

Institution: Cardiff University		
Unit of Assessment: Business and Management Studies (17)		
Title of case study: A new toolkit to improve the environmental impact of major sports and cultural events in the UK and internationally		
Period when the underpinning research was undertaken: 2004 – 2019		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Max Munday	Professor	01/01/1990 – present
Calvin Jones	Professor	02/10/1998 – present
Annette Roberts	Reader	01/10/1994 – present
Nicole Koenig-Lewis	Reader	01/01/2015 – present
Period when the claimed impact occurred: 2016 – 2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact (indicative maximum 100 words) <p>Evaluations of sporting and cultural events historically focused on economic consequences. Interdisciplinary research in economics, geography and environmental planning at Cardiff led to the adoption of an event impact evaluation methodology, which identifies linkages between economic and environmental impacts. The research transformed how policymakers, event organisers and consultants understand and evaluate event environmental impacts. It underpinned the environmental section of the 'eventIMPACTS' toolkit from UK Sport (the UK's high-performance sports agency), the widespread adoption of which led to the staging of more sustainable events in five continents. It also influenced the development and scope of the first International Sustainability Standard for Golf Tournaments, which certified major tournaments in the US, Italy, and China.</p>		
2. Underpinning research (indicative maximum 500 words) <p>Business cases for hosting major sporting and cultural events, which often rely upon public funding, traditionally focused on economic consequences but neglected to consider that such events can also have adverse environmental impacts. An interdisciplinary team from Cardiff's Schools of Business (specifically the Welsh Economy Research Unit) and Geography and Planning analysed the environmental consequences of tourism consumption at major events. The research team's interdisciplinary focus allowed the integration of economic approaches in analysing event-related consumption spending with methods used in geography and environmental planning to assess the environmental consequences of this spending.</p> <p>This highlighted the importance of assessing linkages between the economic and environmental consequences of event development and resulting visitor impact in event business management and planning. This work was supported through funding from ESRC and AHRC programmes, including the ESRC Centre for Business Relationships, Accountability and Sustainability and Society, and significant funding from the Environment for Growth (E4G) consortium of public sources in Wales [3.1, G3.1, G3.2].</p>		
2.1 Combining environmental and economic assessments to evaluate sporting events <p>There has historically been a shortage of assessment tools (and benchmark evidence) to evaluate the environmental impact of events. In response, the Cardiff research team integrated methods from economics with methods from geography and planning to assess both the environmental and economic impacts of events [3.1, 3.2, 3.3, 3.4]. One of the two existing methodologies assessed was ENVIO (Environmental extended Input Output Analysis), traditionally used for examining the economic consequences of events, but more recently expanded to take account of environmental effects linked to event consumption. Research team members from the Business School contributed their expertise in using input-output tables as part of ENVIO, as a different means of exploring the environmental</p>		

consequences of events. The second methodology assessed was EF (Ecological Footprint), used to assess resource use and measure its global environmental impact.

In 2004, the Cardiff team was the first to use both methodologies in combination to evaluate a major sporting event (FA Cup Final at Cardiff's Millennium Stadium) [3.2]. They further examined the appropriateness of applying ENVIO and EF to other major sporting events (e.g. Tour de France Grande Départ in London, 2007) [3.3]. This demonstrated that both methods could be used in combination and employed similar data sets which could also inform an economic assessment [3.4]. This research:

- showed that direct and indirect environmental emissions could be estimated through the assessment of tourism spending linked to events [3.1, 3.2];
- identified the types of visitor spending which generated the most significant environmental impacts, particularly the significance of event-related travel and food and drink consumption [3.1, 3.2, 3.3, 3.4];
- highlighted how changes to travel behaviour (e.g. reducing air and car travel) could significantly reduce the environmental impacts of events [3.3].

The researchers recommended that this combined approach should be used in event impact evaluation as standard as it enables event organisers, policy makers and consultants to consider environmental impacts alongside economic impacts [3.2, 3.4].

2.2 Validating the new method for large scale events

The research team further assessed and compared the economic and environmental impacts of major sporting events, including the FA Cup Final (Cardiff, 2004), a Six Nations rugby fixture (Cardiff, 2006) and the Tour de France Grand Départ (London, 2007), as well as cultural events, such as the Hay Literature Festival (Wales, 2012). The research:

- identified specific resource demands and policy amenable drivers that influence the scale of event environmental impacts. This includes visitor numbers, spending/consumption patterns, travel distance and mode, length of stay and event duration [3.4];
- found that visitor profiles and spending patterns differed across events, resulting in varying economic and environmental impacts and a different composition of impacts [3.4, 3.5];
- noted that tourism spending in a regional economy, including from visitors to sporting and cultural events, can impact on the carbon footprint and waste [3.6];
- highlighted the need for future *ex ante* studies predicting event impacts to recognise the impact that different visitor types can have on spending/consumption patterns and resulting environmental consequences [3.4, 3.5].

Overall, this body of research identified how event evaluations can be extended to effectively assess the environmental, as well as economic, impacts of major sporting and cultural events.

3. References to the research (indicative maximum of six references)

[3.1] Jones C., Munday, M., and Roberts, A. (2009-12 & 2012-14), Cadw, Visit Wales, Countryside Council for Wales & Capital Regional Tourism. *Monitoring and evaluation framework for Environment for Growth (ERDF) projects*. Project reports for E4G Management Groups see <http://e4g.org.uk/evaluation-reports/>

[3.2] Collins, A., Flynn, A., Munday, M., and Roberts, A. (2007) Assessing the environmental consequences of major sporting events: The 2003-04 FA Cup Final, *Urban Studies*, 44, 457-476. DOI: 10.1080/00420980601131878 *Also included in an *Urban Studies* 2017 Special Issue on 'Urban debates for climate change after the Kyoto Protocol' due to its contribution to urban studies scholarship.

[3.3] Collins, A., **Munday, M.**, and **Roberts, A.** (2012) Environmental consequences of tourism consumption at major events: An analysis of the UK stages of the 2007 Tour de France. *Journal of Travel Research*, 51 (5), 577-590. DOI: 10.1177/0047287511434113

[3.4] Collins, A., **Jones, C.**, and **Munday, M.** (2009) Assessing the environmental impacts of mega sporting events: Two options? *Tourism Management*, 30 (6), 828-837. DOI: 10.1016/j.tourman.2008.12.006

[3.5] Collins, A., and **Roberts, A.** (2017) 'Assessing the environmental impact of economic activity surrounding major sport events', in, B. P. McCullough and T. B. Kellison (eds) *Routledge Handbook of Sport and the Environment*, Oxford: Routledge, 207-219. DOI:10.4324/9781315619514-15

[3.6] **Jones, C.**, and **Munday, M.** (2007) Exploring the environmental consequences of tourism: A satellite account approach, *Journal of Travel Research*, 46 (2) 164-172. DOI: 10.1177/0047287507299592

Selected grants:

[G3.1] Munday, M., Bryan, P., Jones, C., Roche, N. *Strategic Environment for Growth (E4G)*. Capital Regional Tourism, Visit Wales, Cadw, and Countryside Council for Wales. 01/11/09-30/04/12 £63,305

[G3.2] Jones, C., Munday, M., Roche, B. *Monitoring and Evaluation Framework of four Welsh Government strategic E4G projects*. Visit Wales, 14/08/12-31/07/15, £43,100

4. Details of the impact (indicative maximum 750 words)

Cardiff research identified how methodologies (drawn from economics, geography and environmental planning) could be combined to assess the environmental impacts of major events. Adoption of this approach nationally and internationally changed how policymakers, event organisers and consultants understand and evaluate the adverse environmental impacts of their events. This transformed impact evaluations of events, and informed planning, policies and actions through:

- i) forming the environmental section of UK Sport's 'eventsIMPACTS' toolkit. Since 2017, the widespread adoption of this toolkit has resulted in the staging of more sustainable events in the UK and across five continents;
- ii) establishing international best practice standards for evaluating event environmental impacts, through the Golf Environment Organisation Foundation.

4.1 Transforming event impact evaluations

UK Sport (the government agency responsible for investing in Olympic and Paralympic sports in the UK) first developed the eventIMPACTS toolkit in 2008 to standardise event impact methodologies. The toolkit is run on a collaborative basis between UK Sport and partners including: Department of Culture, Media and Sport; Discover Northern Ireland; Event Scotland; and Welsh Government.

A lack of understanding of and appropriate tools for evaluation in this version of the toolkit meant that event organisers were giving limited attention to the wider impacts of events. When updating the toolkit, the agency, "*wanted the event sector to go beyond economic impacts when setting objectives for their events and calculating their impacts*" **[5.1]**.

The Cardiff research team was invited to revise the environmental section of the toolkit. Crickmore stated that "*partners specifically wanted to work with Dr. Andrea Collins and Prof. Max Munday at Cardiff University when revising the environmental section of eventIMPACTS due to their research expertise in evaluating events and their environmental impacts*" **[5.1]**. The Cardiff team's redevelopment of the environment section of the toolkit and associated resources, based on **[3.2, 3.3, 3.4, 3.5]** included:

- the case for measuring the environmental impact of events;
- guidance on which environmental impacts should be considered;

- specific cases studies (based on their own research) demonstrating methodological approaches and measurement tools [5.1, 5.2].

The eventIMPACTS toolkit is now used extensively by UK Sport to enhance understanding of event environmental impacts and transform event impact evaluations. Crickmore stated that UK Sport *“specifically uses the toolkit when making financial decisions on which events to support”*, and signposts organisations to the environmental section of eventIMPACTS *“to determine how they might undertake their own research and a broader evaluation of environmental impacts”* [5.1].

4.2 Staging more sustainable sporting and cultural events

Around 3,000 individuals and organisations in the UK and across five continents have registered to use the transformed toolkit. In 2017, Munday and Collins collaborated with UK Sport to undertake a survey of registered toolkit users. The 50 responses showed that eventIMPACTS had been used to assess the economic and environmental impacts of sporting and cultural events by a wide range of organisations (including businesses, not-for-profits, consultants, event organisers and governments) across 13 countries worldwide (England, Wales, Scotland, Northern Ireland, the Netherlands, Spain, Denmark, Serbia, Cyprus, Singapore, Australia, South Africa and Columbia) [5.3].

The toolkit informed planning decisions, policies and actions, and led to the staging of more sustainable events, as reported by users in the survey [5.3]. The survey identified two main benefits of the toolkit. Firstly, it found that 47% of organisations strongly agreed it had enhanced their understanding of event environmental impacts and their evaluation; and 31% of organisations strongly agreed it had advanced their thinking about how to reduce these impacts. For example, John Coxeter-Smith (CEO of Sagacity Management Consultancy Services) stated that eventIMPACTS has been an *“invaluable”* resource for the Panamanian Government and Panama City Government: *“We are confident, that it has at least opened Government ‘minds’ and hopefully enhanced...[their] understanding of the wider environmental impacts of the [2022 Central American and Caribbean] Games and beyond the Games, methodologies for assessing impacts and indicators they might use”* [5.4]. The Games will involve 6,000 athletes from 37 nations.

Secondly, the survey found that 22 organisations responding to the survey had directly used resources from the environmental section of eventIMPACTS to inform event planning and operation decisions; and 27% had reduced the negative environmental impact of their events as a result of using the toolkit. For example, Clare Hartley (Director of ARC Events Consultancy) stated that the UK’s National School Games *“found the case studies and guidance on measuring [environmental] impact invaluable, specifically on food and drink and reducing waste”*; *“reduced single use plastic water bottles by more than 50%, from 55,000 in 2017 to 20,000 in 2018”*; and significantly changed its branding policy; *“Previously we spent about £120,000 on branding, last year we spent £50,000 as we reuse so much more. We have been able to reduce costs, but also reduce waste”* [5.5].

The research also changed the event planning decisions and CO₂e (carbon dioxide equivalent) emissions of two major annual national events in Wales. Between 2017 and 2019, the research team collaborated with Run4Wales, organisers of the Cardiff Half Marathon (20,000 participants and 65,000 spectators) and the National Eisteddfod (45,000 visitors), to apply the measurement tools and guidance from the environmental section of eventIMPACTS. Surveys conducted at both events in 2017 provided new information on visitor profiles, their travel behaviour and its associated environmental impact, and factors influencing travel choices. In 2018, organisers of both events used this research to inform event planning decisions and encourage more sustainable travel choices [5.6, 5.8].

A joint report by the research team and Run4Wales showed resulting changes to travel patterns and a 49% reduction in CO₂e travel-related emissions at the Cardiff Half Marathon [5.7]. An 18% reduction in CO₂e travel-related emissions was achieved at the National Eisteddfod [5.8]. Matt Newman (CEO of Run4Wales) stated that the research *“greatly enhanced our understanding of runners’ spending activities and their environmental impact”*; enabled them to be *“better equipped to minimise the environmental impact of our race”*.

catalogue"; *"make real progress towards staging a more sustainable race"*; and directly informed the scope of their first Environmental Policy and Green Action Plan [5.6].

4.3 Environmental event impact evaluations for international golf tournaments

In 2016, Cardiff research influenced the development and scope of the first International Sustainability Standard for Golf Tournaments via the Golf Environment Organisation Foundation (GEO) Expert Group. GEO is a not-for-profit that supports the international golf community to embrace sustainability. Collins represented the Cardiff team on the group developing the Standard [5.9], sharing the team's research findings on event environment impact evaluation. She was the sole academic member of the group. She shared the expertise developed by the whole Cardiff research team in event environmental impact evaluations. Jonathan Smith, CEO of GEO, stated: *"your expertise and knowledge...was invaluable in developing the criteria, scope and guidance"* for the Standard. [5.10]. The research informed the scope of the new Standard and was incorporated as mandatory criteria for achieving GEO® Tournament Certification [5.9, 5.10].

Smith stated that the Standard *"changed how GEO, the golf industry and tournament organisers consider the environmental impacts of golf tournaments, specifically in relation to the scope of a tournament's carbon footprint, spectator travel...and sustainable food and drink"* [5.10]. The Standard's credibility also led to the following direct strategic impacts [5.10]:

- accelerated sustainability commitments in golf and through golf;
- raised awareness of the importance and need to address environmental and social sustainability at professional and amateur golf events;
- raised expectations within the industry to meet the Standard;
- elevated other tournaments to be more comprehensive by broadening their scope and deepening the delivery.

Since the launch of the Tournament Standard in 2017, Smith noted: *"six major golf tournaments have achieved GEO® certification including RBC Heritage (US, 2017); Waste Management Phoenix Open (US, 2017, 2018 and 2019) (the world's largest golf tournament with 720,000 spectators); the US Kids Venice Open (Italy, 2018 and 2019); Dow Great Lakes Bay Invitational (US, 2019) (with 35,000 spectators) and the AT&T Pebble Beach Pro-Am (US, 2019) (with 150,000 spectators) and...The Foshian Open (China, 2019) - the first tournament in the Asia Pacific"* [5.10].

The CJ Cup (South Korea) and AT&T Byron Nelson (US) have committed to working towards certification, and twelve tournaments (in US, Europe, Asia and South Africa) are using the Standard as a guide to implement sustainability [5.10]. The Standard is also directly informing the International Olympic Committee for Olympic Sports [5.10].

5. Sources to corroborate the impact (indicative maximum of 10 references)

[5.1] Testimonial from Lucy Crickmore, Major Event Consultant at UK Sport

[5.2] UK Sport eventIMPACTS Toolkit: Environmental section

[5.3] Collins, A. and M. Munday (2018) eventIMPACTS.com: User Engagement and Impact (Summary Report)

[5.4] Testimonial from John Coxeter-Smith, Director of Sagacity Management Consultancy

[5.5] Testimonial from Clare Hartley, Director of ARC Events Consultancy

[5.6] Run4Wales: Testimonial from Matt Newman, CEO; Environmental Policy (2019)

[5.7] Collins, Munday and Run4Wales (2019) The Race for Sustainability (Report)

[5.8] Cardiff University research presentation to National Eisteddfod organisers

[5.9] Golf Environment Organisation Foundation (2017, First Edition) Sustainable Golf Tournament Voluntary Sustainability Standard

[5.10] Testimonial from Jonathan Smith, CEO, Golf Environment Organisation Foundation