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IS SUSTAINABLE RUNNING POSSIBLE? EXPLORING INITIATIVES IN URBAN MARATHONS IN EUROPE

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Abstract

Background and Objective: The increasing popularity of urban marathons has brought significant attention to their impact on sustainability. Despite bringing numerous economic and social benefits, large-scale events represent a challenge from the perspective of sustainable development. This study aims to identify the communicated sustainability strategies used in organising marathon running events in Europe and to highlight the best practices associated with their implementation.

Study Design/Materials and Methods: This research employs a literature review, coupled with case studies of sustainable initiatives from major European urban marathons. A quantitative content analysis and a comparative analysis were conducted to examine the approaches taken by different marathon organisers.

Results: The study reveals a variety of sustainable practices adopted by marathon organisers. All races on their websites highlight efforts related to recycling and waste reduction, and nearly all mention supporting local charities, using biodegradable materials and promoting sustainable transport.

Practical implications: The findings of this study underscore the importance of transparent communication and the involvement of all stakeholders in enhancing the sustainability of large-scale sporting events. By identifying successful strategies, this research provides valuable insights for different event organisers, policymakers and cities aiming to improve the environmental outcome of urban marathons.

Conclusion and summary: In conclusion, while significant progress has been made in integrating sustainable practices into urban marathons, considerable challenges remain. The study underscores the need for ongoing innovation and collaboration with stakeholders to further reduce the environmental impact of these events. The identified best practices offer a framework for other running events.

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1. Introduction

Running is not only one of the simplest forms of physical activity, but also a way to improve health and well-being. Thanks to its simplicity, running can be done anywhere and at any time, and can be adapted to the individual needs of runners. As a result, running has become popular worldwide, contributing to the development of this market and the organisation of numerous running events that support this way of spending leisure time. Within the running events market, there are urban running (road running) events, which typically take place in cities, and trail running events, which occur in natural environments (mainly mountains, forests, etc.). Road races are the most popular form of running events.

The most demanding distance in road running, which is also a long-term goal for many runners, and garners prestige and recognition, is the marathon (i.e. 42.195 km). Nevertheless, the development of mass sports events and the popularisation of physical activity have made running accessible to a larger percentage of people who previously viewed marathons as extreme, exhausting, very difficult, and suitable only for highly trained athletes (Ridinger *et al*., 2012). Globally, there are 800 marathons organised (McAlister, 2023) annually. In 2023, the largest marathons (The Abbott World Marathon Majors) were completed by the following numbers of runners: London – 53K runners, New York – 51K runners, Berlin – 48K runners, Chicago – 48K runners, Tokyo – 37K runners, and Boston – 30K runners (data from official marathon websites, referring to finishers). Furthermore, over 840K runners worldwide have expressed interest in participating in the TCS London Marathon in 2025 (biegowe.pl, 2024). Due to the start limits – over 50K some runners will be selected through a ballot procedure. This unprecedented level of interest demonstrates the growing market among participants.

It is worth noting that for such events, participants often engage in running tourism, meaning they travel outside their place of residence to participate in the running event (Kasperska and Kasperski, 2017). They spend at least one night away from home, eat several meals, visit attractions, and buy souvenirs (McGehee *et al*., 2003). Previous studies indicate that marathons have an economic impact and bring tangible economic benefits to cities (Funk *et al*., 2016; Saayman and Saayman, 2012; Coleman and Ramchandani, 2010). Moreover, it is undeniable that running events generate significant social advantages, including the development of social capital, the promotion of a health and sports culture, and various other intangible benefits

(Jantori and Pongponrat, 2022; Zhou and Kaplanidou, 2018; Shipway and Holloway, 2010).

Events that attract such a large number of participants pose a challenge in terms of sustainable development. This area has become one of the key topics in various fields, including sports. The organisation of large sports events, such as urban marathons, presents numerous challenges for organisers in terms of minimising the negative impact on the environment. The main research question of this article is: What specific sustainable development initiatives are currently being implemented and communicated by the organisers of the largest urban marathons in Europe? The objective of this study is to identify the communicated sustainable development strategies used in organising marathon running events in Europe, and to highlight the best practices and challenges associated with their implementation.

2. Literature Review

The concept of "sustainable development" was firstly defined in 1987 by the World Commission on Environment and Development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 37). Sustainable development is founded on three interconnected aspects: social, economic and environmental sustainability. Given the complexity of this field, the article concentrates primarily on environmental aspects.

Nevertheless, the introduction of the 2030 Agenda for Sustainable Development, globally adopted by the United Nations in 2015, has sparked increased attention towards sustainable urban development. Indeed, the potential of sport to contribute to achieving the Sustainable Development Goals (SDGs) has been emphasised (Masdeu Yelamos *et al.,* 2019). The interaction between sport and the natural environment is mutual: sport affects the natural environment and is also influenced by it (McCullough *et al*., 2020).

The impact of sporting events on the environment can be studied from various perspectives. These include the carbon footprint associated with participant travel to marathons (Castaignède *et al.,* 2021). The conclusions of the study are that participation in marathons outside one's place of residence leaves a significant carbon footprint regarding CO2 emissions. Similar conclusions were reached by researchers who focused on the assessment of the carbon footprints of 28 mass participation running events in North America. The results indicated that the average event procuced 3363 MtCO2e (0.23 MtCO2e per capita). Scope 3 emissions accounted for 99.9% of these emissions, with 98.9% being attributable to participant travel (McCullough *et al.,* 2023). Moreover, individual sports, including mass running events, produce more emissions than team or racket sports (Wicker, 2019). In long-distance running events, like marathons, a major concern is also the environmental impact caused by the large amount of waste, especially plastic waste (Bianchini and Rossi, 2021). The

authors proposed a sustainable model for managing plastic waste during marathons which significantly reduces plastic waste through measures such as reusable water bottles and better waste segregation. Researchers have investigated different strategies for incorporating sustainable practices into the management of sports events, aiming to reduce environmental damage and enhance the beneficial effects of participatory sports events (Breitbarth *et al*., 2023). Although the environmental impact is mainly discussed in the context of urban races, a study conducted in Australia indicated that trail races can be a significant source of microplastic pollution in protected and wild areas. This is because the clothing and footwear designed for trail running release microplastics during use, which settle on the surface of the trails (Forster *et al.,* 2023).

It is worth noting that in addition to sustainable development being an obvious necessity, it is also an important aspect for participants. Environmental awareness in society is constantly increasing and is reflected in the running events market. One manifestation of this trend is the growing popularity of races organised in natural environments (Delińska, 2024). Moreover, participants increasingly expect the organisers of these events to be engaged in sustainable development. All eco-friendly practices should not only be implemented, but also effectively communicated. Neglecting these aspects can lead to dissatisfaction and negative opinions among participants, while implementing new environmental solutions and improvements can serve as an interesting differentiator in the market.

Huang and Chiu (2024) investigated how the environmental awareness of runners impacts their perceptions of green initiatives and their support at a sporting event. The study finds that higher environmental consciousness among participants leads to positive green brand perceived quality, which in turn increases their support for sustainable practices at these events. It was also found that there is a positive relationship between perceived sustainable development and support for hosting sports events (Parra-Camacho *et al*., 2023). These findings underscore the importance of promoting sustainable event management to enhance resident support. From a marketing perspective, it is important not only to actually implement activities related to sustainable development, but also to communicate them effectively. Spindler *et al.* (2023) conducted an analysis of German runners' preferences regarding sustainable sports apparel, focusing on functional T-shirts. The results show that German runners value both environmental and social sustainability, are willing to pay more for higher levels of sustainability, and that unified scoring systems for sustainable sports apparel could be beneficial for consumers and manufacturers.

Despite some research on sustainable development and running events, an evaluation of actions related to sustainability and their communication among the largest marathons in Europe has not been conducted so far. Therefore, after reviewing the literature, it was decided to fill this research gap.

3. Methodology

In the initial phase of the study, a literature review was conducted. This was followed by a quantitative content analysis of marathon websites, which allowed for the systematic organisation of information. Additionally, Pearson's correlation coefficient was calculated to examine the relationship between the communication of sustainable development actions and the number of marathon participants. Subsequently, case studies were employed to provide detailed descriptions of individual marathons, focusing on specific sustainable development actions and analysing particular examples. Finally, a comparative analysis was conducted, comparing actions taken by different marathon organisers, in order to identify best practices and common patterns.

First and foremost, it should be assumed that the scale of the event (number of participants) correlates with the magnitude of its environmental impact. Consequently, the effect of large events can be greater than that of local ones. For this reason, the analysis concerns the largest running events. A list of all marathons held in the capital cities of European Union member states in 2023 was compiled. For further analysis, only marathons with at least 1,000 participants (according to the definition of a mass event) in the analysed year were considered. Therefore, marathons such as Wizz Air Sofia Marathon in Bulgaria, Zagreb Marathon in Croatia, BMW Helsinki Marathon in Finland, Wizz Air Marathon La Valette in Malta, Raiffeisen Bank Bucharest Marathon in Romania, and ČSOB Bratislava Marathon in Slovakia were not included, as they did not meet this criterion. For the content analysis, key terms such as 'sustainability', 'eco-friendly', and 'environmental impact' were used to identify and categorise initiatives communicated by event organisers. The selection process aimed to include a diverse range of events to offer a comprehensive view of sustainability efforts across urban marathons in Europe. Ultimately, 20 marathons were analysed, as shown in Table 1.

It was verified whether each marathon's official website included a subpage informing about actions implemented in the framework of sustainable development. Eight out of 20 marathons (constituting 40% of the analysed events) communicated such actions on their websites. This subpage was most commonly labeled "sustainability", but sometimes also appeared as "eco-friendly" or "environment".

The Pearson correlation coefficient between the number of marathon participants and the communication of sustainable development actions (coded as 1 for sustainability actions and 0 for none) was calculated. The results indicate a moderate positive correlation ($r=0.52$), suggesting that marathons attracting a larger number of participants tend to implement sustainable development initiatives. The data indicates that among the 10 most popular marathons, 7 (a clear majority) communicate such sustainability actions.

Table 1. Participation and sustainability communication among European marathons in 2023

No.	Marathon	Country	Number of participants in 2023	Communication of sustainable actions
1.	Vienna City Marathon	Austria	6 650	yes
2.	Brussels Airport Marathon	Belgium	1 696	no
3.	Prague International Marathon	Czechia	5 468	no
4.	Copenhagen Marathon	Denmark	10 164	yes
5.	Swedbank Tallinn Marathon	Estonia	1 702	no
6.	Schneider Electric Marathon de Paris	France	52 078	yes
7.	Athens Marathon. The Authentic	Greece	17 073	no
8.	Zurich Rock 'n' Roll Madrid Marathon	Spain	9 129	no
9.	TCS Amsterdam Marathon	Netherlands	16 070	yes
10.	Irish Life Dublin Marathon	Ireland	16 492	yes
11.	Danske Bank Vilnius Marathon	Lithuania	1 201	no
12.	ING Night Marathon Luxembourg	Luxembourg	1 347	no
13.	Rimi Riga Marathon	Latvia	1 291	yes
14.	BMW Berlin Marathon	Germany	47 912	yes
15.	Nationale-Nederlanden Warsaw Marathon	Poland	5 558	no
16.	EDP Lisbon Marathon	Portugal	4 602	no
17	Volkswagen Ljubljana Marathon	Slovenia	1 644	no
18.	adidas Stockholm Marathon	Sweden	12 714	no
19.	The SPAR Budapest Marathon	Hungary	3 565	no
20.	Acea Run Rome The Marathon	Italy	11 235	yes

Source: own elaboration.

In the subsequent phase of the study, a case study approach was employed to illustrate the sustainability actions communicated by each of the identified marathons. A comprehensive analysis of all initiatives listed by the organisers on their official websites was then performed, with all sources documented in the referenc-

es. The marathons examined include: Schneider Electric Marathon de Paris, BMW Berlin Marathon, Irish Life Dublin Marathon, TCS Amsterdam Marathon, Acea Run Rome The Marathon, Copenhagen Marathon, Vienna City Marathon and Rimi Riga Marathon.

4. Results

In 2017, the Schneider Electric Marathon de Paris signed the first Charter of 15 eco-responsible commitments for Major International Sports Events, under the guidance of the Ministry of Sports and WWF, derived from the Sustainable Development Goals and adapted to the sports event sector. The Schneider Electric Paris Marathon integrates eco-friendly practices throughout the event with comprehensive recycling and waste management strategies, including sorting waste at the source and ensuring minimal landfill impact. Since 2017, the event has achieved a 50% reduction in its waste. In 2023, 5.4 tonnes of runners' clothing were sorted and recycled for secondary use, 16 tonnes of waste (cardboard, wood, and PET) was recycled, 3.5 tonnes of bio-waste from refreshment stands was composted to become topsoil, 2237 kg of fruits were donated to a local charity organisation and 422 pairs of running shoes were donated to the Africa Run association. In addition to its sustainability efforts, the Schneider Electric Marathon de Paris has offset all its greenhouse gas emissions since 2019.

The BMW Berlin Marathon commits to a detailed sustainability programme covering various aspects such as: biodiversity, emissions reduction, energy efficiency, waste reduction and disposal, material efficiency, water and waste water (each area has a separate subpage). In 2018, the marathon organisers adopted the EMAS (Eco-Management and Audit Scheme) to manage environmental protection measures. This independent third-party certification ensures that all environmental aspects are legally compliant and transparent. To support biodiversity, the goal is to use only sustainably-produced food for catering. Therefore, regional and seasonal caterers are chosen. Refreshment points already offer exclusively regional and organic apples, while only organic bananas are used. The BMW Berlin Marathon acknowledges that participant travel to and from the event is one of the biggest challenges in reducing emissions. Participants receive a free BVG public transportation ticket for their arrival and departure. On the day of the event, participants' race bibs function as tickets for all public transport in Berlin. Additionally, a discounted event ticket has been arranged for train travel, so participants are encouraged to travel by train, which emits fewer greenhouse gases than planes or cars. Furthermore, these measures serve also an educational purpose. They focus on the use of innovative energy concepts during and around the events. Since 2020, only green electricity has been used at all power connections. Where waste reduction is challenging to implement, the aim is to use raw materials that remain in the cycle. In this regard,

communication with service providers and suppliers is essential. One improvement includes changing the packaging of ponchos, which used to be individually packaged and are now delivered in packs of 100. Another example of recycling is the warming foils, which after use are pressed into bales and returned to the manufacturer. Participants are encouraged to properly segregate waste and return the used warming foils. The event magazine is produced exclusively in digital format, which saves paper. Moreover, the refill stations allow runners to use their own hydration systems before and during the race. They are also testing different reusable cup concepts. Additionally, runners are encouraged to donate unwanted running clothes and shoes to a local charity organisation. To limit water consumption, aerators are used.

The Irish Life Dublin Marathon emphasises reducing its environmental footprint through comprehensive recycling and waste management strategies. The event aims to create a positive environmental impact by implementing a zero-waste policy and promoting the use of reusable materials. The race is committed to the continuous review and implementation of sustainability strategies and environmentally friendly practices throughout the event. Implemented measures include using biodegradable and reusable goodie bags, baggage bags made from oxo-degradable plastic, reducing the number of bottles from the event which end up in a landfill to 0%, increasing the number of collection bins by 300%, and segregating recyclable waste streams. Furthermore, all clothes discarded at the start will be donated to a local charity organisation. Additionally, race instructions and registration materials will be only digital. Not all race numbers will be printed before the event, and all branding materials will be collected and reused. The marathon also focuses on reducing carbon emissions by using generators with exhaust gas recirculation or a diesel particulate filter. Moreover, all leftover goodie bags will be donated to a local organisation supporting the homeless. Biodegradable materials will also be used, and fully compostable cups will be trialed by Lucozade Sport. The Irish Life Dublin Marathon actively engages the community in sustainable practices by encouraging the use of public transport. To reduce car journeys, shuttle bus transfers from the local train station to and from the event will be provided. Moreover, bike parking will be available.

The TCS Amsterdam Marathon integrates sustainability during the event by focusing on such aspects as raw materials/waste, mobility, energy, food and drinks. Firstly, the organisers focus on zero waste, meaning that the start and finish areas are waste-free, and all waste generated by visitors and participants is recycled. They also ensure proper packaging, such as providing lunches for volunteers in paper bags instead of plastic. Since 2021, official shirts (by Mizuno) are not packaged in plastic. Moreover, food and drinks at care stations are supplied in a way that minimises packaging. The organisers are also working to introduce biodegradable cups at refreshment points. At one supply station, a pilot project was conducted using only biodegradable cups made from cane sugar. Along the route, black rubbish bins are placed every two kilometres. Furthermore, sanitation partners use only environ-

mentally friendly cleaning products. Participants are encouraged to travel by bicycle or public transportation through informational campaigns and cooperation with local authorities. Additionally, to limit travel movements as much as possible, the organisers work with local suppliers. All logistics operations are carefully planned in advance. Sustainable actions also include efficient energy use. Fixed power and water points in the city are used whenever possible and if not, mobile batteries or renewable and fossil-free fuel are utilised. LED lighting is used wherever feasible. Notably, participants have access to free tap water within the stadium. If any products are left over after the event, they will be donated to a food bank, and fruits will be given to the zoo.

Acea Run Rome The Marathon aims to adhere to some of the UN's 17 SDGs. The marathon obtained ISO 20121 certification for sustainable event management in 2022. Collaboration with sustainability partner Circularity promotes the circular economy with initiatives focusing on waste reduction, energy efficiency, and community engagement. The marathon in Rome is dedicated to combating food waste as a top priority. Through strong partnerships and targeted initiatives, the marathon recovers surplus food from the event and redistributes it to those in need. Promoting sustainable mobility is another key focus. The marathon organisers minimise the event's environmental impact by utilising hybrid and electric vehicles, which currently make up 75% of the transportation modes. The goal is to reach 100% usage of these vehicles, further reducing the carbon footprint of the event. Moreover, building on data from the 2021 edition, the event's carbon footprint is annually monitored. This monitoring allows for effective offsetting through various initiatives, aiming to significantly reduce the environmental impact. The marathon fosters a circular economy by promoting sustainable development principles. This involves implementing waste recovery and valorisation initiatives that repurpose waste through new production cycles, giving materials a second life. According to the data on the website, over 63 tonnes of surplus food have been recovered, more than 60,000 litres of water and beverages have been salvaged, 12,320 shirts and bags have been saved, 3,047 trees have been planted, and 13,910 kg of waste have been retrieved and sorted for recycling. Additionally, a vade mecum has been published on their website encouraging participants to practice sustainability. The guidelines emphasise minimising waste through reducing, reusing and recycling, properly sorting waste, and avoiding single-use plastics. Participants are encouraged to eat local and seasonal products, save energy with renewable sources, and use green transportation methods. The vade mecum also highlights conserving water, reducing food waste, and choosing environmentally certified products, while promoting environmental education for a sustainable future. In summary, it should be noted that Acea Run Rome The Marathon, among all the marathons analysed, has the most formalised official document (5 pages) - a sustainable development policy.

The Copenhagen Marathon has introduced several practices to minimise its environmental footprint. The organisers have adopted various initiatives and product solutions designed to use fewer resources and thus lower the marathon's environmental impact. Additionally, they maintain close dialogue with sponsors, partners, public authorities and suppliers to further these efforts. Race bibs are printed onsite to reduce resource waste, ensuring only bibs collected by entrants are printed. Biodegradable, plastic-free cups are used to eliminate single-use plastic. Water bottles are made of 100% recycled plastic, and the container deposit is donated to foundations supporting seriously and chronically ill children, so runners are encouraged to use the special bins in the finish area. Refreshment zones use tap water directly from the city's fire hydrants to avoid unnecessary transportation and packaging. Rain covers are biodegradable and made from cornstarch, and reusable race bags are crafted from recycled materials. Printed participant materials have been replaced with digital communication, including registration cards, runner guides, and other information. They avoid using confetti, non-biodegradable balloons, and similar materials during the race. Additionally, there are several drop zones along the route for runners to dispose of energy product packaging, facilitating easy rubbish collection and helping to keep the city clean.

The Vienna City Marathon is guided by the "Athletics for a Better World" action programme and the UN's 17 SDGs, as a World Athletics Label Event. The organisers have implemented detailed steps towards sustainability and climate neutrality with their partners, sponsors and suppliers. In 2023, a new green area was planted and landscaped. They phased out gas at the marathon office and warehouse building by installing an air heat pump in 2022, with plans to subsequently install a photovoltaic system. The race T-shirts, provided by adidas, are made from 100% recycled materials. The event equipment for employees, including shoes, is also made almost entirely from recycled materials. Additionally, the reusable wardrobe bags are made from biodegradable corn starch. All marathon advance and support vehicles from BMW are electric and emission-free. In 2023, an electric cargo tricycle powered by photovoltaics was used for construction work in the finish area. The Vienna Provincial Traffic Department deploys a uniformed bicycle service as an advance team during the event. Old clothing left behind in the start area is collected and either reused or recycled if possible. All plastic bottles used for beverages (Coca-Cola, Powerade and Römerquelle) are made from 100% recycled PET and are sent to a recycling plant after the event. Information about this is communicated at a stand in the finish area. Beverage cups at catering outlets are made of paper and are 100% recyclable, and drinks in aluminum cans are not used during the race or in the finish area. In 2023, the start location was moved to shorten distances, reduce resource use, and simplify logistics. Refreshments are provided in bags made from biodegradable material (PLA), which is produced from renewable raw materials like sugar cane or corn and is petroleum-free. Large-scale printing is done with

biodegradable and ecologically compatible colours that meet current environmental standards, using an autonomous outdoor printing robot powered by an electric motor. Only reusable crockery is used in hospitality and guest areas at the finish line; where reusable items are not feasible, products made from renewable raw materials are used. Print productions for the Vienna City Marathon are significantly reduced, with digital event guides replacing information brochures and postcards instead of image brochures. When printing is necessary, PEFC-certified paper is used. Any leftover food from the race is donated to local charity organisations. Stand equipment for the Marathon Expo and start number distribution primarily consist of reusable elements.

Rimi Riga Marathon conducted a sustainability audit of the marathon in collaboration with Janis Brizga, a researcher from the University of Latvia. Three pillars have been established: reduction, education and involvement, and compensation. Rimi Riga Marathon has implemented several measures to reduce its CO_2e footprint, including reducing consumption and production volume, digitising various materials required for the marathon, and utilising recyclable or already recycled materials in the organisation. Participant bags are made with at least 70% recycled material, and eco-friendly banners used for the event are fully recyclable. Water glasses provided on the route and at the finish are made from recycled materials. The participant guide has been digitised to reduce paper usage, and offers from partners are provided digitally, further minimising the use of physical materials. Additionally, the marathon employs five electric cars and seven hybrid cars to reduce emissions during the event. The Vienna City Marathon focuses on educating and involving the runner community in reducing their environmental footprint. By engaging tens of thousands of running enthusiasts through blogging, training sessions, videos on energy point usage, and international virtual competitions, the event aims to instill sustainable, environmentally-friendly habits. Tests are conducted to calculate each participant's carbon footprint, plogging runs are organised to clean up the environment, and recommendations are provided for reducing footprints during the race. A plogging challenge on the Virtual Run Club, an exchange programme for bibs, pins, or bags for fir tree saplings, and a sustainability test at the Expo further support these efforts. The Riga Marathon is the first large-scale national sports event to financially compensate for its carbon footprint, supporting sustainable projects in Riga and Latvia in partnership with Riga Forests and the Riga City Council. These initiatives serve as a foundation for implementing further sustainability plans. Efforts include planting 2000 pine trees and contributing to urban modernisation projects.

In the presented results, it should be noted that only the actions communicated on official websites were evaluated. It is important to consider that actual activities may be much broader, or communicated through other channels such as social media, which were not analysed in this study.

The next step in the research process involved conducting a comparative analysis, as presented in Table 2. The sustainability actions adopted by European mar-

athon organisers were categorised, and it was verified which races implement each specific initiative.

Table 2. Summary of sustainability initiatives in European marathons in 2023

Initiatives/ Marathons	Paris	Berlin	Dublin	Amster-dam	Rome	Copen-hagen	Vienna	Riga
Recycling	v	v	v	v	v	v	v	v
Biodegra-dable materials		v	v	v		v	v	v
Waste reduction	v	v	v	v	v	v	v	v
Sustainable transport		v	v	v	v		v	v
Energy efficiency		v		v	v		v	
Emission reduction	v	v	v				v	v
Water management		v		v		v		
Organic food		v						
Local charity	v	v	v	v	v	v	v	
Local suppliers				v				
Digital materials		v	v			v	v	v
Race bibs on site			v			v		
Education initiatives		v			v		v	v
Tree planting					v			v

Source: own elaboration.

All races communicate efforts related to recycling and waste reduction. Nearly all of them mention actions such as supporting local charities, using biodegradable materials, and sustainable transport on their websites. Analysing all marathons, it can be observed that the BMW Berlin Marathon communicates the most initiatives.

5. Conclusions

Urban marathons in Europe, being highly popular and attracting runners from around the world, are events that can impact the natural environment in various ways. It is worth noting that the vast majority of organisers of the largest marathons in Europe demonstrate a strong commitment to sustainable development through a range of innovative initiatives. Strategies aimed at reducing negative environmen-

tal impacts are communicated on the marathons' websites. Events such as Acea Run Rome The Marathon and Vienna City Marathon directly state that they are pursuing the SDGs.

The biggest challenge is to minimise the carbon footprint resulting from participant travel, especially regarding those who travel between countries or continents. Another challenge with such a large number of participants is to manage waste. In terms of recycling, waste reduction, biodegradable options, and generally adhering to the zero waste philosophy, marathon organisers seem to be doing very well (at least at the level of communicated initiatives). Some initiatives, such as using organic food, supporting local suppliers, proper water resource management, or preparing race bibs directly at the start, are not yet popular. A recommendation for race organisers is to introduce innovations that can provide a competitive advantage and distinguish their race from others. However, for the common good, in the area of sustainable development, benchmarking and implementing actions from other entities in the market are valuable.

The study underscores the need for ongoing innovation and collaboration with stakeholders to further reduce the environmental impact of events. The findings indicate that implementing changes is a complex process requiring involvement at various levels from stakeholders—cities, suppliers, partners and the runners themselves. The identified best practices offer a framework for other running events. The conducted study can serve as a collection of good practices, and the presented initiatives have an application value. Some actions can be successfully implemented in smaller urban race events, not just marathons.

In conclusion, while the study highlights the importance of sustainability from the perspective of event organisers, it is equally crucial to consider the views of other key stakeholders, such as runners, sponsors and local communities. On one hand, organisers recognise the need to mitigate the negative environmental impact when organising events for tens of thousands of participants. On the other hand, runners, increasingly conscious of environmental issues, expect proactive measures, and their perceptions of these actions deserve further exploration. Future research should thus aim to broaden the understanding of how different stakeholders, including participants and sponsors, perceive and respond to sustainability initiatives, which could shape more effective communication and engagement strategies.

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