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This paper proposes a monitoring framework to be used during the planning stage for a sports mega-event. The research identifies a lack of monitoring and evaluation studies during the development stage for sports mega-events. Importantly, it notes the absence of research which evaluates an event systematically from the outset of the process and from the perspectives of host residents and event planners. The framework was developed on the basis of the philosophical approach of pragmatism; it focused on a sustainable development perspective, and it was applied to a case study of the Kaohsiung 2009 World Games. A survey of the views of 606 host residents about the potential impacts of the event revealed that the respondents tended to show higher levels of agreement on the host benefits. The results of 38 interviews with various stakeholders indicated big gaps in both the city's long-term development aspirations and the Games themselves and also in the event strategies adopted. Using this information, key sustainability issues can be identified and monitored during the event planning stage so that the desirable outcomes of events can be enhanced and then sustained in the longer term.

Keywords: World Games; sports mega-events; sustainable development; triple bottom line

Introduction

From an assessment of mega-event studies this paper identifies the lack of a comprehensive review process during the event development stage, and it suggests a new approach to this review process. This novel approach involves the application of an assessment framework to review the development processes prior to the mega-event. The approach can inform decisions about the planning, development and promotion of the mega-event, before, during and after the event.

It has become commonplace for governments and event organisers to pursue events in order to develop or regenerate their cities, regions or even countries. Essentially, events, such as sports mega-events, can bring substantial positive and negative impacts to host areas. However, as a consequence of the proliferation of these events, there is an increasing need to justify whether such a strategy is desirable or beneficial. Yet research investigating event impacts has frequently been restricted to just the economic dimension (Masterman, 2004; Sherwood, Jago, & Deery, 2005), with limited attention being paid to the social

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and environmental dimensions. Fredline (2006) notes how research on the "sustainable management" of events in a region or area increasingly uses the idea of the "triple bottom line". This concept was developed by John Elkington in the 1980s, when it was treated as a way in which organisations can either create or destroy value in the economic, social and environmental spheres (Elkington, 1999a). It was later broadened into triple bottom line reporting, or sustainability reporting (Sherwood et al., 2005), and linked to assessments of sustainable development (Elkington, 1999b). Chernushenko, van der Kamp and Stubbs (2001) maintain that organisations adopting triple bottom line strategies can benefit through the mutual reinforcement of meeting business, social and environmental goals. These strategies require analysis of broad issues across the economic, social and environmental dimensions.

It has also been recognised for a long time that there is a need for more systematic event planning if mega-events are to achieve their various aims (Bramwell, 1997b). Several commentators now recognise the need for "a more systematic approach to events tourism planning" (Getz, 1989). That this need is still very real can be seen from the recent work by Whitson and Horne (2006). They conclude that since the late 1970s a major feature of the analysis of sports mega-events is a gap between optimistic forecasts of benefits and a serious underestimation of real costs. The literature has many examples of financial underestimation, and there is a growing interest in the opportunity costs, particularly for the residents of the host cities. This includes the experiences of Sheffield as host to the World Student Games (1991) (Bramwell, 1997a, 1997b) and of the Vancouver World Fair (1986). A contrary view is expressed by Preuss (2004), who puts a more positive spin on the Olympics in terms of urban regeneration, economic development and wider social benefits. However, ongoing concerns have led event organisers to give more consideration to a broader range of economic, social and environmental issues. This is illustrated by a recent initiative to develop a toolkit for sustainable sport and event development led by the International Academy of Sports Science and Technology (AISTS) and the Vancouver Organising Committee for the 2010 Olympic and Paralympic Winter Games:

> The toolkit aims to be a practical "how to guide" for organisers of domestic and international sports events as well as National Federations, International Federations and National Olympic Committees interested in making their sport and events more sustainable (i.e. low environmental footprint, ethical, inclusive and economically smart). (International Academy of Sports Science and Technology, 2007)

It is in this context that the present research was undertaken, focused on the city of Kaohsiung in Taiwan and its hosting of the World Games in 2009. A framework (Figure 1) was developed in order to facilitate a more strategic approach to sustainable development and the regeneration of Kaohsiung City through the Games. The intention was for the framework to assist in the planning process prior to this sport mega-event and other events elsewhere.

The framework was developed from the literature which evaluates previous mega-events (e.g. Berntsen, 1994; Bramwell, 1997a, 1997b, 1998; Cashman, 2006, p. 204; De Groote, 2005; Essex & Chalkley, 1998; Greenpeace, 1995; London Organising Committee of the Olympic and Paralympic Games & Olympic Delivery Authority [LOCOG & ODA], 2007a; Preuss, 2004; Roche, 1994; Roper, 2006; Spilling, 1998; Vigor, Mean, & Tims, 2004). However, these studies generally examine specific processes found in case studies, and thus they tend to produce rather fragmentary results and generally lack a more holistic approach. For example, most studies of Sheffield's World Student Games examine its financial performance, with only one (Bramwell, 1997b) discussing its broader economic, social and environmental dimensions from a sustainable development perspective. Many
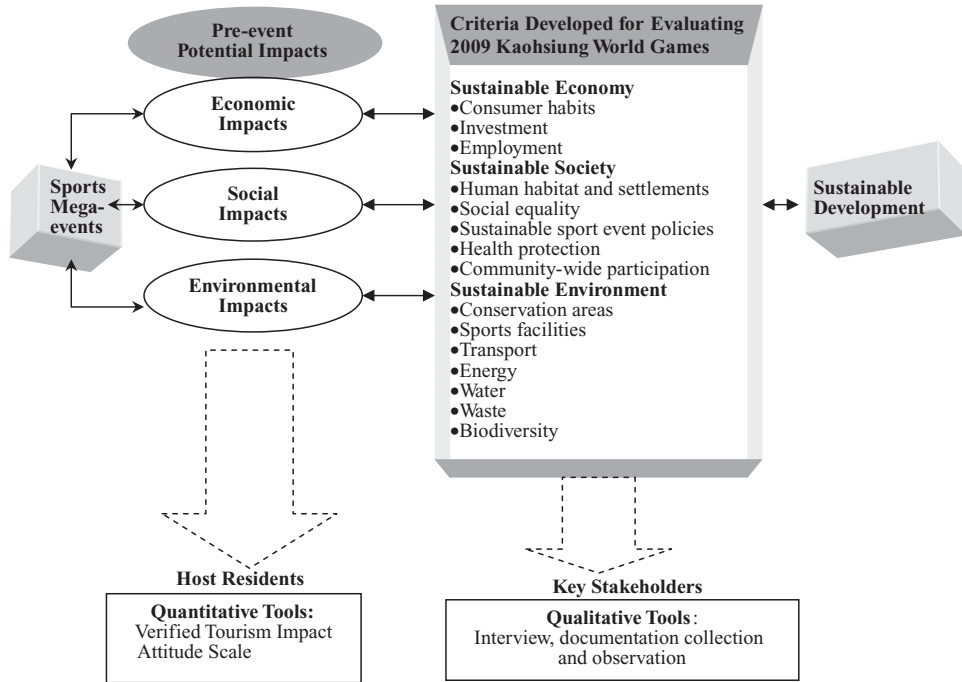
Figure 1. Framework for monitoring during the planning stage for the 2009 Kaohsiung World Games.

researchers examining Lillehammer 1994 and Sydney 2000 have focused on the positive and negative impacts of the events on the host destinations as well as on their long-term effects (Preuss, 2004; Spilling, 1998). In relation to London 2012, more consideration has been given to how a "green games" can be achieved, presumably influenced by the sustainability concept outlined in the bidding proposal (Roper, 2006; Vigor et al., 2004).

Thus, the existing literature provides insights into the processes and impacts of sports mega-events, but there is a lack of systematic research from the perspective of the triple bottom line. Furthermore, there is an absence of research using a framework that considers sustainability issues prior to the event. The approach normally adopted in research on mega-events generates reports of temporary phenomenon, and thus mostly we are informed only about fragments of the overall economic, social or environmental impacts. To address these deficiencies the study's framework was developed to review systematically the sustainability of mega-events. A key objective of the design of the framework is to produce a model that is sufficiently robust to be used at the planning and development stages as well as for post-event evaluation. The authors consider that this is essential and that an ongoing appraisal is necessary to assess the sustainability and stated benefits of a mega-event. Thus, the framework was developed from an in-depth review of the literature on mega-event evaluations, and it focuses on the triple bottom line approach.

The uniqueness of this framework is its aim to facilitate monitoring and evaluation prior to event inception so that the event strategy can be responsive to need and may evolve during the planning stages. This contrasts with Sheffield's approach to the World Student Games, where a more strategic approach to the Games investment evolved respectively through pragmatic learning and trial and error (Bramwell, 1997b). The framework developed here is based on the triple bottom line, and it provides a more structured approach to the

identification of issues. This will allow for the modification of policy and practice in the run-up to an event, thus increasing the likelihood of positive contributions to sustainable development.

The framework (Figure 1) uses the triple bottom line to help identify potential pre-event impacts and to establish criteria to assess those impacts. These criteria help establish the sustainability of the event. The left-hand side of the framework identifies the pre-event impacts, and the right-hand side focuses on the criteria to assess those impacts. The next stage was to develop a set of methodologies that allow these impacts and specific criteria for the impacts to be evaluated at the post-planning but pre-event stage.

For the right-hand side of the framework, the criteria to evaluate the Kaohsiung 2009 World Games were derived in part from the literature review and assessed through scoping studies. A qualitative approach to documentation analysis for the Kaohsiung 2009 World Games was also used to identify the stated objectives for the event, and these were then developed into the specific criteria to evaluate the event. This was supplemented by observation of what was actually in place on the ground in the city. In turn these criteria were used to identify the questions used in the interview process with key stakeholders. The data were then analysed against these specific criteria in order to decide whether or not the World Games were on a sustainable path.

The left-hand side of the framework applied a different approach to assess the views of the host residents in Kaohsiung about the sustainability of the event. This considered whether the event was likely to be sustainable during the event and after it. Because of the complexity of the issues and the need to reflect the views and experiences of a large and diverse population it was decided to adopt a quantitative approach here. One advantage of this was that it created a quantitative benchmark with which to compare the qualitative results from the other side of the framework. This part of the framework raises the interesting question as to how one can measure the views of residents about the event when they have not yet experienced it.

In order to explain the link between the attitudes of host residents and potential event impacts, an approach known as the Nicosia model was adopted. This model uses a flow diagram to understand the consumer decision process in the context where "no prior consumer knowledge or experience with the product exists" (Vignali, Gomez, Vignali, & Vranesevic, 2001, p. 463). This is relevant because the host residents in Kaohsiung had never previously experienced a sports mega-event like the World Games, with the Games being the first international multi-sport event to take place in Kaohsiung or Taiwan. The salient features of the model begin with the flow of a message from a company, which includes the organisational attributes of the company and the interaction among these attributes, with this leading to the "internalisation" of the message by a consumer. Perception of the message is determined by the attributes of both the company and the consumer (Gilligan & Wilson, 2003). At this stage, internalisation is used to signify the physical perception of the stimulus attributes, the environmental attributes prevailing at the moment of perception and the cognitive structures that give meaning to the stimulus and its components (Nicosia, 1968, p. 33). This process may lead to the development of an attitude towards the product. The next stage consists of a search procedure. The consumer then searches for information that is compared with their experiences of the product or the commentary from other external sources such as newspapers. Thus a feedback loop operates on the consumer's perception of the product. Specifically, in this case study actions based on these criteria represent the organisational attributes (i.e. the attributes of the Kaohsiung Organising Committee [KOC] and the Kaohsiung City Government). The interactions between these attributes generate a message (i.e. the preparatory work) to the consumer (i.e. host residents). The perception of

this message is determined by the organisational attributes at this stage. However, it should be noted that the host residents are exposed to the message and further form "their own attributes". In this process the internalisation of the message takes place, which includes the perception of the economic, social and environmental impacts (event attributes) generated by preparatory work and commentary from local news sources. Consequently, the results may lead to the formation of an attitude towards the World Games in this case.

This research was conducted two years prior to the Kaohsiung 2009 World Games event. The framework was used to structure the research, in particular guiding the interview questions and sampling frame. This enabled the authors to evaluate the framework during the event development stage (and it is also intended to use the framework to carry out a post-event evaluation). The views of host residents were sought about the possible negative impacts of the Games, so that these could be better understood before the event. The exploration of the views of residents and other key stakeholders helped develop a better understanding of how the planning process for the Games impacted on the city and how these impacts could be managed. The time period for the primary research on the Games covered the bidding and decision-making processes in 2003, the establishment of the KOC and related policies in 2005 and the main data collection period in 2007. Understanding the planning process for the Kaohsiung 2009 World Games during its early stages provided the opportunity for event managers and policymakers to review the processes and to continue their evaluation after the Games.

Impact studies of events, especially sports mega-events, have recently focused on sustainability and their social, economic and environmental dimensions. Use of indicators is increasingly being encouraged in assessments of events, as seen in the Olympic Games Global Impact project. But to create comparable benchmarks is relatively difficult because of the differing character of each host area and the importance of meeting specific localised needs. Yet for an event to be sustainable, it should be evaluated "from the outset in relation to the concept of sustainable development, with key indicators of sustainability being identified and then monitored over a long period" (Bramwell, 1997a, p. 18). The current study addresses this objective through its framework and the application of the framework to the 2009 Kaohsiung World Games.

Methodology

This research used a mixed methods approach. The qualitative elements involved semi-structured interviews, documentation analysis and observation. Desk research was used to identify the initial stakeholders for the interviews, but other stakeholders were identified through "snowball sampling". Purposive sampling was used to select a sample of 38 respondents (Patton, 2002). They were drawn from the Kaohsiung City Government and the KOC members who were involved in planning the Games, non-government associations and host community leaders (see Table 1). Data were collected from January 2007 through to March 2007. Twenty-six interviews were conducted face-to-face and four by telephone, and two participants gave email responses. Telephone interviews with host community leaders were undertaken during August 2007, and these particularly focused on community participation. Around these interviews the opportunity was taken to collect document evidence on the 2009 Kaohsiung World Games and the 2001 Akita World Games, including official documents, minutes of meetings, proposals, progress reports, formal studies and articles in local and national newspapers. In addition, the official website (Official Publications Echo Network, or OPEN) provided abundant observations from those who received governmental funds for related projects. Daily news sources were also searched

Table 1.   Details of final respondents and organisations.

Types of participants	Sources of respondents	Method
KOC and Kaohsiung City Government ($N = 17$)	Members of Kaohsiung City Government and KOC	In person
Non-government organisations ($N = 4$)	Kaohsiung commercial and sporting associations	In person and through telephone
Individuals ($N = 9$)	Senior business, university and community members speaking in an individual capacity	In person and through email
Host communities ($N = 8$)	Local community leaders	Through telephone and email

with respect to commentary on the progress of the World Games. Observational evidence was also obtained through direct research. Although this was not the principal technique for collecting information, it did provide additional evidence about the issues and activities for triangulation against other data sources.

With respect to the quantitative approaches employed, purposive sampling was also selected for the survey, since an accurate sampling frame was unavailable. This was largely due to the ambiguous boundaries between host and non-host zones. Data were collected from host communities near four competition venues (i.e. the main stadium, the Kaohsiung Dome, the Lotus Lake and the Love River) in Kaohsiung City. Citizens residing close to the chosen survey sites were selected to receive questionnaires because they were more exposed to the impacts prior to the Games, such as the construction work and the hosting of pre-events, and the competitions during the Games themselves. In total, 700 face-to-face questionnaire surveys were undertaken in early 2007, with 606 useable questionnaires. In order to minimise sampling error and reduce any potential bias to an acceptable level, various influential factors were carefully considered to determine the sampling frame. These included timing (e.g. weekdays vs. weekends, office hours vs. non-office hours), exact locations (e.g. precise streets and blocks), weather and residential proximity (e.g. tourism zone vs. non-tourism zone).

The interview questions were posed principally on the basis of the criteria identified by various authors as relevant to the sustainable development of sports mega-events (see Table 2). They ensured that a holistic approach was adopted to explore diverse sustainability issues with specific respect to economy (changing consumer habits, attracting investment and the employment objective), society (human habitat and settlement, combating social exclusion, integrating the concept of sustainable development into sports event policies, health protection and community-wide participation) and environment (protection of natural resources and cultural heritage, sports facilities, transport, energy, water management, management of hazardous products, waste and pollution and maintenance of biodiversity). Two forms of generic and specific questions were designed for the interviews to ensure that views were gathered on issues from both a strategic and a local perspective.

The qualitative data were analysed using content analysis and thematic analysis. The content analysis was based on Ezzy (2002), and predefined categories that were identified from the framework were used. In contrast, for the thematic analysis the categories into which themes were identified were not predetermined before the data were coded. The coding procedures were adapted from techniques suggested by Strauss and Corbin (1990). The first stage of "open coding" (Ezzy, 2002, p. 88) involved a thorough examination of the data and manual categorisation of important themes. They were then checked and compared

Table 2. Specific criteria for sustainable development in sports mega-events.

Sustainability criteria	Description
Economic issues	
Changing consumer habits	(1) Green labels
	(2) Green purchases
Investment	(1) Sports and recreational park
	(2) Main stadium
	(3) Diversification of the economy into tourism and service sector activities
Employment objective	(1) Local employment
	(2) Numbers of full-time and part-time jobs
Social issues	
Human habitat and settlements	(1) Living accommodation
	(2) Sports infrastructure and social needs
Combating social exclusion	(1) Event projects developed to assist those who are excluded (for reasons of economic resources, sex, race or social group)
	(2) The priority development of sports infrastructure in socially and economically marginalised areas
Sustainable sport event policies	(1) To integrate the concept of sustainable development into the policies, the rules and the management system
Health protection	(1) To combat drug abuse among young people
Community-wide participation	(1) Empowerment in decision-making
	(2) Consult with local community
	(3) To involve communities in event planning and volunteering
Environmental issues	
Protection of natural resources and cultural heritage	(1) To protect conservation areas, cultural heritage and natural resources
	(2) To minimise the environmental impact of the infrastructure
Sports facilities	(1) To use existing sports facilities
	(2) To design facilities to fit in with the surrounding natural or man-made scenery
Transport	(1) To encourage use of public transport
	(2) To encourage walking or cycling for short distances
Energy	(1) To promote the use of renewable energy sources and energy savings
Water management	(1) Not to jeopardise general water supplies in order to satisfy the needs of a sports activity
	(2) To avoid contaminating underground or surface water
Management of hazardous products, waste and pollution	(1) To take advantage of the organising of major events to remediate contaminated sites
	(2) To build upon successful practices and technologies used in previous events
	(3) To maximise the recycling of the products used
Quality of the biosphere and maintenance of biodiversity	(1) To avoid giving rise to unnecessary or irreversible contamination of air, soil or water
	(2) To avoid jeopardising biodiversity or endangering plant or animal species
	(3) To avoid contributing to deforestation or be prejudicial to land conservation

with the general codes to identify any potential for differentiation or merger. "Axial coding" was then used to integrate the codes on the basis of the axes of the central categories. During this stage, the relationships between codes were checked, and the data were revisited to reorganise the previous codes and where necessary to rename them. Finally, "selective coding" was used to identify the core categories. Validation strategies (Creswell, 2007; Creswell & Miller, 2000) were employed to ensure research trustworthiness, including the following: (1) the use of triangulation, which involved corroborating the evidence from multiple sources, including between the interviews, field notes, observations and documents, in order to elucidate a theme or perspective; (2) checking with participants; and (3) peer debriefing with other key stakeholders and researchers.

The questionnaire used to explore residents' attitudes of the perceived potential impacts of the 2009 Kaohsiung World Games was based on the Verified Tourism Impact Attitude Scale (Lankford & Howard, 1994) and on other sources in the event tourism literature (Getz, 1991, 1997; Hall, 1992; Ritchie, 1984; Shultis et al., 1996; Twynam & Johnston, 2004). A specific question was asked as to whether residents were aware that some "Games" would be hosted in their local area in 2009.

The data from the quantitative analysis were tested for statistical significance using independent-samples t-tests, exploratory factor analysis (construct validity) and reliability analysis (Cronbach alpha coefficient). These were performed to test and refine the Verified Tourism Impact Attitude Scale, resulting in the final 24 items. The Cronbach alpha coefficient on the total scale was 0.887.

Findings

Analysis of the data revealed significant gaps between the stated aspirations of the Games and the emerging reality with regard to their likely sustainability. The framework provided a structured approach to identifying the emerging failures of policy to ensure that the games would be sustainable.

Sustainable economy

Changing consumer habits

Previous researchers have identified how the promotion of "green labels" and the integration of "green procurement systems" into Games planning processes can encourage sustainable consumer habits after the Games, in both the public and private sectors (e.g. the Torino 2006 Winter Olympics). However, this research highlighted how in organising the 2009 World Games the issue of changing consumer habits was not considered from the outset.

Investment

A key justification for hosting this sports mega-event was that public investment in infrastructure and venues, and the associated private investment in hotels and other tourism facilities, would lead to significant increases in the tourist economy. This would occur specifically through attracting tourists to future events using the new facilities, through the improved global image of the host city and through the one-off impact associated directly with the event (for the Kaohsiung 2009 World Games it was predicted that there would be 400,000 person-time visits). Yet this research indicates that local enterprises were not fully involved in the planning processes for the Games or in meetings to develop potential international business opportunities. For example, there was no strategy on how to deal with the shortage of available hotel rooms or discussion with the hotel community about this.

Employment objectives

Contrary to the expectations of local residents, neither the event organisers nor the urban planners made any specific commitments to providing full-time or part-time jobs for host residents. Although it was predicted that 20,000 short- and long-term jobs were likely to be created because of the Games, there were no tangible strategies to ensure the longer-term sustainability of these employment opportunities. Moreover, there were no strategies to ensure that the host population would benefit from these new employment opportunities.

Sustainable society

Human habitat and settlements

The creation of new sports infrastructure is often justified in terms of meeting the social needs of host communities (e.g. the Sheffield 1991 World Student Games and the London 2012 Olympic Games) (Bramwell, 1997a; LOCOG & ODA, 2007b). The main considerations for constructing new facilities for the Games were to meet the requirements of the standards of international federations, to develop transportation and to make suitable land available, rather than to secure future use of the facilities by the host population. There were also issues of social equality and inclusion together with the relocation of some of the host population. In this research the host population identified a failure of communication prior to the Games concerning all these potential impacts on the local population.

Combating social exclusion

It is often claimed that sports mega-events can contribute to social sustainability by including potentially disadvantaged groups in sports participation (Bramwell, 1997a; International Olympic Committee [IOC], 1999). This research indicated that in practice there was little consideration of this aspect by the Games organisers. In particular, there was no explicit consideration in the Games-themed projects to meeting the needs of women, the aboriginal community or the disabled. The selection of competition sites is increasingly recognised as important in creating opportunities for the redevelopment of marginalised areas and thus for combating social exclusion (e.g. the Sheffield 1991 World Student Games and the London 2012 Olympics). However, in practice Kaohsiung Games' strategy again did not specifically consider this issue.

Integrating the concept of sustainable development into sports event policies

It is now recognised that the integration of the concept of sustainable development into event policies is necessary to ensure a more sustainable operation of an event (IOC, 1999). But the actions associated with the Kaohsiung 2009 World Games were not governed by any holistic policy related to the concept of sustainable development. The application of the framework identified this omission and highlighted the Kaohsiung City Sustainable Development Network as a potential platform to bridge the gap between the policymaking and implementation stages.

Health protection

It is often suggested that health issues are closely connected with the sustainable development of a society through the encouragement of residents from the host city to engage in sport activity (Frey, Iraldo, & Melis, 2007; LOCOG & ODA, 2007b). However, the application of the framework found that the Games-related health protection strategy was

not effectively developed during the planning process. In practice the specific focus was on young people and athletics participants. It is also noteworthy that the event and government authorities had no policies or procedures in place in order to track changes in residents' responses after participating in the Games-themed health facilitation activities. This means that there is no possibility of measuring success.

Community-wide participation as a key aspect of social sustainability

The inclusion of "host communities" in the planning process has become regarded as an essential criterion for the success and sustainability of staging a mega-event (Frey et al., 2007; Leonardsen, 2007). The application of the framework to the Kaohsiung Games planning process identified that there was only limited host resident empowerment in decision-making processes or even in the consultation with people affected by Games-related projects. For example, "cultural festivals" can be an effective approach to community-wide involvement, but the Kaohsiung Games made no attempt to include the host community in planning the cultural programmes. As noted in the literature (Masterman, 2004), to represent the host community in the cultural programmes can catalyse a longer-lasting sociocultural legacy. Furthermore, this research suggests that Games-themed community participation projects can be connected with Integrated Community Development Projects. The recruitment of volunteers in hosting major sporting events is itself beneficial for community development. For example, the engagement of volunteers from the host community is beneficial for the long-lasting management of sports facilities. Again, the research found no evidence of a clear strategy for community engagement at the planning stage for the Games.

Sustainable environment

The protection of natural resources and cultural heritage

Sports mega-events can play an active role in protecting natural resources and cultural heritage. However, the reality was that there was no long-term conservation plan for the National Sports Park.

Sports facility

To create a successful legacy, the surrounding built environment should be considered (IOC, 1999). For the Kaohsiung Games, however, there were no robust planning guidelines to protect or enhance the built environment, and little consideration was given to the post-event phase.

Transport

Sports mega-events frequently face transport challenges which can have massive environmental impacts (Chernushenko et al., 2001). The application of the framework (see Table 2) identified that the Kaohsiung Games had no strategies in place to reduce the number of private vehicles entering the event zones during the Games, and there were also no public transport strategies for the period of the Games or after it.

Energy

It is suggested that the achievement of sustainable energy management is important for the organisation of a major sporting event. While it is clear that energy consumption is inevitable, the IOC (1999) highlights key issues associated with reducing energy

consumption, promoting renewable energy and energy savings techniques. This research found that the Kaohsiung Games planners promoted renewable energy and achieved energy savings in two of the newly built sports facilities. Yet the application of such approaches was relatively limited compared with other major sporting events, such as the Sydney 2000 Olympics. This was because the Games were encouraged to use existing facilities, rather than the newly built ones, that had inherent energy inefficiencies. The study found that there was a missed opportunity to look at improving the energy efficiency of the competition facilities and beyond (such as of event contractors and of hotels).

Water management

The achievement of sustainable water management in a sports mega-event is dependent on planning prior to the event and on ongoing monitoring (IOC, 1999). A key element of water management for the Kaohsiung 2009 World Games was refurbishing work on the Lotus Lake. The research identified a lack of monitoring information, and thus no overall evaluation was possible, highlighting the importance of a robust benchmark and ongoing monitoring.

Waste management

Hosting sports mega-events can create a great amount of waste and pollution. It is necessary to take measures to avoid such negative consequences, which otherwise can be detrimental in the long term to the wider host city environment (IOC, 1999). Again, the framework (see Table 2) identified the lack of a robust strategy and monitoring. Consequently, in practice the event contractors just collected rubbish in bulk, and there was little attempt in practice to meet recycling targets.

Biodiversity

Issues regarding the quality of biosphere and maintenance of biodiversity have become important in the staging of a so-called green games (e.g. the Sydney 2000 and London 2012 Olympic Games). The application of the framework showed that the Kaohsiung Games did not have a "Games-related biodiversity action plan" or a "conservation plan". It also lacked venue-based biodiversity plans and environment management plans to ensure conservation objectives were met before, during and after the Games.

Descriptive analysis of quantitative data indicated that the respondents tended to be positive about the potential of the Games to improve the socio-economic outlook for Kaohsiung. It was found that 86% of the respondents knew that some events relating to the World Games would be held in their local areas. More insight into the degree to which the host residents were positively or negatively disposed to the event impacts can be gained from examination of the survey results in Table 3, where items are displayed on the basis of the descending mean scores. The items with higher mean scores (above 4) were related to statements concerning the following: "event support" or more opportunities to host other sporting events will become available; the right decision was made in hosting of the World Games; residents' pride has risen because of the World Games; the "economic and image benefits" will draw national and international attention to the area; the World Games will provide a short-term boost to the economy in this area; and visitors to the World Games will contribute sizeable revenues to the local economy. It is notable that the majority of these respondents either agreed or strongly agreed with the idea of hosting the Games and the economic and city-image benefits it brings. Items with lower mean scores (below 3.5)

Table 3.   Attitudes of the host community to the staging of the 2009 World Games.

Items	Mean	Disagree[a] (%)	No opinion (%)	Agree[a] (%)
(1) Hosting the World Games will give Kaohsiung more opportunities to host other sporting events.	4.13	3	12	85
(2) The World Games will draw national and international attention to this area.	4.10	4	15	81
(3) The city government made the right decision in hosting of the World Games.	4.08	4	16	80
(4) The World Games will provide a short-term boost to the economy in this area.	4.06	4	16	80
(5) City residents' pride has risen because of the World Games.	4.03	5	19	76
(6) Visitors to the World Games will contribute a sizeable revenue to the local economy.	4.02	5	17	78
(7) I would like to see the city government hosting sports mega-events like the World Games.	3.99	4	16	80
(8) Hosting the World Games will make Kaohsiung more of a tourist destination.	3.98	5	18	77
(9) I believe the World Games should be actively supported in the local area.	3.95	5	20	75
(10) Hosting the World Games will enhance the city's beauty.	3.93	7	19	74
(11) Because of the World Games I will have more recreational opportunities.	3.89	7	22	71
(12) The benefits of hosting the World Games will outweigh any of its negative impacts.	3.87	7	20	73
(13) Hosting the World Games will enhance the efforts for preserving heritage tourism resources.	3.86	8	21	71
(14) I support the World Games because of its vital role in our community.	3.81	7	24	69
(15) Hosting the World Games will leave Kaohsiung with a negative image.[b]	3.79	10	21	69
(16) The World Games will increase local people's interest in participating in sports.	3.76	9	28	63
(17) The World Games will provide jobs for local people.	3.76	11	24	65
(18) Overall I believe my standard of living will be increased because of the World Games.	3.67	11	29	60
(19) The city government listens to residents about their concerns with the World Games.	3.59	13	30	57
(20) I felt I could take part in the decision-making process to improve the World Games' development.	3.59	12	39	49
(21) The World Games will increase the crime rate in the local community.[b]	3.39	21	30	49
(22) The World Games will boost this area's long-term economy.	3.13	29	34	37
(23) The World Games have caused a political turmoil in this area.[b]	3.03	30	37	33
(24) The World Games will negatively impact the environment.[b]	2.98	38	26	36

[a]Disagree = response of either strongly disagree or disagree; Agree = response of either agree or strongly agree.
[b]The 5-point Likert scale has been reversed on four negative items (items 15, 21, 23 and 24). Therefore, it explains, for example, that 69% of the respondents tend to agree with statement "Hosting the World Games will *not* leave Kaohsiung with a negative image", while 10% disagree with it.

were associated with "negative impacts" and long-term economic benefits. These were as follows: it will increase the crime rate in the local community; it has caused a political turmoil in this area; it will negatively impact the environment; and it will boost the area's long-term economy. These findings generally reinforce the view that the host residents had a positive view of the potential impact of the Games. However, it is worth repeating the point that at the time when the questionnaires were undertaken the residents' views were very much influenced by the positive spin from the Games authorities about the potential benefits.

Discussion

Application of the framework to evaluating the pre-Games development stage identified key sustainability issues under each heading. Some of these suggested where failures of strategic planning meant that the triple bottom line would not be met before and during the Games event and also over the longer-term post-Games period. The examples discussed above demonstrate how a lack of strategic thinking about sustainability during the planning stage of the Games resulted in a breakdown of the conditions needed to achieve sustainable development. The application of the framework before the Games demonstrated a series of failures in the requirements for sustainable development during the development and building stages, a key example being the lack of an effective waste management strategy. Similar issues were identified as likely during the Games themselves and during the post-Games period. It is argued that this was because of the lack of strategic planning that explicitly focused on sustainable development.

To achieve the triple bottom line for a sustainable economy, it is vital to address employment objectives. This had been proposed as one of the likely long-term economic benefits of the Games, and it was a clear expectation of the host residents. The raised expectation for this came from the high unemployment rate in Kaohsiung City (Ma, Rotherham, Egan, & Ma, 2006). In this context, the authorities must understand that similar to other types of festivals and mega-events, residents were very concerned about how much extra income and how many jobs would be obtained from the visitors and participants (Crompton et al., 1998, in Kim, Gursoy, & Lee, 2006, p. 94). Both the quantitative and qualitative results showed that in terms of a sustainable economy, it is clear that the majority of temporary construction job opportunities were not targeted at host residents. However, the residents expected the anticipated job vacancies to come from the long-term and outsourced projects at several Games-related sports facilities. The hospitality industry could expect the most short-term benefits from staging the Games, and this was expected by the host residents. But again there was no strategy to target the jobs towards the resident population. Research on other sports mega-events suggests that the "investment attraction" (e.g. Barcelona 1992, Atlanta 1996 and Sydney 2000) is important, given that business leverage is increasingly recognised as critical for long-term host city development. This study found that the event planners for the 2009 World Games did not fully embed this into the planning process, and this partly explains the host residents' ambivalent attitudes to the long-term economic benefits. This further suggests that the city planners put little emphasis on long-term economic integrity, with most attention being directed to the Games themselves. In other words, the event investment strategy for the Games as a driving force for the future economy was not effectively developed. If the event planners did not subsequently address these concerns and issues, it would be unlikely that the host residents would approve of further spending of tax money on bidding for future mega-events. A good financial return on the invested resources would rely considerably on inward commercial investment, tourism, new

business (Masterman, 2004), the generation of new jobs, the growth of existing business and a legacy of new or upgraded capital works for the host region (Westerbeek et al., 2005). Importantly, however, the issue of the financial return also plays a crucial role in shaping the host communities' reactions to the hosting of sports mega-events (Kim et al., 2006).

A wide range of issues were identified in terms of the social impacts. The issues reflected the changing attitudes of host communities based on their experience of the development process. This was in turn explained by the interdependent nature of the interactions between sports mega-events and the social context of host areas. The study showed that the host residents actively supported the Games, and it also found that they agreed that more recreational opportunities would be provided in the host areas (71%). Compared with the Sheffield 1991 World Student Games (Bramwell, 1997a) and the London 2012 Olympic Games (LOCOG & ODA, 2007b), there was no full assessment of the precise needs of the host area communities, or consultation with them, during the period of bidding to host the Games. This study shows that local residents tended to agree that hosting the Games would increase their interest in sports participation (63%). However, it was found that the Kaohsiung 2009 event strategy for sports participation focused on helping young people and on the avoidance of related social problems, rather than on helping combat social exclusion and social inequality. Thus the needs of the wider host communities were generally overlooked at this stage. This meant that there was a high probability of long-term failure to meet these wider social objectives through increased sports participation.

A total of 91% of the host residents generally supported the Games, so it was not surprising that they saw the event as important for their communities and as something to be supported enthusiastically. However, the research identified how a number of tensions were beginning to emerge, largely because of the lack of involvement of residents in the decision-making procedures. This research on the development stage for the event found a growing view that the host residents were low on the priorities of the city government. As noted by Frey et al. (2007), the involvement of host communities and the recognition of their views are essential. This is because major events are often able to play a significant part in improving social networks of trust and solving problems in local areas. Unfortunately, throughout the consultation process, the Kaohsiung 2009 Games failed to do this. Host residents still valued the Games as important to their communities, wanted to support the Games and believed that they would result in increased national and international recognition of the host region (81%). There was a naive view that tourism would transform an industrial city into a tourist destination overnight. This in turn was expected to raise and reinforce residents' pride (Frank Hsieh, former Mayor of Kaohsiung City, personal communication, January 14, 2007). These high expectations were unlikely to be met, suggesting that there may be a growing disappointment with the outcomes of the World Games among the host population. In practice, the event planners have focused on the recruitment of volunteers in local communities as the means to enhance citizens' pride and confidence.

With respect to the environmental impacts investigated, the study found that the host residents had a high level of expectation in terms of the enhancement of city beauty. Indeed, the refurbishing works related to existing sports facilities (e.g. the Lotus Lake) and the nearby environs around Zhongshan Road, Formosa Boulevard and Bo-ai World Games Boulevard had already been completed for the Games. This was one of the main reasons for the high level of support among host residents. They also tended to agree that the hosting of the Games would encourage extra efforts to preserve cultural heritage and natural resources. This finding was consistent with a previous study by Kim et al. (2006). The research showed that the preservation of historic buildings and infrastructures with

cultural meaning was embedded into the construction plans. In terms of natural tourism resources, such as the refurbishing works on the Lotus Lake, there was improved water quality and more waterfront leisure space for both local people and tourists. This was similar to the IOC's (1999) and Deccio and Baloglu's (2002) observations relating to sports mega-events or mega-events as facilitators that can catalyse the protection of conservation areas, natural resources and the cultural heritage of the area involved. Thus, host residents' expectations in this regard were likely to be achieved, and this in turn encouraged support for the Games.

However, host residents were concerned about the potential negative impacts which might affect the wider environment. According to host residents, the reason why some of them did not support the Games was because of environmental concerns. It was felt that they would cause "much noise for the host communities" and "impact on daily life, especially traffic". But as Kim et al. (2006) note, traffic congestion is unavoidable. Therefore, event planners and city governments need to react proactively to this challenge. For the Kaohsiung 2009 World Games, transportation needs at the time of the Games had been planned to lessen traffic congestion through public transport systems such as Kaohsiung Mass Rapid Transport and shuttle buses. Distances between hotels and competition venues were also arranged to be within several minutes' walk or half an hour's drive from events. In spite of this, the study suggests that further traffic planning for the main stadium areas would be necessary. If this were not addressed, then it would become an adverse factor that could decrease support for hosting future events. In terms of noise impacts, it was taken for granted that the sources for excessive noise would most likely come from crowds of spectators and participants, increased numbers of vehicles entering the host areas, the events and construction work. This substantial impact seems to be inevitable, as it arises from the atmosphere of "hustle and bustle" in the host area. In this respect, future event planners need to address these issues and include them in event plans at the earliest possible stage. They then need to undertake monitoring work during the event and to assess the consequence afterwards. In this way, the "noise" could possibly become the "joy" of the festival. Although great efforts had been made to maintain the quality of the environment through or within Games-related projects, the host residents tended to show a neutral attitude towards the overall environmental impacts. The analysis indicated that the message of the city's strategy of investing in the Games as a means to promote regional regeneration, together with planning for environmental integrity, had not been fully communicated to residents.

Conclusion

The underlying rationale of this research was to develop a framework and to evaluate it through its application to the case study of the run-up to the 2009 World Games. The framework was proposed for use before, during and after mega-events, and it used the triple bottom line to provide a systematic structure. It identifies key sustainability issues in terms of the economic, social and environmental dimensions. The study also helped provide an understanding of host residents' attitudes to event attributes, with reference here to the theoretical and empirical insights of previous studies. While the approach of triple-bottom-line-based event evaluation is still relatively young, this area of research is important and provides valuable insights into Bramwell's (1997a) perspective on the economic, social and environmental sustainability of events, perhaps echoing a need for further empirical studies (Hede, 2008).

The framework presented here provides a significant contribution to an innovative approach to event management research. Its theoretical combination allows for growing recognition for a triple-bottom-line-based approach and for consumer behaviour theory to be presented in the same framework in order to evaluate the sustainability issues in hosting a mega-event. The adoption of the model has advanced understanding in event research, notably by helping to simplify complex phenomena. This is particularly the case when sustainability issues need to be integrated with the perspectives of key consumers, such as the host residents. This contrasts with previous studies which concentrate on economic issues (e.g. Gratton, Shibli, & Coleman, 2005; Jones, 2001; Masterman, 2004; UK Sport, 1999). Some researchers also highlight the omission of specific indicators for the evaluation of events (Fredline, Raybould, Jago, & Deery, 2004; Sherwood, Jago, & Deery, 2004), and this study contributes to the research by integrating together in one framework a broad range of these indicators.

While this work demonstrates the value of applying the triple bottom line concept to event evaluation, it is necessary for future studies to be aware of other, additional dimensions associated with event impacts on host areas. This is because different types and scales of events may have different levels of impact on the various stakeholders (Hede, 2008). For example, the findings here suggest that in the preparations for the Kaohsiung Games more emphasis was placed on environmental issues than on economic and social development. This was due to a need to transform an industrial city into a tourist destination. The triple bottom line approach is borrowed as a link to studying sustainability issues in event planning, but clearly there is a need for more understanding of how and under what conditions the key dimensions are determined. This is in order to meet both the needs of the event and the interests of key stakeholders. Future research may consider combining the sustainability criteria proposed here with local indicators to make the results more informative.

The research described here was limited to a pre-event survey into the attitudes of host residents. Yet communications, perceptions and visual impacts are probably different before, during and after the mega-event (Gursoy & Kendall, 2006; Kim et al., 2006; Mihalik, 2000). Longitudinal research that tracks definite outcomes during and for some time after the event would add to our understanding of changes in attitudes. The findings of such longitudinal research would be useful in helping future event managers know how their event impacts on host areas and why local people may support, or not support, the event. The results might also be used to avoid mistakes and to improve other events at an early stage, such as during the bidding process.

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