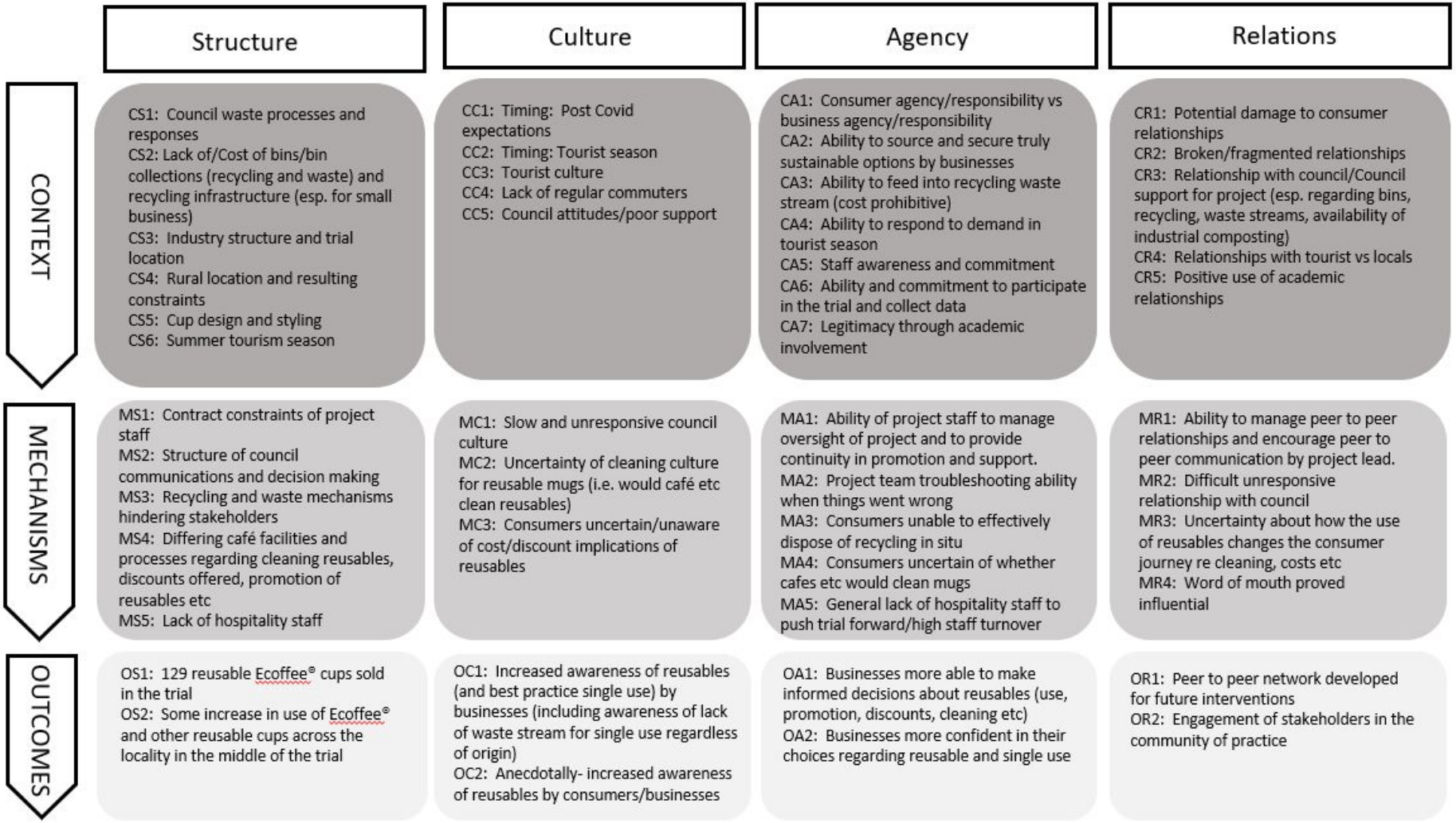


Figure 5: Context Mechanisms Outcomes

(Source: Authors)

Table III: Practical Recommendations and Future Research

Area of interest/ Benchmark criteria	CMO	Practical Recommendations	Further Research
Segmentation	CS2: Lack of/Cost of bins/bin collections (recycling and waste) and recycling infrastructure (esp. for small business)	Audience analysis prior to an intervention should seek to understand the mix of establishments, their clients and offering and whether a segmented approach targeting businesses would be beneficial. Install centralised disposable cup separation and collections by suppliers.	Testing with SMEs of different sizes and types; Sit in cafes versus pure takeaway; Would a reusable intervention be more effective for certain types of businesses?
	CS5: Cup design and styling	Should differently styled cups be made available to meet the needs of different audiences?; Would branded cups (either area or business based) be advantageous to the businesses and lead to further sales?; Can branding be done cost effectively?	Is there a cup design and styling that is preferred by consumers?; Is there a cup design that is easier to carry, prevents leakage etc?
	CS6: Summer tourism season CC2: Timing: Tourist season CC3: Tourist culture CC4: Lack of regular commuters CR4: Relationships with tourist vs locals	Consideration of the potential impact of tourism on use of cafes/businesses; If significant should a segmentation strategy be taken either producing different interventions/promotions or by working with, rather than against the high/low seasons.	Are tourists or locals (esp. regular commuters) more likely to accept the behaviour change of renewables?; What are the barriers and motivators for each segment?
	CS1: Council waste processes and responses CC5: Council attitudes/support poor CR3: Relationship with council/Council support for project (esp. regarding bins, recycling, waste streams, availability of industrial composting)	Potential for an upstream intervention/segment targeting of the council? Is there a learning opportunity from best practice waste stream models.	Is there a potential to treat the council as an upstream segment with its own bespoke intervention/communication strategy?

	MS2: Structure of council communications and decision making MR2: Difficult unresponsive relationship with council		
Audience Insight	CS5: Cup design and styling	Prior to intervention there is a need to understand consumer preferences related to cups in terms of design and styling; Also there is a need to understand the practical use of cups for the businesses- storage, stackability, branding, fit with establishment image.	Which cup designs and styles do consumers and cafes/takeaways prefer?; Which style or design are people more willing to carry and use?
	CA1: Consumer agency/responsibility vs business agency/responsibility	Are consumers/businesses ready to take responsibility for litter mitigation in the form of reusable cups?; Is awareness raising/further knowledge required before they can make the change take place? Are targeted policy interventions needed?	What are the values of each part of the process? Do the business/consumers see themselves responsive for making sustainable alternatives?; Do consumers/businesses feel able to make informed choices re reusables?
	CA4: Ability to respond to demand in tourist season CA5: Staff awareness and commitment MS5: Lack of hospitality staff MA5: General lack of hospitality staff to push trial forward/high staff turnover	Acknowledgment that not all staff have a financial interest in the business or hold sustainability values and may not be motivated to engage with supporting the trial; Potential to examine staff training and ways to improve commitment and involvement with the project (esp. during busy times).	The role of frontline employees in potential efforts to encourage reusable cup use; Employee motivators and barriers to being involved and committed to reusables.
Infrastructure	CS1: Council waste processes and responses CS2: Lack of/Cost of bins/bin collections (recycling and waste) and recycling infrastructure (esp. for small business) CS3: Industry structure and trial location CS4: Rural location and resulting constraints	What is the role of councils, businesses and consumers within the waste journey; Is there a role for suppliers? How do consumer/business make decisions based on their understanding of the waste journey; Be clear what the waste journey is for litter or different types.; What is the best way to fit into the waste journey.; what pathways are available	Examine the different waste journeys and infrastructures and differences between councils and areas- availability, key stakeholders, key decision makers - the supply chain waste; What is the knowledge of consumers/businesses about the waste journey of litter and items disposed of outside of the home?; Can

	CA2: Ability to source and secure truly sustainable options by businesses CA3: Ability to feed into recycling waste stream (cost prohibitive) CR3: Relationship with council/Council support for project (esp. regarding bins, recycling, waste streams, availability of industrial composting) MC1: Slow and unresponsive council culture MS2: Structure of council communications and decision making MS3: Recycling and waste mechanisms hindering stakeholders	for sustainable products/single use products?	improvements be made to the waste infrastructure and journey to encourage more sustainable behaviours?; Life Cycle analysis of single use cups (both plastic and other sustainable materials) and reusable cups (of different materials).
	CS5: Cup design and styling MS4: Differing café facilities and processes regarding cleaning reusables, discounts offered, promotion of reusables etc	An understanding of the in-cafe/takeaway infrastructure and cleaning practices; space constraints to be able to provide good cup solutions and support; acceptability of discounts to businesses.	What facilities are needed to use reusables vs single use in a live environment; How do consumers respond to reusables visual displays and discounting/incentives (potential for experimental research) (N.B. Links to customer experience and consumer journey)
Customer experience and consumer journey	CA4: Ability to respond to demand in tourist season CS2: Lack of/Cost of bins/bin collections (recycling and waste) and recycling infrastructure (esp. for small business) CS5: Cup design and styling CS6: Summer tourism season CC1: Timing: Post-Covid expectations CC2: Timing: Tourist season CC3: Tourist culture CC4: Lack of regular commuters CA1: Consumer agency/responsibility vs	For segment(s) to be focused, map the consumer journey to understand key points at which choices regarding reusable and single use are made and the reasons for this; Mitigate for potential damage to consumer business relationships.	An understanding of the customer experience and journey across all stages - pre, during, post purchase and consumption; How does each stage of the customer journey relate to choices regarding reusables vs single use.; Is the consumer journey different for tourist, locals, pre/post Covid, seasonally etc; How do consumers respond to staff suggestions, discounts penalties, promotional materials - how does this make them feel about the business; why

	business agency/responsibility CR1: Potential damage to consumer relationships CR4: Relationships with tourist vs locals MS4: Differing café facilities and processes regarding cleaning reusables, discounts offered, promotion of reusables etc MS5: Lack of hospitality staff MC2: Uncertainty of cleaning culture for reusable mugs (i.e. would café etc clean reusables) MC3: Consumers uncertain/unaware of cost/discount implications of reusables MA3: Consumers unable to effectively dispose of recycling in situ MA4: Consumers uncertain of whether cafes etc would clean mugs MR3: Uncertainty about how the use of reusables changes the consumer journey re cleaning, costs etc		do consumers resist?; How do these aspects affect loyalty and repeat business; How do temporary vs permanent staff embed reusable culture?
Promotion/ Marketing Mix	CS5: Cup design and styling MS4: Differing café facilities and processes regarding cleaning reusables, discounts offered, promotion of reusables etc MC3: Consumers uncertain/unaware of cost/discount implications of reusables	Need to consider all marketing mix elements: promotion (product design, styling, materials); promotion (communications, message, media); place (where products are made available and used) and price (discounts, incentives, penalties); Social marketing research highlights the need to go beyond promotion and to meet wider benchmark criteria (Suggs and Speranza, 2020); use of social/word of mouth approaches and reinforcement.	A range of marketing mix elements can be utilised to discourage use of reusables either alone or simultaneously and research needs to determine the optimum combination.
	MR4: Word of mouth proved influential	Encourage word of mouth through social media and in person events.	How effective is word of mouth in promoting sue of reusables; how ca word

			of mouth be encouraged in reusable interventions?
Relationships and Peer to Peer Support	CC5: Council attitudes/support poor CR2: Broken/fragmented relationships CR3: Relationship with council/Council support for project (esp. regarding bins, recycling, waste streams, availability of industrial composting) MR2: Difficult unresponsive relationship with council	Work with council and stakeholders from early in the project to understand potential barriers and to gather information about the waste streams/recycling journey for products; be proactive in determining pinch points/likelihood of tensions. Stakeholders can add to the intervention success if chosen carefully but optimum numbers of stakeholders and communication between them is important.	Tensions within social marketing partnerships are common (Mitchell, Madill and Chreim, 2016) and further research is needed to understand these more deeply and mitigate for them; Number of and communication between stakeholders.
	CA6: Ability and commitment to participate in the trial and collect data	Work with businesses early to develop strategies for and develop good practice around the intervention and data collection; allow peers to meet in suitable settings at less busy times; share information about good business practice and wider experience; mitigate barriers to participation e.g., accessing stockists.	Understand novel ways to allow peer to peer communication and share good practice- peer group meetings (on and off-line), documentation and tips.
	CA7: Legitimacy through academic involvement CR5: Positive use of academic relationships	Find and utilise 'friendly' academics with real world experience and enthusiasm for the project; Involve at earliest stages of planning; Consider academics joining peer to peer networks.	Examining the role of academics in supporting live, real-world projects - barriers, motivators, opportunities, threats etc.
	MS1: Contract constraints of project staff MA1: Ability of project staff to manage oversight of project and to provide continuity in promotion and support. MA2: Project team troubleshooting ability when things went wrong	Ensure more than one staff member is responsible and backup in case of planned and unplanned absences is provided; Risk plans prepared for pro-active troubleshooting.	Role of project managers in balancing the demand of projects and day to day activities; Skills required to manage live projects and enhance personal development.

	MR1: Ability to manage peer to peer relationships and encourage peer to peer communication by project lead.		