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Key Challenges and Potential Solutions for Implementing Sustainable Business Models at Football Stadiums

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Abstract

This research explores the integration of sustainable business models within football clubs, especially in the context of sporting events, utilizing the Norwegian football club's SK Brann's project and RESTART framework by Jørgensen and Pedersen (2018) as foundational guides. The study primarily focuses on how football clubs can innovate and adapt their operations to enhance environmental performance and at the same time align with economic prosperity and social responsibility, driving insights from attendees' preferences, attitudes and behaviours.

The research presents important practical implications, providing football clubs with useful information to improve their sustainability strategies. This includes developing strategic alliances, adopting circular economy principles and engaging fans through enhanced service-driven experiences, trying to change their behaviour towards a more sustainable one. The thesis concludes that by embedding these sustainability practices into their core operations, football clubs can achieve a triple bottom line impact—advancing economic, environmental, and social goals concurrently.

The findings reveal a strong inclination among fans towards supporting sustainability initiatives, particularly those that mitigate the environmental impacts associated with stadium events, and offer valuable insights on their preferences and attitudes. Utilizing the RESTART framework, the study delves into strategies for continual redesign, following controlled experimentation, of football clubs' business models to make them more sustainable and profitable at the same time.

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1. Introduction

1.1 Background: the general environmental problem

1.1.1 The need for sustainable development

Over the years, concerns regarding the environmental impact of human activities have continued to grow, making it increasingly challenging for individuals and organizations to hide and get away with irresponsible practices (Jørgensen & Pedersen, 2018). Indeed, the human interference has become more and more evident, resulting in enormous amount of greenhouse gases (GHGs) emissions, climate change and global warming issues, pollution of air, water and soil, depletion of non-renewable resources and many related issues that can now be considered global menaces and represent consequently top priorities in the agendas of all the governments, organizations, researchers and common citizens around the globe (Arora et al, 2018). To further underline the seriousness of the situation, the Stockholm Resilience Center has developed a framework that covers nine planetary boundaries (that together capture the planet's carrying capacity) that are currently under pressure, publishing each year updated reports in which they attempt to measure the progress in these nine areas, several of which are already under considerable pressure (Jørgensen & Pedersen, 2018; Rockström et al, 2009).[1]

In this sense, the aforementioned environmental problems sparked discussions on the necessary remedial actions to prevent further deterioration of the environment, which would have lasting devastating consequences on the world as we know it. In 2019, in a recent report by Global Sustainable Development Report, the UN Secretary-General António Gutierres has stated:

> *"The world as we know it and the future as we want are at risk. Despite considerable efforts these past for years, we are not on track to achieve the Sustainable Development Goals by 2030"* (Arora & Mishra, 2019)

[1] The nine areas mentioned above the Stockholm Resilience Center includes in its framework are: stratospheric ozone depletion; loss of biosphere integrity; chemical pollution and the release of novel entities; climate change; ocean acidification; freshwater consumption and the global hydrological cycle; land system change; nitrogen and phosphorus flows to the biosphere and oceans; atmospheric aerosol loading.

Therefore, it is clear that climate change and the related problems pose significant challenges to future growth and well-being. This increased awareness is the result of a worldwide need for sustainable development brought about by a growing understanding of the interdependence of the environmental, social, and economic systems. First of all, it has to be clarified the definition of "sustainable development", that refers to the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This can be considered the starting point, whose consensus was reached by the World Commission Environment and Development (WCED 1987), of the new trends aiming at achieving a sort of green growth. (Barbier and Burgess, 2017)

On this purpose, the United Nations recently paved the way with the creation of the so-called "*Sustainable Development Goals*" (SDGs), that are an adapted follow-up of the "*Millennium Development Goals*", which reached their deadline in 2015 and intended to eradicate misery and create better health conditions within developing countries (Filho et al, 2018). However, while the *Millennium Development Goals* mainly regarded poverty and healthiness all over the world, the more ambitious SDGs aim at guiding social development and environmental sustainability globally, with the attention given to the latter being enormous. In this sense, the 2030 Agenda for Sustainable Development provides a shared blueprint among Member States for peace and prosperity for people and the planet, representing a sort of call for action by all countries to promote and achieve a more sustainable future for all, addressing the global challenges our planet faces. (United Nations, 2015)

To do so, it is clear that it is not possible to maximize all the economic, social and environmental systems simultaneously, therefore a process of trade-offs among the various goals of the three systems has been and will be needed. Managing these tensions, however, does not necessarily mean achieving a stable proportion between all dimension, but rather addressing all dimensions simultaneously and through an integrated approach (Giovannoni and Fabietti, 2013).

Nevertheless, there currently exist little guidance on how those trade-offs among the goals of the various systems should be made (Barbier and Markandya, 2012), with choices that must therefore be made in terms of which goals should receive greater priority (Holmberg and Sandbrook, 1992). In this sense, although there exists a remote possibility that progress is made across all these goals, it is certainly more likely that achieving improvements toward

one SDG goal in such a short frame of time may come at the expense of another (Barbier and Burgess, 2017).

In recent years, from a firms-side perspective, the concept of prioritizing one goal rather than another has been given the name of "materiality assessment", which usually refers to the process through which companies identify social and environmental issues they face and prioritize them with regard to their importance from economic, social and environmental standpoints (Jørgensen & Pedersen, 2018). This concept will be recalled throughout all this work.

Turning back to the starting point of this thesis, as we mentioned before, the huge environmental problem the Earth is currently facing has been threatening the world as we know it today. Back in 1988, well before the establishment of the Millennium Development Goals followed by the Sustainable Development Goals, the United Nations Environment Programme already set an Intergovernmental Panel on Climate Change aimed at assessing the scientific basis of climate change, evaluating its potential impacts and the possibilities for adaptation and mitigation. The various reports that succeeded over the years have provided progressively robust evidence of the human influence on the climate system, underscoring the urgent need for action to address its impacts and thus mitigate GHGs emissions.

On the same page, another transformative agreement adopted by nations within the span of a few months from the UN SDGs is the Paris Agreement (Zhenmin and Espinosa, 2019), that was approved under the United Nations Framework Convention on Climate Change and has as its central goal that of substantially reduce GHGs emissions, limiting global warming to well below 2° C above pre-industrial levels and pursue efforts to limit the temperature increase to up to 1.5° Celsius (UNFCCC, 2015)

Apart from having been approved in the same year, the Paris Agreement and the SDGs are closely linked, as they share common objectives related to sustainable development and climate action.

1.1.2 Race against time: is it too late?

The urgency of combating climate change and addressing sustainability challenges raises the question of whether it is too late to mitigate their impacts. Climate change, biodiversity loss, pollution and resource depletion are only a few of the issues that make up the larger

environmental problem, which calls for immediate human intervention. The question of whether it is too late to intervene and whether we are losing the race against time is complex one, but it is important to recognize both the gravity of the current situation and the possibility of meaningful intervention.

On the one hand, the scientific community agrees unequivocally that human activity has a major role in contributing to environmental catastrophes like global warming. This includes the burning of fossil fuels, deforestation and industrial operations. Global warming is already causing effects that are being felt, such as increased frequency and intensity of extreme weather events and rising sea levels. With species extinctions occurring at rates never seen in human history, biodiversity loss is accelerating alarmingly. Pollution, whether it comes from plastic waste in our oceans or air pollution from industrial emissions, continues to destroy ecosystems and endanger human health. All these challenges make it clear that climate change cannot be considered a distant threat, but rather a present and alarming danger to humanity (Zhenmin and Espinosa, 2019).

As the window of opportunity to mitigate the worst effects of climate change and environmental degradation is rapidly narrowing, with the consequences of inaction being potentially catastrophic for both people and the planet, everyone must work to reverse the trend and accomplish the goals set forth in the Paris Agreement and the 2030 Sustainable Development Goals (SDGs) agenda, that set ambitious goals for creating a more resilient, productive and healthy environment that is sustainable for both present and future generations. In this sense, it is essential to recognize that while the situation is desperate, it is not hopeless. It will take coordinated efforts from businesses, governments, civil societies and common citizens to accomplish these goals. Given the scale of the environmental issues we are facing, cooperation and collaborative action across national boundaries, industries and communities are essential.

Even if major international agreements and policy changes are necessary, small actions taken by individuals and communities can have a big impact. Small steps like cutting back on energy use, water conservation, waste reduction and switching to more environmentally friendly transportation choices can add up to significant reductions in carbon emissions and preservation of natural resources.

1.2 Background: the sustainability problem in the sports industry

In recent years, the urgency for the global community to start a transition towards more sustainable practices across various sectors to address environmental challenges has been becoming increasingly evident. Within the sports and entertainment industries, stadiums have become the centre of attention for sustainability initiatives, given their significant environmental footprint and potential to influence large audience. In particular, sporting events are characterized by massive energy consumption, waste generation and carbon emissions, all of which exacerbate climate change and contribute to environmental deterioration.

The growing appeal of sports combined with the expansion of major events like the Olympic Games[2] and the FIFA World Cup[3] has increased the environmental effects of stadium operations and spectators' behaviours. In light of this, it is imperative to investigate innovative strategies and initiatives for encouraging sustainability in stadium management, cutting carbon emissions and mitigating environmental harm.

As a consequence, the purpose of this study is to examine the challenges and potential solutions for introducing more sustainable economic models in stadiums, with a particular emphasis on sporting events. By investigating the relationship between environmental sustainability, event management and spectator behaviours, this research seeks to fill a critical gap in the existing literature and contribute to advancing scholarly understanding in this field, as well as providing events' organizers and policymakers with some inputs on the most feasible and effective practices on this regard. The study is driven by the recognition of the fact that, despite stadiums' enormous potential as venues for fostering environmental stewardship and promoting sustainability, there are still many barriers to overcome before these goals can be realised in real, practical ways.

[2] The modern Olympic Games are the world's foremost multi-sports event. They are the largest sporting celebration in terms of the number of sports on the programme and the number of athletes present. Organised every four years, they include a summer and a winter edition. Athletes from all 206 National Olympic Committees and the IOC Olympic Refugee Team are eligible to compete in a wide range of sporting disciplines and events (Olympics.com)

[3] The FIFA World Cup is a quadrennial football tournament of men's national teams that determines the sport's world champion.

By exploring attendees' perceptions, attitudes and behaviours related to sustainability initiatives during stadium events, this study aims therefore to expand on previous research on environmental management in the sports business by engaging with perspectives from different relevant stakeholders such as governmental bodies, event organizers and attendees. As mentioned before, the aim is to identify the main challenges for promoting sustainability at sporting events, as well as offering actionable insights on best practices to potentially solve the related problems, thus seeking to provide practical recommendations for enhancing environmental performance, reducing carbon emissions and fostering social responsibility in the sports industry.

While existing research has explored various sustainability initiatives implemented in some stadium events, analysing also the huge environmental footprint of sporting events, there exists an evident lack of comprehensive studies that investigate the attitudes, behaviours and intentions of stadium attendees towards sustainable initiatives.

To fill this gap, this research aims at investigating attendees' perceptions and preferences regarding the implementation of more sustainable business models, exploring the differences caused by contextual factors, including those related to the demographic groups, age, gender and geographical location.

Moreover, this study aims at unveiling the origins of the behavioural barriers related to the implementation of more sustainable initiatives at stadium events, as well as potential interventions and strategies to overcome resistance and promote positive and proactive behaviour among stadium attendees.

1.3 Research Questions

Generally speaking, therefore, a key question this study aims at answering is:

> *"Exploring the Role of Sporting Events as Catalysts for Climate Action: What are the Key Challenges and Potential Solutions for Implementing Sustainable Business Models at Stadiums?"*

A comprehensive investigation is indeed needed to identify and mitigate the specific barriers that make it difficult for stadium organizers to effectively reduce the negative impact of

sporting events on the environment. To do so, a specific case study will be taken into account, that is the sustainability initiative supported by UEFA[4] that the Norwegian football club SK Brann implemented for the home games at their stadium (Brann Stadion) for the 2023 season (NHH, 2023). In addition to the main research question shown above, to further elucidate this study, several sub-research questions that delve into attendee behaviours, attitude towards sustainable initiatives and preferences for environmentally-friendly practices at stadiums events have been identified, ultimately aiding in the exploration of challenges and solutions for implementing more sustainable business models at stadiums and mitigating the enormous carbon footprint caused by sporting events worldwide. The five sub-research questions identified on this regard are:

- *What are the main challenges faced by stadium organizers in implementing sustainable business models, and how do these challenges vary across different types of events?*

- *How do consumer behaviours and attitudes towards sustainability initiatives at stadiums vary across different demographic groups and what factors influence their level of acceptance and feasibility of more sustainable business models?*

- *What are the key differences in consumer perceptions and preferences for sustainable initiatives at stadiums based on their geographical location and how can stadium organizers tailor their sustainability efforts accordingly so as to have standardized patterns of intervention worldwide?*

- *What are the potential economic, social and environmental benefits of adopting sustainable business models at stadiums, and how do these benefits contribute to the overall sustainability goals of sporting events and their impact on climate action?*

[4] UEFA (*Union of European Football Associations*) is the governing body of European football. It is an association of associations that acts as a representative democracy for 55 national football associations across Europe

- *How do the perceived benefits and drawbacks of implementing sustainable business models at stadiums differ among various stakeholders?*

The findings of this study can therefore provide useful recommendations to both stadium events' organizers but also to governmental bodies and associations, in order to have a deeper understanding of attendees' perceptions and preferences on sustainability at sporting events and draw standardized policies worldwide and common practices accordingly.

Although the research tries to provide valuable insights, it is important to recognize some limitations. However, while acknowledging the contextual specificity of the study's initial focus on the Norwegian football club SK Brann and the fans (including away fans) attending their games in the 2023 season, thus not capturing long-term trends or changing of fan behaviours over time, this research aims to address this limitation by conducting a quantitative survey to participants coming from a variety of global geographic locations. By capturing perspectives beyond the confines of a single club or location, this approach allows us to mitigate the temporal dynamics inherent in studying a single season, enabling a broader understanding of long-term patterns and variations in sustainability attitudes and behaviours among diverse spectator populations, thus giving more valuable insights for events' organizers.

1.4 Significance of the Study

The importance of this study lies in its holistic examination of the challenges and potential solutions for implementing more sustainable business models at stadiums, particularly in the context of sporting events. Indeed, sports events have a significant environmental impact due to their large crowds and resource-intensive operations. They also contribute to waste generation, resource depletion and carbon emissions. Our research tackles this issue head-on, seeking to reduce the negative environmental effects connected to stadium operations and attendees' behaviours.

Furthermore, by offering thorough insights into the dynamics of sustainability in stadium management, this study fills a crucial gap in the existing literature, which has historically focused solely on the impact of sporting events on the environment, mentioning some stand-alone initiatives, without giving any relevant guideline or pattern on how to act to address this issue. Through a nuanced analysis of attendee perceptions, preferences and behaviours,

supplemented by already known practices in stadium events' management and by the expansion of the sustainable business model framework *RESTART*, which was developed by researchers Jørgensen and Pedersen, the aim of the study is to uncover underlying patterns and drivers shaping sustainability initiatives in the stadium context. Additionally, the findings of our study hold significant utility for governmental bodies and event organizers around the globe, offering actionable insights and practical advice for promoting sustainability in stadium operations and enhancing environmental performance, reducing carbon emissions and fostering social responsibility in the sports industry on a global scale.

In a nutshell, this study aims to catalyse meaningful change towards more environmentally responsible and socially conscious practices in the sports industry by fostering greater awareness, involvement and collaboration among stakeholders. In the end, we hope that this research can help stadiums and communities around the world have a more sustainable future, aligning with broader efforts to combat climate change and promote sustainable development.

1.5 Structure of the Thesis

Turning to the structure of this thesis, we would begin with a comprehensive review of the existing literature on the general environmental problem and the related repercussions on our lives, then focusing on the concept of waste management at mega stadium events, underlining the key role sports can play in tackling climate change. This will lay the theoretical foundation necessary to conduct the research, identifying key concepts, trends, and gaps in current knowledge.

This chapter will be then followed by the methodology section where the research design, data collection methods and data analysis tools will be explained in detail. This section will focus on the rationale behind the chosen quantitative approach, that is based both on data collected by the Norwegian football club SK Brann for their 2023 project and primary data collected for the purposes of this work. Moreover, it is going to be explained how the SPSS software will be applied for the data analysis phase. This chapter serves as a guide to understanding the empirical methods utilized in the study.

The following chapter delves more in detail into the sustainability initiative run by SK Brann at their stadium in the 2023 season. The focus will be on the birth of the idea and on the three phases conducted for the experiment, with the first being a baseline analysis and the other two

focusing on the actual intervention measures. The chapter will provide with a brief analysis and discussion of the data collected by the club in the context of consumer behaviour at sporting events.

Chapter 5 presents the empirical analysis of the study, including a detailed outline of the data and the hypotheses that lay the foundation of the statistical analysis.

It will then be time to explore the study's findings in depth, analysing the implications and significance of sustainability initiatives at stadiums. In this chapter, the results will be interpreted so as to explore how different drivers affect consumer behaviours and choices, in order to get insights on the characteristics and features that new business models at stadiums must have in order to be successfully sustainable and profitable at the same time. Through an examination of the research results, the thesis provides valuable insights into the challenges and opportunities inherent in promoting sustainability within stadium environments, contributing to a deeper understanding of effective strategies for enhancing sustainability in the larger context of stadium event management. The empirical analysis serves as a foundation for addressing research questions and offering practical recommendations for stakeholders in the sports industry.

Finally, the limitations this research had to face are discussed, providing the required guidelines and suggestions for the development of further research on the same subject. The concluding chapter summarizes the main findings of this study.

2. Literature Review

2.1 The environmental impact of mega stadium events

2.1.1 Evaluating environmental footprints: main polluting sources in sports

When it comes to sustainability, some industries tend to get all the attention, while some others go unnoticed. Indeed, contrary to the food, fashion or consumer-goods industries, to mention a few, the environmental impact of professional sports is not often a highly discussed topic (Henczel, 2021).

However, sporting events, often celebrated for their ability to unite communities and showcasing athletic excellence, also cast a shadow of environmental impact that cannot be overlooked. Moreover, despite sporting events, especially mega events such as the Olympics or the FIFA World Cup, provide the hosting cities with short-term tourism-related advantages as well as long-term economic and infrastructural benefits, that include urban revitalization and improved quality of life for the local population, sport events and associated venues impose a significant impact on the environment. (Collins et al, 2009; Pourpakdelfekr & Oboudi, 2022). In this sense, as the size and number of these events continue to captivate growing audiences worldwide, the scale of the associated environmental footprint becomes increasingly evident. To mention a few, Waste Management[5] estimates that the NFL, MLB, NBA and NHL (Waste Management, *no date*) generate around 35,000 tonnes of CO_2 each year just from their fans. The 2010 FIFA World Cup edition, hosted in South Africa, generated alone 2.75 million tonnes of carbon emissions, while the 2014 FIFA World Cup hosted in Brazil generated 2.8 million. To conclude, the 2016 Rio Olympics produced 4.5 million tonnes of CO_2 (Henczel, 2021).

As you can see, these events leave a lasting mark on the environment long after the final whistle blows or the Olympic flame is extinguished, mainly due to the massive infrastructure development, extensive transportation networks and heightened energy consumption, which all together, as well as many more sport event related activities, have environmental

[5] Waste Management (WM) is North America's leading provider of comprehensive waste and environmental services

consequences such as waste production, land, air and water pollution and deterioration of the natural environment (Sotiriadou and Hill, 2015).

Reducing the negative impact of sport facilities and events on natural environment has thus become imperative and therefore sporting authorities, clubs and event organizers have to reinvent their operations, just like any other business in any sector, in order to shed more lights and cast less shadows (Jørgensen & Pedersen, 2018). However, before planning any strategic intervention, the first step should consist in recognizing[6] which are the main polluting sources of professional sporting events. In fact, understanding the main sources contributing to the global carbon footprint is essential for implementing effective sustainability initiatives. On this regard, below the primary contributors to the carbon footprint worldwide are delineated:

- Transportation

  Not surprisingly, the main driver of the negative environmental footprint of sporting events, representing by far the largest share of all greenhouse gases emissions attributable to these events, is transportation. In fact, sporting events are usually attended by a large number of spectators, to which the contribution of other stakeholders that make the event possible such as the organizing team, match officials, the athletes, media representatives, institutional figures and volunteers must be added. As a consequence, transportation stands as a significant contributor to the carbon footprint of professional sporting events, accounting for up to 70%[7] of the total carbon footprint associated, of which two-thirds attributable to car travel, despite the obvious huge contribution of air travel as well, as mega events held in the last decade such as the 2010 FIFA World Cup in South Africa, the 2014 FIFA World Cup in Brazil and the 2016 Rio Olympics demonstrate. (Collins et al, 2009; Öko Institute for Applied Ecology, 2019).

[6] The term "recognizing" refers to the first of four steps in "*The Business Model RESTARTer"* tool by Jørgensen and Pedersen, which will be analyzed more in detail in the third paragraph of the literature review

[7] Data estimated from reports by multiple sources, all agreeing it contributes at least for the 50% of the total

- Energy Consumption

  Professional sports events involve a wide range of energy-consuming activities, including broadcast operations, lighting, HVAC systems, stadium operations, hospitality services and so on. These energy demands can be particularly pronounced during major events, where large stadiums host thousands of spectators and media personnel. In this sense, the *International Energy Agency* (IEA) estimates that energy consumption during sporting events can constitute up to 30% of the total carbon footprint (Collins et al, 2009). This implies that implementing energy-efficient technologies and utilizing renewable energy sources for stadium operations can play a crucial role in reducing the environmental impact of sporting events.

- Stadium Construction and Operations

  Stadium construction, which includes all stages of the venue development from planning and design to building and operation, accounts for a relevant portion of the carbon footprint of major sporting events. According to research, depending on the project's size, the material utilized, and the construction techniques used, building the stadium facilities may produce hundreds of tonnes of CO_2 emissions, as all these activities include carbon-intensive processes such as resource extraction and material transportation, to mention a few. Moreover, stadium operations - such as lighting, heating and cooling systems - contribute to ongoing energy use and carbon emissions during the facility's lifespan. Thus, reducing the environmental impact of stadium development in professional sporting events can be achieved by implementing sustainable construction processes, using eco-friendly materials and incorporating energy-efficient technologies. (Waste Management, *no date*)

- Waste Generation

  Stadiums and arenas generate substantial amounts of waste materials from events activities, as they are characterized by large crowds and extensive

concessions. Waste generation normally includes food waste, packaging materials, single-use plastics and similar, contributing to pollution and environmental degradation. Therefore, even if waste may not represent a significant share of the total carbon footprint generated by sporting events, its actual environmental impact is substantial, as its degradation also affects the climate through greenhouse gases emission. In order to reduce the amount of waste generated at stadiums, recycling programs, reusable products and responsible waste disposal among attendees are frequently put into place. But even with these initiatives, waste management is still a serious problem that needs constant attention and coordinated efforts to reduce its negative effects on the environment, therefore a comprehensive approach addressing economic, social and environmental challenges simultaneously is needed in order to achieve a zero-waste system (Zafari & Golzary, 2023).

- Water usage

  Water consumption at professional sports events is diverse and includes stadium operations, irrigation for playing fields, sanitation facilities and hospitality services. Water use may not be the main source of carbon emissions, but it still has a significant environmental impact, especially in areas where there is a shortage of water. Large volumes of water are frequently needed for irrigation, maintenance and sanitation during major athletic events, which puts a strain on the area's water resources.

2.1.2 How can sports be a key player in climate action

Few other businesses can match the enormous potential that sports have to encourage climate action and positive environmental change as a result of their unparalleled global reach and influence. At the heart of this potential lies the extraordinary capacity that sports have to capture the attention and passion of billions of people worldwide, overcoming gaps in language, geography and culture to bring people together in the pursuit of athletic excellence and sporting glory.

As mentioned in the previous paragraphs, major sporting events such as the FIFA World Cup and the Olympics generate millions of tonnes of GHGs, but even single games such as the 2003/04 FA Cup[8] final have such an extensive carbon footprint that is equivalent to the annual emissions of more than 100 British citizens (Collins et al, 2009; Wilby et al, 2022), meaning that action by sporting authorities is urgent in order to reverse this trend and mitigate the negative environmental footprint of professional sports. On this purpose, as we will show more in detail in the following paragraph, the United Nations suggested in 2018 that sports can be an important enabler of sustainable development, with more than 280 sport organizations having joined their initiative to commit to the Paris Agreement since then. (Gollagher and Fastenrath, 2023)

Generally speaking, one of the most effective ways in which sports can support climate action is through advocacy and awareness-raising initiatives. However, while there is little doubt on the huge influential power sports have in activating citizen participation, much less is known on the role sporting events can play in the context of climate change mitigation by promoting the sustainability transition (Gollagher and Fastenrath, 2023). Obviously, as leaders in their fields and representatives of their sports, we can assume that athletes have a powerful platform to spread awareness of climate change and the pressing need for action. Athletes can easily encourage fans, followers and other athletes to take up the battle against climate change by speaking out on environmental concerns, using their social media power. Similarly, sports clubs, regardless of whether they compete in football, basketball, hockey or others, have a great deal of influence over their communities and supporters' groups. These teams have indeed the capacity to captivate audiences and use their platforms to tackle environmental issues, encourage eco-friendly behaviours and promote sustainability initiatives.

In addition to advocacy, sports could naturally encourage climate action by being frontrunner through innovation and technology. Indeed, sports stadiums and arenas provide unique opportunities to implement cutting-edge solutions for reducing carbon emissions, saving resources and promoting sustainability, and many of them all over the world are starting to adopt sustainable technologies and practices to minimize their environmental impact.

[8] The FA CUP is an annual knockout competition in the English football landscape. It was the very first football competition worldwide, as it was founded in 1871

Generally speaking, the environmental impact of professional football can surely be reduced. Based on a report published by the Sports Positive Summit, there are eight areas in which clubs can make a direct impact (Papp-Vary and Farkas, 2022) which mainly correspond to the polluting sources that were previously mentioned in this study. These areas are:

- The use of renewable energy sources (RES)
- Energy efficiency
- Water efficiency
- Environmentally friendly transport modes
- Waste management
- Replacement of single-use plastics
- Availability of plant-based or low-carbon food
- Communication and commitment to green goals

2.1.3 Driving change: sustainable initiatives by sporting authorities and clubs

In recent years, sustainability in sports has gained significant attention with a notable increase in related initiatives, as governing bodies, sports authorities and football clubs have realized how critical it is to address economic, social and environmental challenges simultaneously in the sports industry. In this sense, a variety of stakeholders have launched a number of initiatives aimed at promoting sustainability, minimizing environmental impact and fostering positive societal change, including not only international sporting bodies like the *International Olympic Committee* (IOC), FIFA, UEFA and individual clubs, but also the United Nations and the European Union, that have recognized the huge potential professional sports have in being in the front run for the transition.

The United Nations, for instance, through its *United Nations Framework Convention on Climate Change*[9], introduced in 2018 the "Sports for Climate Action" initiative, encouraging sports organizations to take voluntary action to reduce their greenhouse gas emissions and contribute to global climate goals by providing them with a forum where signatories to the

[9] The UNFCCC is the United Nations entity tasked with supporting the global response to the threat of climate change

framework could disseminate good practices, lessons learned and develop new tools, committing to adhere to the following five principles and incorporate them into strategies, policies and procedures and mainstream them within the sports community:

- Undertake systematic efforts to promote greater environmental responsibility
- Reduce overall climate impact
- Educate for climate action
- Promote sustainable and responsible consumption
- Advocate for climate action through communication (United Nations, *no date*)

Signatories to the framework include international sports federations, leagues, clubs and events, demonstrating a collective commitment to sustainability within the sports industry. In addition, the United Nations developed a football-related initiative named "*Football for the Goals*" (FFTG) in collaboration with UEFA (which was the inaugural member), welcoming confederations, national associations, leagues, clubs, players, organized fan groups and media and commercial partners to commit to a series of principles related to sustainable development across their business practices, with the final aim of promoting the Sustainable Development Goals (SDGs) through football-related activities and events (United Nations, *no date*). The FFTG, nevertheless, tap into the power of football not only to raise awareness and recognition of the SDGs, but also to achieve behavioural change and sustainable practices in the football industry. Members include five of the six international confederations[10], many national associations and some of the top domestic leagues in the world, as well as some clubs and clubs' associations, player associations and unions and so on.

On this regard, organizations like UEFA and FIFA have recently been at the forefront for what concerns the promotion of sustainability initiatives within the sport, launching comprehensive strategies and programs with the aim of reducing the carbon footprint of their operations and promoting environmental stewardship. Among these, one of UEFA's primary sustainability projects is the "Strength through Unity" sustainability strategy 2030, that has the mission of inspiring, activating and accelerating collective action to "respect human rights and the environment within the context of European football" (UEFA documents, 2021). The strategy

[10] With the only exception of CAF, the *Confederation of African Football*

encompasses 11 policies aligned with the pillars of human rights and the environment, with the latter focusing on circular economy, climate and advocacy, event sustainability and infrastructure sustainability. More specifically, the four environmental policies regard:

- Circular economy (policy number 8) → At the very end of 2023, UEFA released its circular economy guidelines, providing associations, leagues, clubs and stadium events' organizers with guidance on adopting circular economy principles in their operations, emphasizing resource efficiency, waste reduction and material reuse and promoting a closed-loop approach. UEFA are trying to optimize the consumption and life cycle of products throughout their operations and events. The focus mainly concerns four macro areas of activity in football, that are food and beverage, apparel and football equipment, event materials and energy and water. On this purpose, the 2030 ambition of the policy related to circular economy is to shift from the current consumption model, built on the "Take, Make, Waste" to a circular model that embeds a 4R approach, built around "Reducing, Reusing, Recycling and Recovering" in all their operations to minimize the negative impact of football on the environment and drive resource efficiency and cost savings. The guidelines showcase an eight-step approach to implementing the 4R framework, that are: selecting accountable individuals; analysing specific contexts; defining missions; setting KPIs; prioritizing solutions; creating action plans; monitoring progress; reporting on achievements (UEFA documents, 2023). In compliance with these guidelines, European top clubs like Bayern Munich (fcbayern.com, 2017) and Arsenal (Arsenal.com, 2023) have developed waste management programs, recycling schemes and initiatives to cut back on single-use plastic, both achieving significant reductions in waste generation through these initiatives.

- Climate and advocacy (policy number 9) → With this policy, UEFA aims at preventing or at least reducing direct and indirect carbon emissions related to their operations and events, while at the same time leveraging the sport's reach and visibility to raise awareness and advocate the urgency of climate action across the football community. The related 2030 ambition is thus reducing European's football carbon footprint and be a credible reference partner for organizations working on climate protection. (UEFA documents, 2021)

- Event sustainability (policy number 10) → With this policy, UEFA aims at designing, planning and implementing events in ways that prevent or reduce negative environmental impact on host cities and their surrounding communities through the forthcoming creation of the UEFA *sustainable event management system* (SEMS), which will make it possible the measurement and benchmarking of event sustainability in football and offer end-to-end traceability of UEFA's impact at all of its events. The SEMS first full implementation will take place at EURO 2024[11] in Germany, after a piloting phase at Women's EURO 2022. The related 2030 ambition is setting a new benchmark for zero-impact sporting events by developing introducing its own sustainable event management system (UEFA documents, 2021)

- Infrastructure sustainability (policy number 11) → through the infrastructure sustainability guidelines, UEFA's ambition is to "continue to raise the bar for European football infrastructure", including stadium and training facilities. More specifically, the guidelines provide detailed indications on the day-today life of a facility, including the use of technology embedded in the infrastructure and the pitch, event management and waste management. The 2030 ambition is to set criteria and share practices for a new generation of sustainable football venues (UEFA, 2022).

Finally, in 2024, the introduction of UEFA's carbon footprint calculator enabled stakeholders to identify and calculate their emissions related to football-specific areas, particularly mobility, facilities, purchased goods and services and logistics, with the aim of supporting all users to manage and reduce carbon emissions in a simplified and cost-effective way based on a single, third-party approved[12] framework. (UEFA.com, 2024)

Clubs like Udinese Calcio have embraced all of these guidelines and diminished their environmental impact by putting in place energy-efficient infrastructure projects like solar

[11] UEFA EURO 2024 will be the 17th edition of the UEFA European Championship, a quadrennial competition for men's national teams across Europe

[12] "UEFA Carbon Accounting Methodology" vers 5 (date: 07.02.2024): Is based on the requirements of the "Greenhouse Gas Protocol Corporate Accounting and Reporting Standard, Revised Edition (2004; 'Corporate Standard')" and the "EPA guidance on measuring direct emissions associated with events".

panels, rainwater harvesting systems and LED lighting systems. Udinese's stadium, BlueEnergy Stadium, has become a model of sustainability, incorporating green building technologies and renewable energy sources to minimize its carbon footprint, and has recently reached carbon-neutrality, allowing the club to become the most sustainable team in Serie A in the context of the Brand Finance Football Sustainability Index 2023, a classification based on ESG parameters that placed Udinese in 4th place worldwide (Udinese.it, 2023). However, the club that has recently gained prominence not only for its on-field performances but also for its pioneering efforts in promoting environmental sustainability within the sports industry is Forest Green Rovers, which compete in the English fourth division. The club has been recognized as the greenest in the world by FIFA and has also received an honourable mention by the UN for being the first carbon neutral club in the world. The club's dedication to sustainability is visible in every facet of its operations, from the usage of renewable energy sources to the adoption of eco-friendly initiatives at its stadium. The stadium itself, The New Lawn, is a showcase for environmentally friendly design, featuring solar panels, rainwater harvesting systems and an organic pitch maintained without the use of chemical pesticides or fertilizers.

In addition, Forest Green Rovers has implemented a number of innovative programs to minimize their impact on the environment, including the installation of an electric vehicle charging station, the promotion of plant-based foot options for both players and fans, the introduction of reusable cups and water-bottles to prevent waste from the use of single-use plastics and the realization of match kits made from 50% bamboo waste and 50% recycled plastic. Also, the team travels in 100% electric vehicles, reducing carbon emissions (Papp-Vary and Farkas, 2022; fgr.com, *no date*). Furthermore, the club actively engages with fans, local communities and other sports organizations to raise awareness about environmental issues and inspire positive change and has been a pioneer in measuring its carbon footprint in accordance with the international environmental standard ISO1400[13].

Outside of football, the International Olympic Committee (IOC) has been actively promoting sustainability initiatives within the Olympic Movement, aiming to minimize the environmental impact of the Olympic Games and inspire positive change beyond the sporting

[13] "ISO 14001 provides requirements with guidance for use that relate to environmental management systems. Other standards in the family focus on specific approaches such as audits, communications, labelling and life cycle analysis, as well as environmental challenges such as climate change" – ISO.org

event. In particular, the IOC established the IOC's Olympic Games Knowledge Management Program (OGKM), which created the Olympic Games Impact studies to help organizers understand and quantify potential impacts hosting an Olympic Games has on the host cities. Other key initiatives by the IOC include the development of a comprehensive strategy for environmental stewardship, social inclusion and economic development; the adoption of sustainability as a pillar of Olympic Agenda 2020 with recommendations for reducing carbon emissions, minimizing waste and promoting sustainable development in host cities; strict sustainability guidelines and reporting requirements for host cities and organizing committees throughout the planning, staging, and legacy phases of the Olympic Games; commitment to making the Olympic Games carbon neutral through renewable energy projects, reforestation programs, and carbon offsetting schemes; promotion of legacy projects such as sustainable infrastructure and community initiatives benefiting local populations long after the Games have ended; and efforts to raise awareness about sustainability issues through educational programs, campaigns, and partnerships, inspiring action to protect the environment, promote social equity, and build a more sustainable future for generations to come. (International Olympic Committee, *no date*)

Sustainability initiatives have also been implemented in other sports venues, such as major tennis tournaments like Grand Slams Australian Open in Melbourne and Wimbledon in the UK. The latter, especially, has set goals for 2030 that focus on four macro areas, that are resource efficiency, operational emissions reduction, biodiversity gains and inspiring wider action. Wimbledon strives to minimize waste generation, optimize the use of water and energy and improve recycling and reuse procedures throughout its activities in order to achieve resource efficiency. For instance, the site has already started promoting a culture of reuse, reducing single-use plastic waste by providing reusable cups for all drinks served at the club, offering multiple chances for after-use management for spectators. Other efforts to mitigate operational emissions involve implementing RES, transitioning to low-carbon transportation and adopting energy-efficient technologies. Beyond its operations, Wimbledon hopes to inspire wider action by involving stakeholders, bringing sustainability challenges to the public's attention to drive positive change inside and outside of the sports industry. (Wimbledon.com, *no date*)

All in all, it is clear that sports organization can play a significant role in addressing global challenges and building a more sustainable future for the sport and the planet. Mitigating the negative effects of sporting events on the environment necessitates a set of multifaceted

solutions. Two potential approaches may include changes in consumer (fans) behaviours and shifts towards more sustainable business models within the sports industry. Nonetheless, addressing such a complex issue requires a comprehensive approach, which may also entail investments in new technologies and infrastructures. The subsequent paragraphs will delve deeper into the theoretical foundation of our research, particularly focusing on behavioural economics and, above all, sustainable business models as critical concepts for understanding and addressing the environmental challenges associated with sports.

2.2 Changing consumer behaviour for sustainability

2.2.1 Theoretical background on behavioural economics and “nudges”

The field of behavioural economics, which lies at the intersection of economics and psychology, has substantially contributed to the study of consumer behaviour by providing insights into the irrational yet frequently predictable ways in which individuals make decisions. While traditional economic theory assumes that customers are rational agents that make decisions in such a way that they maximise their utility, behavioural economics contests this notion by emphasizing the existence of cognitive biases that impact the decision-making process (Kahneman & Tversky, 1979).

In this sense, behavioural economists have identified various factors that shape consumer behaviour, including social norms, cognitive biases, emotional responses and contextual cues (Thaler, 1980; Ariely, 2008).

Within behavioural economics, one important concept that has gained recognition is "nudges." The term “nudges”, which was first introduced by Richard Thaler and Cass Sunstein in their influential book "Nudge: Improving Decisions About Health, Wealth, and Happiness", refer to interventions that steer individuals towards making better choices without restricting their freedom of choice, thus “influencing” the decision they make without changing either objective payoffs or incentives (Thaler & Sunstein, 2008). Nudges work by leveraging insights from behavioural science to subtly influence decision-making processes, often by altering the choice architecture or providing salient cues that guide individuals towards desirable outcomes.

To make it clearer, Thaler and Sunstein define nudges as:

> *"... any aspect of the choice architecture that alters people's behaviour in a predictable way without forbidding any options or significantly changing their economic incentives. To count as a mere nudge, the intervention must be easy and cheap to avoid. Nudges are not mandates. Putting the fruit at eye level counts as a nudge. Banning junk food does not".*

An alternative definition has been provided by the Danish behavioural researcher Hansen (2016), who states that:

> *"A nudge is ... any attempt at influencing people's judgment, choice or behaviour in a predictable way (1) made possible because of cognitive biases in individual and social decision-making posing barriers for people to perform rationally in their own interest, and (2) working by making use of those biases as an integral part of such attempts".*

Being nudges tools that mostly work on changing non-deliberative aspects of individuals' actions, people are often unaware of the effects that changes in the environment. Nudge tools include defaults, working with warnings of various kinds, changing layouts and features of different environments, reminding people about their choices, drawing attention to social norms and using framing in order to change behaviour. In general, nudging builds on the idea that not only the amount or the accessibility of information provided to people matters, but also how this information is presented, i.e., how the physical environment built around the decision-making context looks like, as it has been acknowledged to have a significant impact on individual's choices. (Mont et al, 2014)

In a recent study, instead, researchers Katherine White, Rishad Habib and David J. Hardisty developed a framework that links consumer behaviour and sustainability, with the objective of shifting consumer behaviours towards a more sustainable one. The framework is represented by the acronym SHIFT and highlights that consumers are "more inclined to engage in pro-environmental behaviours when the message or context leverages the following psychological factors (White et al, 2019):

- Social influence → This factor highlights how social norms, peer pressure and social interactions affect an individual's behaviour. Individuals are affected by the

attitudes and actions of those around them, whether it be friends, family, or larger social groups. The authors analyse how three different facets of social influence, such as social norms (information about what other people are doing or commonly do), social identities (for instance, ingroup messages) and social desirability (consumers are more likely to act in a socially desirable manner where other people can observe and evaluate their actions), can shift consumers to be more sustainable.

- Habit formation → Individual actions are greatly influenced by habitual behaviour. Habits are behaviours that persist over time and are automatic, as they are acquired through frequent repetition in consistent contexts. Once established, habits can greatly influence behaviour without the need for conscious decision-making. According to Donald, Cooper, and Conchie (2014) and Verplanken and Roy (2016), a lot of behaviours that have sustainability implications are highly habitual. These include food consumption, transportation choices, energy and resource use, shopping and product disposal. Disrupting negative habits can be accomplished through interventions that break repetition, like discontinuity and penalties. Positive behaviours can instead be reinforced by actions that encourage repetition, such as making sustainable actions easy and utilizing prompts, incentives and feedback.

- Individual Self → This component focuses on individual characteristics such as identity, values, beliefs and personality traits. Personal motivations, aspirations and self-perceptions can drive behaviour change by aligning actions with personal goals and values. Sustainable practices can be adopted by people because of their environmental ideals as "green" or environmentally conscientious people.

- Feelings and cognition → Behaviour is also greatly influenced by attitudes, emotions, and cognitive processes. Negative emotions or cognitive barriers may impede progress, while positive emotions and attitudes can support behaviour change by making activities more rewarding and enjoyable. Indeed, people might be inspired to take action to safeguard the environment by positive emotions like stewardship towards nature, empathy for future generations and concern for the environment, but also by negative emotions such as “fear appeals”.

- Tangibility → The term "tangibility" describes the benefits of changing one's behaviour that are thought to be real or tangible. People might be more inclined to embrace sustainable practices if they see observable advantages like cost savings, improved health outcomes or social recognition. Energy-saving practices, for instance, like installing energy-efficient appliances or taking public transport, not only help to conserve the environment but also result in cost savings for individuals. (White et al, 2019)

2.3 Implementing more sustainable business models

2.3.1 Theoretical background on sustainable business models: RESTART

In an era characterized by unparalleled environmental challenges and societal demands for corporate social responsibility, there is a greater need than ever for sustainable business models. Climate change, resource depletion, biodiversity loss and socioeconomic inequality are among the crises that the world is currently confronting, each exacerbated by traditional modes of commerce and industrialization. As companies navigate this landscape, they are increasingly called upon to transcend the narrow focus of profit maximization and embrace a broader commitment to sustainability on a three-dimensional paradigm.

Traditional business models, rooted in a linear "take-make-waste" paradigm, have had detrimental effects on the environment and its inhabitants. The relentless pursuit of short-term objectives has often come at the expense of long-term viability, perpetuating a cycle of environmental degradation and social injustice. Nonetheless, these difficulties present a significant chance for innovation and transition.

The need for sustainable business models stems not only from ethical imperatives but also from an economic approach. As the impacts of climate change become more pronounced and regulations tighten, businesses face escalating risks—from supply chain disruptions to reputational damage. Furthermore, customers are becoming more selective and want businesses that show a sincere dedication to sustainability, as evidence shows that they are increasingly making purchases on the perceived company’s sustainable commitment since they tend to trust more companies that are innovating through sustainable initiatives (Jørgensen et al, 2021).

Generally speaking, sustainable business models aim to provide value that goes beyond financial measurements to include social and environmental indicators in addition to economic prosperity, such as environmental stewardship and social equality. In this regard, Norwegian researchers Lars Jacob Tynes Pedersen and Sveinung Jørgensen developed a framework that can support managers in their attempts to recognize, rethink, reinvent and reorganize the business model of their organization, that is the way in which the company creates, delivers and captures value. The aforementioned framework has been named with the acronym RESTART and is intended to capture the characteristics of innovative business models that can simultaneously be sustainable and profitable. In this sense, there is compelling evidence that sustainability and profitability are not only possible to align, but also that integrating sustainability within a company's processes may also lead to a competitive advantage that could make the company outperform those who haven't aligned to ESG practices in the long-run, especially in industries in which there is closer contact with customers and brand image and reputation matter, thus making the incentives to become greener even stronger (Eccles et al, 2014). In this sense, as companies can be considered both part of the problem and part of the solution at the same time, there are two potential approaches to the sustainability transition. On the one hand, there are companies that take responsibility for their culpability in contributing to the problem and, as a result, make efforts to lessen the harm they cause to the environment and society. On the other hand, other businesses see an opportunity to address the issue and develop viable business models that allow them to provide goods and services that make up for the damage done by others. This distinction between the two approach is summarized by the following illustration (Jørgensen & Pedersen, 2017).

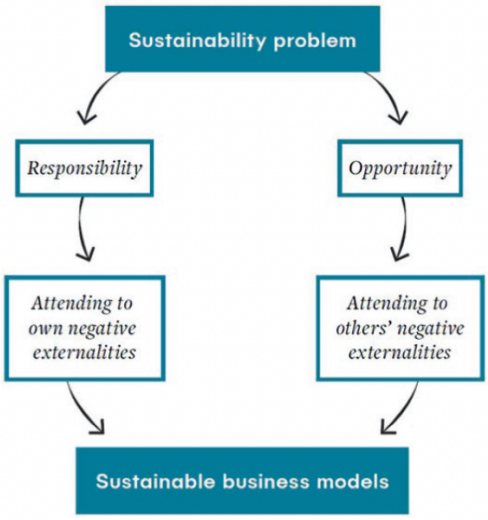


Figure 1: sustainability as responsibility and as opportunity (Jørgensen and Pedersen, 2017)

However, every single organization cast shadows, that is that causes problems for others through their operations, and shed lights, that is they solve problem caused by others. The aim should be achieving the green growth, increasing their economic growth while reducing their negative impact on society and the environment. The following graph (McDonough and Braungart, 2010) depicts the positive and negative externalities of a company. Their objective should be contributing to more sustainable businesses by moving towards the right, thus shedding more lights and casting less shadows.

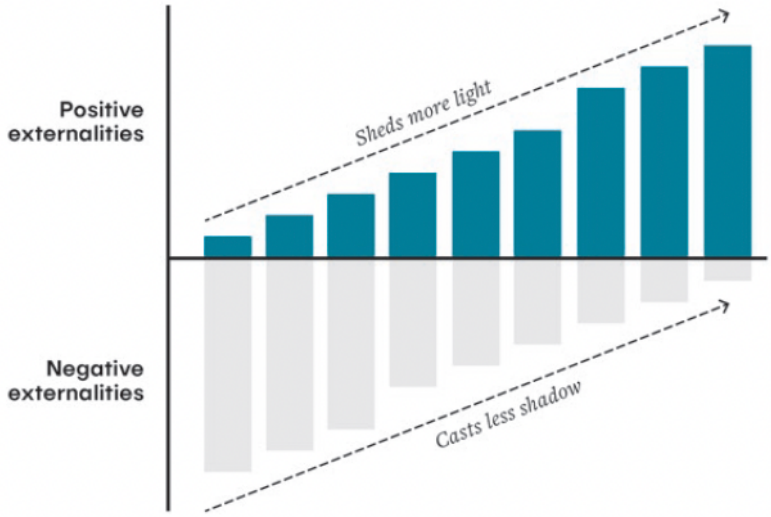


Figure 2: the net effect of sustainability efforts (based on McDonough and Braungart 2010, taken from Jørgensen and Pedersen, 2018)

According to the two researchers, the need for a RESTART is driven by three major trends that our society has recently experienced. The first reason stands obviously on the huge sustainability problem our planet is facing, that can be at the same time a threat and an opportunity for companies, with sustainability issues thus being drivers of innovation (Nidumolu et al, 2009). Secondly, the rapid technological advancements we have been experiencing in the last decades makes old business models soon obsolete and creates huge opportunities for creating values in innovative ways (Teece, 2010).

Lastly, this can also be made possible by changes in consumer preferences and consumption patterns. Overall, more sustainable business models will enable a more efficient use of resources in a way that can enhance the offering to customers while at the same time reducing

the footprint generated by the company's operations (Bocken et al, 2014; Boons and Lüdeke-Freund, 2013; Jørgensen and Pedersen, 2015).

In their book "RESTART Sustainable Business Model Innovation" (2018), Jørgensen and Pedersen present their framework by highlighting seven main changes that could make business models more efficient and sustainable, making it possible to achieve a green growth.

These seven propositions suggest that the business models of the future:

...they will require frequent REDESIGN,
...which necessitates controlled EXPERIMENTATION.
...and be characterized by SERVICE-LOGIC
...based on ideas from THE CIRCULAR economy.
...which will make ALLIANCES even more important,
...in order to achieve the right RESULTS
...in a world where the scorecard is THREE-DIMENSIONAL.[14]

In the following section, a brief analysis of the seven steps mentioned above will be performed.

Redesign

The first proposition consists in integrating the concept of frequent "redesign" rather than standstill, redesigning the business model to be sustainable and profitable at the same time. This process implies changing how the company creates, delivers and captures value in such a way that it reduces the shadows it casts on the environment and sheds instead more lights. The goal should be identifying the needs of customers, thus recognizing problems that are not at present solved in a satisfactory manner and aligning the value proposition to this need (Johnson et al, 2008; Jørgensen and Pedersen, 2018). Following that, the company should be wise in finding the right strategic and organizational conditions that allow them to deliver efficiently the value created, and finally come up with a wise smart of profitability.

Experimentation

The movement toward sustainable development requires experimentation and a step-by-step approach in testing new business models opportunities, in order to uncover what works and what does not and why, reducing the risk of innovation. Obviously, business model

[14] Passage taken from the book "RESTART Sustainable Business Model Innovation"

experimentation deals with the ways a company creates, delivers and captures value, and sustainable business models' innovation is about creating superior customer value by addressing societal and environmental needs through the way business is done. While trial and error in a controlled way is generally a good strategy for business model experimentation (Davenport, 2009), since there is uncertainty about the outcome of innovations in sustainability, creating shared value (Porter and Kramer, 2011) is difficult to realize in practice (Bocken et al, 2019). On this regard, Bocken developed a four-step framework that enable a systemic form of sustainable business model experimentation. The four steps identified encompass defining the sustainability aims of the business, identifying dependencies, framing the nature of the dependencies and mapping value by modifying, destroying or creating dependencies and innovating sustainability through key partnerships.

Service-logic

The imperative for sustainable business models in the modern world pivots towards a service-oriented paradigm, shifting from the traditional product-centric approach to one rooted in access over ownership. By embracing a service-logic, businesses can unlock opportunities for smarter utilization of technology and resources, fostering a more sustainable relationship between consumers and products. The sharing economy serves as an example of how companies may use technology to promote cooperative consumption and optimize resource allocation through platforms like ridesharing, accommodation rental and peer-to-peer lending. Overall, by building business models based on service-logic, companies can enable a smarter use of resources, contributing to improved capacity utilization and less resource waste (Jørgensen and Pedersen, 2018).

The circular economy

The circular economy can be seen as a promising approach to help reduce our global sustainability pressures, as it contrasts with the traditional linear business model of production of take-make-dispose and ensures that resources are used repeatedly, thus closing the loops. Jørgensen and Pedersen identify at least three necessary changes, that are the need to use resources in a way that does not exhaust resource stocks, design products, services and processes in a way that leads to less use of scarce resources and facilitate the reuse thereof and maintain products and materials at as high-quality level as possible to reuse them.

To do so, circular economies build on three strategies (Bocken et al, 2016):

- Closing resource loops, which means that the loop between post-use and production is closed
- Narrowing resource loops, using fewer resources per product
- Slowing resource loops, extending the utilization period of products which will result in a slowdown of the flow of resources

The circular economy requires companies to rethink their supply chain and business models. As pointed out by Lüdeke-Freund et al (2019), there are six major circular economy business models (CEBM) patterns with the potential to support the closing of resource flows:

- Repair and maintenance

- Reuse and redistribution
- Refurbishment and remanufacturing
- Recycling
- Cascading and repurposing
- Organic feedstock

Alliances

As no single organization can have a relevant impact alone, collaboration is crucial in order to develop business models that are both sustainable and profitable. In this sense, collaboration might require providing potential competitors with access to internal processes, and the concept of coopetition has been getting increasing attention in recent decades (Brandenburger and Nalebuff, 2011). Collaboration, therefore, can increase value creation for all stakeholders, increasing the “size of the cake” and allowing companies to improve their value capture by getting a slightly smaller piece of a much larger cake.

Results

In order to achieve the hoped results, prioritization is crucial, therefore companies need to work out what is material (Forstsater et al, 2006). Evaluating the company's most important social and environmental issues and ranking them according to their importance from an economic, social, and environmental perspective are necessary steps in determining materiality. As the following illustration shows, companies should place more emphasis on

issues that are more material for both the company and its stakeholders, and issues further up and to the right in the diagram are gradually more important and need to be prioritized.

Generally, companies that invest in solving material sustainability issues experience greater positive financial performance effects than those that do not make such investments and those who try to solve both material and immaterial issues (Jørgensen and Pedersen, 2018; Jørgensen et al, 2022).

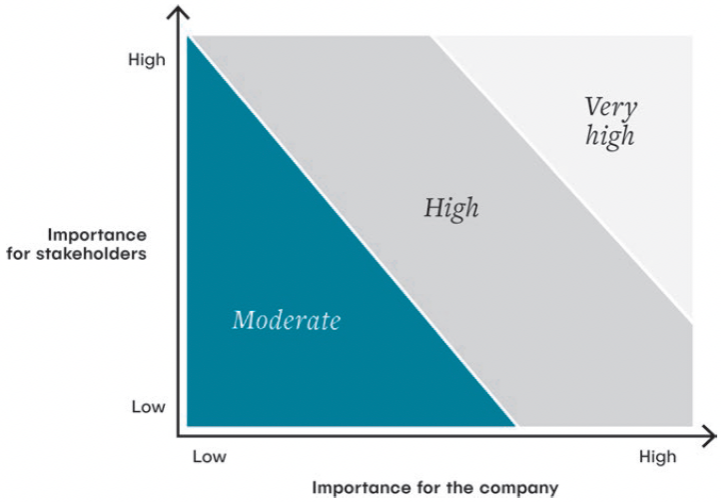


Figure 3: how to assess which issues are material for the company and its stakeholders (Jørgensen and Pedersen, 2018)

Three-dimensionality

The entire organization must be designed in a way that renders the company able to be sustainable and profitable at the same time, which requires setting the right objectives on a three-dimensional rather than one-dimensional approach, thus integrating social, environmental and financial dimensions within the company's processes. In this sense, four organizational characteristics are particularly important (Jørgensen and Pedersen, 2018):

- Assignment of authority and accountability
- Contact with stakeholders inside and outside the organization (boundary spanners)
- Development and monitoring of control systems and performance indicators
- Development of appropriate incentive structure

The Business Model RESTARTer

In order to help managers in starting the transition, Jørgensen and Pedersen further developed the RESTART framework by implementing a comprehensive process model to give them guidance in such a change. This model, named *The Business Model RESTARTer*, can be divided in four phases:

- *Recognize* your business model: understand the status quo, the way the company creates, delivers and captures value, and identify the need for change
- *Rethink* your business model: identify opportunities, threats and possibilities for an improved business model
- *Reinvent* your business model: hypothesize, test and decide on a new business model, develop new ways of creating, delivering and capturing value
- *Reorganize* your business model: implement the new business model by rebuilding the organization in a way it facilitates and supports the new business model in the long-term

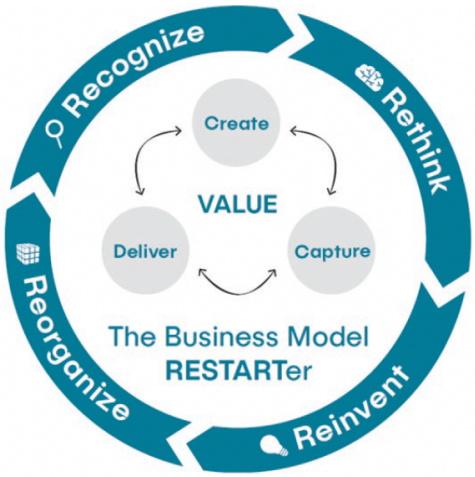


Figure 4: The business model RESTARTer for sustainable business model (Jørgensen and Pedersen, 2019)

To put everything in practice, it can be argued that it would be better to perform a TRATSER rather than a RESTART, reverting the sequence of the letters.

In this way, the first step of the changing process would be taking the concept of *three-dimensionality* into account to define the new objectives of the company.

Following that, the process would continue with aiming for the right *results* and thus assess materiality. Next, the analysis would continue by encompassing the concepts of *alliances*, *the circular economy* and *service-logic* within the new business model.

Obviously, an *experimentation* phase would follow to test the new business model and, based on the insights gathered, finally be ready to *redesign* the company's business model towards sustainability and profitability simultaneously (Jørgensen and Pedersen, 2018).

3. Research methodology

3.1 Research design

3.1.1 Approach and data collection

The nature of this study is primary explanatory, as it aims to understand and explain the relationships between drivers influencing consumer choices and behaviours and attitudes towards sustainable business models at stadiums. Additionally, this research also incorporates some exploratory elements, as it also investigates into consumer perception on potential patterns of sustainable business models at stadiums, which is potentially a new area of investigation. (Yin, 2014; Stebbins, 2001)

In order to conduct this explanatory research, a quantitative approach will be used. According to Watson (2015), a "quantitative research encompasses a range of methods concerned with the systematic investigation of social phenomena, using statistical or numerical data". As previously mentioned, this research will focus on the challenges and potential solutions for introducing more sustainable economic models at sporting events by investigating attendees' perceptions, attitudes and behaviours related to sustainability initiatives.

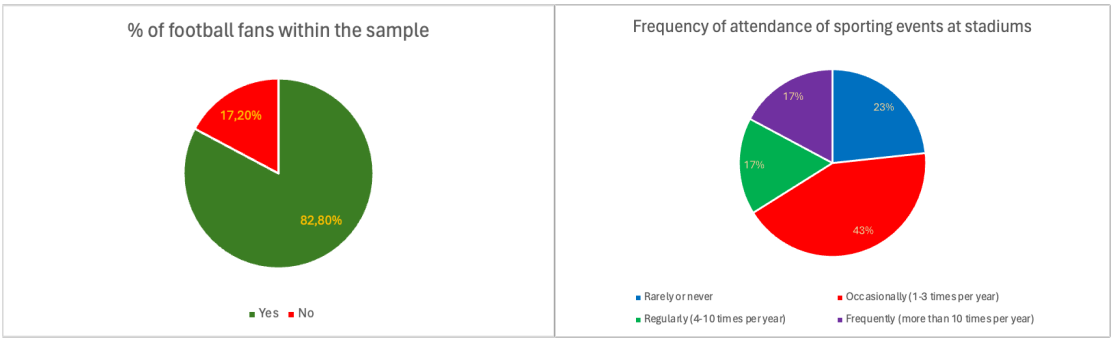
This study used an integrated approach to gather its data, drawing from both primary and secondary sources. Indeed, the secondary data were obtained from the ongoing research conducted by the NHH research team and Sportsklubben Brann as part of their sustainability initiative at Brann Stadion, which will better explained in the next chapter of this work. Despite the ongoing nature of the research and its unpublished status, access to their data was allowed for the sake of this study. These secondary data provide valuable insights into consumer behaviour at sporting events and the impact of nudging techniques and awareness-raising initiatives had in changing and shaping the fans behaviours.

In addition to the secondary data, primary data were also collected via a survey designed specifically for this research endeavour. The purpose of the survey was to explore a range of topics related to sustainability in the context of sporting events, examining the respondents' perceptions towards the role of sports in climate action, their attitudes toward sustainable practices such as the likelihood to engage in sustainable practices and the perceived

importance of potential interventions by organizers, and, most importantly, fans' preferences among different options for sustainable business models at stadiums.

3.1.2 Sampling choice

The survey sample consisted of 180 respondents, with data collected through a combination of convenience and purposive sampling techniques. Convenience sampling involves selecting individuals who are readily available and easily accessible to the researcher, in this case mainly acquaintances. Purposive sampling, on the other hand, involves selecting individuals based on specific characteristics or criteria relevant to the research objectives (Neuman, 2014; Babbie, 2016). In particular, the aim of this research was that of having a sample as representative as possible, therefore a purposive approach was used by recruiting sports enthusiasts through online platform. In this sense, the research targeted predominantly football fans (83% of the respondents) who attend sporting events at least once a year (77% of the respondents).



Figures 5 and 6: Information on the sampling choice and characteristics of the sample selected

3.2 Data analysis tools and procedure

Data analysis for this study will be conducted using the Statistical Package for the Social Sciences (SPSS). The software, developed by IBM, a global technology company specialized in hardware and software, provides researchers with a comprehensive platform for managing, analysing and interpreting data. The analysis process will commence with descriptive statistics, which provide a comprehensive overview of the dataset. Descriptive statistics will include measures of central tendency, measures of dispersion and frequency distributions of stadium events attendees' preferences and perceptions on sustainability initiatives and sustainable business models.

Following the descriptive analysis, multinomial logistic regression analysis will be employed to test the hypotheses formulated for the study, which will be shown more in detail in the empirical analysis section. Multinomial regression is a statistical technique used to explore relationships between categorical dependent variables (e.g., choice among different options of sustainable business models) and one or more independent variables (Bayaga, 2010), such as the drivers o choice that can be considered either as perceived obstacles or incentives. Multinomial regression will thus assist in identifying the variables influencing decision-making in the context of sustainability at sporting venues by analysing the impact of different predictors on the probability of preferring specific sustainable business models. To conclude, a Pearson's correlation will be employed to test whether demographic information could be relevant predictors for spectators' behaviours and choices.

4. The SK Brann's sustainable events project

4.1 A brief overview of the club and the initiative

SK Brann is a professional football team based in Norway's second largest city, Bergen, which was founded in 1908. With over a century of history, SK Brann has soon established itself as one of the most iconic and successful football clubs in Norway, also being one of the major clubs in terms of public interest. The men first team currently plays in Norway's premier division of football, Eliteserien[15], and has recently had the chance to compete at international level thanks to the successful achievements in the domestic competitions. As "Bergens Stolthet", the "pride of Bergen", SK Brann enjoys a very strong connection to its territory and its community (Brann.no, *no* date). Beyond the confines of the pitch, SK Brann has increasingly prioritized sustainability initiatives, recognizing the importance of environmental responsibility and social impact, with the aim of minimizing the carbon footprint associated to its operations and promoting eco-friendly practices within its community. More specifically, after watching the FIFA World Cup in Qatar in 2022, where Japanese supporters cleaned the stands they had been standing in and took their rubbish home with them after every Japan match, the club decided to start a research project with the research team from Bergen's main business school Norwegian School of Economics (NHH) and BIR Bedrift AS, a Bergen-based company specialized in waste management services, trying to replicate the "Japanese conditions" in Western Norway.

The project received support from both the *Norges Fotballforbund* (NFF, the Norwegian football association) and UEFA's research fund. The main focus of the initiative is analysing and changing consumer behaviour at sporting events, in this case at SK Brann's men's first team home games, by studying possible measures that can bring football supporters to:

- Take their waste from their seats in the stadium to the nearest waste bin
- Put the right waste "fractions" in the right bin. (NHH, 2024)

[15] Eliteserien is the Norwegian professional league at the top of the Norwegian football's system

4.2 The project at Brann Stadion for the 2023 season

4.2.1 Setting the stage: baseline assessment to understand the situation at the stadium

As mentioned above, a ground-breaking sustainability initiative is underway at the men's first team home games of Norwegian SK Brann at Brann Stadion. This initiative marks a significant step forward in the club's commitment to environmental stewardship and has been made possible by the research team from the Norwegian School of Economics composed by Sveinung Jørgensen, Lars Jacob Tynes Pedersen and club's board member Siv Skard.

At the start of the 2023 Eliteserien season, which featured fixtures against notable opponents such as Vålerenga and Sandefjord, a baseline assessment was carefully carried out prior to taking any corrective action. The research group carefully collected all waste generated from each stand and meticulously weighed it in order to have full control of what was sorted where and thus to get comprehensive insights into the waste disposal habits of spectators. The findings from the first two games of the season painted a revealing picture: despite the presence of easily noticeable waste bins, spectators often opted to leave their waste on the stands rather than carrying it to the designated bins, resulting in an alarming accumulation of approximately 170 kg of littering. Moreover, when spectators did make an effort to dispose of their waste, they frequently struggled to utilize the designated bins correctly, leading to improper trash sorting. For instance, the sorting rate of single-use cups during the match against Vålerenga was found to be a mere 20%. This discrepancy underscores the urgent need for targeted interventions aimed at fostering a sense of responsibility and promoting sustainable practices among football supporters.

To investigate this issue theoretically, SK Brann conducted an online experiment on a sample of English Premier League fans (N=885), exploring nine conditions manipulating the final result (win, loss, or no information on the outcome of the game) and the group-identity message (in-group or out-group identity). Participants were presented with scenarios simulating attendance at a match, such as being a Manchester United fan at Etihad Stadium after losing to arch-rival Manchester City, and then asked whether they would make an effort to sort their waste correctly. Interestingly, most of respondents indicated they would sort their waste correctly, regardless of the scenario presented. However, when participants were asked about the amount of time they would dedicate to trash sorting on a scale of 1-10, a different

pattern emerged. It was observed that respondents would allocate more time to trash sorting if they were informed of their team's victory and if they were shown an in-group identity message (*SK Brann* internal document, 2023). This discrepancy between intention and behaviour highlights a notable gap that clubs must address to effectively promote sustainable practices among fans. To overcome these barriers and foster a shift towards sustainable behaviour (White et al, 2019), clubs need to implement smart strategies that bridge the attitude-behaviour gap and incentivize fans.

In light of these findings, the research team has collaborated closely with SK Brann and other stakeholders to develop and implement effective strategies to address the identified challenges. To do so, concepts of behavioural economics, nudges as well as the SHIFT framework have all been strongly taken into account in shaping of the sustainability initiative at Brann Stadion.

4.2.2 Discussion on the data collected by the club

SK Brann aims to create a stadium environment where sustainable activities are deeply embedded in the fan culture, promoting a long-lasting commitment to sustainability. As mentioned above, the first phase of the project, the baseline assessment, uncovered the existence of a huge gap between the fan's intention and their actual behaviour on site, resulting in them leaving an alarming amount of waste at their seats or "contaminating" waste by sorting it incorrectly. The research team identified three main causes:

- Spectators don't know where to sort their waste correctly (cognitive ability)
- Spectators want to go back home as soon as possible (conflict of needs)
- Spectators see that the others don't sort their trash correctly, so they don't worry (impact bias)

Consequently, the research team had to work meticulously on possible measures that can get the spectators at the match to bring their own waste to the closest waste station and throw it in the correct bins, thus making it easier for them to act in accordance with their goals and intentions (NHH, 2024). However, as the research is still ongoing, much cannot yet be disclosed in this regard, therefore the analysis will be limited to few data.

Following the baseline assessment, the second phase of the project consisted in the introduction of nudges, whose main idea was explained above.

The stadium was subdivided into five different sections, in each of which different measures were implemented:

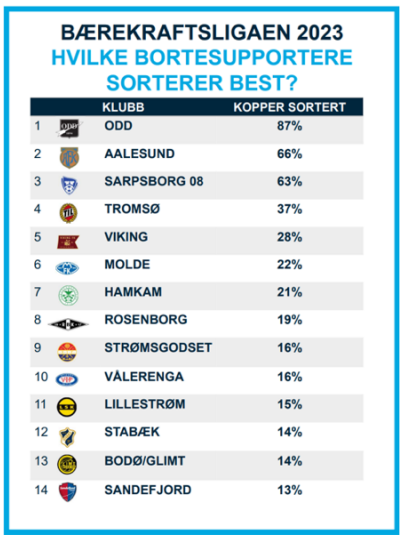
- Frydenbø, the principal short-end stand within the stadium, mainly attended by the hard-core fans and supporters' organized groups
- BT, the other short-end stand, mainly attended by families and casuals
- Fjordkraft, one of the two long-end stands, the one in front of the VIP section
- SPV, the other long-end stand, that includes VIP, hospitality and media
- Away section for the visiting teams' supporters

In this second phase of the experiment, which can be considered the first phase of intervention, both short-end sections saw the implementation of the "availability" measure, consisting in the exponential increase of available bins just outside the stands to increase the chance supporters would sort their waste. While on the SPV section no actual intervention measure has been taken, the strategy on the other long stand was that of increasing the visibility, in order to help the fans better understand what goes where. On the away stand, instead, the ingroup/outgroup strategy explained above was implemented, with the exact same pattern as the one that was developed for the experiment made to the English Premier League supporters.

In the following phase of intervention, starting from the ninth game till the very end of the season, the innovative concept of "gamification" was introduced and adopted to catalyse changes in consumer behaviour. Gamification is a tool used to encourage behavioural change and promote desired attitudes and can be considered as a design process that applies play, fun and user experience elements to different services in non-gaming context (Deterding et al, 2011; AlMasherdi et al, 2016). In the Frydenbø section, a captivating approach was employed, featuring a large bin with dual entries and a series of thought-provoking questions posed to hardcore fans during each game. Fans were tasked with voting for or against various topics by depositing their waste into the corresponding hole. Questions ranged from football-related debates like the use of Video Assistant Referee (VAR) to broader societal issues such as regional politics, for instance whether the city of Bergen should become independent from Norway, fostering lively interaction among supporters.

On the other hand, in the away stand, gamification consisted in the implementation of a competitive element, where teams were ranked based on how well supporters disposed of their waste correctly. This approach leveraged social influence, particularly the psychological factor

of "social norms," by showcasing how other teams were performing in waste management, thereby motivating fans to emulate or surpass their counterparts in sustainability efforts. As the table below shows, gamification was rather successful (highest % are after gamification) and worked better than nudges, even if the sample is quite small and more testing is needed.



BÆREKRAFTSLIGAEN 2023
HVILKE BORTESUPPORTERE SORTERER BEST?

	KLUBB	KOPPER SORTERT
1	ODD	87%
2	AALESUND	66%
3	SARPSBORG 08	63%
4	TROMSØ	37%
5	VIKING	28%
6	MOLDE	22%
7	HAMKAM	21%
8	ROSENBORG	19%
9	STRØMSGODSET	16%
10	VÅLERENGA	16%
11	LILLESTRØM	15%
12	STABÆK	14%
13	BODØ/GLIMT	14%
14	SANDEFJORD	13%

Figure 7: Data on correct trash sorting by the away supporters at Brann Stadion (brann.no)

Overall, the results of the two stages of interventions have produced some interesting findings that show a tangible shift in the behaviour of the fans. Remarkably, the correct sorting rate in the home sections increased from a modest 30% to an excellent average of around 70% during the final games. Notably, certain stands even achieved impressive peaks of over 90% correct sorting throughout the season. The following graph shows the sorting rate trend for each of the home stands for all of the games of the season at Brann Stadion.

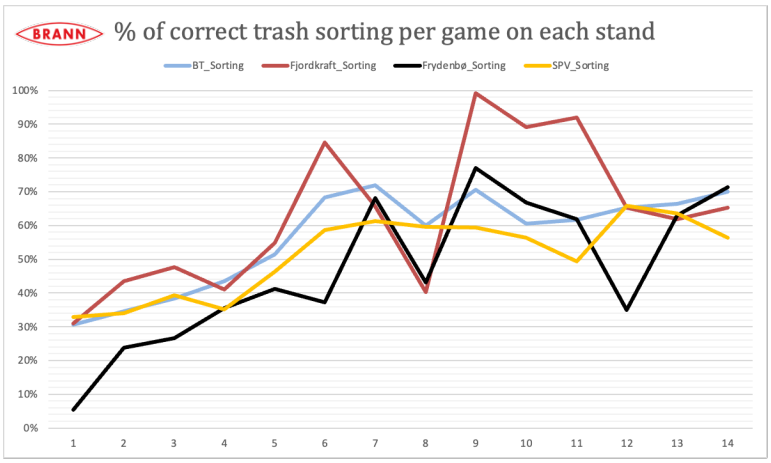


Figure 8: sorting rate of the home sections at Brann Stadion for the 2023 season

4.2.3 Changing consumer behaviours is not enough

While these interventions at Brann Stadion have demonstrated promising results in reshaping consumer behaviour towards sustainability, it's essential to acknowledge that behavioural change alone is insufficient in the broader quest for environmental stewardship within sporting venues. Beyond simply altering how fans dispose of their waste, the journey towards sustainability necessitates comprehensive transformations across the entire stadium ecosystem. Indeed, the problem starts long before the supporters sit down in the stands with their food, and perhaps what is sold in the stadium kiosks creates impure waste fractions that are difficult to sort and do not provide with an efficient use of resources. At Tottenham Hotspur Stadium, for instance, beer is served in plastic glasses that are sold and reused. Tivoli Gardens in Copenhagen provide with vending machines where people can return used cups in exchange for money, while other stadiums do net sell any longer things that lead to mixed waste. (NHH, 2023)

Other crucial actions include rethinking fundamental aspects of stadium operations, such as energy consumption, transportation logistics and the sourcing of materials. Moreover, achieving carbon neutrality requires a multifaceted approach that encompasses renewable energy adoption, carbon offsetting initiatives and the implementation of sustainable practices throughout the stadium's supply chain. Football clubs and sporting institutions must recognize their pivotal role in driving systemic change, taking proactive steps to integrate sustainability into their business models and organizational culture. Sports events can only fully realize their potential as catalysts for positive societal and environmental change if they make an intense effort to address the entire spectrum of environmental concerns. Therefore, in order to achieve the goal of truly sustainable sports venues, more extensive structural changes must be implemented in addition to behavioural interventions, which are an essential first step. This will require rethinking of new business models and investments in new technologies and infrastructures. In the following chapters, this argument will be further developed through an empirical analysis on insights from event attendees, which will be followed by a detailed discussion.

5. Empirical analysis

5.1 Hypotheses

As already extensively discussed throughout this study, the objective of this work is to understand attendees' perceptions on sustainability issues at stadiums as well as their reaction towards different options of potential sustainable business models and what are the drivers of their behaviours and choices. Indeed, the study is grounded in the sustainability initiative undertaken by SK Brann, which was explained in the previous chapter, that explores the most effective ways in which football clubs can make spectators change their behaviour into a more sustainable one. While both nudging and gamification, especially the latter, have been proven as effective strategies to succeed in achieving this goal, there is compelling evidence that changing consumers behaviours is not sufficient. Football clubs, and more in general sporting events organizers, should indeed try to solve this problem at the foundation, by changing the way they do business. For this reason, in the following chapter, we will delve into how they could possibly do it by integrating this study with the RESTART framework, which will be a crucial tool for rethinking football clubs' business models.

On this regard, building upon the foundation of the theoretical background on consumers behaviour and sustainable business models, a descriptive analysis of the data collected through our survey will be first performed in the following chapter, with the objective of understanding spectators' attitudes, perceptions and preferences regarding sustainable practices at stadium events. Before, in order to investigate the drivers that may have an impact on fans' behaviours and choices and thus focusing on the challenges and potential solutions for making sporting events more environmentally friendly, we need to list the hypotheses of our study that will be then tested through our dataset on SPSS by performing a series of multinomial logistic regressions, as explained in the methodology section.

After a meticulous research, four main potential drivers of choice and behaviour of football supporters have been identified and have thus been measured through the survey. These are time consumption, ease-of-use, benefit for the environment and benefit for the club. Participants were asked to rate the extent to which[16] the various options proposed would have

[16] A 1-7 Likert scale was employed for these questions

been, according to them, time-consuming, easy to cope with for them, beneficial for the environment and beneficial for the club. The scenario presented simulated the attendance to a European's top club football match with around 20,000 spectators where the club decided to implement a reusable cup system, and different options to manage the cups after used were shown, specifically:

- **Bring Home**: You can take the cup home after the match and bring it back for the following game and reuse it.
- **Deposit Refund**: You can get back the 2€ deposit directly at the stadium when you return the cup after the match
- **Donation**: You can donate the 2€ deposit to a sustainability charity by returning your cup in a designated bin at the end of the game.
- **Leave the cup on the stands**: You can leave the cup directly at your seat, and the club will collect it after the match when cleaning the stands

Based on this scenario, we simultaneously developed a series of hypotheses to analyse concerning the relationship among the drivers chosen and the various options. These hypotheses are:

H_1: Consumers who perceive certain reusable cup options as less time-consuming are more likely to choose those options over others that are perceived as more time-consuming at sporting events

H_2: Consumers who perceive certain reusable cup options as more easy- to-use are more likely to choose those options over others that are perceived as less easy-to-use at sporting events

H_3: Consumers who perceive certain reusable cup options as more beneficial for the environment are more likely to choose those options over others that are perceived as less beneficial for the environment at sporting events

H_4: Consumers who perceive certain reusable cup options as more beneficial for the club are more likely to choose those options over others that are perceived as less beneficial for the club at sporting events

Following the analysis on the impact of the drivers identified on consumers behaviours and choices, a similar analysis will be performed to assess if there is any association between the demographic or personal information and their behaviours and choices, for instance variables

such as age, gender and location as well as the measure concerning the frequency of attendance of sporting events.

The related hypotheses will be the following:

H_5: Consumers' demographic characteristics (age, gender, location) are significant predictors of their preference for a particular reusable cup system at sporting events

H_6: Consumers' frequency of attendance at sporting events is a significant predictor of their preference for a particular reusable cup system

H_7: Consumers' demographic information (age, gender, location) is a significant predictor of their attitudes towards sustainability

H_8: Consumers' frequency of attendance at sporting events is a significant predictor of their attitudes towards sustainability

The hypotheses H_7 and H_8 will be tested through three specific questions from the survey, one concerning the likelihood of fans of performing specific sustainable actions in the context of sporting events, one asking to rank in order of importance, thus measuring materiality on a consumers' perspective, potential initiatives that sporting events organizers should implement at stadiums to reduce the environmental footprint associated to matchday operations or, more broadly, club's operations, and the last ones focusing on respondents' concerns on sustainability and climate change, both in general and at sporting events. A correlation analysis will be performed to investigate these two hypotheses.

Overall, the hypotheses presented in this section are anchored in the theoretical concepts of behavioural economics and the RESTART framework for sustainable business models. The insights from behavioural economics, particularly the concept of "nudges," inform our understanding of how subtle changes in choice architecture can promote sustainable behaviours. Meanwhile, the RESTART framework guides the study's approach to redesigning business models into more sustainable ones, thus changing the way in which the clubs operate by integrating a three-dimensional approach within their day-to-day activities.

The study intends to uncover the primary forces behind sustainable practices at stadiums and offer feasible solutions for football teams and event planners by integrating these theoretical perspectives with empirical data.

6. Results and discussion

6.1 The need to switch to more sustainable business models at stadiums

As environmental concerns continue to escalate, it is now becoming more and more clear that stadiums urgently need to implement more sustainable business models. Sporting events, with their large gatherings of spectators and associated infrastructure, have a significant environmental footprint, therefore it is no longer possible for football clubs and sporting institutions to hide and get away with irresponsible practices. With this study, as repeatedly mentioned, the aim is providing them with a comprehensive analysis on the challenges they face before implementing more sustainable business models and how to possibly overcome them with potential solutions developed thanks to the insights from events spectators from all over the world. In this section, the results of our survey will be uncovered through both a descriptive statistics analysis and a series of multinomial logistic regressions that were pointed out in the methodology and empirical analysis sections. Following that, we will develop a discussion that lays the foundations on our findings.

6.1.1 Sustainable business models in sports: descriptive statistics

Before delving into our analysis, we first provide you with some characteristics of the population. The vast majority of the sample is represented by males, that represent almost 75% of the population. 60% of them are students within the range 18-25 years old, even if a relevant size consists of also a little bit older employed full-time people. Most of the respondents currently reside in Italy, that covers almost 70% of our sample. Another widely represented country is Norway, that covers almost 12% of the sample, while the rest of the population is extremely diverse and covers many parts of the globe, despite most of them coming from European countries. We already mentioned above in the sampling choice that the target of this survey was mainly football supporters (83%) that attend sporting events at football stadiums at least once to three times per year (77%). Among them, when asked if they had a favourite football team, more than 30% chose Juventus. Another widely represented team is AS Roma, with almost 14% of respondents, followed by SK Brann (about 4%), AC Milan and Inter (both 3.3%), while more than 15% did not choose any team.

Now, we start our analysis by comparing respondents' actual choices with their perceptions of other spectators' preferences regarding the after-use management of reusable cups at sporting events. The survey posed two questions: one asking respondents which option they would be more inclined to choose themselves, and the other prompting them to speculate on which option they believed other spectators were more likely to select.

When asked about their own preferences, the results revealed that 36% favoured the bring-home option, 30% preferred the deposit refund, 26% opted for putting the cup in a donation bin and only 8% chose to leave the cup on the stands.

Conversely, when asked to predict the choices of other spectators, a stark contrast emerged. A vast majority of respondents (40%) believed that other spectators would choose to leave the cup on the stands. This was followed by 33% predicting the deposit refund, 20% the bring-home option and just 7% the donation option.

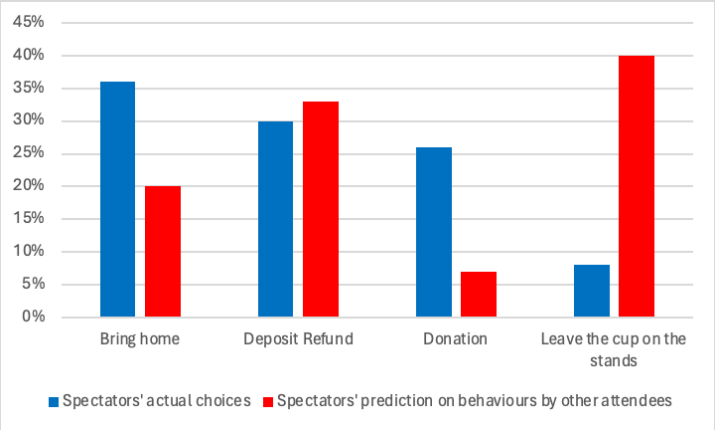


Figure 9: comparison between respondents' actual choices and prediction on behaviours by other attendees

The substantial disparity between respondents' own preferences and their perceptions of others' preferences raises intriguing questions about the factors driving these differences. Indeed, while more sustainable options were mostly preferred in the individual choices, people did not have trust on the behaviours of other spectators, and thus believed that most of them would have just left the cups at their seats. For instance, this discrepancy may have been shaped by social norms and past observations. If respondents observed that leaving the cup in the stands is a common behaviour during previous stadium visits, they may have extrapolated this trend to the broader spectator population, assuming people usually behave unsustainably. Also, factors like convenience and perceived benefits may have played a relevant role in shaping both the choices and the gap between the own choices and the perceptions on the

choices of the others. Indeed, people may be more likely to favour options that they perceive as more convenient and that require minimal effort or disruption such as the bring-home option, or options whose perceived benefit associated is higher. This is exactly the reason why our study will later develop on how the drivers of choice such as time consumption, ease-of-use, benefit for the environment and for the club affect consumers behaviours and choices.

As we have just pointed out, there will now be a descriptive analysis on consumers' perceptions of the various drivers associated with reusable cup management options at sporting events. Specifically, we assess the perceived time consumption, ease of coping with, benefits for the environment and benefits for the club associated with each of these systems. Understanding these factors is crucial in determining the potential success and acceptance of sustainable practices among fans. All the related statistical tables will be shown in a dedicated section at the end of this work.

Time consumption

Unsurprisingly, the option to leave the cup on the stands is overwhelmingly perceived as the least time-consuming, with 81.1% of respondents rating it as "very little time-consuming" (rating it 1 on a 1-7 likert scale). In contrast, the deposit refund system is viewed as the most time-consuming, with 16.1% of respondents rating it as "very time-consuming".

The most frequent response is a rating of 5 (27.2%), and significant percentages also rate it 6 (11.7%), indicating that many find this option to be quite time-consuming, since it is obvious that there would be long queues when the game ends to get the deposit back, making this option not particularly time-efficient, especially when it comes to high-capacity stadiums.

The bring-home and reuse option and the donation bin method sit in the middle in terms of perceived time consumption. The former is therefore perceived as relatively little time-consuming, with almost 39% rating it at very little time-consuming and the vast majority (about 88%) rating it between 1 and 5. Similarly, the latter's related time-consumption is perceived as very little time consuming, as the most common responses (about 84%) range from 1 to 4.

Ease-of-use

Turning to the "ease-of-use" driver, the option to leave the cup on the stands is again overwhelmingly perceived as the easiest, with 85% of respondents rating it as "very easy", as

this method requires virtually no additional effort from fans beyond what they are already accustomed to, that is leaving trash at their seats. In a similar way, putting the cup in a donation bin is seen as an easier option, with more than half of the sample (55%) rating it as very easy or at most easy (rating 1-2), as it just requires them to drop the cup in a bin as they exit. For what concerns the bring-home option, it is believed as relatively easy as well, with more than 37% rating it as “very easy” and a cumulative 63.9% rating it between 1 and 3. Finally, perceptions of ease of the deposit refund options are more distributed across the scale. While 12.2% rate it as "very easy", a significant proportion find it moderately difficult to very difficult (ratings 4-7), accumulating around half of responses. This spread suggests variability in how fans perceive the logistics involved in obtaining a refund, as they have probably never been subjected to such a system.

Benefit for the environment

The bring-home option is viewed as highly beneficial for the environment: almost half of the rate it as very beneficial, and about 70% of respondents rate if at least 6 out of 7, emphasizing a strong positive perception towards its environmental impact. The deposit refund and the donation options also receive a favourable environmental rating, albeit slightly less pronounced than the bring-home option. Surprisingly, despite the concept of the two options being quite different, their perceived associated benefit on the environment is perceived as very similar, with about 60% of respondents viewing the as beneficial or very beneficial (rating 4-7). Conversely, leaving the cup on the stands is perceived as the least beneficial for the environment, with a substantial 39.4% rating it as "very little beneficial" and 73.9% rating it between 1 and 3.

Benefit for the club

The last potential driver that has been identified is the benefit for the club. Indeed, in a context like football where loyalty runs deep, fans decisions and behaviours could be significantly influenced by their perception of how their actions impacts and benefits the club they support. Loyalty, in fact, can induce fans to opt for sustainable solutions they think will have the biggest beneficial effects on their club's operations, finances or reputation.

Here, the donation method is viewed favourably, with more than 60% seeing it at least moderately beneficial for the club (rating 4-7), presumably because it would allow the club to enhance its reputation by contributing to tackling environmental degradation by donating

money to a sustainability charity. Instead, perceptions on the bring-home and the deposit refund options are quite mixed, with the most common answers, the median ones, suggesting a moderate benefit for the club, possibly showing a good potential in terms of enhancing the club's image and reputation or reducing operational costs but also concerns about logistical practicalities or effectiveness. The least favoured option, with a large number (34.4%) viewing it as "very little beneficial", is again leaving the cup on the stands. This reflects a perception that leaving cups on the stands might impose additional cleaning costs or negatively impact the club's environmental stewardship image.

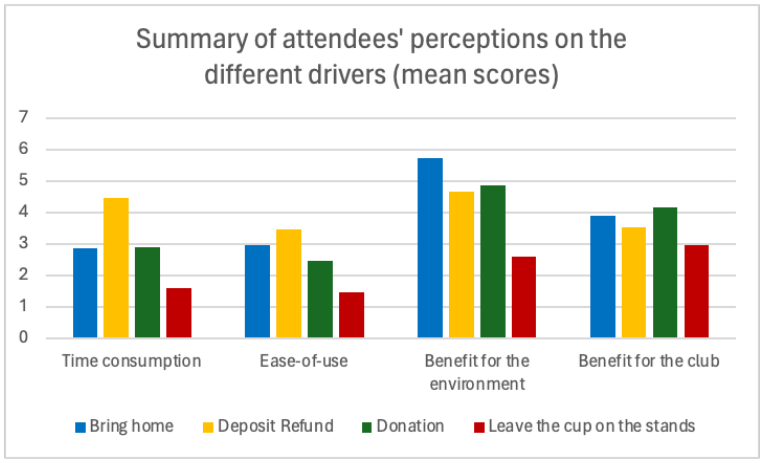


Figure 10: summary of findings regarding the mean scores of the various drivers

6.1.2 Perceptions on other sustainability initiatives: materiality assessment

After analysing a scenario focused on the introduction of reusable cups at football games and exploring attendees' preferences for after-use management, we now extend our examination to other sustainability initiatives. This broader approach includes assessing the likelihood of fans performing specific sustainable activities before, during, and after events, as well as their perceptions of the most important interventions event organizers should prioritize.

The goal of this analysis is to measure materiality, thus to understand which initiatives organizers should emphasize when allocating budgets to specific interventions, considering the diverse interests of all stakeholders in a three-dimensional approach. Obviously, as already explained in the theoretical section, companies should place more emphasis on issues that are more material for both the company and its stakeholders and prioritize them both in terms of budget allocation and effort.

Starting with the likelihood of attendees to perform specific sustainable actions at events, the five activities they have been proposed to potentially do in the context of attending a football match are:

- Purchase merchandising made from recycled or upcycled material for a premium price
- Replace car with public transportation at home games
- Stay behind after the game to help collect the waste left at the stands
- Purchase plant-based or vegetarian food options
- Replace plane with train/bus for away games

Fans show moderate interest in purchasing merchandise made from recycled or upcycled materials, even if these items are priced at a premium. 49% of respondents said they would be at least somewhat inclined to make this kind of purchase, showing that a considerable portion of the audience is open to support green products by even being willing to pay a little extra for them.

Turning to transportation, there is a strong inclination towards replacing car use with public transportation for attending home games, with more than two thirds of respondents likely or extremely likely to make this switch. This suggests a significant potential for reducing carbon footprints related to travel to the stadium.

Similarly, there is a moderate inclination for using trains or buses over planes for away games, with over half of respondents indicating they are at least somewhat likely to choose these lower-impact forms of transportation instead of taking the plane.

There is also potential for attendees to choose plant-based or vegetarian food options at games, as over 30% of respondents said they are likely or highly likely to do so, suggesting there has recently been growing openness towards more sustainable food options.

Conversely, willingness to stay behind after the game to help collect waste is notably lower, with about 70% of attendees being somewhat unlikely or less to participate, indicating a relatively low enthusiasm for direct involvement in post-event clean-up efforts.

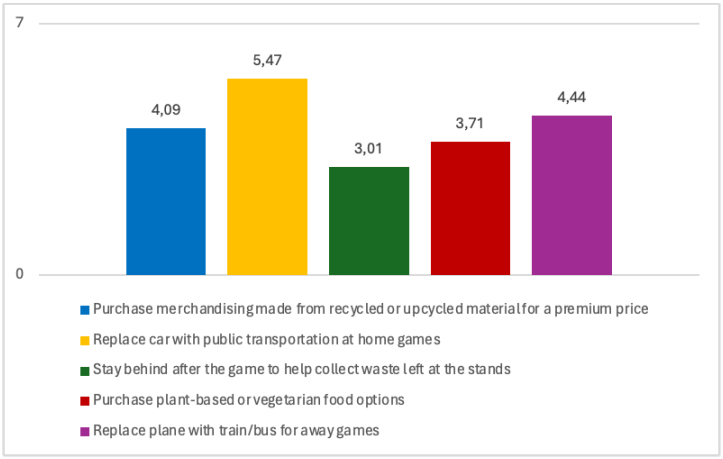


Figure 11: likelihood of attendees to perform specific sustainable actions at football stadiums (mean scores)

In the second part of our materiality analysis, we explore the perceived importance of several sustainability intervention measures that stadium event organizers should put prioritize and into practice. With 42.2% of respondents ranking it as the most important initiative and 90% ranking it within the top three priorities, the results show a strong preference for investing in energy-efficient infrastructure. This highlights a general consensus for long-term investments like solar panels and water conservation systems that can significantly reduce the stadium's operational footprint. Also, this finding is partially in line with the perceptions on the highest polluting sources, as around 30% of respondents see it as the most polluting source. Among the top priorities there is also the promotion of alternative transport, which was ranked as number one priority by 26.7% of respondents and in the top three by more than three-quarters of the sample. This finding is consistent with the view held by 36.1% of respondents that the main source of pollution within the sporting events context is represented by the transportation of supporters to and from the stadium, to which the transportation of athletes, staffing, managers and events' organizers needs to be added. This emphasizes how urgent it is to launch programs to lower carbon emissions associated with event travel. Following that, minimizing single-use packaging and utensils by offering reusable or compostable alternatives ranking it moderately in terms of importance, with about 50% of respondents seeing it as one of the top two priorities, highlighting relatively high concerns regarding the generation oof solid waste caused by the event. Conversely, sourcing local and sustainable food is seen as less critical, as the majority of attendees, almost 60%, rating it as one of the two least material initiatives, indicating that despite obviously being a beneficial measure, it may have smaller direct impact on lowering stadium's environmental footprint compared to the previous initiatives. Finally,

the least important measure is considered to be selling merchandising made of recycled materials, with more than 50% of respondents rating it as the least important initiative.

Generally speaking, as the materiality matrix shown in the theoretical background section suggest, clubs and event organizers should prioritize initiatives that are considered important for both the company and its stakeholders, thus the ones that align with the interests of both parts by having a relevant impact on reducing the related footprint.

The data suggests a strategic focus on improving and promoting alternative and more sustainable transportation options and enhancing stadium infrastructure by investing in energy-efficient measures to power stadium operations to be most effective, together with finding solutions to minimize single-use plastic and thus reduce waste generated by the event.

These areas not only align with stakeholder concerns about the most significant sources of environmental impact but also provide concrete ways to lower the total carbon footprint, therefore stadium managers are advised to prioritize them as it will enhance the likelihood of successful implementation and promise the greatest environmental benefits.

6.1.3 Sustainable business models in sports: multinomial logistic regression results

We now move on to a more comprehensive investigation of the hypotheses mentioned in the empirical analysis section after performing a thorough analysis of the descriptive statistics, which included outlining the population's characteristics, assessing their preferences regarding sustainability options at stadiums and evaluating the most material intervention measures that are important for both the organizers and the stakeholders.

The objective of this subsequent stage is to determine the connections between the drivers of choice and the fans' behaviours and preferences. Understanding these dynamics is crucial for providing event organizers with actionable insights into the challenges and optimal strategies for implementing more sustainable business models at stadiums.

Furthermore, this analysis will look into any connections that might exist between participants' demographic characteristics and their decisions and behaviours.

Let's start with the first hypothesis, that is:

H_1: Consumers who perceive certain reusable cup options as less time-consuming are more likely to choose those options over others that are perceived as more time-consuming at sporting events

To investigate this research question, a series of multinomial logistic regressions will be run, first by setting the "leave the cup on the stands" option as the reference category to which the other three options will be compared, as it is the one perceived as the least time-consuming, and then by setting the option that was perceived as being the most time-consuming, the "deposit refund" one, as the new reference category that will be compared with the "bring-home" and the "put the cup in a donation bin" options.

In the first analysis, as mentioned above, we thus run a multinomial logistic regression to examine the impact of perceived time consumption on fans' choices regarding reusable cups management systems at sporting events, setting "leave the cup on the stands" as reference category. The chi-square statistic for this driver is statistically significant. The negative coefficient suggests that as the perception of the bring-home option being time-consuming increases by one unit, the log odds of choosing the bring-home option decrease by 0.455 units compared to leaving the cup on the stands, holding all other variables constant.

In practical terms, this means that respondents who perceive the bring-home option as more time-consuming are less likely to choose it compared to the passive action of leaving the cup on the stands. Similarly, as time consumption perception increases for the deposit refund option, the negative coefficient (-.288) suggests that the likelihood to choose this option decreases. The exact same is true also for the last option, that is "put the cup in a donation bin", whose coefficient is negative and is -.389. As you can see, the results for all options suggest that any increase in the perceived time consumption negatively affects the likelihood of fans choosing "active" management options over the passive one of leaving the cup on the stands. For this reason, while the descriptive statistics outline that fans would positively welcome the introduction of more sustainable options, what the first driver analysis suggests is that stadium managers should concentrate on simplifying and clearly communicating the time efficiency of the different cup management systems. For example, making sure that deposit refund points are numerous and well-staffed can help reduce perceived time burdens. Likewise, placing donation bins in convenient locations and promoting their ease of use can mitigate time consumption concerns. More widespread adoption and acceptance of more

environmentally friendly habits can thus be facilitated by educating fans about the true time commitment needed for each option and addressing misconceptions about time consumption.

After having compared the various sustainable options using the "leave the cup on the stands" option as the baseline reference category, uncovering the enormous impact time-consumption has on spectators' choices and behaviours, we now compare the impact of time-consumption on choosing among the three sustainable options. To do so, we set the "deposit refund" option, that is the one perceived as the more time-consuming by far, as the reference category. This time, the overall model has a p-value of 0.142, larger than the conventional level of significance 0.05. Therefore, in this case the hypothesis is rejected, and this shows that time consumption does not significantly influence the preference of one of these two options over deposit refund. This finding is consistent with the fact that the deposit refund option, despite being perceived as very time-consuming compared to the other two sustainable options, is actually the second-most chosen option, suggesting that time consumption may not be a pivotal factor in determining preference among the various sustainable options. To conclude, time consumption is a crucial factor driving the decisions of fans to opt for one of the sustainable options rather than just leaving the cups on the stands. Conversely, it seems that this driver does not affect their decision to opt for one of the "active" options over the other, even if this might also depend on the relatively small size of the sample and results might change by increasing it.

Let's now continue with the second hypothesis, that is:

H_2: Consumers who perceive certain reusable cup options as more easy- to-use are more likely to choose those options over others that are perceived as less easy-to-use at sporting events

Again, a multinomial logistic regression will be run to investigate the impact this driver has on spectators' choice. First, the reference category will be the option perceived by far as the easiest to cope with, that is "leave the cup on the stands". Then, the second multinomial regression will have the deposit refund option as the reference category, as it was the option on which respondents were more doubtful on the ease of coping with it would have.

In the first case, with leaving the cup on the stands as the reference category, the significance of the model is $p < .001$, therefore the hypothesis is accepted, indicating there is an association between the ease-of-use of the options and the fans' choices. Starting with the bring-home option, the negative coefficient -0.748 implies that as the perceived ease of use decreases, fans

are predictably less likely to choose this option over leaving the cup on the stands. Likewise, for the deposit refund option, the negative coefficient -0.348 suggests a similar trend: the less easy this option is perceived, the higher is the likelihood of opting for leaving the cup on the stands rather than choosing the deposit refund. The exact same is true for the donation option, that presents a negative coefficient of -0.507, showing that the decrease ease negatively influences the choice of this option.

The significant results for every option indicate that ease of use is a critical factor in the decision-making process for stadium attendees regarding cup management. The negative coefficients show that the probability of selecting an active management option declines with task perceived difficulty. As a consequence, to encourage the adoption of sustainable cup management practices, stadium managers should focus on making these options as user-friendly as possible by providing spectators with clear instructions, easily accessible facilities for cup return and fast processes.

After having compared the various sustainable options using the “leave the cup on the stands” option as the baseline reference category, that highlighted the huge impact the driver “ease-of-use” has on spectators’ choices and behaviours, we now compare the impact of perceived “ease-of-use” on choosing among the three sustainable options. To do so, we set again the “deposit refund” option, that is the one on which the perceived ease was less evident, as the reference category. The model’s p-value is <0.001, therefore again the hypothesis is accepted. First, we compare the bring-home option with the reference category. Here, the significance level is lower than 0.05, and the negative coefficient -0.400 indicates that as the perceived ease of completing this option decreases, its likelihood compared to "Deposit Refund" also decreases. This demonstrates that choosing this option over the deposit refund is largely depends on its ease of usage. For what concerns the donation option, instead, the significance level is higher than 0.05, therefore its perception of ease does not impact the preference for this option over the deposit refund.

Improving the perceived ease of use of the bring-home option could thus increase its attractiveness, therefore the primary goal for managers should be to streamline the procedure and successfully explain it to the attendees.

For what concerns the donation option instead, although ease of use does not show a significant impact, ensuring it is perceived as easy to use and accessible could still potentially increase their usage, considering the general trend in other options

We go on with the analysis by focusing on the third hypothesis, that is:

H_3: Consumers who perceive certain reusable cup options as more beneficial for the environment are more likely to choose those options over others that are perceived as less beneficial for the environment at sporting events

A multinomial logistic regression will be run to investigate the impact this driver has on spectators' choice, with "leave the cup on the stands" as reference category. The overall model's p-value is 0.020, meaning that the perceived environmental benefits may be a relevant driver in predicting the choice among the cup after-use management options. However, when analysing the impact on the various options individually, no relationship is statistically significant for any of the options. The lack of significant relationships between perceived environmental benefits and the choice of specific cup management options suggests that other factors may have a greater influence on these decisions. Still, there's a broad tendency towards favouring options perceived as environmentally beneficial, despite the impact on the likelihood of choosing one of these options over "leave the cup on the stands" of this driver being minimal.

The fourth hypothesis that is going to be analysed concerns the impact of the last driver identified, that is "benefit for the club". As mentioned above, it was selected because factor like club's loyalty may influence football fans' decisions. The fourth hypothesis is:

H_4: Consumers who perceive certain reusable cup options as more beneficial for the club are more likely to choose those options over others that are perceived as less beneficial for the club at sporting events

Similar to the previous driver, the overall model's p-value is 0.038, meaning that the perceived benefits for the club may be a relevant driver in predicting the choice among the cup after-use management options. Nevertheless, when analysing the impact on the various options individually, no relationship is statistically significant for any of the options, suggesting that in this case the perceived benefits for the club actually do not significantly influence the spectators' choices.

After having analysed the impact of the drivers of choice on the actual attendees' preferences, the second part of this section focuses on investigating whether there is an association between

the demographic information and consumers preferences or attitudes towards sustainability at stadiums as well as whether there exists an association between the frequency of attendance and both consumers preferences and attitudes towards sustainability. On this regard, the fifth hypothesis is:

H_5: Consumers' demographic characteristics (age, gender, location) are significant predictors of their preference for a particular reusable cup system at sporting events

In order to evaluate the impact of "location", it was transformed into a numerical variable by differentiating Italian and international respondents, assigning the value "1" to the former and the value "2" for the latter. The chi-square statistics for the effects of age, gender and location are not statistically significant, being respectively 0.391, 0.123 and 0.115. As the model is not statistically significant, we conclude that these demographic variables do not have any relevant association with the consumers preferences and therefore do not significantly improve the model's ability to predict the choice of cup management options. The absence of significant results for age, gender, and location across all cup management alternatives implies that these demographic characteristics could not be the main determinants in the decision-making process for these sustainability practices at stadium events. Since there is no significant differentiation in preferences based on demographic variables, stadium managers might consider implementing uniform strategies that appeal broadly to all demographic groups rather than tailoring interventions to specific age groups, genders, or locations. However, further studies may be needed to investigate the role location has on spectators' behaviours.

We go on with the analysis by focusing on the sixth hypothesis, that is:

H_6: Consumers' frequency of attendance at sporting events is a significant predictor of their preference for a particular reusable cup system

Through this hypothesis, the objective is to evaluate whether the frequency of attendance at sports events or other type of events (like concerts or festivals) influences the choice of spectators among reusable cup management options. However, as the p-value for the effects of attendance frequency at sporting events and other events are not significant, being 0.171 and 0.841 respectively, these variables do not impact consumers behaviours, therefore the hypothesis is rejected.

This means stadium managers do not need to rely on attendance frequency when tailoring the intervention measures, as the frequency of attendance seems to have minimal influence on spectators' choices.

The last two hypotheses will be evaluated together through a correlation analysis. These are:

H_7: Consumers' demographic information (age, gender, location) is a significant predictor of their attitudes towards sustainability

H_8: Consumers' frequency of attendance at sporting events is a significant predictor of their attitudes towards sustainability

For what concerns the first hypothesis, age shows very little correlation with sustainability attitudes and behaviours. Conversely, there are slight differences in environmental concerns and attitudes towards sustainability based on gender, with female showing higher propensity to engage in sustainable practices such as using public transportation, choose plant-based options or participate in clean-up versions. The same is true for location: while there is no significant difference between concerns on climate change and environmental footprint of sporting events between Italians and internationals, international respondents may be slightly more inclined than Italian ones to engage in sustainable practices, especially for what concerns public transportation and plant-based food, indicating that these intervention measures could be more successful outside Italy and that possibly stronger educational campaigns may be needed in Italy. Turning to the frequency of attendance, the only relevant associations show that regular attendees at sporting events are more likely to opt for sustainable transportation options rather than car and individuals who frequently attend other types of events may be more likely to opt for plant-based or vegetarian food options.

Figure 52: Summary of hypotheses and results

	Hypothesis	**Result**
H1	Consumers who perceive certain reusable cup options as less time-consuming are more likely to choose those options over others that are perceived as more time-consuming at sporting events	Partially supported
H2	Consumers who perceive certain reusable cup options as more easy- to-use are more likely to choose those options over others that are perceived as less easy-to-use at sporting events	Supported

H3	Consumers who perceive certain reusable cup options as more beneficial for the environment are more likely to choose those options over others that are perceived as less beneficial for the environment at sporting events	Not entirely supported
H4	Consumers who perceive certain reusable cup options as more beneficial for the club are more likely to choose those options over others that are perceived as less beneficial for the club at sporting events	Not entirely supported
H5	Consumers' demographic characteristics (age, gender, location) are significant predictors of their preference for a particular reusable cup system at sporting events	Not supported
H6	Consumers' frequency of attendance at sporting events is a significant predictor of their preference for a particular reusable cup system	Not supported
H7	Consumers' demographic information (age, gender, location) is a significant predictor of their attitudes towards sustainability	Partially supported
H8	Consumers' frequency of attendance at sporting events is a significant predictor of their attitudes towards sustainability	Partially supported

Robustness analysis

To evaluate the reliability and stability of the empirical results of this study, a brief robustness analysis will be conducted by checking for multicollinearity among the independent variables.

Generally speaking, multicollinearity occurs when independent variables in a regression model are highly correlated, which can lead to biases estimates. To test multicollinearity in our regression model, the Variance Inflation Factor (VIF) will be employed, as it measures how much the variance of a regression coefficient is inflated due to multicollinearity. Commonly, a VIF value above 10 indicates significant multicollinearity (Hair et al, 2019).

Despite SPSS does not provide VIF values for multinomial logistic regressions, the issue was addressed by performing a linear regression using the exact same set of independent variables employed in our significant regression models presenting more than one variable. Indeed, a multicollinearity analysis was conducted on all attributes (perceived time consumption, ease-of-use, benefit for the environment and benefit for the club) for all the four options presented in the dependent variable (choice of reusable cup system). Multicollinearity tables are shown, as all other statistical tables, in the appendix.

The results of the multicollinearity tests confirm that the independent variables used in our multinomial logistic regressions models are not highly correlated, as all of them show VIF values close to 1. These findings support the robustness of the empirical findings of this study, therefore the relationships identified between consumers' perceptions and preferences on sustainable business models' options at stadiums are not biased by multicollinearity.

Including this robustness assessment strengthens the study's credibility and validates our conclusions. By ensuring that multicollinearity is not a concern, we can be more confident in the reliability of the identified relationships and the practical recommendations derived from the research.

6.2 Practical implications: applying the RESTART framework

6.2.1 RESTART football clubs' business models for sustainability

In recent years, growing environmental challenges and increasing stakeholder awareness of the effects of human activity on the planet have made adopting sustainable business practices urgently a top priority across industries. The sports sector, and specifically football clubs that attract large crowds and significant media attention, is under particular scrutiny to lead by example. Football stadiums are not just venues for sports, they have a significant influence on local community and have a profound impact on local economies and environments. As a result, in this situation, switching to more sustainable business models is not only beneficial but also necessary to guarantee these organizations' long-term survival and to satisfy the changing demands of stakeholders, investors and authorities.

Given this scenario, evaluating the possibility to "restart" their business models becomes pivotal for football clubs. On this regard, Jørgensen and Pedersen's RESTART framework

provides a strategic approach to rethinking business models in light of sustainability. This framework is designed to help organizations innovate and adapt continuously addressing economic, environmental and social concerns. By applying this framework, football clubs can systematically address the challenges and opportunities presented by the need for sustainability, ensuring that their operations are not only environmentally friendly but also economically viable and socially responsible. In the following discussion, we will delve into how each component of the RESTART framework can be specifically applied to the context of football clubs, drawing from the empirical data provided by the survey and the broader needs identified in the global push for sustainability. To do so, rather than just the RESTART framework, the comprehensive tool "*The Business Model RESTARTer*" will be used, following the "TRATSER" pattern.

Obviously, unlike typical businesses that usually primarily focus on economic returns, football clubs are placed in a complex operational sphere where their core business of sporting results must be harmonized with economic results and sustainable practices. Therefore, it is more complicated to assess and recognize their business models, the way they create, deliver and capture value. Indeed, sporting success, economic viability and, increasingly, social and environmental responsibility have all become key elements for football clubs.

As event organizers, football clubs have the dual challenge and opportunity to make a significant impact. Each match day is a big event, attracting thousands of people and consuming vast amount of resources as well as generating significant waste. Additionally, the day-to-day operations of these clubs, from training facilities to transportation, also contribute to their overall environmental footprint.

In this context, recognizing and reassessing their current business model becomes crucial. Football clubs need to identify how they create value, not just through sports but through every aspect of their operations and event management, thus taking responsibility for their culpability in contributing to the problem and making efforts to lessen the harm they cause to the environment and society. This entails a deep dive into the ways clubs can reinvent their approaches to be more aligned with sustainability goals.

Having recognized the problems of the current status quo of most of football club's business model, we begin to rethink and reinvent it by taking into account, as mentioned above, the

concept of *three-dimensionality* rather than one-dimensionality, as the TRATSER pattern suggests.

While traditionally the primary focus of football clubs, apart from sporting result, has been economic performance, with the main revenues streams being broadcasting rights, tickets sales, sponsorships, player trading, merchandising and matchday sales, it is now crucial for football clubs to consider both their impact on society and on the environment. As a consequence, there is a critical need to develop a scorecard that not only tracks financial outcomes but also measures social impact, encompassing stakeholders' satisfaction (including fans, partners and employees) and social cohesion and equality, and environmental impact, that is carbon footprint and waste reduction. By integrating these strategies into their business models, football clubs can redefine their value creation and capture mechanisms to be more sustainable, which can lead to increased long-term viability, enhanced fan loyalty and a stronger brand reputation.

The second step in quest of restarting football clubs' business models, it is crucial to set the right *results* that needs to be achieved. As a consequence, prioritizing and addressing material issues is crucial. As mentioned above, materiality involves identifying issues that significantly impact both the club and its stakeholders, particularly attendees, and focusing efforts on those areas. By doing that, there is compelling evidence that the club will achieve better result than those who do not take materiality into account and either try to solve both material and immaterial issues at the same time or do not try to solve any of them.

Based on insights from this research, there are three main areas that are very important for both the club and their stakeholders. These are transportation, energy and water consumption and waste generation. To effectively prioritize these material issues, football clubs should develop a strategic plan that includes setting specific, measurable sustainability goals.

Starting with transportation, the largest challenge is changing fan behaviour and, in some countries, managing the logistical requirements of mass transportation on game days. Being it the most impactful factor in terms of environmental footprint, multiple different solutions may be needed. In this sense, one potential solution to incentivize the use of public transportation rather than carbon intensive means of transport, that has already been proposed for some big events (Juventus.com, 2024), is offering free public transport service on matchdays for those who possess the tickets for the match. Sporting clubs could thus collaborate with public transit

providers and local governments to develop a smooth, ticket-integrated transportation system. For example, presenting a game ticket may grant complimentary use of the city's public transportation system for a predetermined amount of time. At the same time, an innovative solution could entail the implementation of a dedicated space in a club-specific app, preferably in partnership with ride-sharing or carpooling incumbents, so that fans are encouraged to use these services to attend games. To do so, the club could decide to offer discounts and promotional offers or rewards for fans who use public transport, carpooling or bike to the stadium, for instance discounts on food, merchandising or even on tickets for the match, as well as possibly raffling off unique experiences for some of those who stood out for their sustainable behaviours, such as a meet and greet with their idols. This approach can significantly reduce the number of personal vehicles on the road, lowering carbon emissions and reducing traffic congestion around stadiums. Furthermore, together with focusing in encouraging spectators to use more sustainable means of transports, clubs should also try to reduce their internal footprint related to transportation by transitioning to using hybrid or fully electric buses for transporting teams, staff, and equipment to games.

Turning to energy and water consumption, in order to reduce the high energy and water usage by balancing operational efficiency with sustainability, the best solution would be implementing energy-efficient technologies such as LED lighting, solar panels and smart energy management systems. Installing rainwater harvesting systems and low-flow fixtures can instead help improve water management. Clubs might also invest on educational initiatives to motivate employees and attendees to encourage conservation behaviours.

Finally, the last of the most material issues identified is waste reduction, which was also the main focus of this study. Managing the volume of waste generated during events, especially non-recyclable and food waste, is a significant challenge. While it is true that changing consumer behaviour is crucial, clubs must try to solve the problem at the foundation by carefully selecting what to sell, thus minimizing as much as possible single-use plastics and packaging and favouring instead compostable or reusable materials. On this regard, apart from working with vendors to reduce packaging and switch to compostable materials, clubs should implement sustainable initiatives such as the introduction of reusable cups. This research highlights there is not a significant difference among the option proposed, therefore it might be wise to introduce more than one option simultaneously. While the most appreciated seems to be the bring-home option, the donation option also received positive feedback, and might consequently be introduced at the same time.

To make fans positively welcome the implementation, thus making it successful, it is crucial to make the options be perceived as both not time-consuming and easy to use. Conversely, the perceived benefits for the environment and for the club do not seem to have any relevant positive impact on consumers behaviours. In addition, branding the reusable cups with the team's logo to enhance community identity and sense of belonging might be useful as well.

Next, the clubs should continue to reinvent the way they create, deliver and capture value by encompassing the concepts of *alliances*, *the circular economy* and *service-logic* within their new business model.

While football clubs typically operate in highly competitive environments for their very nature, which might hinder collaboration, the reality is that in the quest for sustainable development they should form *alliances* not only with environmental organizations and local governments but also with other football clubs, even their competitors. Indeed, they can collectively push the industry towards more sustainable practices by sharing best practices, resources and learning from each other's sustainability initiatives. Thanks to initiatives such as the UN *Football for the goals*, in collaboration with UEFA, there already exist networks dedicated to sustainability to facilitate the sharing of ideas and strategies where football clubs can start to make the difference all together, therefore all clubs should take advantage of this possibility and start collaborating, as this will allow them to get a smaller piece of a much larger cake. Furthermore, collaborating on joint ventures for large-scale projects such as renewable energy plants or waste recycling facilities that could serve to multiple clubs and communities could be considered as well.

Following alliances, *the circular economy* is another fundamental principle that football clubs need to encompass when rethinking their business models. The idea is to switch from the traditional pattern "take, make, dispose" and adopt the principles of closing, slowing and narrowing resource loops, in order to use less resources and significantly reduce the waste generated by the clubs' operations, especially events like matchday activities. To do so, a series of potential initiatives exist. Obviously, one of them is the implementation of a reusable cup system for beverages and possibly boxes for food, with deposit schemes, donation points or the possibility to bring-home and reuse for the next game, or a combination of all. This would allow to prevent waste generated by the disposal of single-use plastic cups at the foundation, thus closing the loops.

Another potential measure concerns food waste management. Here, there are different alternative options to manage unsold, expiring food. On the one hand, clubs could partner with food rescue organizations to donate unsold food to charities, enhancing at the same time a positive impact on the social and environmental sides. On the other hand, clubs may decide to implement a sub-business model similar to "Too Good To Go", or even directly partner with them, to sell unsold food at a reduced price. This would not only reduce waste generated by the clubs' operations, but it would also generate new revenue streams for them. Indeed, "Too Good To Go" claim to operate a *win-win-win* business model, helping companies unlock revenues from their surplus, helping consumers enjoy good food at a great value for money and at the same time protecting the environment by reducing waste (Too good to Go, *no date*). Again, this would allow to close the loops.

Finally, to simultaneously close, slow and narrow the loops, clubs could focus on recycling used merchandise by implementing programs for recycling or upcycling old team jerseys. For instance, reusing unsold items to recover material to be reused to make the new season's jerseys. Also, slowing the loops may involve using one season's jerseys, especially training gears, for multiple seasons rather than changing it every year, as well as stop offering more than two kits per year. This could be done in particular for youth teams, as they do not have any impact of the club's merchandising sales needs and can thus reuse old stuff for multiple times.

Turning to the *service-logic*, shifting from a product-centric to a service-centric approach requires a fundamental change in business operations and fan engagement strategies. To do so, club should emphasize services over the sale of physical products, enhancing game-day experiences by integrating digital solutions that promote sustainability. Moreover, clubs could promote the transition to digital membership and loyalty programs that reward sustainable behaviours among fans, such as discounts for using eco-friendly products or participating in club-sponsored environmental initiatives. Obviously, rewarding would involve gifting unique experiences, such as for instance meet and greets with the players or participating to training sessions, rather than gifting physical products.

Before being ready to finally redesign the clubs' business models, an *experimentation* phase is obviously needed to test one or more of the initiatives proposed above. The primary purpose of experimentation in sustainability initiatives is to understand the effectiveness, reception, and impact of different measure. Clubs can begin with small-scale pilots before implementing

an initiative stadium-wide. For example, introducing a reusable cup system in select sections of the stadium allows the club to gather targeted feedback and adjust the program based on practical considerations before a full-scale launch. Similarly, this could be done with all the other measures proposed above. During this experimentation phase, it is pivotal to collect data rigorously and utilize analytics to understand the outcome of experiments in order to learn from each initiative and decide on how to move forward for successful implementation. This involves not just quantitative metrics, but also qualitative feedback from fans and staff about their experiences with the new initiatives.

The final phase of *The Business Model RESTARTer* framework following the TRATSER pattern is *redesign*. Football clubs operate in a dynamic environment where fan expectations, regulatory requirements and environmental challenges continually evolve. Staying ahead requires a mindset of constant innovation and flexibility. Redesigning the business model isn't a one-time task but an ongoing process of improvement and adaptation.

Football clubs should therefore see their sustainability journey as a continuous cycle of improvement during the redesign process rather than as a set destination. By embracing new technologies, maintaining flexible operational strategies and fostering a culture of innovation and collaboration, clubs can not only adapt to changes but can drive forward the agenda of sustainability in sports. This proactive approach ensures that football clubs continue to deliver value to their fans, enhance their operational efficiencies and contribute positively to the environment, staying relevant and respected in a rapidly changing world.

7. Limitations and future research

7.1 Limitations of the study

This study, the explores the main challenges and potential solutions to implement more sustainable business models in football stadiums, provides essential insights but, like all research, comes with limitations that can influence the generalizability and applicability of the findings. Addressing these limitations can guide recommendations for future research, ensuring that subsequent studies provide a more comprehensive understanding of the topic. The primary limitations and suggestions are listed below.

First of all, despite the study has mainly targeted football fans and sporting events attendees, a vast majority of the insights come from Italian respondents, therefore the findings might not reflect broader, more diverse fan bases or cultural attitudes towards sustainability in different regions and thus may not be applicable on a general basis. On this regard, therefore, generalizability and limited external validity may be a concern.

Secondly, another potential limitation consists in the gap between intentions and actual behaviour caused by social desirability and self-reporting biases, as respondents may have provided answers they believe to be socially acceptable that in the end might not reflect their actual behaviour. On this regard, it is challenging to ascertain the potential effectiveness of specific interventions or to predict long-term trends without experimenting them first in practice.

Finally, another limitation may arise from the lack of longitudinal elements, which would have allowed to observe the evolution of fan attitudes and the long-term impacts of the sustainability initiatives, as well as the lack of a qualitative analysis, which would have allowed to get deeper insights on the reasons why certain sustainability practices or options are more effective or preferred compared to what this quantitative study did, that limited itself at gathering responses and analysing them at group level, possibly overlooking underlying motivation and barriers of some choices.

To potentially solve these constraints, some suggestions for future research will be provided in the following paragraph.

7.2 Recommendation for future research

While future studies should aim to include a broader array of respondents from various geographical locations and demographic backgrounds, which would help in understanding diverse attitudes and behaviours, making the findings more globally applicable, single clubs should instead specifically target their own fans and stadium attendees in order to get insights on contextual preferences and tailor intervention measures based both on global and local needs.

What is indeed crucial is incorporating experimental elements, such as piloting specific sustainability initiatives in controlled settings, which might provide more definitive evidence of their effectiveness. Also, it would allow to observe the evolution of fan attitudes over time so as to adjust the sustainability initiatives accordingly. Some examples of potential intervention measures have been discussed in detail in the previous chapter.

Finally, future studies, and especially sporting authorities, should also focus on the practical aspects of implementing sustainability initiatives, including cost, resource allocation and operational changes. Research on scalability and adaptation of successful models across different types and sizes of sports facilities can be particularly valuable. This could certainly encompass collaboration between clubs, federations and environmental organizations

By addressing these limitations and incorporating these recommendations, future research can provide more robust, actionable insights that help football clubs and other sports organizations develop sustainable practices that are effective, economically viable and widely accepted by their diverse stakeholder groups.

8. Conclusion

8.1 Summary of findings

This research aimed to explore the possibility to implement more sustainable business models within football clubs, focusing particularly on how clubs can integrate sustainability into their core operations while still achieving their traditional goals of sporting success, economic stability and environmental and social responsibility. The RESTART framework served as a foundational guideline, offering a structured approach to rethink business models in the context of sustainability, evaluating the key challenges and potential solutions to deal with the transition.

First of all, this study provided with findings on spectators' preferences, attitudes and behaviours, indicating a significant awareness and concern among fans regarding the environmental impacts of their behaviour and the operations of football clubs. On this regard, this research also gives insights on prioritization for clubs and sporting authorities, revealing that transportation, energy and water consumption and waste management are perceived by fans as the most material issues, mostly corresponding with the importance for the club and institutions, and as a consequence are the issues that need more effort, attention and investments.

However, despite the attendees' positive attitudes, there are notable barriers to implementing more sustainable business models and practices within the stadium contexts. Results suggest that organisers should try to make intervention measures and new initiatives as few time-consuming and as easy as possible for spectators, or at least they should be perceived as that. On the contrary, factors such as perceived benefit for the environment, perceived benefit for the club, demographic characteristics or frequency of attendance do not seem to be relevant and decisive drivers in shaping the differences in attitudes, despite further studies with a larger and more specific sample may be needed to assess this with certainty and make sure it is true on a general basis and not just in particular contexts.

Other challenges that may need to be investigated concern the cost of implementing these measures and the complexities of managing large-scale sustainability initiatives within the dynamic and chaotic environment of football stadiums.

Finally, this study has extended the RESTART framework's logic, that has historically been applied in more traditional business and sectors, to the unique context of football clubs. The RESTART framework provided a valuable lens for addressing potential challenges and analysing and proposing solutions, taking into account fundamental concepts such as the circular economy and the need of a three-dimensional approach.

To effectively implement a holistic three-dimensional approach, football clubs need to continuously innovate and adapt their business models. This entails leveraging technology and forming strategic alliances. Moreover, experimentation and flexibility in adopting new practices will be critical as clubs navigate the uncertainties of technological advancements and constantly changing regulatory environments and fan expectations.

Following experimentation, clubs should focus on achieving tangible results through the implementation of sustainability initiatives that align with their core missions, measuring outcomes through a multi-dimensional scorecard will help ensure that they not only adhere to best practices in sustainability but also contribute to the global efforts against environmental degradation.

8.2 Contribution to existing knowledge

While existing research has explored various sustainability initiatives implemented for some specific events, this study helped to fill the evident lack of comprehensive studies that investigate the attitudes, behaviours and intentions of stadium attendees towards sustainable initiatives. This research, especially thanks to the application of the RESTART framework, makes a substantial contribution to current knowledge by enhancing our understanding of how large sporting organizations can integrate sustainability into their core operations effectively. These contributions are not only useful for the academic community but also for business professionals within sporting clubs and sporting authorities and legislators, who are interested in switching sporting events towards sustainability through environmentally friendly practices at stadiums and, more broadly, in the context of football clubs' operations.

Apart from having expanded the scope of the RESTART framework by applying it to the unique football industry, this study has investigated in detail spectators' attitudes towards sustainability, discussing on possibilities to integrate sustainability into sports management by adapting common best practices accordingly. Indeed, this research enriches the sports

management literature by focusing on the three-dimensionality approach, as existing literature has often emphasized economic and at most social aspects but less frequently the environmental dimensions. This study, therefore, highlights the importance of incorporating environmental strategies into the core strategic management of sports clubs.

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AI tools that have been used in the work on this master's thesis:

- **Name (and version) of the AI tool:** ChatGPT 4.0.
  The purpose of the use of the tool: used for data insights and ideas generation

- **Name (and version) of the AI tool:** Quillbot.
  The purpose of the use of the tool: used to improve writing

I am aware that I am responsible for all content of this master's thesis, including parts where AI tools are used. I am responsible for ensuring that the thesis complies with ethical rules for privacy and publication.

10. Appendices

10.1 Statistical Tables

10.1.1 Frequencies

What is your age?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 18	2	1,1	1,1	1,1
	18-25	108	60,0	60,0	61,1
	26-34	25	13,9	13,9	75,0
	35-54	29	16,1	16,1	91,1
	55-64	13	7,2	7,2	98,3
	65+	3	1,7	1,7	100,0
	Total	180	100,0	100,0	

What is your gender?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	132	73,3	73,3	73,3
	Female	45	25,0	25,0	98,3
	Prefer not to say	3	1,7	1,7	100,0
	Total	180	100,0	100,0	

What is your level of education?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Middle school diploma	6	3,3	3,3	3,3
	High school diploma	34	18,9	18,9	22,2
	Bachelor's Degree	66	36,7	36,7	58,9
	Master's Degree	60	33,3	33,3	92,2
	Doctorate or professional degree	14	7,8	7,8	100,0
	Total	180	100,0	100,0	

What is your occupation?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Student	105	58,3	58,3	58,3
	Employed full-time	51	28,3	28,3	86,7
	Employed part-time	7	3,9	3,9	90,6
	Self-employed	10	5,6	5,6	96,1
	Unemployed	5	2,8	2,8	98,9
	Retired	2	1,1	1,1	100,0
	Total	180	100,0	100,0	

Which country do you reside in?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Argentina	2	1,1	1,1	1,1
	Austria	3	1,7	1,7	2,8
	Belgium	1	,6	,6	3,3
	Bulgaria	1	,6	,6	3,9
	Canada	1	,6	,6	4,4
	Denmark	1	,6	,6	5,0
	France	5	2,8	2,8	7,8
	Germany	5	2,8	2,8	10,6
	Italy	125	69,4	69,4	80,0
	Luxembourg	1	,6	,6	80,6
	Norway	21	11,7	11,7	92,2
	Spain	4	2,2	2,2	94,4
	Sweden	4	2,2	2,2	96,7
	Switzerland	2	1,1	1,1	97,8
	UAE	2	1,1	1,1	98,9
	Ukraine	1	,6	,6	99,4
	United Kingdom	1	,6	,6	100,0
	Total	180	100,0	100,0	

Appendix A: demographic information

Which of the four options do you believe the other spectators are more likely to choose?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bring-home and reuse next game	36	20,0	20,0	20,0
	Deposit Refund	60	33,3	33,3	53,3
	Put the cup in a donation bin	12	6,7	6,7	60,0
	Leave the cup on the stands	72	40,0	40,0	100,0
	Total	180	100,0	100,0	

Which of the four options are you more likely to choose?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bring-home and reuse next game	65	36,1	36,1	36,1
	Deposit Refund	54	30,0	30,0	66,1
	Put the cup in a donation bin	47	26,1	26,1	92,2
	Leave the cup on the stands	14	7,8	7,8	100,0
	Total	180	100,0	100,0	

Appendix B: consumers' preferences on reusable cups options

On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Bring-home and reuse next game

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little time-consuming	70	38,9	38,9	38,9
	2	28	15,6	15,6	54,4
	3	21	11,7	11,7	66,1
	4	12	6,7	6,7	72,8
	5	27	15,0	15,0	87,8
	6	10	5,6	5,6	93,3
	7 = Very time-consuming	12	6,7	6,7	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Put the cup in a donation bin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little time-consuming	36	20,0	20,0	20,0
	2	47	26,1	26,1	46,1
	3	40	22,2	22,2	68,3
	4	28	15,6	15,6	83,9
	5	17	9,4	9,4	93,3
	6	9	5,0	5,0	98,3
	7 = Very time-consuming	3	1,7	1,7	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Deposit Refund

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little time-consuming	15	8,3	8,3	8,3
	2	13	7,2	7,2	15,6
	3	25	13,9	13,9	29,4
	4	28	15,6	15,6	45,0
	5	49	27,2	27,2	72,2
	6	21	11,7	11,7	83,9
	7 = Very time-consuming	29	16,1	16,1	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Leave the cup on the stands

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little time-consuming	146	81,1	81,1	81,1
	2	9	5,0	5,0	86,1
	3	5	2,8	2,8	88,9
	4	7	3,9	3,9	92,8
	5	2	1,1	1,1	93,9
	6	4	2,2	2,2	96,1
	7 = Very time-consuming	7	3,9	3,9	100,0
	Total	180	100,0	100,0	

Appendix C: consumers' perceptions on time consumption

On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Bring-home and reuse next game

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very easy	67	37,2	37,2	37,2
	2	15	8,3	8,3	45,6
	3	33	18,3	18,3	63,9
	4	19	10,6	10,6	74,4
	5	21	11,7	11,7	86,1
	6	16	8,9	8,9	95,0
	7 = Very difficult	9	5,0	5,0	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Put the cup in a donation bin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very easy	58	32,2	32,2	32,2
	2	41	22,8	22,8	55,0
	3	44	24,4	24,4	79,4
	4	24	13,3	13,3	92,8
	5	6	3,3	3,3	96,1
	6	5	2,8	2,8	98,9
	7 = Very difficult	2	1,1	1,1	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Deposit Refund

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very easy	22	12,2	12,2	12,2
	2	33	18,3	18,3	30,6
	3	40	22,2	22,2	52,8
	4	36	20,0	20,0	72,8
	5	30	16,7	16,7	89,4
	6	11	6,1	6,1	95,6
	7 = Very difficult	8	4,4	4,4	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Leave the cup on the stands

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very easy	153	85,0	85,0	85,0
	2	8	4,4	4,4	89,4
	3	4	2,2	2,2	91,7
	4	5	2,8	2,8	94,4
	5	3	1,7	1,7	96,1
	6	2	1,1	1,1	97,2
	7 = Very difficult	5	2,8	2,8	100,0
	Total	180	100,0	100,0	

Appendix D: consumers' perceptions on ease-of-use

On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Put the cup in a donation bin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little beneficial	3	1,7	1,7	1,7
	2	11	6,1	6,1	7,8
	3	23	12,8	12,8	20,6
	4	39	21,7	21,7	42,2
	5	39	21,7	21,7	63,9
	6	20	11,1	11,1	75,0
	7 = Very beneficial	45	25,0	25,0	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Bring-home and reuse next game

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little beneficial	9	5,0	5,0	5,0
	2	3	1,7	1,7	6,7
	3	8	4,4	4,4	11,1
	4	15	8,3	8,3	19,4
	5	23	12,8	12,8	32,2
	6	36	20,0	20,0	52,2
	7 = Very beneficial	86	47,8	47,8	100,0
	Total	180	100,0	100,0	

Frequencies

Statistics

On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (

N	Valid	180
	Missing	0

Frequencies

Statistics

On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with

N	Valid	180
	Missing	0

On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Leave the cup on the stands

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little beneficial	71	39,4	39,4	39,4
	2	29	16,1	16,1	55,6
	3	33	18,3	18,3	73,9
	4	18	10,0	10,0	83,9
	5	11	6,1	6,1	90,0
	6	9	5,0	5,0	95,0
	7 = Very beneficial	9	5,0	5,0	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Deposit Refund

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little beneficial	12	6,7	6,7	6,7
	2	9	5,0	5,0	11,7
	3	25	13,9	13,9	25,6
	4	36	20,0	20,0	45,6
	5	36	20,0	20,0	65,6
	6	24	13,3	13,3	78,9
	7 = Very beneficial	38	21,1	21,1	100,0
	Total	180	100,0	100,0	

Appendix E: consumers' perceptions on benefit for the environment

On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Bring-home and reuse next game

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little beneficial	26	14,4	14,4	14,4
	2	20	11,1	11,1	25,6
	3	29	16,1	16,1	41,7
	4	38	21,1	21,1	62,8
	5	28	15,6	15,6	78,3
	6	14	7,8	7,8	86,1
	7 = Very beneficial	25	13,9	13,9	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Put the cup in a donation bin

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little beneficial	11	6,1	6,1	6,1
	2	19	10,6	10,6	16,7
	3	37	20,6	20,6	37,2
	4	42	23,3	23,3	60,6
	5	28	15,6	15,6	76,1
	6	21	11,7	11,7	87,8
	7 = Very beneficial	22	12,2	12,2	100,0
	Total	180	100,0	100,0	

Frequencies

Statistics

On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 b

N	Valid	180
	Missing	0

Frequencies

Statistics

On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1

N	Valid	180
	Missing	0

On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Deposit Refund

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little beneficial	28	15,6	15,6	15,6
	2	24	13,3	13,3	28,9
	3	38	21,1	21,1	50,0
	4	39	21,7	21,7	71,7
	5	27	15,0	15,0	86,7
	6	14	7,8	7,8	94,4
	7 = Very beneficial	10	5,6	5,6	100,0
	Total	180	100,0	100,0	

On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Leave the cup on the stands

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Very little beneficial	62	34,4	34,4	34,4
	2	33	18,3	18,3	52,8
	3	21	11,7	11,7	64,4
	4	22	12,2	12,2	76,7
	5	15	8,3	8,3	85,0
	6	8	4,4	4,4	89,4
	7 = Very beneficial	19	10,6	10,6	100,0
	Total	180	100,0	100,0	

Appendix F: consumers' perceptions on benefit for the club

If you were to attend a football game, indicate how likely you would be to do the following things - Purchase merchandising made from recycled or upcycled material for a premium price

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely unlikely	13	7,2	7,2	7,2
	Unlikely	30	16,7	16,7	23,9
	Somewhat unlikely	21	11,7	11,7	35,6
	Neither likely nor unlikely	27	15,0	15,0	50,6
	Somewhat likely	49	27,2	27,2	77,8
	Likely	32	17,8	17,8	95,6
	Extremely likely	8	4,4	4,4	100,0
	Total	180	100,0	100,0	

If you were to attend a football game, indicate how likely you would be to do the following things - Replace car with public transportation at home games

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely unlikely	9	5,0	5,0	5,0
	Unlikely	10	5,6	5,6	10,6
	Somewhat unlikely	9	5,0	5,0	15,6
	Neither likely nor unlikely	11	6,1	6,1	21,7
	Somewhat likely	19	10,6	10,6	32,2
	Likely	64	35,6	35,6	67,8
	Extremely likely	58	32,2	32,2	100,0
	Total	180	100,0	100,0	

If you were to attend a football game, indicate how likely you would be to do the following things - Stay behind after the game to help collect the waste left at the stands

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely unlikely	39	21,7	21,7	21,7
	Unlikely	40	22,2	22,2	43,9
	Somewhat unlikely	42	23,3	23,3	67,2
	Neither likely nor unlikely	19	10,6	10,6	77,8
	Somewhat likely	25	13,9	13,9	91,7
	Likely	10	5,6	5,6	97,2
	Extremely likely	5	2,8	2,8	100,0
	Total	180	100,0	100,0	

If you were to attend a football game, indicate how likely you would be to do the following things - Purchase plant-based or vegeterian food options

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely unlikely	30	16,7	16,7	16,7
	Unlikely	28	15,6	15,6	32,2
	Somewhat unlikely	27	15,0	15,0	47,2
	Neither likely nor unlikely	30	16,7	16,7	63,9
	Somewhat likely	29	16,1	16,1	80,0
	Likely	17	9,4	9,4	89,4
	Extremely likely	19	10,6	10,6	100,0
	Total	180	100,0	100,0	

If you were to attend a football game, indicate how likely you would be to do the following things - Replace plane with train/bus for away games

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely unlikely	9	5,0	5,0	5,0
	Unlikely	23	12,8	12,8	17,8
	Somewhat unlikely	23	12,8	12,8	30,6
	Neither likely nor unlikely	28	15,6	15,6	46,1
	Somewhat likely	36	20,0	20,0	66,1
	Likely	43	23,9	23,9	90,0
	Extremely likely	18	10,0	10,0	100,0
	Total	180	100,0	100,0	

Appendix G: consumers' alleged attitudes towards sustainable behaviours

Rank the initiatives you believe stadium events organisers should implement by dragging and dropping them in order of importance, with 1 being the most important and 5 being the least important - Minimize single-use packaging and utensils by offering reusable or compostable alternatives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	36	20,0	20,0	20,0
	2	56	31,1	31,1	51,1
	3	38	21,1	21,1	72,2
	4	32	17,8	17,8	90,0
	5	18	10,0	10,0	100,0
	Total	180	100,0	100,0	

Rank the initiatives you believe stadium events organisers should implement by dragging and dropping them in order of importance, with 1 being the most important and 5 being the least important - Invest in energy-efficient infrastructures (like solar panels) to power stadium operations and in water conservation measures

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	76	42,2	42,2	42,2
	2	44	24,4	24,4	66,7
	3	42	23,3	23,3	90,0
	4	12	6,7	6,7	96,7
	5	6	3,3	3,3	100,0
	Total	180	100,0	100,0	

Rank the initiatives you believe stadium events organisers should implement by dragging and dropping them in order of importance, with 1 being the most important and 5 being the least important - Promote and facilitate alternative transportation such as public transport or biking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	48	26,7	26,7	26,7
	2	51	28,3	28,3	55,0
	3	37	20,6	20,6	75,6
	4	23	12,8	12,8	88,3
	5	21	11,7	11,7	100,0
	Total	180	100,0	100,0	

Rank the initiatives you believe stadium events organisers should implement by dragging and dropping them in order of importance, with 1 being the most important and 5 being the least important - Source food and beverage from local and sustainable suppliers

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	17	9,4	9,4	9,4
	2	20	11,1	11,1	20,6
	3	39	21,7	21,7	42,2
	4	66	36,7	36,7	78,9
	5	38	21,1	21,1	100,0
	Total	180	100,0	100,0	

Rank the initiatives you believe stadium events organisers should implement by dragging and dropping them in order of importance, with 1 being the most important and 5 being the least important - Sell only merchandising made of recycled or upcycled materials

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	3	1,7	1,7	1,7
	2	9	5,0	5,0	6,7
	3	24	13,3	13,3	20,0
	4	47	26,1	26,1	46,1
	5	97	53,9	53,9	100,0
	Total	180	100,0	100,0	

Which of the following polluting sources do you believe generates the highest environmental footprint in a football club's operations at a stadium event?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Transportation of supporters to and from the stadium	65	36,1	36,1	36,1
	Generation of solid waste during the event	20	11,1	11,1	47,2
	Energy and water consumption in the stadium	55	30,6	30,6	77,8
	Food consumption and waste	24	13,3	13,3	91,1
	Production and sale of merchandise	16	8,9	8,9	100,0
	Total	180	100,0	100,0	

Appendix H: consumers' insights on materiality

On a scale from 1 to 7, to what extent do you think it is possible for football clubs to make a difference in taking climate actions? (with 1 being "not at all possible" and 7 "extremely possible") - 1

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1 = Not at all possible	1	,6	,6	,6
	2	7	3,9	3,9	4,4
	3	17	9,4	9,4	13,9
	4	44	24,4	24,4	38,3
	5	56	31,1	31,1	69,4
	6	28	15,6	15,6	85,0
	7 = Extremely possible	27	15,0	15,0	100,0
	Total	180	100,0	100,0	

Indicate your level of agreement or disagreement with the following statements - I am concerned about the climate crisis

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	,6	,6	,6
	Disagree	5	2,8	2,8	3,3
	Somewhat disagree	4	2,2	2,2	5,6
	Neither agree nor disagree	6	3,3	3,3	8,9
	Somewhat agree	30	16,7	16,7	25,6
	Agree	78	43,3	43,3	68,9
	Strongly agree	56	31,1	31,1	100,0
	Total	180	100,0	100,0	

Indicate your level of agreement or disagreement with the following statements - I am concerned about the environmental footprint of sporting events

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	,6	,6	,6
	Disagree	11	6,1	6,1	6,7
	Somewhat disagree	13	7,2	7,2	13,9
	Neither agree nor disagree	38	21,1	21,1	35,0
	Somewhat agree	62	34,4	34,4	69,4
	Agree	42	23,3	23,3	92,8
	Strongly agree	13	7,2	7,2	100,0
	Total	180	100,0	100,0	

Indicate your level of agreement or disagreement with the following statements - I am concerned about the amount of waste generated in a stadium

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	1	,6	,6	,6
	Disagree	8	4,4	4,4	5,0
	Somewhat disagree	9	5,0	5,0	10,0
	Neither agree nor disagree	26	14,4	14,4	24,4
	Somewhat agree	59	32,8	32,8	57,2
	Agree	51	28,3	28,3	85,6
	Strongly agree	26	14,4	14,4	100,0
	Total	180	100,0	100,0	

Appendix I: consumers' concerns on sustainability

10.1.2 Multinomial logistic regressions and correlations

Parameter Estimates

Which of the four options are you more likely to choose?[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B) Lower Bound	Upper Bound
Bring-home and reuse next game	Intercept	3,070	,665	21,333	1	<,001			
	On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Bring-home and reuse next game	-,455	,149	9,295	1	,002	,634	,474	,850
Deposit Refund	Intercept	2,422	,674	12,928	1	<,001			
	On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Deposit Refund	-,288	,147	3,863	1	,049	,750	,562	,999
Put the cup in a donation bin	Intercept	2,575	,678	14,433	1	<,001			
	On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Put the cup in a donation bin	-,389	,152	6,531	1	,011	,678	,503	,913

a. The reference category is: Leave the cup on the stands.

Likelihood Ratio Tests

Effect	Model Fitting Criteria -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	104,475	34,522	3	<,001
On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Bring-home and reuse next game	80,906	10,953	3	,012

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

Likelihood Ratio Tests

Effect	Model Fitting Criteria -2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	88,597	17,492	3	<,001
On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") - Put the cup in a donation bin	76,544	5,440	3	,142

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

Appendix J: how perceived time consumption affects consumers' preferences

Parameter Estimates

Which of the four options are you more likely to choose?[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B) Lower Bound	Upper Bound
Bring-home and reuse next game	Intercept	4,105	,812	25,574	1	<,001			
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Bring-home and reuse next game	-,748	,177	17,866	1	<,001	,473	,334	,669
Deposit Refund	Intercept	2,798	,817	11,729	1	<,001			
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Deposit Refund	-,348	,166	4,379	1	,036	,706	,510	,978
Put the cup in a donation bin	Intercept	3,169	,821	14,911	1	<,001			
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Put the cup in a donation bin	-,507	,173	8,640	1	,003	,602	,429	,845

a. The reference category is: Leave the cup on the stands.

Effect	Likelihood of Reduced Model	Chi-Square	df	Sig.
Intercept	118,284	51,563	3	<,001
On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Bring-home and reuse next game	94,400	27,679	3	<,001

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

Parameter Estimates

Which of the four options are you more likely to choose?[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B) Lower Bound	Upper Bound
Bring-home and reuse next game	Intercept	1,307	,360	13,180	1	<,001			
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Bring-home and reuse next game	-,400	,109	13,475	1	<,001	,670	,541	,830
Put the cup in a donation bin	Intercept	,371	,391	,901	1	,343			
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") - Put the cup in a donation bin	-,159	,105	2,278	1	,131	,853	,694	1,049

Appendix K: how perceived ease affects consumers' preferences

Parameter Estimates

Which of the four options are you more likely to choose?[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B) Lower Bound	Upper Bound
Bring-home and reuse next game	Intercept	,091	1,160	,006	1	,938			
	On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Bring-home and reuse next game	,241	,192	1,586	1	,208	1,273	,874	1,853
Deposit Refund	Intercept	1,967	1,049	3,515	1	,061			
	On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Deposit Refund	-,111	,178	,391	1	,532	,895	,632	1,268
Put the cup in a donation bin	Intercept	1,635	1,071	2,331	1	,127			
	On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Put the cup in a donation bin	-,076	,181	,174	1	,676	,927	,650	1,322

a. The reference category is: Leave the cup on the stands.

Effect	Model Fitting Criteria –2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	72,268	9,314	3	,025
On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Bring-home and reuse next game	72,815	9,861	3	,020

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

Appendix L: how perceived benefit for the environment affects consumers' preferences

Parameter Estimates

Which of the four options are you more likely to choose?[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B) Lower Bound	Upper Bound
Bring-home and reuse next game	Intercept	,435	,642	,459	1	,498			
	On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Bring-home and reuse next game	,291	,164	3,151	1	,076	1,338	,970	1,844
Deposit Refund	Intercept	1,207	,626	3,715	1	,054			
	On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Deposit Refund	,043	,166	,066	1	,798	1,043	,754	1,444
Put the cup in a donation bin	Intercept	,307	,661	,216	1	,642			
	On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Put the cup in a donation bin	,244	,168	2,105	1	,147	1,277	,918	1,776

a. The reference category is: Leave the cup on the stands.

Effect	Model Fitting Criteria –2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	81,258	6,320	3	,097
On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Bring-home and reuse next game	83,358	8,420	3	,038

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

Appendix M: how perceived benefit for the club affects consumers' preferences

Likelihood Ratio Tests

Effect	Model Fitting Criteria –2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	121,093	3,568	3	,312
What is your age?	120,529	3,004	3	,391
What is your gender?	123,305	5,780	3	,123
Loc	123,460	5,934	3	,115

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

Likelihood Ratio Tests

Effect	Model Fitting Criteria –2 Log Likelihood of Reduced Model	Likelihood Ratio Tests Chi-Square	df	Sig.
Intercept	120,214	1,253	3	,740
How often do you attend sporting events at stadiums?	123,968	5,007	3	,171
How often do you attend other event types at stadiums (say music concerts, festivals, etc)?	119,798	,837	3	,841

The chi-square statistic is the difference in -2 log-likelihoods between the final model and a reduced model. The reduced model is formed by omitting an effect from the final model. The null hypothesis is that all parameters of that effect are 0.

Appendix N: how demographics and frequency of attendance affect consumers' preferences

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	,139	,518		,268	,789		
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") – Bring-home and reuse next game	,658	,060	,643	11,030	<,001	,979	1,021
	On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Bring-home and reuse next game	,056	,069	,047	,805	,422	,976	1,025
	On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Bring-home and reuse next game	,114	,060	,110	1,900	,059	,995	1,005

a. Dependent Variable: On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") – Bring-home and reuse next game

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	2,427	,459		5,283	<,001		
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") – Deposit Refund	,562	,072	,508	7,807	<,001	,993	1,007
	On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Deposit Refund	,061	,067	,061	,912	,363	,953	1,049
	On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Deposit Refund	-,058	,069	-,055	-,833	,406	,959	1,043

a. Dependent Variable: On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") – Deposit Refund

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	,815	,431		1,892	,060		
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") – Put the cup in a donation bin	,569	,071	,519	7,994	<,001	,984	1,016
	On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Put the cup in a donation bin	,118	,061	,126	1,933	,055	,976	1,025
	On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Put the cup in a donation bin	,028	,058	,031	,474	,636	,977	1,024

a. Dependent Variable: On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") – Put the cup in a donation bin

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	1,044	,253		4,125	<,001		
	On a scale from 1 to 7, how easy do you think it would be to complete each of the alternative actions for you? (with 1 being "very easy" and 7 "very difficult") – Leave the cup on the stands	,304	,084	,264	3,626	<,001	,990	1,010
	On a scale from 1 to 7, how beneficial for the environment do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Leave the cup on the stands	,036	,064	,043	,559	,577	,900	1,111
	On a scale from 1 to 7, how beneficial for the club do you think each option would be? (with 1 being "very little beneficial" and 7 "very beneficial") – Leave the cup on the stands	,010	,057	,013	,170	,865	,908	1,101

a. Dependent Variable: On a scale from 1 to 7, how time-consuming do you think each option would be for you? (with 1 being "very little time-consuming" and 7 "very time-consuming") – Leave the cup on the stands

Appendix O: Multicollinearity

Correlations

		Indicate your level of agreement or disagreement with the following statements – I am concerned about the climate crisis	Indicate your level of agreement or disagreement with the following statements – I am concerned about the environmental footprint of sporting events	Indicate your level of agreement or disagreement with the following statements – I am concerned about the amount of waste generated in a stadium	What is your age?	What is your gender?	Loc	If you were to attend a football game, indicate how likely you would be to do the following things – Purchase merchandising made from recycled or upcycled material for a premium price	If you were to attend a football game, indicate how likely you would be to do the following things – Replace car with public transportation at home games	If you were to attend a football game, indicate how likely you would be to do the following things – Stay behind after the game to help collect the waste left at the stands	If you were to attend a football game, indicate how likely you would be to do the following things – Purchase plant-based or vegeterian food options	If you were to attend a football game, indicate how likely you would be to do the following things – Replace plane with train/bus for away games
Indicate your level of agreement or disagreement with the following statements – I am concerned about the climate crisis	Pearson Correlation	1	,600**	,477**	-,014	,067	,041	,034	,260**	,093	,359**	,207**
	Sig. (2-tailed)		<,001	<,001	,855	,370	,581	,647	<,001	,216	<,001	,005
	N	180	180	180	180	180	180	180	180	180	180	180
Indicate your level of agreement or disagreement with the following statements – I am concerned about the environmental footprint of sporting events	Pearson Correlation	,600**	1	,687**	-,019	,046	-,018	,133	,264**	,162*	,239**	,200**
	Sig. (2-tailed)	<,001		<,001	,797	,538	,809	,075	<,001	,029	,001	,007
	N	180	180	180	180	180	180	180	180	180	180	180
Indicate your level of agreement or disagreement with the following statements – I am concerned about the amount of waste generated in a stadium	Pearson Correlation	,477**	,687**	1	-,063	,098	,033	,113	,220**	,133	,173*	,144
	Sig. (2-tailed)	<,001	<,001		,404	,190	,660	,130	,003	,074	,020	,055
	N	180	180	180	180	180	180	180	180	180	180	180
What is your age?	Pearson Correlation	-,014	-,019	-,063	1	-,079	-,204**	,161*	,103	,054	,091	,135
	Sig. (2-tailed)	,855	,797	,404		,290	,006	,031	,169	,472	,226	,070
	N	180	180	180	180	180	180	180	180	180	180	180
What is your gender?	Pearson Correlation	,067	,046	,098	-,079	1	-,054	-,084	,090	,022	,301**	,070
	Sig. (2-tailed)	,370	,538	,190	,290		,470	,262	,232	,764	<,001	,352
	N	180	180	180	180	180	180	180	180	180	180	180
Loc	Pearson Correlation	,041	-,018	,033	-,204**	-,054	1	-,073	,210**	,027	,165*	,018
	Sig. (2-tailed)	,581	,809	,660	,006	,470		,328	,005	,718	,027	,811
	N	180	180	180	180	180	180	180	180	180	180	180
If you were to attend a football game, indicate how likely you would be to do the following things – Purchase merchandising made from recycled or upcycled material for a premium price	Pearson Correlation	,034	,133	,113	,161*	-,084	-,073	1	,234**	,319**	,123	,065
	Sig. (2-tailed)	,647	,075	,130	,031	,262	,328		,002	<,001	,100	,389
	N	180	180	180	180	180	180	180	180	180	180	180
If you were to attend a football game, indicate how likely you would be to do the following things – Replace car with public transportation at home games	Pearson Correlation	,260**	,264**	,220**	,103	,090	,210**	,234**	1	,338**	,242**	,323**
	Sig. (2-tailed)	<,001	<,001	,003	,169	,232	,005	,002		<,001	,001	<,001
	N	180	180	180	180	180	180	180	180	180	180	180
If you were to attend a football game, indicate how likely you would be to do the following things – Stay behind after the game to help collect the waste left at the stands	Pearson Correlation	,093	,162*	,133	,054	,022	,027	,319**	,338**	1	,198**	,228**
	Sig. (2-tailed)	,216	,029	,074	,472	,764	,718	<,001	<,001		,008	,002
	N	180	180	180	180	180	180	180	180	180	180	180
If you were to attend a football game, indicate how likely you would be to do the following things – Purchase plant-based or vegeterian food options	Pearson Correlation	,359**	,239**	,173*	,091	,301**	,165*	,123	,242**	,198**	1	,195**
	Sig. (2-tailed)	<,001	,001	,020	,226	<,001	,027	,100	,001	,008		,009
	N	180	180	180	180	180	180	180	180	180	180	180
If you were to attend a football game, indicate how likely you would be to do the following things – Replace plane with train/bus for away games	Pearson Correlation	,207**	,200**	,144	,135	,070	,018	,065	,323**	,228**	,195**	1
	Sig. (2-tailed)	,005	,007	,055	,070	,352	,811	,389	<,001	,002	,009	
	N	180	180	180	180	180	180	180	180	180	180	180

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Appendix P: correlations