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A pragmatic perspective on the future of sustainability in sport

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Environmental Legacy of Mega Sport Events

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This chapter covers mega sporting events in relation to environmental protection. We first introduce why sport and associated mega-events serve as important platforms for environmental protection and actions. Next, we explain the basic processes related to environmental planning and implementation. The history of environmental legacy at mega-events is covered before introducing case studies which show how mega-events provide an environmental legacy while also addressing challenges. Finally, the barriers and issues related to environmental legacy are discussed.

Fact: Mega-events provide unique sustainability challenges, and they require long-term strategic planning to ensure environmental legacies will remain intact in the years and decades following the event.

Fairytale: The positive environmental legacies proposed by mega-event organisers during the bid process are typically realised without challenges or alternations.

Introduction

> Mega events must leave enduring legacies that benefit societies long after games are over. All hosts of mega events should integrate sustainability at their core. Let us work together so that the motto of all mega events in the future is cleaner, greener and more sustainable.
>
> UN Secretary General Ban Ki-Moon (FIFA, 2016)

Sport presents broad opportunities to promote environmental awareness, capacity building and far-reaching actions for environmental, social, and economic development across society

(International Olympic Committee: IOC, 2012). Sustainable development has become increasingly integrated into the objectives of hosting mega-events (Hall, 2012). Therefore, a vast majority of mega sport event organisations (e.g., International Olympic Committee [IOC], Fédération Internationale de Football Association [FIFA]) have sustainability management plans designed to integrate the principles, actions, and projects related to sustainability when hosting events. The goal is to integrate sustainability in all aspects of the organisational processes, thus reducing the impact of the event, and setting an example of good practice for society as a whole (IOC, 2013).

Why Sport?

Sport is part of global cultural fibre (Klein, 2014). Sport is interwoven in culture and society and the sport industry can use its unique influence to provide much-needed business leadership in ecology and sustainable practices (Barth, 2016). The reason for using sport to enhance environmental protection stems from both the environmental impact of the events themselves (the focus of this chapter), and even more importantly, how they serve as a platform to enhance environmental behaviour to the significant number of fans that attend mega-events. There are few cultural or social phenomenon in the world that can leverage such numbers. Some examples include:

- We follow sports: 16% of Americans follow science, but 70% follow sports (Barth, 2016).
- We are loyal to sport at a young age: According to ESPN's 2013 Sports Poll, 88% of Americans age 12 or older state they are fans of and follow at least one sport (Luker, 2014).

- We attend and watch sport: FIFA reported about 3.3 million people attended the 64 games and nearly half the planet (3.2 billion people) tuned in to at least one match of the 2014 World Cup (FIFA, 2015).

Sport events provide a visible platform for environmental corporate social responsibility efforts that in turn influence spectator behaviour. Consequently, sporting organisations and events can not only reduce a large environmental footprint from the event itself, but also educate and expose spectators to environmental practices that may influence sustainable behaviours within their everyday lives (Casper & Pfahl, 2015).

What is Event Greening?

Event-greening is the process of incorporating socially and environmentally responsible decision-making into the planning, organisation and implementation of, and participation in, an event. It involves including sustainable development principles and practices in all levels of event organisation, and aims to ensure that an event is hosted responsibly. It represents the total package of interventions at an event, and needs to be done in an integrated manner. Event-greening should start at the inception of the project, and should involve all the key role players, such as clients, organisers, venues, subcontractors and suppliers. It aims to achieve the following (Ackermann, 2011, p. 25):

• To improve the resource efficiency of the entire event and supply chain management;

• To reduce negative environmental impacts, such as carbon emissions, waste ending up on landfill sites, and the effect on biodiversity;

• To increase economic, social and environmental benefits (triple-bottom line);

• To enhance the economic impact, such as local investment and long-term viability;

• To strengthen the social impact, such as community involvement and fair employment;

• To improve sustainable performance within an available budget;

• To present opportunities for more efficient planning and use of equipment and infrastructure;

• To reduce the negative impact on local inhabitants;

• To protect the local biodiversity, water and soil resources;

• To apply the principles of eco-procurement of goods and services; and

• To raise awareness of sustainability.

Basic Planning and Implementation

There are three major phases for integrating sustainability within a mega-event (Rio, 2013):

Preparation phase: includes the conceiving and designing of permanent infrastructure, venues and facilities; detailed operational planning; construction of new permanent facilities and renovation of existing venues; construction of temporary venues and facilities; human resources development; legacy planning.

Operational phase: starts a few months before the mega-event. Along with the competitions themselves, includes cultural and educational activities, test events, the opening and closing ceremonies and the disassembly of the venues and facilities.

Legacy phase: after the mega-event, the work continues to ensure lasting positive transformations that maximise the social, economic, environmental, and sporting benefits of hosting.

While most sustainability mega-event plans focus on three major categories (people, planet, and prosperity), this chapter will focus on environmental planning and implementation, or

planet. Major elements within the environmental focus include transportation and logistics, sustainable design and construction, environmental conservation and clean-up, and waste management (Table 1).

Insert Table 1 Here

Environmental Legacy

While there is tremendous planning and efforts toward environmental sustainability with mega-events, there is still controversy about the sincerity of the efforts as well as follow through once the event is over, and ultimately the event's environmental legacy. Mega-events are still often considered as "footloose industries" in that their organisations mobilise considerable resources in the short-term but then disappear, leaving long-term consequences (Preuss, 2013). They come to a place with a need for resources and then disappear. Have past mega-events been environmentally friendly, genuinely "green" games or only a "green washing" exercise? The next section will explore this controversy, both the positive and the negatives, through an overview of the history of environmental legacy at mega-events and subsequent case studies.

Reconciling Rhetoric and Reality: A Collective Case Study of Sustainability Claims

The formalisation of environmental legacy in mega-event planning is a relatively recent development resulting from rising awareness of environmental issues from sport organisations and key international organisations like the United Nations and the IOC (Kellison, Trendafilova, & McCullough, 2015; McCullough, Pfahl, & Nguyen, 2015). Calls for ecological stewardship from activists, policymakers, and sport leaders have undoubtedly affected the increasing attention on environmental legacy planning among mega-event organisers and hosts. While it is

highly likely that any mega sporting event today will pledge to minimise its impact on the natural environment, such planning can be derailed by any number of reasons, including reduced funding for pro-environmental initiatives (e.g., due to cost overruns on infrastructure; Flyvbjerg & Stewart, 2012) or pressure from governing bodies (e.g., Bob & Swart, 2009). Thus, pre-event claims predicting that a major sporting event will be "the greenest" or "most sustainable" can only be realised after months and years of post-event analysis.

This section discusses the history of environmental issues related to mega sporting events, which traces back to the 1930s and became an Olympic mainstay in the 1990s. Additionally, there is an exploration of several recent examples of sport's largest international events - the Olympic and Paralympic Games, FIFA World Cup - through a comparison of pre-event legacy development with post-event environmental impact analyses. The chapter concludes by outlining the challenges that come with planning and operating a mega sporting event, many of which come in the weeks, months, and years after the event has ended.

Early Environmental Protection Initiatives

No other major sport governing body has been tied to environmental issues longer than the IOC. After all, the wide range and scale of events between the Summer and Winter Olympic and Paralympic Games require significant infrastructural developments to accommodate the competitions, athletes, spectators, press, and officials. According to Chappelet (2008), "The Olympic Winter Games are partly held in mountain resorts and are thus closer to nature, a fact that has frequently led them to encounter strong opposition from environmental organizations" (p. 1884). The construction of stadiums and other competition venues, housing for athletes and visitors, and roads are a few examples of Games-related projects that could impact the

surrounding environment, particularly when events are held in isolated locations (e.g., Mbombela Stadium in South Africa, Arena da Amazônia in Brazil; Manfred, 2015; Young, 2015). Less than a decade after the first Winter Olympic Games were held in Chamonix, France, in 1924, environmental activists began pushing back at Olympics organisers. For instance, when organisers of the 1932 Winter Olympics in Lake Placid, New York, considered removing 2,500 trees to make room for a bobsled run, a local activist group called the Association for the Protection of the Adirondacks successfully blocked the run's construction (Chappelet, 2008).

Chappelet (2008) recounted the first mega sporting event that took "the environment in a serious way" (p. 1889), the 1972 Winter Olympic Games in Sapporo, Japan. The IOC's selection of Sapporo as the host city came as a surprise to many, especially the delegation from Banff, Alberta, who were considered frontrunners to host the '72 Games after being narrowly beaten in their bid for the previous Games. A number of factors contributed to the selection of Sapporo over Banff, but the influence of environmental activists was unmistakable: while the Japanese delegation was unified in their commitment to protect the natural environment, the Canadian bid committee faced threats of protests from the Canadian Wildlife Association and other environmental groups. In subsequent Winter Games, the environment played prominent roles (e.g., as a consideration during the bidding process, as subjects of protests) for aspirant (e.g., Denver and Interlaken in 1976) and host cities (e.g., Lake Placid in 1980).

In the 1990s, the growing commercialisation of the Olympic Games led to fears that the event was becoming unsustainable—a concern that still persists today. The IOC, recognising the need to temper criticisms of the increasing spectacle of the Olympic Games and bolstered by the momentum of several high-profile environmental meetings (including the release of the historic Brundtland Report that defined sustainability and then-Norwegian Prime Minister Gro Harlem

Brundtland's subsequent address to the IOC in Seoul in 1988; Cantelon & Letters, 2000; Mallen, Stevens, & Adams, 2011), sponsored several key environmental initiatives. As recounted by Gold and Gold (2013), these initiatives included:

- an amendment to the Olympic Charter in 1991 compelling host cities to hold the Games under "conditions which demonstrate a responsible concern for environmental issues" (International Olympic Committee, 1991, p. 9);
- the adoption of the environment as the third pillar of Olympism in 1994 (IOC, 1996); and
- an additional modification to the Olympic Charter in 1996 that symbolised the IOC's commitment to "sustainable development" (IOC, 1996).

In addition to the aforementioned drivers of the IOC's environmental focus, the 1992 Winter Games in Albertville, France, were highly influential. These Games were deemed "an environmental disaster" that could have been avoided had "the IOC had in place a carefully considered policy for environmental protection" (Cantelon & Letters, 2000, pp. 300–301). In its official report following the Games, the local organising committee (*Comité d'Organisation des Jeux Olympiques*; COJO) said as much, though in admittedly more charitable tones: "Albertville and Savoie proved that this event could activate and sustain essential projects which will have a long-term effect on this region" (p. 124). In their review of the Games, the COJO offered a buoyant view of the Games' poor environmental performance:

> Even if everything was not perfect, at least the Winter Olympic Games of 1992 will have brought to light one imperative point: in September 1991, [COJO co-president] Michel Barnier presented a proposition to the IOC that henceforth, every town or region applying to host the Games should present an impact study to show the effects of their project on the environment. (COJO, 1992, p. 124)

The 1994 Olympic Winter Games in Lillehammer, Norway, were a reversal to the Albertville Games and marked a major shift in the way in which the Olympics would be managed. In 1990,

the Lillehammer Olympic Organising Committee (LOOC) clashed with environmental groups on the location of Hamer Olympic Hall (*Vikingskipet*, or "The Viking Ship) in Åkersvika (LOOC, 1994). As a result of this conflict, the LOOC developed five primary environmental goals: (1) increase environmental awareness, (2) maintain regional social considerations, (3) promote sustainable development and growth, (4) ensure environmentally friendly arenas, and (5) demand environmental quality at every stage of the event. By the start of the Games, more than 21 projects had been included in the LOOC's environmental agenda, including management and training, food services and accommodation, sponsors and suppliers, and transportation and waste. In their post-Olympics evaluation, the LOOC identified four conditions deemed "essential" to the success of the Games' environmental-related initiatives:

1. Environmental responsibility must be anchored in the organisation from the top leaders and throughout the entire organisation.
2. Environmental goals and requirements must be defined and followed up.
3. Cooperation with environmental organisations and public authorities is important.
4. Careful selection of environmentally inclined sponsors. (LOOC, 1994, p. 86).

The Lillehammer Games were largely celebrated for their comprehensive environmental design and led the IOC and subsequent host cities to consider more carefully what would be left behind once the Olympics had concluded (Andranovich & Burbank, 2013).

Although previous cities had considered the long-term impact of hosting an international mega-event, the explicit association between mega sporting events and the term *legacy* first surfaced in the early planning stages of the 1956 Melbourne Candidature File (Leopkey, 2009). From that point on, references to legacy appeared sporadically until the 1996 Centennial Olympic Games in Atlanta (ACOG, 1997; Andranovich & Burbank, 2013). In sum, eight

primary legacies were cited by the IOC in its analysis of the Atlanta Games: economic, reputation, urban regeneration, accommodation, tourism, environment, telecommunications, and venues (IOC, 2012).

More generally, the IOC and its local organising committees categorise the long-term effects of the Games into five categories of legacy: sporting, social, environmental, urban, and economic (IOC, 2013). But these legacies are aspirational, and they are not always realised by a host city. Furthermore, legacies are difficult to measure, can develop slowly, and are not exclusively benefits. For example, shortly after the Centennial Olympic Games had concluded, an analysis of its impact on Atlanta reported some negative consequences: "While Atlanta has made progress on redeveloping some of its poorest communities, the extensive redevelopment generated by the Olympics damaged several communities" (Research Atlanta, 1996, p. 16). Nearly two decades after the Atlanta Games, local news headlines still reflect the challenges of defining the city's Olympic legacy: "The eroding legacy of the 1996 Olympics in Atlanta" (Browne, 2014); "Nearly 20 years later, the legacy of Atlanta's Olympic venues is still being written" (Nickisch, 2015); and "Atlanta's Olympic legacy in the eye of the beholder" (Chapman, 2016).

Although mega-event organisers are demonstrating a commitment to legacy planning with increasing frequency, there may still be large contrasts between the legacy aspirations and the actual impact of an international sporting event. These contrasts may be particularly pronounced when it comes to environmental legacy, as sustainability initiatives may be pushed aside in favour of new priorities or because of budget shortfalls. Every case is different, and examples can be extended beyond the Olympic and Paralympic Games to include mega-events such as the FIFA World Cup, which is discussed in further detail below.

Environmental Legacy Planning in Select Mega-Events

Unsurprisingly, international governing bodies like the IOC and FIFA often tout the positive environmental impact of their events. Yet, an event's legacy encompasses both its positive *and* negative effects (Kaplanidou, 2012). As Sant and Mason (2015) note, it is often the case that the negative aspects of an event are obscured: "[One] point of contention is that legacy is most often employed when expressing positive outcomes of hosting a mega-event, whereas negative legacies, such as overcrowding and environmental damage, are ignored by bid and event proponents" (p. 43). In addition to the possibility that an official environmental assessment authored by a governing body may contain incomplete information, the uniqueness of each event and host city necessitates that researchers exercise caution when evaluating an event's environmental legacy. In this section, differences are examined by highlighting the sustainability claims of some of the largest and most celebrated sporting events globally.

The Olympic and Paralympic Games

As illustrated previously, the IOC has stressed its commitment to environmental stewardship by selecting the environment as one of its three Olympic pillars and mandating that prospective host cities include comprehensive environmental legacy plans in their Bid Books. While the 1994 Olympic Winter Games in Lillehammer are usually credited with setting the pro-environment precedent, momentum for sustainability really escalated in the 2000s. After Salt Lake City hosted the first carbon-neutral Olympic Games in 2002, every Olympic city that followed has proclaimed itself to be the most sustainable Games, beginning with Athens, then Torino, then Beijing, then Vancouver, then London, and so on (Westerman, 2010).

For its part, the Torino Organising Committee (TOROC) made environmental sustainability a central component of its Candidature Files to host the 2006 Olympic Winter Games. As noted by Minnaert (2012), TOROC's commitment to the environment was prioritised over other legacy programming such as social inclusion: "The consensus clearly indicates that the social aspect of sustainability was relatively neglected, particularly compared to the environmental aspect" (p. 367). After the Games, TOROC disseminated a 213-page report highlighting its sustainability policies, initiatives, and environmental performance. Although the report was produced shortly after the Games, TOROC was already defining the long-term impact of the Torino Games:

> The Torino Games have left a twofold legacy. The Games were a driving force for the development of sport and mass events in general, but they also were a stimulus to improving sustainability policies both for the territory and for the world of sport (TOROC, 2006, p. 95).

This statement highlights an important theme of legacy planning: an environmental legacy encompasses not only the impact on the host city, but also the influence on future Olympic programming.

Few Olympic events have drawn more attention to the environment than the 2008 Summer Games in Beijing, a city with a history of environmental problems. After losing its bid to host the 2000 Olympics to Sydney, which heavily promoted environmental initiatives, Beijing planners refocused their 2008 effort accordingly (Beyer, 2006). More than $17 billion was allocated to projects related to improving environmental performance (Ramzy, 2008). Additionally, in light of concerns that atmospheric pollutants could adversely affect air quality, the Chinese Government responded by "shutting down factories, restricting car usage and slowing down construction" (Ramzy, 2008, para. 3). The Games produced clear environmental benefits, particularly when it came to educating citizens (Chen & Tian, 2015; Jin, Zhang, Ma, &

Connaughton, 2011). Despite these advances and proclamations from the UN Environmental Programme that the "Beijing Olympics met or exceeded green goals" (Gronewold, 2009), analysis by Wang et al. (2011) suggested the Beijing Olympics were "the most polluted games ever" (Jamieson, 2009). This dramatic contrast illustrates the importance of context when evaluating the legacy of mega-events: though the Beijing Olympics provided some relief to a taxed natural environment, the size and scale of the Games meant the environmental impact was still substantial.

Similar to other legacies, environmental legacies can range in scope, and may be planned or unplanned. For example, the Vancouver Organising Committee for the 2010 Olympic and Paralympic Winter Games (VANOC) made a concerted effort to comprehensively evaluate the environmental impact of the Winter Olympics, as measured by a number of criteria. These included the location and size of land used within protected areas of high biodiversity value, the number of infractions for non-compliance with environmental laws and regulations, the number and volume of significant spills, the number of newly constructed venues applying for green building certification, and the weight of solid waste diverted (VANOC, 2010, p. 16). VANOC's focus on sustainably designed facilities was particularly important to projecting Vancouver as a world-class, pro-environmental destination (Kaplanidou & Karadakis, 2010). Ten years earlier, the Sydney Organising Committee for the Olympic Games (SOCOG) predicted a similarly positive effect from building green stadiums, but this expectation has not been fully realised:

> It was forecast that world-class, environmentally friendly sports facilities would attract international sporting competitions for decades… Ironically, then, one of the strongest subjects of criticism of Sydney's Olympic legacy has been the use of, or lack thereof, of the facilities that were constructed for the games, especially those at Sydney Olympic Park (Toohey, 2008, p. 1960).

Interestingly, one unplanned legacy of the Sydney Games was the creation of a conservation plan to protect the endangered green and golden bell frog, which was found during the development of the Olympic Park site (Darcovich & O'Meara, 2008).

The development (and post-Games redevelopment) of the Queen Elizabeth Olympic Park site for the 2012 Summer Games represented one of three primary foci of the London Organising Committee of the Olympic and Paralympic Games' (LOCOG) sustainability agenda (Gold & Gold, 2013). The site on which the Olympic complex was constructed was a mix of green and brownfields, which required builders to remediate contaminated soil before construction could begin (Raco, 2015). The competition facilities, many of which were temporary and made from sustainably sourced or recycled materials, received acclaim for their pro-environmental designs. The transformation and post-Games transition of the Olympic Park was an ambitious undertaking; accordingly, it represented the crown jewel of the London Olympic legacy plan. Despite the pronounced effort on the part of LOCOG, a study by Konstantaki and Wickens (2010) indicated Londoners were less aware, and in some cases, sceptical, of the Games' positive environmental impact.

Most recently, the 2016 Olympics in Rio represented an opportunity for Brazil to use "sport as a catalyst for social integration and the Games for 'celebration and inclusion' of the city, the region and the country" (IOC, 2009, p. 84). For the IOC, it "could help the country develop faster and could bring an entire continent of people close to the Olympic movement" (Macur, 2009, p. A1). Given our temporal proximity to the Games, the environmental legacy of the Games will take time to fully evaluate. Still, based on the significant number of negative news reports leading up to and during the Games, it is likely the Rio Games did not live up to expectations. For example:

> In 2009, when Rio de Janeiro was named the Olympic host city for the 2016 games, Governor Sergio Cabral was full of promises. The residents of Rio, he told *The Guardian*, will "gain more metro lines, more trains, more sewage treatment, more in terms of the environment, social services, in terms of sport and culture." Pretty much none of those promises were kept; at least, they weren't kept for everyone equally (Delgadillo, 2016, paras. 1–2).

For Allen Hershkowitz, a former scientist with the Natural Resources Defense Council and co-founder of the Green Sports Alliance, the challenges faced by Rio underscore the significant planning and capital required to minimise the environmental effects of mega-events: "I very much understand the IOC's desire to be more equitable in delivering the Olympics to the developing world. But the Sochi and Rio Olympics indicate that there are such huge environmental, transportation, water and air-quality questions" (as quoted in Powell, 2016, para. 21). These challenges may be even more pronounced for mega-events with larger geographical footprints, as discussed further below.

The FIFA World Cup

FIFA formalised its first environmental programme in 2006 and established comprehensive "Green Goal" initiatives to coincide with the 2006 and 2011 World Cups in Germany and 2010 World Cup in South Africa. In 2009, it instituted a requirement that all applicant nations include environmental protections as well as plans for avoiding, minimising, or offsetting any negative effects of hosting the World Cup in their Bid Books (FIFA, 2013). The current iteration of FIFA's environmental programme, called "Football for the Planet," centres on waste, water, energy, transportation, procurement, and climate change.

Called "one of the biggest infrastructure investment projects in South Africa" by the national government, the 2010 FIFA World Cup cost nearly $4 billion, including $1.3 billion to construct or renovate 10 stadiums across the country (Egan, 2014; Molloy & Chetty, 2015). In

preparation for the event, FIFA invested in several environmental initiatives, including a carbon offsetting project that used sewage gas to generate electricity and the installation of solar arrays at 20 "Football for Hope" community centres in South Africa (FIFA, 2013). In addition to the direct benefits of the solar panels, they also served to educate citizens about alternative forms of clean energy. Although South Africa reported a lower carbon footprint the year it hosted the World Cup (Melo et al., 2014), it was still double the carbon footprint of the Beijing Olympics (Cornelissen, Bob, & Swart, 2011). As Cornelissen et al. (2011) observed, despite efforts to raise awareness of environmental issues, the World Cup suffered from logistical problems including South Africa's reliance on coal and the need for air travel to reach competition venues.

These logistical challenges were also present in Brazil during the 2014 World Cup. World Cup organisers elected to place competition venues in 12 cities rather than the recommended eight, a decision Rio mayor Eduardo Paes later called "a mistake" (Baxter, 2014). Because of the distance between venues, the U.S. team reportedly travelled close to 9,000 miles to compete in three games across 10 days. These long travel distances had a clear impact on teams, but they also placed more stress on the environment because of the demand for long-haul flights. Furthermore, the Brazilian government had to confront a number of issues in the time leading up to the World Cup (which continued into the 2016 Olympics), with the environment representing just one of many concerns:

> The economy is sputtering, Brazilians are furious at the bill for the costliest World Cup ever, corruption allegations are flying and public services like health, education, housing and transportation are in decline. Environmental impacts are near the bottom of a long list of grievances (Spanne, 2014, para. 5).

On a positive note, more than half of the World Cup stadiums received Leadership in Energy and Environmental Design (LEED) certification (Sport and Urban Policy Initiative, 2017), though a facility's sustainable design does little good for facilities that are not actively occupied and

operated.

Looking forward, FIFA's selection of Qatar to host the 2022 World Cup has presented new challenges because of the country's arid climate and desert landscape. On the other hand, organisers are already considering how they can improve upon past World Cups (Henderson, 2016). For example, in contrast to the large distances between Brazil's football stadiums, the Qatari Bid Book indicated most events would take place within a 60-kilometer radius. Furthermore, they have committed to several pro-environmental initiatives, including "zero carbon emissions through strategies such as the adoption of sophisticated air-conditioning technologies" (p. 87). Henderson (2016) continues, "Stadia [will be] designed in a modular fashion to enable several to be dismantled and reconstructed at 22 venues in needy developing countries after the World Cup" (p. 87).

Like similar policies created by the IOC, FIFA's mandate ensures that any state seeking to host the World Cup has a plan in place for producing a positive environmental legacy. However, as discussed throughout this section, the mere presence of a plan does not guarantee that a positive environmental legacy will be realised. Competing or misguided priorities; unforeseen obstacles arising before, during, or after an event; and difficulties measuring environmental performance can each play a role in the development and execution of an environmental legacy plan. We discuss these barriers in turn below.

Barriers to Effective Environmental Legacy Planning

By definition, an environmental legacy is meant to be sustainable, or long-lasting. To be effective, it must be able to withstand the natural changes that occur over time. Furthermore, it must be comprehensive and cannot be hastily implemented. As Allen Hershkowitz noted, "You

can't just do this for a one-month event; it's got to be a decades-long planning. Otherwise, you're left with empty stadiums and a wrecked environment" (as quoted in Powell, 2016, para. 27). So, why do the pro-environmental plans of so many mega-events seem to unravel so quickly? Certainly, unforeseen events like poor economic conditions or new legislative directives can alter the course of a legacy plan—though ideally, a legacy plan would weather these shocks. Other obstacles to effective environmental planning, however, are more predictable.

Greenwashing

Looking to gain a competitive advantage over their rivals, businesses may promote charitable or community-centred programmes to demonstrate their corporate social responsibility. On occasion, these programmes may be accompanied with hollow promises or exaggerated claims about their benefits. When applied to environmental programming, this embellishment is known as greenwashing. Examples of greenwashing include claiming oneself to be a "green" organisation despite implementing minimal pro-environmental controls, promoting environmental initiatives that are considered industry standards or regulatory requirements, or simply lying about one's positive environmental impact.

Both the IOC and FIFA have been accused of greenwashing because their continued pursuit of seemingly contradictory goals: to advance their events (and brands) to new markets—many of which lack the infrastructure to host an international mega-event—while promoting a pro-environmental agenda. Additionally, while both the IOC and FIFA include some form of environmental programme mandates in their bid specifications, it is unclear how enforceable—or even meaningful—these requirements are. For example, given the evidence that FIFA officials accepted bribes from the Russian and Qatari delegations (both nations were later selected as

future World Cup hosts), how serious can FIFA's policies be taken ("Black Marks on the Beautiful Game," 2015)?

On the subject of FIFA's selection of Qatar as 2022 World Cup host, Klotz (2015) contended that FIFA's desire to hold the mega-event there (regardless of motive) raised serious environmental questions:

> Qatar's winning bid included the construction of 12 new stadiums, including the one where the finals will be played—in a city that doesn't even exist yet. While the number of stadiums may be lowered to 10, the event may move to the winter (conflicting, however, with the European club season), and the stadiums may not be air-conditioned, it is a sure bet that the 2022 World Cup will be an environmental disaster.
>
> At a time when the world is increasingly troubled by global warming and arguing over how to reduce environmental impacts, the ability of FIFA to escape serious and sustained criticism in this field is amazing (Klotz, 2015; paras. 5–6).

As of early 2017, the total number of stadiums had still not been finalised, though FIFA had approved the tournament's move to Qatar's winter season. Similar critiques of the IOC and FIFA's separate endorsements of Rio and Brazil have focused on the unfulfilled promises made in that nation's Bid Books. In his reproach of Rio's Olympics preparation, Jules Boykoff, a professor and former professional soccer player, accused FIFA and Brazilian organisers of overstating their sustainability claims: "These days, Olympic bids come chock full of so-called legacy projects that gleam green. But Rio 2016 is in the running for the most greenwashed Games ever" (as quoted in Young, 2016, para. 21).

In response to negative perceptions about its selection process, FIFA recently considered new reforms to be instituted for 2026 World Cup bidding. Included in these proposed reforms were more specific environmental and sustainability requirements (Das, 2016). For critics, however, these reforms offer little promise; instead, they argue, the governing bodies must enact more comprehensive rules related to environmental legacy planning. For instance, Preuss (2013) provided four suggestions for ensuring that environmental legacy plans are legitimate and

sustainable, including publishing the promises made in Bid Books and exerting "political pressure on the organizers to fulfil them" (p. 3595). Stuart and Scassa (2011) took these suggestions one step further, arguing that "if the IOC were serious in their professed intent that Games' legacies be beneficial for residents of host cities, regions and countries over time, they could require the enactment of straightforward legislation guaranteeing planned and sustainable outcomes" (para. 1). After all, they argue, the IOC has successfully implemented strict policies in order to protect the Olympic brand and its official sponsors.

Reprioritisation

Implicit in the argument that international governing bodies should enact and enforce laws that require pro-environmental legacy planning *and* implementation is the assumption that they have good incentive to do so. Previous research has shown that the public often shows little awareness about a mega-event's environmentally friendly initiatives (Konstantaki & Wickens, 2010). Additionally, according to Agha, Fairley, and Gibson (2012), local Olympic organising committees have little motivation to think critically about post-Games legacy because their primary responsibility is the production of the Games themselves. Once the Games conclude, the organising committee typically dissolves, unofficially delegating the local community - the group affected most by Olympic legacy - to see the legacy plan through. Because of this lack of incentive, organising groups typically propose broad, but ambitious, legacy plans "with no accountability leading to a slew of broken promises" (p. 126). In light of this potential issue, several recent host cities have created post-Games legacy organisations to actively monitor and deliver on post-event promises (e.g., London Organising Committee of the Olympic Games and Paralympic Games Ltd., 2012).

As noted in previous sections, mega-event organisers may face conflicting priorities after the initial planning stages of an international event. Pressure from governing bodies, local governments, sponsors, the media, activists, and local citizens may force organising committees to reprioritise projects. With the possibility that environmental initiatives could be sacrificed in favour of other projects, Agha et al. (2012) pointed to the IOC's Olympic Games Global Impact (OGCI) study as an encouraging model for making host cities more accountable for legacy planning and monitoring. While still not forcing sanctions on cities with failed legacies, the OGCI study—currently underway in Beijing, Vancouver, and London—may help temper the tendency of bidding cities to make unrealistic promises in their Bid Books. Of course, until groups like the IOC and FIFA no longer incentivise bold (and overambitious) promises in Olympic and World Cup Bid Books, the practice of offering hollow assurances is unlikely to subside.

Stadiums

Competition venues are important aspects of a mega-event's legacy plan, as they mark the culmination of years of planning, negotiation, and labour. Often, the extent to which these facilities are utilised after a mega-event provides an unscientific evaluation of the organisers' legacy plan. Projects like John Pack and Gary Hustwit's (2013) *The Olympic City* showcase what happens to mega-event facilities after the event has ended. Images of abandoned and crumbling stadiums surface biennially, illustrating what can happen when organisers do not have a post-event plan for a facility constructed for specialised use (be it an 80,000-seat athletics stadium, 10,000-seat arena, or 5,000-seat velodrome). As discussed in the previous section, those

entrusted to see an environmental legacy plan through must prepare for shifting priorities before, during, and after a mega-event (Smith, 2015).

On the plus side, Olympic and World Cup stadiums are frequently featured during coverage of the events, and they can serve as physical symbols of a city or nation's pro-environmental agenda (Kellison & Mondello, 2012). Furthermore, planners, architects, and builders can leverage pro-environmental stadiums to showcase their own skills: "…Global construction and development firms are now using the Games as a showcase for their own skills and ways of working 'with' sustainability regulations" (Raco, 2015, p. 129). Given the high visibility of large sport stadiums, a well-executed plan can attract positive attention many years after the conclusion of a major international sporting exhibition.

From an environmental perspective, stadiums built for mega-events are not ideal. They may be used infrequently, and when they are used, they create significant strains on local resources by drawing thousands of individuals to a single site (Kellison, 2015). Recent advances to building systems and sustainable technologies have allowed stadium designers to moderate a facility's environmental impact. Still, when selecting stadium sites and considering tournament logistics, governing bodies and local organising committees may place other priorities (like aesthetics and surrounding neighbourhoods) before the environment (e.g., Bob & Swart, 2009). The potential incompatibility between site selection and sustainable design can be illustrated by several stadiums constructed for the Brazil World Cup, as reported by Dave Zirin (2014):

> There's no question the World Cup will put greater stress on Brazil's critical ecosystem. This can be seen most clearly in the efforts to build a "FIFA-quality stadium" in the middle of the Amazon rainforest. Brazil will be spending $325 million, almost $40 million more than the original estimates, while uprooting acres of the most ecologically delicate region on the planet. The project has been a disaster since the first plant life was destroyed, before the cement was even poured. Building a new stadium doesn't just ignore environmental concerns, it defies logic—the Amazon is already home to a stadium that draws far less than its capacity. And all of this to house a mere four World Cup matches (para. 6).

As further illustration of the way in which competing motives in mega-events can create juxtapositions, Arena da Amazônia, the subject of Zirin's contempt, is LEED Silver certified.

Measurement

Even when a mega-event is well-organised, its sustainability initiatives are intact, and a defined legacy plan is in place, organisers may face difficulties when trying to measure the effectiveness of the event's environmental management initiatives. The initiatives themselves may be complex and difficult to measure. Additionally, because an environmental legacy takes place over a long period of time (i.e., years and decades), most assessments are incomplete (Collins, Jones, & Munday, 2009). In light of the challenges with accurately measuring mega-event legacies, Dickson, Benson, and Blackman (2011) suggested a framework that included both positive and negative outcomes, that could be utilised across multiple events, and was robust to changes made by planners. Pitts and Liao (2013) expanded on the need for a comprehensive list of metrics in their own proposed evaluation framework. First, they identified nine assessment issues, or typical "problems associated with the large-scale development and operation" (p. 726) of mega-events before outlining nine evaluation issues: strategic development goals, master plan and site selection, energy consumption, water conservation, materials and structures, transport, post-Olympic usage, functionality, and environmental impacts. In his proposed analytical framework, Preuss (2013) suggests looking not just at infrastructural markers of sustainability (like those proposed by Pitts and Liao), but other dimensions like knowledge, networks, culture, policy, and emotions.

For their part, both the IOC and FIFA have published their own sustainability reports following recent mega-events (e.g., Stahl, Hochfeld, & Schmied, 2006; TOROC, 2006; VANOC,

2010; Wolter & Schulte, 2011). However, these reports are typically produced within 12 months of the closing of an event, so while they provide important information about waste, consumption, and other environmental impacts occurring during the event itself, they are inadequate evaluations of a host's long-term environmental legacy. Furthermore, based on Agha et al.'s (2012) point that most organising committees suspend operations within two years of the end of an event, it is unlikely that either governing body will produce a comprehensive legacy evaluation 10–20 years after an event, when it perhaps would be most appropriate. Thus, the responsibility remains with the local community, independent researchers, and anyone else with an honest commitment to minimising the environmental impact of mega sporting events.

Conclusion

From the planning phase to the legacy phase, mega-events provide unique sustainability challenges. Based on the sheer scale of environmental impact, in addition to social and political pressures, environmental sustainability has become a point of parity for all mega-events. Much of the attention on the environmental impact of mega-events—particularly from governing bodies like the IOC and FIFA—is relatively recent, although there is a much longer history of sporadic environmental stewardship employed by local organisers. The case studies in this chapter highlight the positive legacy implementation can have for the events as well as sustainability policies that affect the host city/region. On the other hand, despite the earnest intentions of event organisers, pro-environmental legacy planning can be derailed by overstated claims, the reprioritisation of public funds, complications related to stadium design and operation, or inadequate measurement tools. Therefore, in many cases, the environmental goals and claims are aspirational and not always realised without challenges or alterations. Recent

reforms by governing bodies and event organisers have been implemented to address some concerns related to environmental legacy, but given the complexity and long-term nature of effective legacy planning, it remains unclear whether these strategies will lead to any profound change in the degree to which mega sporting events impact the natural environment.

Further Reading

International Olympic Committee: https://www.olympic.org/sustainability

FIFA: http://www.fifa.com/sustainability/

United Nations Environment Programme: http://www.unep.org/sport_env/

Database of major LEED-certified sports facilities: http://www.stadiatrack.org/green

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