

# **Event greening: is this concept providing a serious platform for sustainability best practice?**

**This thesis uses a proposed rating system to measure the sustainability factor of event greening projects and in so doing remove the ‘green wash’ syndrome associated with the concept.**

Charmaine Tzila Katzel



This thesis presented in partial fulfilment of the requirements for the degree of Masters of Philosophy  
Development Planning Sustainable Development at the University of Stellenbosch.

**Supervisor:** Saliem Fakir

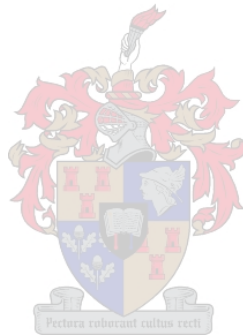
**Co- supervisor:** Laurence Beder

**March 2007**

## Declaration

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature..... Date.....



## Abstract

Large scale events have historically been ignored by those involved in the sustainability debate. However there is growing realization that major events can have significant environmental and socio-economic impacts and opportunities. This has been highlighted by the global growth of a phenomenon which has become known as event greening. The hosting of a major event like the Olympic Games comes with benefits and problems to the host city or region. The question is can the benefits be maximised and the problems minimised? This thesis shows that events can be hosted in a manner that contributes positively to the host city and limits the negative impacts, by incorporating principles of sustainable development with in the event management plan. This is known as event greening. Managing an event in a way that minimizes negative impacts and maximizes positive impacts produces results that are true reflections of success of a major event (GoJ Report, 2003).

Event greening has been evolving since the early 1990's and has arguable reached a point where absolute definition and standardisation is required to ensure its authenticity and integrity into the future. As the practice of event greening programmes occurs more and more so the need for a benchmarking tool to ascertain true measurable all encompassing impacts of events becomes more essential. The use of a Sustainability Rating System was employed as a way of measuring the percentage sustainability an event greening project or programme is actually achieving. This system was developed as a way of determining whether event greening is in fact contributing to sustainable development or is it another attempt at perceived sustainability best practice known as green washing. A selection of event greening projects is measured according to the Sustainability Rating System and the results show event greening is progressively contributing to global sustainable development best practice. This thesis also suggests that event greening is evolving into a sophisticated mechanism for implementing sustainable development best practice through mega- events.

This research is a prelude to developing an assessment tool and a standard for event greening. The use of the Sustainability Rating System in this thesis and the discussed results propose this method as an adequate rudimentary tool which can be used to assess in a broad way the extent of sustainability of an event greening programme. This method and the information in this thesis are intended to be used as a first step in the development of an industry event greening measuring and evaluating standard or tool. It is intended that this thesis will act as a catalyst for further research and development into standards, benchmarking and possibly even certification processes for event greening.

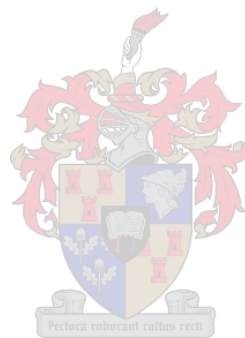
## Opsomming

Grootskaalse gebeure is histories-gesproke geïgnoreer deur mense wat in die volhoubaarheidsdebat betrokke is. Daar is egter toenemende gewaarwording dat belangrike gebeurtenisse betekenisvolle omgewings- en sosio-ekonomiese-impak sou hê, asook geleenthede. Dit is beklemtoon deur globale groei van 'n verskynsel wat bekend geword het as die vergroening van geleenthede. Die aanbod van belangrike geleenthede soos die Olimpiese Spele gaan gepaard met voordele en probleme vir die gasheer-stad of -area. Die vraag is, kan die voordele gemaksimaliseer en die probleme geminimaliseer word? Hierdie tesis wys dat geleenthede aangebied kan word op 'n manier wat 'n positiewe bydrae tot die gasheer-stad kan maak en wat die negatiewe impak beperk deur die insluiting van beginsels van onderhoubare ontwikkeling by die geleentheidsbestuursplan. Dit staan bekend as vergroening van geleenthede. Om 'n geleentheid so te bestuur dat voordele gemaksimaliseer en probleme geminimaliseer word lewer resultate wat 'n ware refleksie is van die sukses van 'n belangrike geleentheid (GoJ Report, 2003).

Die vergroening van geleenthede ontvou reeds vanaf die vroeë 1990's en het moontlik op die punt gekom waar absolute definisie en standaardisering nodig is om in die toekoms geloofwaardigheid en integriteit te verseker. Soos wat die beoefening van vergroening van geleenthede meer en meer voorkom, sal die behoefte aan 'n beginpuntstelsel onontbeerlik word om die ware meetbare impak vas te stel. Die gebruik van 'n Volhoubaarheidsmerieteskaal was gebruik as 'n manier om die persentasie volhoubaarheid te meet wat die vergroeningsprojek of –program in werklikheid behaal. Hierdie sisteem was ontwikkel as 'n manier om vas te stel of vergroening van 'n geleentheid wel bydra tot volhoubare ontwikkeling en of dit net nog 'n poging is tot waarneemde volhoubare beste-praktyk wat bekend staan as groen-spoeling. 'n Seleksie van geleentheidsvergroeningsprojekte is gemeet aan die Volhoubaarheidsmerieteskaal en resultate het bewys dat vergroening van geleenthede toenemend bydra tot globale volhoubare ontwikkelings-beste-praktyke. Hierdie tesis stel ook voor dat vergroening van geleenthede ontvou in 'n gesofistikeerde meganisme vir die implementering van volhoubare ontwikkelings-beste-praktyke deur middel van megageleenthede.

Hierdie navorsing is 'n inleiding tot die ontwikkeling van 'n beginpuntstelsel en 'n standaard vir vergroening van geleenthede. Die gebruik van die Volhoubaarheidsmerieteskaal in hierdie tesis en die bespreekte resultate stel voor dat hierdie metode 'n voldoende elementêre stelsel is wat gebruik kan word om in 'n breë wyse die omvang van volhoubaarheid van die program vir die vergroening van die geleentheid vas te stel. Die metode en inligting in hierdie tesis word bedoel om gebruik te word as 'n eerste stap in die ontwikkeling van 'n industrie-vergroening-van-geleentheid evalueringstandaard of stelsel. Dit is bedoel dat hierdie tesis 'n rol sal speel as katalis

vir verdere navorsing en ontwikkeling van standaarde, 'n beginpunt en moontlik selfs 'n sertifiseringsproses vir vergroening van geleenthede.



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# 1 Chapter One: Introduction

In 2002 the United Nations World Summit on Sustainable Development (WSSD) was staged in Johannesburg South Africa. In the spirit of the philosophies and concepts of sustainable development being discussed and negotiated at the WSSD, the South African government initiated a project called 'Greening the WSSD' (GWSSD). The aim of this project was to plan, organise, manage and implement the WSSD in a manner that reflected environmental and social best practice. I was one of a team of project managers responsible for executing this project. I worked on the project for three consecutive years 2002 to 2004. The first year consisted of strategising and implementation of the initiative during the staging of WSSD. It was an exceedingly experimental time where no definite formula or model was available for guidance on such a concept. Hence the project management team followed an approach based on a mixture of sustainable development theory, government policy and sometimes pure instinct. The second year was a year of reflection and debate regarding the achievements and lessons learned from the GWSSD. It was a time of recording and reporting, providing content and structure to this "thing" that was slowly evolving within the event industry. The third year involved publication of guidelines and academic discourse regarding this growing phenomenon known as event greening.

My work on the GWSSD ignited an academic interest in event greening. The polarity associated with events was intriguing. On the one side a city that hosts a mega event may reap enormous economic benefits; on the other side hosting an event has its social and environmental cost. The big question is; can these seemingly opposite outcomes be meaningfully reconciled? And if they can, could a model or management system be developed that would not only mitigate the negative and maintain the positive results, but would take it a step further and find additional opportunity and value for the hosting community through the event?

My interest and involvement in a range of different event greening projects over the years has provided me with some answers to the posed questions. I would argue that indeed there is a method of mitigating negative impact and optimising opportunity. It is in fact this 'event greening' notion and it is evolving into a sophisticated mechanism of sustainable development best practice blended with event project management.

Event greening is not a new concept, but it is an evolving concept. In 1994 in the Lillehammer Olympic Games event greening was simply about being environmentally friendly in the preparations for the event (Chenushenko, 1994). This thesis will show that since then, there has been a profound development of the event greening concept to include social and economic elements with environmental preservation. Not only has there been an inclusion of the other two pillars of sustainable development, but the quality and sophistication of the event greening project has become revolutionary. Since 1994 many event greening projects have been implemented either as fringe projects or as mainstream event management best practice. The diversity of the



components of these projects is immense. Yet all these projects and efforts are defined as event greening projects and the mega events of their association are publicly disclosing and leveraging on the fact that the event is a 'green' event. Surely an event that only has environmental guidelines cannot be classified the same way as an event that has environmental guidelines, local economic development components and social equity principles? Hence I began researching the details of event greening projects and determined that there is no standard or basic set of requirements that is being used to allow an event to declare itself as a green event. Rhetorically, the definition of event greening exists yet practically evidence suggests that some events are very definitely "greener" than others. In an attempt to resolve this dilemma and in the absence of any standard or verification process specifically for event greening, I propose the Sustainability Rating System for event greening. The hypothesis is the proposition of the Sustainability Rating System as a measuring tool for the extent and effectiveness of sustainability best practice in event greening. This will determine how "green" an event really is or the percentage of "greenness" that event greening projects were in fact able to yield through interventions.

## **1.1 What is event greening**

The convergence of project planning and sustainable development comes together in a mechanism known as event greening. Event greening is a methodology that incorporates sustainable development best practices (of environmental, social and economic concerns), in some instances mainstreamed into the operations and logistics of the event management process. The word responsible or socially conscious events have been used to depict this practice in conjunction with event greening or green events. All these terms are essentially referring to the same concept. In this thesis event greening is the predominantly used term however, green events or sustainable events are used in references and refer to event greening. The term event greening has been criticised internationally as not accurately depicting the true scope of the concept. Greening suggests tree planting or only environmental concerns yet the notions evolution is slowly incorporating components of social and economic concern in a more real fashion. This criticism is acknowledged within this thesis, however the terms event greening and green events are used never the less as this has become the global common term.

Events that have adopted sustainability decision-making into their management strategies can often show direct benefits, this is especially so for large sporting events. Benefits can be through economic and environmental interfaces resulting in saved costs and resources, such as eco-efficiency. Though this may require capital investment the long term returns contribute significantly to cost savings and reduced waste. A decision to adopt principles of sustainability within event decision making can have a profound impact on the community in which the event is being hosted. The community can benefit from the economic savings, reduced stress on municipal infrastructure, environmental health and the often long – term benefits of the facilities. The

awareness-raising of social and environmental issues during an event often results in educated communities and new habits and attitudes amongst the locals. This adds another dimension to the sustainability impact on the society to an often more sustainable and environmental conscious way of life into the future.

In this thesis I shall argue that the industry is in need of a standard or verification system that can authenticate the extent of sustainable development intervention of event greening projects. The Sustainability Rating System proposed in this thesis is aimed to be a catalyst for further research and development. The ultimate goal being that through the further development of this sustainability rating system, an event such as the Olympic Games can determine their percentage sustainability, they can in fact determine how “green” the event is. In this way a benchmark can be set and events can actively strategise initiatives that will improve their event greening performance. The Sustainability Rating System can be used to compare events and measure trends. In the case of reoccurring events, it can act as a feedback mechanism allowing event managers to consistently improve performance by addressing gaps and challenges on an episodic basis.

## **1.2 Context**

Event greening has evolved in the context of the event industry. This industry has grown in the last twenty years, and has become a key aspect of tourism strategise for cities and regions. In South Africa the tourism industry contributes significantly to the GDP. In 2004 this amounted to approximately R100 billion. Tourism is referred to as the “new gold” of the South African economy owing to the foreign direct spend overtaking gold foreign exchange earnings. It is a sector that the government has prioritised as one of five economic growth sectors to facilitate growth and investment (S.A.Tourism, 2004).

Tourism does not only refer to holiday makers or visitors of relatives. Included in the tourism definition is business tourism and sports tourism. Business tourism is visitors (foreign and domestic) coming to a new city or country for business meetings, conferences or special dealings. Sports tourism is visitors for sporting events they include the athletes, their management and spectators. It is with in this aspect of tourism that event greening found definition (S.A. Tourism, 2005).

### **1.2.1 Event Tourism**

Tourism is increasingly being recognized for its contribution in driving economic development in a region. This is not only in terms of foreign currency but spin-off benefits such as job creation and urban planning. South Africa has invested considerably into generating a global position as a

viable tourism destination. In 2002 the tourism growth strategy of South Africa identified MICE<sup>1</sup>, sport and cultural tourism as a key driver for growth of the tourism industry of the country. MICE significantly increase tourism traffic and drive economic development in a region. For the purpose of this thesis three types of events are discussed MICE, sport and cultural events. Event tourism itself is defined as tourism that is concerned with the roles that festivals and special events can play in destination development and the optimisation of an event's magnetism to tourists. In other words, non residents are participating in or attending a predetermined MICE, sport or cultural even (Getz, 1991).

'Event Tourism is a growing niche market in the wider world of tourism', (Rees, 2000:72). Events are seen as additional element to cities or countries marketing mix, alongside natural and man made attractions (Fredline and Faulkner, 2000). States, provinces and cities are investing heavily in infrastructure and marketing strategies that promote event hosting. These events provide substantial tourism or visitor expenditure and media (international) exposure and boost the city or state as a tourism destination. Events play a significant role in tourism and commerce across the world. They can be image-makers, income generators and tourist attractions. This contributes to the local communities and businesses and supports key industries in those regions. The City of Cape Town in South Africa is positioning itself as a world class event destination by 2010; this will deliver substantial economic and social benefits to the citizens through government interventions to stimulate the market. Cape Town is using this marketing approach to flatten the seasonality pattern with regard to tourism influx. The intention is for events to occur during off peak/season times, and in such a way generate uniform tourism revenue for the year and avoid the current feast or fast scenario (Towards a National Event Strategy for SA, 2002).

Events have become an increasingly important component of destination branding. Events can enhance tourism development. They are being used to aggressively market comparative advantages and support destination branding. Cities are starting to understand the potential of using events to draw attention to the host city, this has resulted in a trend toward the establishment of municipal agencies with a mandate to attract and promote events to their city (GoJ Report, 2003).

The event industry has shown a consistent growth since the early 1990's. This can be attributed to a number of factors, including technological advancement and cheap, accessible international transportation systems. Goldblatt suggests that our high tech almost virtual world needs to balance with our inherent humanness through personal interaction, this is happening through live events. Another reason may be the growth in the world economy. International corporate importance coupled with free market systems has resulted in live events being pursued as means of global marketing. In the year 2000 one third of all events involved corporations. Events are being used to seek out new locations and expand into new markets (Goldblatt, 2000). The City of Durban has

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<sup>1</sup> MICE stands for Meetings, Incentives, Conferences and Events and is seen as a specialised area of tourism.

identified sports and cultural events as a key strategy to promoting the city. The Durban Events Corporation has been established to develop and manage an event strategy for the city which includes, stimulating economic development, investment in various events, developing skills in event management and services (Towards a national event strategy for SA, 2002).

### **1.2.2 What does event mean?**

What is really meant by the term 'event'? And how has it become a billion dollar industry? An event is defined by Robert F. Jani as 'that which is different from a normal day of living' (Goldblatt, 2000:3). A planned event has one or more special purposes, and a limited duration. Each event is unique in its management, programme, setting and participants. These components interact in a specific manner to create that specific event. Events shape our lives, births, anniversaries and holidays, public events create a sense of community within a society and may define culture or nationalism (Getz, 2000). Events can be further classified into those that are recurring and those that are once-off. In South Africa regular recurring events are the Comrades Marathon, Tourism Indaba and Rand Easter Show.

A special purpose combined with strategy and project management make up an event as it is defined in this thesis. A project management approach to events has become known as event management. Event management concentrates on planning, organizing, directing and controlling of events. This includes bidding processes, venues or facilities design, construction and maintenance of facilities or venues and implementing the event (GoJ Report, 2003). Events can take on a specific nature, depending on a number of characteristics and the location of staging. This provides each event with uniqueness and as such an exclusive management plan.

Events can be categorised according to a number of characteristics. Table 1 is a summary of characteristics which determine the typography of an event and is valuable to fully understanding the impact of events. In 2001 at an international meeting on events, De Coninck suggested that 9000 international meetings were held globally annually, of which 20% were mega – events, that is to say had over 1000 registered participants. In 2001 the United States of America recorded 11 800 major conventions this translated into approximately 12.5 million participants (Greening the WSSD, 2003). Five years later, we stand at an estimated rate of growth in the event industry of nearly 11% per annum, globally. There is no disputing this is an emerging industry (Events, 2005:09).

The growth of this industry and the sophistication of its management processes and procedures provides the framework for event greening intervention. This means that familiarising with the project management and planning aspect of events allows for sustainable development principles and practice to be injected in a meaningful manner. These interventions can alter the negative aspects associated with events and optimise the positive impacts and opportunities.

Category	Definition	Sub-Category	Definition	Characteristics  (Arcodia and Robb, 2000 p. 160)
Events	Primary activities related to provision of entertainment for commercial gain	Mega-events	Are large and significant and yield extraordinarily high levels of tourism, media coverage, prestige or economic impact for the host community or destination (Getz, 1997,p.6)	High volume of visitors  Extensive media exposure  Economically significant
		Major events	Are less large than a Mega-event, has the potential to impact an entire community and generates global media interest (O'Toole, 1999 p.11)	High volume of visitors  Wide media exposure  Economically significant
		Hallmark events	A special event of limited duration and significant scale, attended by large crowds whose attention is focused on a distinct theme (Nicholls et al, 1992 p34)	High volume of visitors  Strongly themed  Presence of ceremony and ritual
		Signature Events	An event which is linked directly with its location. An event always associated with a particular place (Arcodia and Robb, 2000 p. 157).	Linked to particular location
		Special Events	Infrequently occurring event outside normal program or activities of the organizing body and often celebrate a unique moment in time to satisfy special needs (Arcodia and Robb, 2000).	Once only or occurring irregularly
Festivals	Primary activity revolve around the marking of special occasions and the celebration of significant events	Community Entertainment	A celebration of something the local community wishes to share and which involves the public as participants in the experience.	Community Focus  Community Participation  Celebratory
		Community service		
		Multicultural celebration	A public freely accessed and themed celebration which involves a variety of media such as arts and crafts, performances and demonstrations.	Cultural, religious or seasonal themes
		Religious celebration	A public freely accessed and themed celebration which involves a variety of media such as arts and crafts,	

			performances and demonstrations reflecting religious occasion or celebration.	
		Seasonal and/or harvest celebration	A public freely accessed and themed celebration which involves a variety of media such as arts and crafts, performances and demonstrations commemorating an historical occurrence associated with community staging the event.	
MICE	Primary activities centre on the provision of information, the exchange of ideas, and/or the display of new products and services generally for commercial gain.	Conventions	A general formal meeting of a legislative body, social or economic group in order to provide information on a particular situation in order to deliberate and consequently, establish consent on policies among participants. Usually of limited duration with set objectives, but no determined frequency (Shone, 1998. 165).	Large scale meeting National, regional or international significance
		Congresses	A general formal meeting of a legislative body, social or economic group in order to provide information on a particular situation in order to deliberate and consequently, establish consent on policies among participants. Usually of limited duration with set objectives, but no determined frequency it may be attended by delegates who represent a local chapter or geographical areas (Weissinger, 1992).	Large scale meeting International significance Political connotation
		Conferences	An event used by any organization to meet and exchange views, convey a message, open a debate or give publicity to some area of opinion on a specific issue. No tradition, continuity or periodicity is required to convene a conference. Usually of short duration with specific objectives.	Exchange of ideas Focuses on career interests
		Incentives	Incentive travel is used as a motivational tool to encourage employees to improve their performance. It may be used as a reward for increased productivity or encourage particular buying patterns (CDT, 1995, p 3-4)	Motivational Tool Stimulates employees productivity or encourages buying patterns

		Symposiums	Formal educational small – scale meeting where the main purpose is discussion, instruction and sharing of views often concerned with a single subject (Arcodia and Robb, 2000, p159).	Professionally organized discussion of new developments
		Forums	An open discussion between audience, panel members and moderator (Goldblatt, 1996, p. 75)	Public debate Open discussion Audience participation
		Exhibitions	An event held in conjunction with another meeting or as a stand-alone whose format is used for display, usually by vendors of goods or services, arts or culture. It may have an educational dimension or a commercial dimension or both.	Display of goods or services Showcase cultural achievement Open to public
		Trade Shows	A collection of exhibits that is specific to one or more closely allied or associated trades. In most instances, the buyers represent businesses that are shopping for services and products to use in the conduct of their business (Rutherford 1990, p.44).	Marketing event Meeting of suppliers and buyers Exclusive to particular industries

**Table 1: Types of events and their characteristics**

### 1.3 The impact of events from a sustainable development perspective

The impacts of events range from increasingly positive to disastrously negative. There are clearly many benefits associated with the hosting of events, such as tourism promotion and the complementary economic opportunities, however the negative impacts of events cannot be overlooked, specifically those that disadvantage local residents (Fredline and Faulkner, 2000). The hosting of the Olympic Games for example, puts large pressure on the host cities accommodation stock, waste management system, land use, energy supply, water and sanitation system and on its transport and security networks. All this is highlighted when the operating cost of hosting a summer Olympic Games for example often exceeds US\$ 2 billion, and the additional public expenditure for new venues, infrastructure and transport can be more than US\$ 1 billion. This is tax payer money and as such citizens of that city often have to deal with the ramifications of these impacts on their daily life (Furrer, 2002).

Event impacts can be grouped into six principle impacts Goldblatt in his 2000 paper on ‘The future for event management’ discusses these six principle impacts and suggests that they are in fact overarching and applicable to all events. The six principles impacts are:

- Capital Impact
- Economic Impact
- Ecological Impact
- Media Impact
- Political Impact
- Stakeholder impact

**Capital Impact** is more often than not quite a positive impact. Large scale events often initiate capital projects such as infrastructure construction, city clean ups, revamping of city centres and new more efficient transportation systems. Valuable assets, such as sport facilities, accommodation or multifunctional venues that are produced specifically for an event are designed with a long term view and provide ongoing benefit to the local economy post event. However, a venue or facility constructed for a mega-event crowd rather than long-term city use that are unused become considerable financial burdens to maintain and often become the responsibility of an over extended city council (Furrer, 2002).

**Economic Impact** has often been calculated based on visitor spending and multipliers that extend this spending to other sectors. For example visitors to an event will need a place to stay, they will frequent restaurants, and they will purchase retail in this way their spending is felt beyond the parameters of the event. This is linked to job creation, income generation (both during the event and post-event) and revisits of event participants in the future. A successful event may create confidence in the host region and create and showcase it as a favourable investment opportunity (Furrer, 2002). Sometimes the positive economic aspects of an event are only felt by the prosperous community. This leaves some communities at the fringe of accessing benefits. All local economic players should be able to access the market being created by an event this allows the wealth to be spread evenly across the host city or region and contributes generically to the development of the local economy.

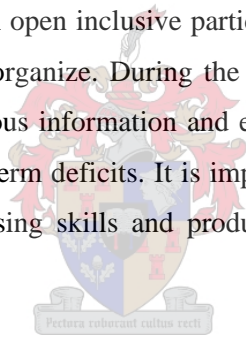
**Ecological Impact:** An event encourages an influx of people to one area. This puts strain on local resources, such as water and sanitation, energy requirements and increases waste production. More people per square meter of area need to be served by the consistent resources and their waste must be discarded. The additional people in a host city for an event cause an increase in consumption of resources. Events can also contribute to the environment by rejuvenating ecological areas and rehabilitating ecosystems for use during the event. The Olympic Games 2012 scheduled to occur in London will facilitate a clean up and ecological rehabilitation of the Lower Lea Valley, a biodiversity rich ecosystem that has been severely degraded (LOCOG, 2006).



**Media Impacts:** Event organizers can gain leverage for their event through careful utilization of the press and media. The presents of media at an event require additional management systems and public relations strategies. It keeps the event organizers and hosts in the spot light. Both positive and negative associated issues of the event can be reported on globally in real time. The media act almost as a “watch” group, exerting a power of international persuasion that may control the event organisers and ensure the event is staged with integrity.

**Political Impact:** A large scale event is often hosted by a city or town. This creates a relationship between event organizers and specifically city politicians. It impacts on the infrastructural developments and regulations associated with planning, environment and economic development. Events are sometimes used by politicians to stimulate economic packages or increase party ratings. Some events are financially supported by a public private partnership (PPP). In this case risk can be shared by the government and the event organiser.

**Stakeholder Impact:** It is imperative that an event organizer identifies all the stakeholders involved in the event and determines processes that will benefit the stakeholders more than antagonize them. This requires an open inclusive participatory process, especially for mega-events which take extended periods to organize. During the preparation time the stakeholders are often negatively impacted and continuous information and engagement will ensure that they realize the long term benefits and the short term deficits. It is important to connect the local community with the economic benefits, by accessing skills and products for the event from the local economy (Goldblatt, 2000).



There are some real burdens that an event can leave as a legacy to the host city. These impacts not only have a negative effect on the surrounding environment or society, but can translate into public relations fiascos for the event itself. In 1992 the Winter Olympics was hosted by Albertville. The preparation turned the alpine region into a disaster of landslides, road building, deforestation, disruption of natural habitats and waste heaps. This was the first Olympic Games to have the opening ceremony preceded by a local community protest march as a response to and on behalf of the natural environment and the negative impact to the quality of life the Games brought to the region (DaCosta, 2002).

## 1.4 Thesis architecture

The approach applied to this thesis is almost a methodology within a methodology. The discussion begins with an establishment of the status quo on event greening. It relates the different approaches being applied and brings in examples of different event greening programs, some have been completed and others are still with in their strategising phase. This establishment of the status quo presents the different types of programmes that fall under the banner of event greening. It illustrates

some of the marked differences and concludes by suggesting that this type of chaotic interpretation of the concept requires the industry to design a standardised approach or method for event greening. The contribution such a tool will have on the event industry at large and specifically on the host cities or regions of large events is phenomenal. The thesis proposes a Sustainability Rating System to use a tool to measure and benchmark the percentage sustainability of an event. Chapter two reflects on the direct development of this Sustainability Rating System and its application. This chapter is followed by a section which establishes the chaotic nature of defining “greenness” of events. The synthesis is a summation of the importance of such a tool and reverts back to discussions of the concept of event greening as a true platform for sustainability best practice, and proves this trueness using the results of the developed Sustainability Rating System.

### **1.4.1 Assumptions and Acknowledgments**

The author has made a number of assumptions and acknowledgments which set parameters to this thesis.

1. The thesis argument is built on a sustainable development basis, meaning it includes three components, environment, society and economy. However, the Sustainability Rating System and the examples chosen for testing this system tend to focus more on the environmental component. This seeming contradiction is a result of most event greening projects being dominated by environmental issues and the subsequent spin off social and economic impacts. The ideal situation and the ideal event greening initiative and subsequent rating system or measuring tool should incorporate all three dimensions of sustainable development with equal importance. The result of such an environmental tangential approach to most implemented event greening initiatives has influenced the Sustainability Rating System to sway in this direction. The social and economic criteria are few and are often associated with resulting consequences from the environmental impact.
2. The assumption is made that the reader is familiar with the concept and definition of sustainable development and sustainability. In this thesis sustainable development and sustainability are terms that are used interchangeably and have the same meaning.
3. The term event greening and green event refer to the same concept as further explained in Chapter Three.
4. The Sustainability Rating System (SRS) is a simple and crude methodology and is a first step approach.
5. There is acknowledgement that owing to events and event green specifically being a new field there is a lack of documented information and academic discourse is rather limited.

## 2 Chapter Two: Methodology and Approach

A thorough understanding of the impacts and their extent associated with events is first established by analysing the sustainable development event management interface. Once the issues are meaningfully understood a measurable response can be applied to the impact. The response may be in an attempt to reduce or expand the opportunity of that impact this is dependent on the type of impact. The use of models which maintain the analysis within a sustainable development context is employed and hence creates a platform for the development of formal criteria and indicators for the Sustainability Rating System. This approach illustrates a rich sustainable development base for the criteria.

The Sustainability Rating System is applied to a selection of events as a testing method and the results are discussed, as proof of the effectiveness of the Sustainability Rating System as a tool to measure the sustainable development best practice associated with event greening. It also gives a value to the performance of that event greening effort, which can be used for publicity purposes or as a benchmark or even a baseline for future events in that host city or that particular event type.

### 2.1 The sustainable development event management interface.

The first step is to fully understand the sustainable development, event management relationship, by establishing general face value interactions. The thesis then delves deeper into these interactions unravelling the details further. The author has employed two different models to achieve this. The first is known as the sustainable development appraisal framework this model gives a quick scope and identifies the preliminary interactions and impacts. Then the DPSIR Model is used to determine detail and response. The DPSIR Impact Table builds on from the DPSIR Model and further explores these details and responses. This method provides a basic foundation to analysing events, based on sustainable development. These methods and models come with advantages and disadvantages, and for sake of accuracy the author wishes to note some of these. The advantage of using the sustainable development appraisal framework is it provides a quick overview of the impacts using the three pillars of sustainable development. It is currently being used to assess an event and predict both positive and negative impacts. This assists in determining risk for a city with regard to hosting an event. This model is being used to make decisions on bidding processes and assess the true nature of the return from hosting an event. This model is very basic and very sketchy, and is best used as a first step to a more comprehensive analysis.

The DPSIR model it could be argued is a natural progression from the sustainable development appraisal framework. It is structured in a way that can maintain the three pillar approach, however provides a much more detailed account of the impact and requires initial thinking for a response to that impact. DPSIR stands for Drivers-Pressure-State-Impact – Responses. It is used to demonstrate detailed interactions. It is used in this thesis as a means of offering a basis for analysing the inter-

related factors impacting the sustainability of an event. It was developed as a tool for sustainable development indicator development and as such has been chosen to assist in developing the indicators and criteria for the Sustainability Rating System. It is an analytical framework that allows for the organisation of information and integration of socio-economic and environmental elements by linking the five indicator categories.

A number of models have been developed and proposed for illustrating the links between issues or impacts of non-sustainable development practice. A better known one is the PSR Model which stands for “Pressure, State, Response” model. The PSR Model was originally developed by the OECD<sup>2</sup>. It was used as the basis for the United Nations Commission for Sustainable Development framework of sustainable development indicators. The European Environment Agency adapted the PSR Model into the DPSIR Model.

D = driving forces: underlying factors influencing a variety of relevant variables

P= pressure: indicators describing the various direct causes (possible cause)

S= state: show the condition (quality)

I= impact: describe the eventual effects of changes of state

R= response: efforts of society to mitigate or solve the problems

Primarily, the DPSIR Model was developed to assist in forming a deeper understanding of the interactions between economy and environment. The absence of society as a dimension does indeed limit this models appropriateness for use when dealing with sustainable development. However it is possible to customize and insert these issues in a crude but valid manner. The DPSIR Model is a useful analytical tool particularly in developing indicators (EEA, 1998).

It is the need for a response at the analysis stage that prompted the author to utilize this model, as it saves time and money by addressing both the detail of the impact, its context and the initial response mechanisms that could be suggested solutions to reducing those impacts. The main disadvantage of the DPSIR model is its tendency to be repetitive and even a bit confusing to the layman. In response to this disadvantage the author has supplemented the DPSIR model with a DPSIR Impact Table. This table is an extremely detailed breakdown of the impacts, their context and response framed within sustainable development dimensions and themes. The use of these approaches was to add depth to the development of the Sustainability Rating System and also to counterbalance the disadvantages each model presents.

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<sup>2</sup> Organisation for Economic Co-operation and Development (OECD)

## 2.2 Developing the Sustainability Rating System

### 2.2.1 Scoping

#### 2.2.1.1 *The sustainable development appraisal framework*

The six impacts discussed above can now be examined in a more detailed manner using sustainable development themes and cross – cutting issues as they relate to event management. In determining the specific sustainable development impacts the sustainable development appraisal framework as presented in the December 2005, Olympic Games Impact Study is used as a basis. It is initiated from the three pillars of sustainable development; economy, environment and society. The referred to study was compiled by PriveWaterhouseCoopers (PWC) LLP. Table 2 is an application of this framework to events in general as is relevant to this thesis. In understanding the framework the definition of the three pillars as they relate to this research are discussed. The framework is used as a quick and easy way of determining the extent to which an event may impact on a host city or region.

Sustainable Development Pillar					
Economic		Social		Environmental	
Account	Impact	Account	Impact	Account	Impact
1.Global economic profile	Macroeconomic Impact	3. People, skills and employment	Demographics	6. Environment	Land/water/air
	Infrastructure		Skills		Biodiversity and ecology
	Inward Investment		Jobs		Energy
	Tourism	4. Sporting, cultural, national, civil, arts legacy	Sporting and cultural facilities		Waste
			Feel good factor		Culture/heritage/built form
			Patriotism and communal integration		Amenity, Transport and Housing
			Pride		Support for environmental services and products
2.Business support, innovation and diversification	New business creation	5.Public health	Socio-economic health	7. Efficiency and Green markets	Eco efficiency technology
	Supply chain opportunities		Physical and mental health		Ecological design and renewable energy
	Cluster development		Well – being health		Environmental services and products

**Table 2: Sustainable development appraisal framework – based on PWC 2005, OGIS Final Report**

Economy is referring to direct costs and benefits. There are two categories of costs when hosting an event, developmental and operational costs. Developmental costs vary according to venue construction requirements and scale of the event. Mega-events like the London 2012 Olympic Games are projected to cost £1.796 billion (GoJ Report, 2003). This capital investment is often directly from government institutions, and sometimes with help from private sector sponsorships. Employment is generated by events. The Sydney Olympic Games generated 15,000 full time and part time jobs over a 14 year period (GoJ Report, 2003).

An event that is organized with principles of sustainability bearing consequence on the operations and logistics may contribute to cost savings. The adoption of environmental management strategies, specifically relating to energy efficiency, waste disposal and water saving often result in lower consumption levels and contribute to lower insurance premiums, fewer accidents and avoided legal costs. This is sometimes referred to as eco-efficiency, which is using fewer resources as possible as efficiently as possible and reducing the waste accumulation. Eco-efficiency requires upfront investment and results into lower costs and greater savings (natural and financial) over time. In Lillehammer in 1994, Hammer Hall was constructed for the Winter Olympic Games, energy saving occurred through a heat recycling mechanism that used heat pumps and surplus heat from ice-making systems. This system produced an annual saving of US\$180 000 for the venue management (GoJ Report, 2003).

Social impacts with an event are difficult to measure and are very integrated with economic spin-offs and indirect impacts. On a social-cultural level or communal level, an event can contribute to community pride or city pride, through the promotion of nationalistic sentiments or cultural identity. However, issues such as noise, traffic, overuse of public facilities, health impacts and directed government spending can make local communities irritated and stressed.

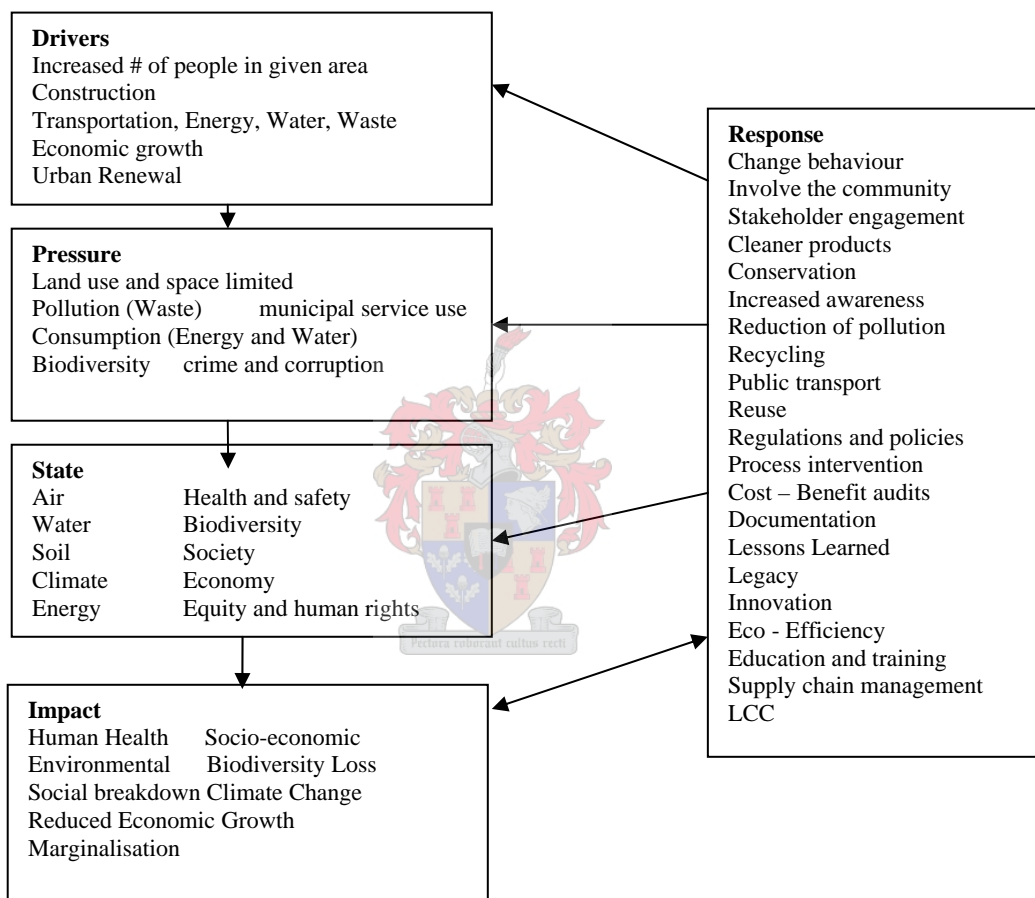
Events contribute significantly to impacts on the environment. These impacts can be minimised through careful planning. Events can have a positive environmental role by influencing values and attitudes of all stakeholders and leveraging buy-in and budget for environmental regeneration. Mega-events contribute to global and local environmental concerns. Local pollution and waste management issues from construction and outdoor activities, high levels of resource consumption (wood, air, water, soil), emissions that contribute to climate change from travel and fossil fuel combustion are all associated with events.

The sustainable development appraisal framework has provided a quick overview of the linkages between the impact of events and sustainable development. The following section takes the information from the framework and further explores its detail, by identifying the impact driver, pressure, state and response.

## 2.3 Detailed analysis for developing indicators

### 2.3.1 The DPSIR Model

This model provides information on all the different components of events. Through this model we can identify and demonstrate connectivity and state and identify an estimated effective response. This model was specifically designed for indicator development and measuring tools of sustainable development, hence it is appropriately used in this thesis. The DPSIR Model used in this thesis has been bespoke from Yan Borne's' DPSIR model of the Environmental Impact of the Olympic Games (Borne', 2003).



**Figure 1 DPSIR model of impacts of a mega-event, (Katzel, 2006).**

This model can be further explained using a detailed table of impacts. The following table of impacts explores the information of the DPSIR Model, and is mega-event specific. It is a further probe and identification of the relationships that exist at the sustainable development event management interface and provides initial ideas for responses. It is a modification and next step of the pure DPSIR Model as it incorporates details of the social and economic impacts and how they relate to environmental impacts and visa versa.

Drivers	Pressure	State	Impact	Response	Global Sustainability <sup>3</sup>
Increased # of people during the event	<p>There is more demand for basic municipal infrastructure and services</p> <p>Overcrowding</p> <p>Need for housing and accessible affordable transportation</p> <p>Increase in water and energy consumption</p> <p>Increase in waste generation</p> <p>Increase in Green House Gases (GHG) and particulate pollutants.</p>	<p>Air</p> <p>Water</p> <p>Energy</p> <p>Health and safety</p> <p>Equity and human rights</p>	<p>Increase in environmental health related disease due to overcrowding</p> <p>Infrastructure stresses resulting in resource cuts or over use.</p> <p>Decrease in municipal services and decrease in quality of services such as health and police.</p> <p>Climate Change</p> <p>Depletion of natural resources</p> <p>Landfill sites overfilling</p> <p>Ozone depletion</p> <p>Acid rain</p> <p>Congestion and traffic associated with mobility issues and resulting in local economic problems.</p> <p>Tourism – increased buying power</p> <p>Foreign exchange and stimulation of hospitality industry</p> <p>Crime and security problems</p>	<p>Public transportation that is effective, efficient and well priced</p> <p>Promotion of walking and cycling</p> <p>Waste reduction, recycling and reuse.</p> <p>Litter avoidance campaigns</p> <p>Water consumption behaviour change and technological enhancements</p> <p>Energy consumption behaviour change and technological enhancement</p> <p>Awareness and education</p> <p>Crime prevention through volunteerism or tourism police</p> <p>Increase in budgets for basic services</p> <p>Capital Investment in infrastructure</p>	<p>Security</p> <p>Sustainable Mobility</p> <p>Climate Change – air travel</p> <p>Consumption and production patterns</p> <p>Human habitat</p> <p>Local economic development</p> <p>Awareness and Education</p> <p>Capacity Building</p>
Construction : Venues and Infrastructure	<p>Heavy metals and toxins. CO, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, O<sub>3</sub>, HC.</p> <p>Noise, dust, land pollution, water pollution, land use changes, consumption of resources, construction waste.</p>	<p>Air</p> <p>Water</p> <p>Soil/Land</p> <p>Energy</p> <p>Health and Safety</p> <p>Biodiversity</p> <p>Socio-economic</p> <p>Climate</p>	<p>Human Health: Carcinogenic; Heart and lung disease, hearing loss, stress and insomnia, headache.</p> <p>Environmental: Climate change, ozone depletion, acid rain formation, smoke, land loss, water waste and contamination of land and water resources</p> <p>Social: displaced communities, traffic congestion, new recreational facilities</p> <p>Economic: job creation, skills development, urban regeneration</p> <p>Loss of aesthetics, ecosystems and biodiversity.</p>	<p>Reuse of existing venues.</p> <p>Use of non-toxic, environmentally safe materials</p> <p>Ecological Design and sustainable construction</p> <p>Design venues and infrastructure in ways that conserve energy and water through efficiency and innovative technologies.</p> <p>Minimise land use by reclaiming and remediation of industrial or waste lands.</p> <p>Comply to land use regulations such as EIA's.</p>	<p>Climate Change</p> <p>Waste generation of construction materials</p> <p>Urban renewal and regeneration of slum and industrial areas in cities.</p> <p>Poverty alleviation and job creation</p> <p>Water and sanitation</p> <p>Commodities, macro economic objectives and trade.</p>

<sup>3</sup> This column is added to demonstrate the local impact and responses link to the global sustainable development agenda



Transport	<p>CO, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, O<sub>3</sub>, HC VOC, particulates, lead, noise.</p> <p>Traffic</p> <p>Too many cars, not enough roads</p> <p>Security and traffic control</p>	<p>Air</p> <p>Water</p> <p>Health and safety</p> <p>Socio-Economic</p> <p>Energy</p> <p>Climate</p>	<p>Human Health: carcinogenic, heart and lung disease, hearing loss, stress, insomnia, depression, frustration, headaches.</p> <p>Social: Accidents, road rage, crime, stress</p> <p>Economic: loss of productivity, people not being able to come to work on time.</p> <p>Environment: Climate Change, ozone depletion, acid rain, smoke, water drainage problems, temperature</p>	<p>Low Nitrogen oxide burners</p> <p>Alternative fuels and hybrid vehicles.</p> <p>Use of integrated public transportation systems and incentives to use the public system</p> <p>No car zones.</p> <p>Promotion of cycling and walking with incentives</p> <p>Police and security presence.</p>	<p>Human Mobility</p> <p>Local economic development</p> <p>Safety and security</p> <p>Trade</p> <p>Climate Change</p>
Waste	<p>Land/soil pollution via landfill sites</p> <p>Water pollution through increased run off and litter</p> <p>Overflowing sewage system</p> <p>Increased chemical and bacterial pollution in water, air and soil</p>	<p>Soil/Land</p> <p>Human rights</p> <p>Health and safety</p> <p>Water</p> <p>Climate</p>	<p>Littering</p> <p>Illegal dumping in rivers or on deserted land</p> <p>Damage to human health.</p> <p>Increased industrial activity producing industrial waste</p> <p>Increase consumption of material results in waste.</p> <p>Methane pollution – climate change</p> <p>Decrease landfill site space</p> <p>Municipal waste collection and disposal problems and costs</p>	<p>Waste reduction through sustainable procurement process</p> <p>Recycling facilities and accompanying education on separating waste at source.</p> <p>Composting of organic waste</p> <p>Decrease in packaging</p> <p>Buying in bulk</p> <p>Reducing amount of waste going to landfill</p>	<p>Human Habitat</p> <p>Consumption and production</p> <p>Stimulating environmental businesses and ecological efficiency.</p>
Water	<p>Water demand is higher than water availability</p> <p>Quality of water is questionable as increased amounts of consumption lead to increased water purification requirements.</p>	<p>Water</p> <p>Soil</p> <p>Human health</p> <p>Human rights</p> <p>Biodiversity</p>	<p>Depletion of natural water resources</p> <p>Pressure on sanitization and purification</p> <p>Human health</p> <p>Increase chemicals and litter in water affecting the quality</p>	<p>Reduction of water consumption through technology or behaviour change</p> <p>Water recycling</p> <p>Dual pipe water system and use of grey water</p> <p>Changing consumer behaviour</p> <p>Rain water capture and improved drainage capture</p>	<p>Water and Sanitation</p> <p>Access to potable water</p> <p>Human rights and health</p>

Energy	<p>Land disturbance</p> <p>Demand exceeds the availability</p> <p>Polluted air and water</p> <p>Carbon emissions, radioactivity, particulates, smoke.</p> <p>Smog</p> <p>Economic growth</p>	<p>Air</p> <p>Socio-economic</p> <p>Health and safety</p> <p>Climate</p>	<p>Climate Change</p> <p>Acid rain formation</p> <p>Depletion of fossil fuel resources</p> <p>Environmental health related diseases</p> <p>Aesthetic</p> <p>Loss of biodiversity</p> <p>Economic and social growth and development</p> <p>Industrialisation</p>	<p>Use of renewable energy resources</p> <p>Green power</p> <p>Phased out fossil fuel combustion process.</p> <p>Insulation and design of facilities</p> <p>Eco-efficiency in appliances, lighting and air conditioning.</p> <p>Regulation and policies</p> <p>Demand site management. Change in consumer behaviour,</p> <p>Carbon mitigation</p>	<p>Climate Change</p> <p>Renewable energy</p> <p>Air pollution</p> <p>Human health</p> <p>Economic growth</p> <p>Industrialisation</p>
Economic Growth	<p>Environmental resource such as energy and water under pressure.</p> <p>Employment</p> <p>Land use changes</p> <p>Loss of biodiversity</p> <p>Overcrowding</p>	<p>Air</p> <p>Water</p> <p>Energy</p> <p>Climate</p> <p>Health and Safety</p> <p>Equity and human rights</p>	<p>Human health: stress, pressure to perform, medical care, decreased government funding into health and safety</p> <p>Social: increased facilities through wealthier communities, increased mobility</p> <p>Economic: jobs, direct foreign investment</p> <p>Environment: increased consumption of resources and waste, biodiversity loss</p> <p>Climate Change</p>	<p>Stakeholder engagement processes and democracy</p> <p>Cleaner production</p> <p>Increased awareness and education</p> <p>Recycling and reuse of waste</p> <p>Regulation and policies</p> <p>Audits and cost benefit analysis</p> <p>Innovation that is responsible</p>	<p>Climate Change</p> <p>Industrialisation</p> <p>Consumption and production</p> <p>Alleviation of poverty</p> <p>Access to water and sanitation</p> <p>Equity and democracy and education</p> <p>Globalisation and Trade</p>
Urban Renewal	<p>Displacement of people</p> <p>Water pollution</p> <p>Soil pollution</p> <p>Increased housing and transportation needs</p> <p>Stress on municipal infrastructure</p>	<p>Water</p> <p>Soil</p> <p>Human Health</p> <p>Socio-economic</p> <p>Equity and human rights</p>	<p>Displacement of people and break up of community life should city areas need to be reclaimed.</p> <p>Reclamation increases property prices causing disparity between those that can and cannot afford to live in the city.</p> <p>Housing and Community cohesion, Aesthetics. Waste generation</p> <p>Biodiversity conservation through green spaces</p> <p>Recreational facilities</p>	<p>Change attitudes and behaviours</p> <p>Involve the community and run a stakeholder engagement process.</p> <p>Conservation of green spaces and recreational facilities.</p> <p>Reduction of all pollution</p> <p>Process intervention</p> <p>Legacy</p> <p>Innovation and Eco-efficiency</p>	<p>Human Settlement</p> <p>Climate Change</p> <p>Urbanization</p> <p>Production and consumption</p> <p>Migration and mobility</p> <p>Health and overcrowding</p> <p>Agriculture</p>

**Table 3: The impact table of mega-events.**

The DPSIR Model illustrates the issues and responses that occur when event management process are combined with sustainability imperatives. Ideally preparation and management of a mega – event should be linked to the host city or regions sustainability strategy. This results in new

infrastructure, better spatial planning systems, improved governance frameworks and improved capacity that is proactive and often a propellant of economic development (Metrex Report, 2003).

Thus far the impacts of events from a sustainable development perspective have been established, using the sustainable development appraisal framework and the DPSIR Model. The information obtained from these models is used to create the criteria and generate indicators for assessing the sustainability of events, through the development of the Sustainability Rating System.

## 2.4 Formation of the ‘Sustainability Rating System’

A set of 10 criteria were determined for this assessment. These criteria were built from the results of the sustainable development appraisal framework and the DPSIR Model. The background resources used for developing the criteria were a combination of current sustainability best practice ideas, baseline information from assessments done on the Olympic Games and Check list information as presented in “Leaving a Greening Legacy: Guidelines for Event Greening”, 2003. A consultative process with experts was conducted through telephonic interviews, focus groups and discussion, this is not representative of any particular stakeholder mapping or formal process. This process was used to ensure inclusively and accuracy of information, from individuals with expert knowledge in the field and to assess the quality and feasibility of the assessment criteria and indicators.

The 10 criteria determined are:

1 Sustainability policy and or principles for the event	2 Human health and well-being
3 Public transportation	4 Education and awareness raising
5 Waste management system	6 Cultural integrity
7 Reduced consumption of natural resources	8 Legacy planning
9 Combating climate change	10 Monitoring and evaluation

Each criterion was assigned a selection of specific indicators. These indicators were developed based on the ability to demonstrate practices that would qualify compliance to the specific criteria. The indicators per criteria are scored on a present, not present method. That is to say, if a demonstration of an indicator exists it is scored as 1. If it does not exist it is scored as 0. This scoring system was chosen for its simplicity. The value of 1 is 1. There are 62 indicators therefore if an event can demonstrate clearly each and every indicator it would score a complete 62. Therefore a 100% sustainability rating is a score of 62, as well as determining in a crude, yet clear manner the extent of sustainability. Table 4 sets out the Criteria and the specific indicators used for this assessment.

Criteria		Indicator
Policy and green/sustainability principles for the event	1	A set of sustainability principles have been developed and adopted by the Local Organising Committee (LOC)
	2	Tenderers are required to demonstrate adherence to the sustainability principles and or policy
	3	The local organising committee or company have a sustainability person on the team
	4	A sustainability or event greening initiative exists
	5	A sustainability or event greening initiative exists as part of the organising of the event
	6	A stakeholder engagement process exists
	7	There is Government buy in for the sustainability or event greening initiative
	8	Local legislation is complied with
	9	International commitments through multilateral agreements is complied with
Public transportation is encouraged	10	There is an efficient public transport system used for the event
	11	Travel cards or tokens are easily and readily available
	12	Accommodation for the event is in close proximity to the venues of the event
	13	Innovative transport types and projects are initiated
	14	Non-polluting public transport is used (bicycles or walkways)
Waste Management system in place that adheres to sustainability principles	15	Recycling programme present
	16	Multi -bin system for waste separation is at the venues
	17	Information is given to patriots on how to use the multibin system
	18	Biodegradable products are purchased where possible
	19	A sustainable procurement processes exists to minimise non recyclable waste to landfill
	20	Educational material is used to minimise waste production and inform the participants
	21	Separation bins are disposed off into correct recycling vehicles
	22	Electronic alternatives are used for paper and posters
	23	Controls exist to ensure the recycling programme is as successful as possible
Reduced consumption of Natural Resources	24	Use of recycled construction material and alternative environmentally acceptable materials
	25	Venues are designed with energy efficiency technologies and materials
	26	Venues are designed with water efficiency technologies and materials (dual flush toilets, irrigation systems)
	27	Construction techniques that minimise waste and air pollution are used
	28	Biodegradable products are purchased for cleaning

	29	Alternative types of energy is used as much as possible (solar heating and lighting, wind energy)
	30	Purchasing of local products (with in a set radius) is preferred through a sustainable procurement process
	31	Grey water is used in venues and hotels
Combat Climate Change	32	A carbon neutral programme exists (voluntary)
	33	A tree planting initiative exists
	34	A green house gas and emissions account for the event has occurred
	35	A sponsored carbon neutral programme exists for the event
Human health and well being	36	Workers on venues and for the event observed health and safety practices
	37	There is an upgrade of public spaces such as parks, sidewalks, beaches and river basins
	38	Planting indigenous trees and plants and improving aesthetics of the host area
	39	There is preferential purchasing of materials or goods produced by marginalised communities or the poor
Education and Awareness Raising on sustainability	40	Information is provided to participants on the event greening initiative seeking their participation and cooperation
	41	Information is provided to employees on the event greening initiative seeking their participation and cooperation
	42	The hospitality industry is involved with the event greening initiative
	43	A public communications campaign on sustainability exists
	44	Showcasing opportunities of sustainability issues and solutions exist
	45	Training programme for employees occurred/planned
	46	Training programme for volunteers occurred/planned
Cultural integrity	47	There is a cultural programme
	48	Local communities are involved with the event
	49	Volunteers are local communities of different ethnicity
	50	Participants are encouraged to contribute to the local economy
Legacy Planning and aspects that last	51	The facilities have been designed and constructed as multifunctional venues that can be used for more than one type of event
	52	Renovation of old facilities has incorporated sustainability best practice
	53	Venues have been designed to operate on low maintenance costs through technologies and design
	54	Jobs are created for the local community
	55	Information is published and accessible regarding event greening and sustainability
	56	Urban renewal and regeneration is part of the event planning

	57	Biodiversity and ecosystem regeneration and preservation areas is part of the event strategy
Monitoring and evaluation processes	58	A life-cycle assessment of the environmental and social impact has been performed on purchases and venues
	59	Energy audits are conducted to ensure efficiency
	60	Water audits are conducted to ensure efficiency
	61	A report is compiled/intended as lessons learned
	62	Reported results are verified/assured by an independent /external source

**Table 4: Sustainability Rating System criteria and indicators**

The development of the criteria and indicators of the Sustainability Rating System is a first step. Now that a measuring tool exists, the main research methodology can be discussed. This methodology is the use of the Sustainability Rating System as a way of proving the hypothesis.

## **2.5 Testing the “greenness” of events**

### **2.5.1 Aims**

The aim of this research is to investigate the sustainability best practice in event greening. This will lead to the development of an industry standard for evaluating the extent of sustainability of events. Best practices were identified through desk top research, analysis of reports, discussions with key events and sustainable development experts, marketers and event managers to identify relevant issues. This identification was preceded by a comprehensive review of existing research, theory and discourse in order to couch the pragmatic in the current rhetoric. The review covered the different theoretical perspectives on event tourism, green events, sustainability, benchmarking and measuring, monitoring and evaluation techniques and current event evaluation systems.

### **2.5.2 Hypothesis**

Event greening as a concept is a platform for sustainability best practice

### **2.5.3 Objectives**

The specific objectives of the research were;

- 1 To develop a methodology that could be used for the evaluation of the percentage sustainability of events internationally as a prelude to the development of a sophisticated assessment tool and a set of standards for event greening.
- 2 To test this methodology by investigate comparability and attempt to track the evolution of sustainable event management from 1994 - 2012

- 3 To demonstrate that event greening is a progressively evolving mechanism for implementing sustainable development

#### **2.5.4 Data sourcing**

The data was gathered by drawing together information and analysis from a large number of different sources available in 2005 and 2006. These include research specifically commissioned for the International Olympics Committee, United Nations Environment Programme (UNEP) and International Commissions for Local Environmental Initiatives (ICLEI). It includes websites, web-based articles, information from non-governmental websites specifically involved in event greening, greening in sports, sports tourism, business tourism and sustainable event management. It also includes existing studies prepared as part of the development of bidding documents for mega – events, urban renewal programmes and tourism strategies. Evaluation reports, lessons learned reports cost – benefit analyses and resource consumption statistical reports for the selected events were also included. These were obtained through website downloads or through direct communication with the sustainability management staff of those events. These reports were emailed on request some of which have not been published and are not readily available or accessible to the public. This paper also relies upon sources such as interviews, discussions and observed evidence as the author was involved in three event greening projects, and has independently reviewed two event greening programmes, as a technical specialist.

#### **2.5.5 Research assumptions and parameters**

There is an assortment of definitions of event greening used for the selected events. For example greening in some events was simply a definition of planting trees and plants and improving public spaces, while in this thesis event greening is about applying sustainable development principles to events. This meant that events were selected that defined event greening as, sustainability programmes, environmental projects or responsible eventing. The types of events selected were diverse, however the presence of sporting events and specifically the Olympic Games is prominent. This is owing to availability of information and currently the most progressive event greening policies internationally (UNEP, 2005).

Different time periods have been analysed ranging over a 15 year period. Some of the impacts in the analysed reports of the selected events have not been quantified and even where quantitative assessments have been produced, the units, style and parameters are not always the same. The events used were of mega-event size. Post-event reports and information were used for events in the range of time from 1994 – 2007. Pre-event strategies, commitments, plans and interim reports were used for selected events from the year 2007 – 2012.

The selected events covered a range of countries and incorporated examples from developing countries as well as developed countries. It is assumed that the translated reports are valid and accurate and have not lost quality data through the translation process.

The information pertaining to selected events in the date range 2007 – 2012 is obviously not proven and can not be read as absolute. Though for this study, the strategies and intentions of the sustainability programmes for those events is part of the data aggregate and is analysed as if absolute and therefore forms part of the proof for the hypothesis. It is acknowledged that this information is not absolute and is based on intent rather than application review or post-event report

## **2.6 Methodology**

- Research the expansion of the event management industry over the last 15 years and determine the event structure conceptually and operationally. Research the meaning and starting point of event greening and its progress over the last 15 years
- Formation of the Hypothesis and assumptions and sustainability assessment criteria and indicators as part of the Sustainability Rating System
- Selection of events for the assessment
- Applying the assessment criteria and indicators to the list of chosen events
- Testing of the rating systems and analyzing the results
- Proof of hypothesis and synthesis

### **2.6.1 Research of the Event Industry**

It was imperative to understand the events industry expansion over the last 15 years, and the relationships existing between events and national or local socio-economic policies. In order to gain an understanding of the categorization and generic structure of events; academic journals on tourism, industrial development and marketing were scrutinized for papers on the events industry. Congress and Conference outcome papers on the events industry were accessed for research direction and used to link to published articles on the subject matter. The novelty of this industry presented a challenge in finding documented theory on event management. There was not much accessible theoretical information available.



### **2.6.2 Research of event greening**

This research was a desk top research on articles, websites, publications and papers available on the World Wide Web. It was conducted through a Google search using the following words, “greening”, “green events”, “sustainable events”, “event greening” and “sustainability management”. Relevant information was determined in terms of organizational integrity, known authors and institutions and authentic websites. The author has been involved in three event greening projects, of various sizes and made use of empirical information and evidence as supplement to the researched data.

### **2.6.3 Selection of Events for the assessment**

A range of events were chosen for the assessment. The diversity of events was purposeful to maintain a generic standard for event greening. The argument being that event greening principles should be able to be applied to any event, despite size, theme, spatial configuration and economic range. The events varied in date of implementation, number of participants, operational time, management style, space (country), proximity (national or international, city or country) and stage of assessment. It is acknowledged that events up to 2006 are based on strategy documents and reports of implementation and monitoring and evaluation reports. While those scheduled for post 2006, were assessed based on the strategies under development for that specific event and plans as determined through interviews with sustainability managers of those events (Annexure 1 is a table of the selected events). The following assumption have been made regarding the selected events and the method of assessing sustainability

- Information obtained from reports published by the organisers, sustainability managers or independent reviewers or other event management agencies associated with the event is accurate
- Empirical evidence or information is accurate and of high quality although not necessarily documented

### **2.6.4 Applying the Sustainability Rating System to the list of selected events**

Each criterion was assigned a variety of indicators. The demonstration of indicators in the events was recognized through reading reports, studying strategies and from information obtained via telephonic or email interviews. The scoring was conducted by the author. The unprocessed score card information is available as Appendix 2. An event that scores 62 can be considered 100% sustainable, at this moment in time, according to this methodology.

The intention of this methodology is to use it as a prelude to the development of a more substantial methodology of measuring sustainability extent in events. The potential for further study and experimentation of such measuring tools is identified as an outcome of this thesis.

## **2.7 Testing the Sustainability Rating System**

The data was used to test the rating system methodology and these results were demonstrated in graphic representation. A correlation analysis between time and percentage sustainability was conducted to prove that event greening projects are contributing more conclusively to sustainable development. This was then analysed and a brief description of the results were included. A linear regression analysis is performed to measure the trend in sustainability best practice application to events. In this way a prediction is made on the future of event greening. This predicted trend gives confirms the argued need for a measuring tool and standard for event greening, as it assess the growth of the phenomenon.



### 3 Chapter Three: Event Greening – The Status Quo

This chapter determines the status quo of event greening in 2006 and also uses the events selected for the Sustainability Rating System to further demonstrate the diversity with in event greening. All the examples used in this chapter are called event greening programmes, however they are all substantially different to each other. This dissimilar nature of definition will show that there is a need in the industry to standardise event greening and validate event greening programmes or projects.

#### 3.1 Definition

An event can be considered ‘green’ when it is designed, organized, managed and staged in accordance with sustainability principles. This means there is a customised focus on natural, environmental, human health, social and economic concerns. Some key characteristics of green events are the reduction in consumption of natural resources (water, fossil fuel and land), waste and pollution of all types is minimized and biodiversity and human well being is protected. In conjunction with these responses to negative impact, a second characteristic is the mobilizing of opportunities, such as rehabilitation of land, improving living conditions, saving financial resources by rejuvenating and rehabilitating already existing infrastructure, and using the event as a mechanism to raise awareness among citizens and participants (ICLEI Report, 2004). A green event is one which has been governed by environmentally and socially responsible decision-making. It is about turning short term decisions into long term actions and benefits. This involves informed decision making that is sensitive and committed to reducing the negative impacts on the environment and local community presently and for generations to come (Katzel, 2006).

In the 2004 edition of “Leaving a greening Legacy, guidelines for event greening’ produced by GWSSD, five basic principles an event must incorporate in order to qualify as ‘green’ are discussed, they are:

1. Environmental best practice
2. Education and awareness
3. Social and economic development
4. Monitoring, evaluation and reporting
5. Leaving a positive legacy

Since the early 1990’s implementation of event greening projects has gained momentum internationally both in developing and developed countries. This momentum is a result of a number

of influential milestones that have occurred over the last 20 years. These milestones have pushed the need and experimentalism of the event greening concept. At the same time a lack of formally defining the concept has resulted in a non-standardised approach to the implementation and strategy of event greening. Hence, the differences in definition of the concept and variation in nature.

## **3.2 Key milestones and historical influences on event greening evolution**

In the last 15 years some key policy milestones and other happenings have occurred that are being suggested as contributing towards event greening. These milestones are in some ways pioneering and it is suggested that they have influenced events by creating an environmental and social angle to mega – events.

### **3.2.1 The Rio Earth Summit in 1992**

Sustainable development as a concept was placed firmly as an international agenda item of consequence at the Rio Earth Summit. It established a sentiment across the world that social and environmental impacts were negatively contributing to humanity. It reflected a need to address development in the world using a holistic approach incorporating issues of social development and environmental preservation. Though the Earth Summit was preaching such sustainability ideals, the event itself did not pragmatically demonstrate these sentiments. Stories are told of the huge mounds of paper waste generated by the Earth Summit, the exploitation of labour and the disparities in economic benefit of the event. It is suggested that the combination of ratifying Agenda 21 and the resulting negative impacts of the event itself caused a conjectural response that evoked innovative thinking that led to combining sustainability issues with event planning and project management.

### **3.2.2 Environment becomes the third pillar of the Olympic Movement**

The Olympic Games have grown in number, effect, extent and cost over the last 20 years. The larger the Olympic Games become the larger is the impact on the host city. The environmental impact was recognized by the International Olympics Committee (IOC) when the Albertville Winter Games 1992 were impeached with public protest regarding the environmental degradation caused by the preparation for the event. The opening ceremony was preceded by a local community protest march as a response to and on behalf of the natural environment and the negative impact to the quality of life the games brought to the region (Chernushenko, 1994). This was seen by the IOC as a humiliation and began the quest for an environmentally friendly games. Albertville heralded a new type of approach to organising and staging the Games in an environmentally responsible manner. In 1994 the IOC signed a co-operative agreement with UNEP and adopted sustainable

development objectives. As a result environment became the third pillar of the Olympic Charter. The three pillars of the Olympics are; sport, culture and environment (Borne', 2003).

### **3.2.3 The Olympic Games; Sports and Environment Commission**

In 1995 a formal commission known as the Sports and Environment Commission was formalized by the IOC. Their mandate was to ensure that the third pillar of the Olympic Movement, environment, was realized (Borne', 2003). In 1999, the Sport and Environment Commission implemented the Olympic Movements Agenda 21, which focuses on improving socio-economic conditions, conserving and managing natural resources for sustainable development and strengthening the role of stakeholders in preparing for the Games (IOC, 2003).

### **3.2.4 Sydney 2000: The Green Games**

The Sydney Olympics put the IOC's commitment to the environment to the test, by organizing the first comprehensively environmentally friendly Games. The Sydney 2000 Olympics was dubbed The Green Games. Its goal was to set a new standard of environmental excellence in staging an Olympic Games or any other large sporting event. The first Environmental Guidelines for the Summer Olympic Games was developed. Recently, the main advances have come as a result of the Sydney Olympic Games in 2000 (Stubbs, 2001). The Sydney Olympics set the benchmark for event greening and spearheaded its further development. There was an attempt to consider the environment in all aspects of planning, managing and staging the games. This environmental consideration extended from design of facilities to construction and operation. It included remediation projects, transport systems, catering and waste management (Huggins, 2003). John Scott, Director of International Relations and Major Events at U.K Sports suggests that

*'The 2000 Olympic Games in Sydney was considered a watershed in 'green' event management...they successfully demonstrated how environmental issues could be addressed cost-effectively, without impacting on the delivery of the event' (U.K Sport, 2003 from Huggins, 2003).*

### **3.2.5 Greening the WSSD: 2002**

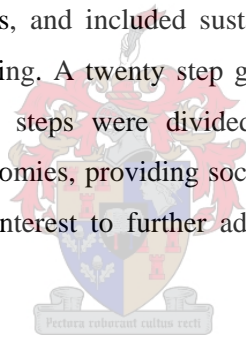
Otherwise known as Rio+10, the United Nations World Summit on Sustainable Development took place in 2002 in Johannesburg South Africa. The local organising committee (JOWSCO) and the government of South Africa decided to organise and manage WSSD in a manner that demonstrated the policy discussions and theoretical concepts of sustainable development. A lessons learned report and guidelines for replication of the event greening project were produced and distributed internationally.

### **3.2.6 ICLEI: Call to Athens and following Symposium on Green Events Barcelona 2004**

ICLEI's contribution began with a call to their constituents to organize all events as green this occurred in 2002. It was followed up by the symposium of experts in Barcelona in 2004 called The International Symposium on Greening Events, hosted by Barcelona, Spain. This gathering brought together local governments bidding for large events, technical experts, international sporting committees, private sector and organisers of cultural, religious festivals and conferences. A major result of the symposium was an unanimous endorsement for the start of a 'Greening Events Initiative'. This initiative would provide a range of projects and programmes for event greening, develop principles or criteria for sustainable events, draft recommendations and create a loose network for cooperation all within the context of local governance (ICLEI Final Report, 2004).

### **3.2.7 European Union (EU) Event Greening**

In January 2006 the Austrian European Union Council Presidency launched a Green Events initiative. The objective of this initiative is to ensure that major events taking place in the EU Member States improve their compliance with sustainability and ecological criteria. This initiative was directed at public authorities, and included sustainability strategies for conferences, sports events, expos, festivals and meeting. A twenty step guide was developed to direct EU Members states into event greening. The steps were divided into issues pertaining to protecting the environment, fostering local economies, providing social and cultural impulses and making use of the public attention and media interest to further advocate sustainability (Trattnigg and Hiller, 2006)



These milestones have contributed to the empirical development of event greening. Today we can determine certain common characteristics and components of event greening projects. Some of these are over arching almost principles based while the components are more specific and relate to response strategies for identified impacts. It should be noted that there is no formal agreed on procedure or accordance for event greening, hence the following section is a reflection of the analysis and research conducted for this thesis.

## **3.3 The event greening process, programme and or project**

The main objectives for event greening are:

- To reduce negative local and global impacts on the environment and society
- To promote positive socio-economic and environmental affects of events
- To foster sustainable behaviour by using events as opportunities to raise awareness of sustainability principles and responsible living (ICLEI, 2004).

- To make significant contributions to enabling a sustainability approach to event organization at the local level, which would lead to global scale benefits (Katzel, 2006)?

### **3.3.1 Characteristics of a ‘green’ event**

A ‘green’ event has certain ample over-arching characteristics; these have been developed from the Sustainable Olympic Games definition as proposed by Phillip Furrer in 2002. Green events must:

- Contribute to the sustainability strategies or sustainable development agenda of the host city, region or country through their legacy
- Be conceived from the start as an opportunity to attend to urban and regional challenges and to promote development solutions and innovations which maintain and improve the quality of life of the community
- Lead the management of all local and regional resources in a way that operational requirements can be attained while still ensuring the maintenance of harmonious socio-economic surroundings, and protecting the cultural integrity, biodiversity and life support systems of the host
- Include the public through participation and consultation processes at the earliest stage
- Benefit equally all of the host population
- Identify and manage risk and mitigate distress and drawbacks experienced by the host



These overarching characteristics are practiced through components that form the skeleton of the event greening project. These components differ per event, however all events investigated and assessed for this thesis have at least six out of fifteen of the suggested components.

### **3.3.2 Components of event greening**

There are a few generic components which should occur in all event greening programmes. In affect these should be used to determine whether the event is truly and justifiably sustainable or “green”. These components are;

#### **3.3.2.1 Policies and management plans**

A sustainable development or sustainability policy should be developed for the event. This policy acts as the guiding document for the strategy. It should outline the intentions of event greening and put all those working on the event on the same proverbial page. This policy could be principle

based as in the case of the ICLEI World Congress 2006 where the event was confined to one main venue. A principles based approach, should work with in a thematic framework even if a full management plan is not necessary (Katzel, 2006).

In the case of the Sydney Olympics 2000, the development of Environmental Guidelines (EG) occurred. An Environmental Management Plan (EMP) was formed as a management tool to meet the objectives discussed in the EG (Environment Australia, 2000).

### **3.3.2.2 Sustainable procurement**

The insertion of specification concerned with purchasing products and services inline with sustainability principles into procurement processes is sustainable procurement. Companies tendering for construction, service delivery or supplier of products are required to submit details demonstrating how they will incorporate the sustainability principles into the specific tender requirement. The sustainability principles include environmental, social and local economic standards for the event. It is imperative that during the selection of suppliers for all aspects of the event, these principles are mainstreamed into the event coordination and procurement process.

At the WSSD in Johannesburg the tenders were specifically customised to ensure applicability of the sustainability issue associated with that specific produce or service. The sustainability manager was present at all tender screening and presentations. In some cases spot checks were conducted at the suppliers premises, to verify the suppliers promises and assess whether recommended alterations had been satisfactorily implemented (GWSSD LL Report, 2003). The objectives of sustainable procurement are:

- Reduce waste at source by ensuring a minimization of packaging and biodegradability of product
- Ensure use of recycled or reused materials
- Protection of biodiversity by screening products that may use materials from threatened or endangered plants and animals
- Manufacturing factories have health and safety regulations and fair labour practice can be demonstrated
- Manufacturing process is energy and water efficient and an ethos of eco efficiency persists through the values of the company.



- Locally produced items are seen as preferential and encouraged, stimulating the local economy and allowing the economic benefits of the event to truly benefit the local market and community.

### **3.3.2.3 Life cycle costing (LCC) or life cycle assessment**

This involves assessing a product from ‘cradle to grave’, in terms of its environmental and social costs. A component is assessed based on its manufacturing process, use and disposal in terms of energy and water usage, green house gas (GHG) emissions, labour practices, solid waste generation and by-product pollutants. This process forces suppliers to scrutinise their products and ensure that the sustainability integrity of the product is on a par with the quality and price (Environment Australia, 2001). A LCC can be integrated into the sustainable procurement process.

### **3.3.2.4 Integrated waste management**

The basic principle with regard to waste management is to minimize waste and maximize recycling. The concept of the three “R”s: reduce, reuse and recycle, is a mantra found in all integrated waste management systems. The objective is to divert as much waste as possible from landfill. The Sydney Olympics greening projected diverted 80% of waste through recycling and composting (Environment Australia, 2001).

The waste management system should begin with the procurement process. The procuring of products should speculate a requirement for reduced packaging, using recyclable or biodegradable materials. Recyclable paper using non-toxic inks should be used for tickets, banners or other communication material. The use of electronic billboards, email booking, online and electronic notices should replace paper communications tools. The banning of certain products should be considered if environmentally responsible alternatives exist and are accessible. A separation-at-source programme should be set up. This includes a multi-bin system or separation bin system, where recyclable waste can be clearly disposed of into a specific bin. Best practice in waste separation includes use of colour –coded waste recycling station, use of compost from organic waste in landscaping and most importantly public education on recycling and waste separation (Environment Australia, 2001).

A waste management system must be supported by an education campaign. This should include posters on the bins specifying what waste should go in which bin. It should be supported by waste monitors at the recycling stations assisting the public.

### **3.3.2.5 Awareness raising and education**

An event can provide an ideal opportunity to communicate to a direct targeted audience messages about sustainable development and environmental best practice. The event is used to drive consumer behaviour change messages. These are designed to encourage a consumer consciousness and work together to upgrade the host city or region to one of high environmental and social standards. Events are excellent mechanisms to roll out awareness-raising and education campaigns pertaining to local environmental and social issues and promote a sustainable lifestyle (Katzel, 2006). The use of events as advocacy tools is demonstrated increasingly through mega-events like the Olympic Games. The IOC together with UNEP and other partners is active in promoting sustainable development in sports internationally and regionally. In Beijing 2008 a far reaching educational and public awareness campaign on sustainable events is anticipated to occur. This is being made possible by a partnership between the Beijing Organising Committee for the Olympic Games (BOCOG) and UNEP that was organised solely for this reason (IOC, 2006).

Large media exposure of some mega-events can be accessed to drive sustainability messages to a public audience. The benefits of education, awareness and the formation of new habits and attitudes as a result of a green event, is a huge benefit.

### **3.3.2.6 Water conservation**

The use of water conservation devices such as dual flush toilets, roof-fed water tanks, water saving shower roses and appropriate irrigation systems all assist in reducing the use of water. The hotels should be encouraged to use low –water use appliances including dishwashers and washing machines.

Infrastructure should be built with waste water and rain water collection systems or tanks. This is known as grey water and can be used for irrigation, toilets and even for construction purposes. This requires a dual pipe system which has been used in the Village and venues at Sydney Olympic Park. This system provides recycled non-potable water for toilets and irrigation saving the processed clean potable water for drinking and cooking. The use of ecological services such as wetlands to remove pollutants from waste water can be used for certain event venues (Environment Australia, 2001).

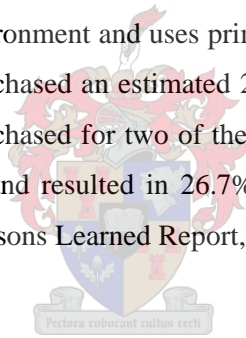
Water quality should be protected by minimizing the use of pesticides in landscaping and chemicals for cleaning. Landscape design should facilitate a water saving agenda by planting indigenous plants, devising irrigations systems that use less water and designing appropriate to climatic conditions.

### 3.3.2.7 Energy conservation

This incorporates two ideas, one is regarding renewable energy and the second is regarding efficiency. Energy efficiency plays a large role in terms of maintenance cost of venues and stress on the host city's power supply. The use of energy efficient light bulbs and appliances in conference centres, halls and stadiums contribute to cost savings as well as energy saving. Selecting construction material for thermal performance, use of insulation and natural ventilation in venues and hotels contribute to reduced energy consumption. Passive solar building design and orientation of rooms to maximize sunlight use can reduce electricity requirements by 50%.

The use of renewable energy resources that are off the municipal electricity grid are featuring increasingly as viable options for addressing energy efficiency. At the Forum 2004 in Barcelona a large solar panel module, produced 1.3MW of electricity. This electricity is used directly in the venue buildings and conference centre (Forum, 2004)

The purchase of Green Power as a method of accessing renewable energy is becoming more standard. Green power or green electricity is electricity generated from and with technology that minimizes the impact on the environment and uses primary energy sources that are renewable. The ICLEI World Congress 2006 purchased an estimated 255MWh of Green Power (Katzel, 2006) At the WSSD Green power was purchased for two of the main venues including Ubuntu Village and NASREC (civil society forum) and resulted in 26.7% of all electricity consumption being from green power sources, (WSSD Lessons Learned Report, 2003).



### 3.3.2.8 Green house gas (GHG) compensation initiative

This is sometimes known as carbon mitigation programmes or climate neutral projects. Climate change is influenced by the emission of green house gases (GHG) into the atmosphere. The effects of climate change are predicted to cause unmanageable natural changes (WSSD LL Report, 2003).

GHG emissions associated with events are mainly produced through air and land travel. A carbon mitigation programme offers participants of events, methods of compensating for their personal contribution to climate change. This is done using a *cash for tonnage* approach. Participants pay per tonne of emissions expelled, at a set fee (normally around 12 EUR) into a trust or holding account. This cash compensation is invested in clean development mechanism projects or carbon sequestration initiatives (reforestation) and mitigated over time through these projects (GWSSD, 2003). This process begins with the evaluation of the GHG produced by the event, through analysing the activities contributing to these emissions.

### **3.3.2.9 Stakeholder and community involvement**

A broad stakeholder engagement process, that includes business, community, non-governmental groups, interested and effected parties and government agencies should occur consistently throughout the preparation for the event. This is a democratic predisposition which offers additional benefits, such as community buy-in. It also builds a sense of team spirit and identifies opportunities for local integration and for a safe and strong volunteer base specifically on issues of environment. In Sydney 2000, Greenpeace was a major stakeholder, engagement proved to be beneficial in that they participated throughout the event from an advisory point of view and played a role in linking international perspectives and ideas on event greening with the local organisers (Environment Australia, 2001).

The community in which the event is being held should be consulted on the environmental and social impact of the event. In some cases this is achieved through the Environmental Impact Assessment (EIA) process at the planning phases where a land use change is occurring.

### **3.3.2.10 Ecological design and sustainable construction**

The construction of new venues provides opportunities to design and build these venues in ways that are eco-efficient, low cost and the actual construction process is environmentally compliant with legislation. Waste is avoided and minimized and aesthetics are kept aligned with the city skyline and image.

The use of innovation and technology is most important in this component. This includes innovative design concepts that contribute to the eco-efficiency and general aesthetics of the structures. It also is an area where alternative construction methods that are less polluting can be tried and honed. The Sydney Showground, SuperDome, Athletes Village and Stadium Australia were constructed with over 90% recycled or reused construction waste material. This proved to be very cost effective, as landfill space for the waste did not have to be paid for and the purchase of raw material was reduced significantly (Environment Australia, 2001).

### **3.3.2.11 Sponsorship**

Sponsors are critical stakeholders in the planning and staging of events, they provide products and services. They give the event a large showcasing value through marketing strategies and branding.

The integrity of corporate sponsors should be assessed prior to engaging them for the event. This includes ensuring the corporate sponsor's products and services will align with sustainability principles and objectives, and that they seek processes and products that run off sustainable or responsible supply chains. Corporate sponsors who respond positively to the sustainability

principles and use technology and innovation to produce sustainable alternatives, should be encouraged to use the event as an opportunity to publicise this in their marketing messages. In this way they achieve positive publicity and raise awareness (Environment Australia, 2001).

### **3.3.2.12 Transportation**

An efficient transport system providing access to the event venues, hotels and city sites is one of the most important components of an event. The preparation by a host city for a mega event often includes an improvement to the current public transportation system or the development of public transport infrastructure from scratch. Park and ride facilities, control on parking areas and car-free zones have contributed to easy and safe access to the event facilities. Improvement of the public transport in a host city is vital to reduce car dependence, traffic and air pollution. It is often integrated with urban planning and consolidation strategies. Some events organize venues in such a way that they can only be accessed through public transportation systems. Ticketing systems should be integrated with the event admission ticket, reducing the need for additional transportation tickets which create waste. Cycle ways and walkways are becoming more prominent in integrated transport systems. As part of the transport system improvement for the Olympic site in Sydney a permanent cycleway and walkway were constructed (Environment Australia, 2001).

The implementations of a transport system, which minimize fossil fuel use and reduce pollution, are being tried globally. The City of London is currently trialling Hydrogen Fuel Cell buses with the intention of purchasing a full fleet of these buses for the 2012 Olympic Games (LOCOG, 2005). The Sydney Olympics used 300 or more compressed natural gas buses (Environment Australia, 2001).

### **3.3.2.13 Biodiversity**

The preservation and protection of natural ecosystems is an international urgency. An event that requires construction of any type should first assess the habitat and species within that habitat. Endangered species and ecosystems protected under international treaties should be avoided at all costs. The interface of conservation landscape and event construction areas should be addressed through a management plan and establishment of a buffer zone if necessary.

The event landscaping should minimize disruption to wild biodiversity by protecting the genetic integrity of that habitat. This can be achieved through planting vegetation that is indigenous and complementary to the wild species. Non chemical pest controls on these landscapes should be used to control weeds and pests.

Many of the Olympic Games include the rehabilitation of ecosystems that are in very close proximity to the Olympic Park. The rehabilitation and revitalisation of natural systems is often a recreational and ecological legacy from the Games. In Sydney a wetland system was restored by returning the tidal flushing to salt marsh in the Silverwater Nature Reserve. The entire ecosystem has been regenerated (Environment Australia, 2001).

#### **3.3.2.14 Urban renewal**

Cities use events as catalysts for urban renewal and regeneration projects. These are projects that reverse the decline of the state of life in the inner city. This contributes to the socio-economic development of a city. The Winter Olympic Games staged in Turin facilitated a reintegration of the city through infrastructural development. This was all part of the cities urban renewal and sustainability strategy ([www.torino.com](http://www.torino.com), 2006)

#### **3.3.2.15 Leaving a positive legacy**

There are many dimensions to legacy from commonly recognised tangible aspects to intangible aspects. The tangible dimension is that of architecture, urban planning, venues, city marketing, infrastructure, economic and tourism development. Intangible dimensions include production of ideas and cultural values, intercultural and inclusivity experiences (gender, disability, and ethnicity), popular memory, education, collective efforts and voluntarism, experience and knowledge generation and innovation. The combination of the intangible and tangible develop lasting legacies for a host city or country (IOC, 2003).

Construction of buildings, transportation systems and awareness-raising can all be classified as legacy of an event, as they have long term opportunities for the host city or country and their impact is felt and retained for many years post event. A venue that is build with eco-efficiency is a positive legacy, as it will contribute to cost savings and reduction in consumption of energy and water for its entire life span (IOC, 2003)

Legacy planning, specifically with regard to infrastructure, can assist in justifying the large capital investment made in the hosting of mega-events. It ensures that the hosting of an event contributes to the development and consolidation of facilities and programs that will benefit local communities for many years. The infrastructure particularly should be built and managed so it is useful for future generations. The legacy of an event can be the method used for obtaining maximum value for money to offset against the capital investment and possible initial financial deficit (GoJ, 2003).

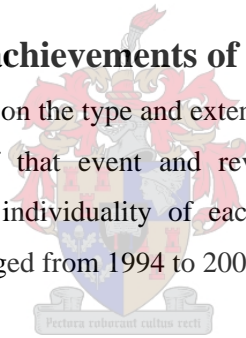
It is important that the short term event requirements are planned and administered in a manner that ensures long term positive returns on investment. Aspects of an event relating to legacy should be

considered from the time the decision is taken to bid for a mega-event. The possible long term effects, the benefits for the host community and the contribution to global sustainability should all form part of the initial consideration (IOC, 2003).

The thesis, so far, has established that there is a relationship which exists between events, their management and impact and sustainable development. This has all come together in a process known as event greening. Many events especially large scale or mega –events have attempted to apply sustainable development practice and principles to the event. The following section is a brief outline of events selected for the assessment component of this thesis. This brief outline will further confirm the dissimilar nature of defining a green event, in an attempt to illustrate the need for a standardized approach. These event greening projects incorporate an assortment of interspersed characteristics and components, rendering each event greening approach unique. The intention of this section is to point out the individual innovations and interesting aspects of each event, in an attempt to illustrate the problems being created by defining each of these projects as a green event, when they are so completely different.

### **3.4 The “greening” achievements of the selected events**

This section includes information on the type and extent of the event itself, a few interesting details on the sustainability aspects of that event and reviewed success stories and extra-ordinary experiences to demonstrate the individuality of each event. The events chosen to prove the hypothesis are those that were staged from 1994 to 2006 and those in planning phase 2007 to 2012.



#### **3.4.1 Lillehammer 1994 Winter Olympic Games, Lillehammer, Norway**

The hosting of the Winter Olympic Games in Lillehammer increased the population of that city from 23 000 to 100 000 over a two week period. This led to environmental pressure, infrastructure stress and congestion. The pressure was mitigated to a certain extent through an event greening project. This was the first greening project to be documented and publicized internationally (Borne', 2003). It involved cooperation between environmental groups and the organizers. Four guidelines were produced for the event,

- 1 Companies were instructed to use natural materials wherever possible
- 2 Emphasis was placed on energy conservation in heating and cooling systems
- 3 A recycling programme was developed for the entire Olympic Games region with the aim of recycling or composting 70% of the generated waste

4 A prerequisite was made that the venues must be built in harmony with the surrounding landscape.

Cavern Hall, one of the venues constructed for the event, was built inside a mountain, using special construction methods, this venue saves \$US120 000 annually in heating owing to this methodology. There was an increase in environmental awareness, some damaged landscapes were remediated and stakeholder engagement processes occurred. The effort to host an environmentally friendly event was equally distributed amongst stakeholders. This was the first step event. The organizers were candid in their reporting and acknowledged the positive and negative aspects with a view for the next Olympic Games to build on the lessons learned from Lillehammer (Chernushenko, 1994). This event greening project focused on environmental dimensions and impacts.

### **3.4.2 Sydney 2000 Summer Olympic and Paralympics Games, Sydney, Australia**

Sydney 2000 was a robust and integrated demonstration of planning for sustainability. A full event greening project plan was developed. The entire event management plan was scrutinised and the event greening project was superimposed on that management plan. Environmental realisations extended throughout the host city mandated requirements, including planning and construction of venues, energy and water conservation, waste minimization and management, air water and soil quality, protection of natural and cultural environments, event management, merchandising, ticketing, catering, transportation and noise control (Environment Australia, 2000).

A contaminated wasteland was turned into the Olympic precinct. Water reclamation and management systems were constructed to treat, recycle and reuse sewage and storm water. This system has reduced the water demands in that area by 50%. The Olympic precinct included the Olympic village which was constructed with solar generated power. Today this area is one of the largest solar powered suburbs. The main stadium was constructed using sustainable building techniques and ecological design. Compared to ordinary building methods this has resulted in a 30% energy reduction, 37% GHG emissions reduction, 13% water use decrease with 77% of water used either recycled or captured on site. A natural ventilation system has been designed and uses natural buoyancy of warm air to expel rising air and pull in cooler external air at low levels. The stadium has a dual water reticulation system, drinking water is only used for human consumption and all other water use is grey water. A life cycle analysis was performed on the stadium and determined the true performance of the venue over 50 years and the true environmental costs. This is a key legacy of the Games (Environment Australia, 2000).

Six hundred and sixty five permanent dwellings were fitted with photovoltaic cells for generating household energy they were constructed using 92% recycled material. A 70-kilowatt rooftop of

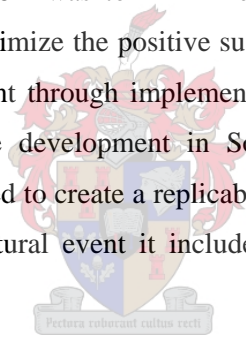


solar power is featured on the roof of the Sydney SuperDome, feeding electricity directly into the city power grid system. The use of green energy at the Sydney Games resulted in the saving of more than 26 000 tonnes of carbon dioxide emissions. A venue environmental plan assisted venue operational teams to understand the eco-features of their specific venue, identify risks, impacts and opportunities and develop a set of tools to assist in achieving environmental objectives during the staging of the Games (Environment Australia 2000).

Full lessons learned and environmental report was publicly released after the Games as an evaluation document and guide for future events.

### **3.4.3 The United Nations World Summit on Sustainable Development (WSSD), Johannesburg, South Africa, 2002**

The GWSSD was an initiative funded by the Global Environment Facility (GEF) and the South African Government. This summit provided organisers with an opportunity to demonstrate sustainable development in action by ensuring it was hosted in a way that reflected the events cause and mandate. The goal of GWSSD was to minimize the negative environmental impact of the WSSD on Johannesburg and maximize the positive sustainable development legacy. The initiative promoted sustainable development through implementing environmental best practice, raising of public awareness on sustainable development in South Africa and creating information and documented fact that could be used to create a replicable model (Greening Guidelines, 2003). This event was a conference and cultural event it included meetings, launches, music concerts and exhibitions.



The GWSSD followed an approach of intervening into the mainstream event management process. These interventions were either of a socio-economic or environmental nature. GWSSD was not integrated into the event management process itself. The GWSSD was an initiative run in parallel to the event management. The interventions included sustainable procurement, waste management, water conservation, energy efficiency (use of Green energy), public awareness and education and monitoring and evaluation. A number of flagship projects also contributed to the GWSSD such as a carbon neutral project known as the Johannesburg Climate Legacy (JCL), which was innovative and pioneering prior to Kyoto's ratification (GWSSD Lessons Learned Report, 2003).

Behaviour change through public awareness and media campaigns was a main component of the GWSSD. Environmental and social responsibility messaging was stressed throughout the planning and staging of the event. The GWSSD exemplified the effectiveness of partnerships in achieving sustainable development and acted as a catalyst for such practice in the rest of South Africa. No infrastructural or construction intervention occurred. The GWSSD placed emphasis on socio-economic intervention as well as environmental. This was predominantly a response to the developing country nature of South Africa and its subsequent battle with extreme poverty.

Approximately 27% of waste generated by the WSSD was recycled. The WSSD generated about 120 000 tonnes of carbon emissions, the majority of which were produced through air travel of delegates and participants. 40% of these emissions were offset through the JCL, 26% of all the energy used was Green Power (GWSSD Lessons Learned Report, 2003).

The WSSD provided a platform to baseline a mega event in a developing country. It also produced numerous publications and documentation to assist other host cities or countries with a framework and guideline for event greening (GWSSD Lessons Learned Report, 2003).

#### **3.4.4 Universal Forum of Cultures (UFC), Barcelona 2004**

The UFC was jointly organized by the Barcelona City Council, Catalan Autonomous Government and the Spanish National Government. Together with UNESCO this international event was designed to promote interaction and communication among diverse cultures and debate challenges and opportunities humanity faces with in the context of globalization. The activities demonstrated at the UFC were mainly associated with three themes; cultural diversity, sustainable development and conditions for peace. The main venue was constructed as part of the urban regeneration programme of Europe. The site chosen for the UFC was a coastal strip with industrial relics and uninhabited buildings. A sewage treatment plant and an urban waste incinerator were on the site servicing over six surrounding districts. The UFC transformed this area into a habitable, recreational site and maintained the sewage treatment plant and the urban waste incinerator and integrating these functions into the facility. The sewage plant infrastructure was upgraded to world class specifications; using compact design technology this brought the water quality of the treatment plant in line with regulations. The urban waste incinerator upgrades included the integration of a system that was based on the re-use of water vapour. The heat generated by this plant was captured and used for the facility. The vapour was used in the heating and air conditioning system of the Forum Building and the Barcelona International Convention Centre (Forum Barcelona, 2004).

Environmental management criteria were developed in line with the sustainability principles of UNESCO. These criteria were applied at the beginning of the planning process and were followed through the event staging and finally to the dismantling phase. They were applied to both permanent, infrastructural developments and temporary structures for the event. Many of the interventions were visible and entwined with the main event themes and objectives that the infrastructure itself served as showcasing of innovations for sustainable development it was a type of “living” exhibition. Barcelona constructed a photovoltaic module of 10,500 m<sup>2</sup> surface area, capable of providing electricity for the buildings and housing in the area, this facility produces 1.3 MW. It has a carbon emission saving of 450 tonnes (Environment Department Barcelona, 2004). The UFC fleet were run on biodiesel, manufactured from cooking oils and other bio-oils collected

as waste from the site itself. Electric cars, hybrid vehicles and bicycles were used (Forum Barcelona, 2004).

### **3.4.5 The United Nations Conference on Climate Change. Conference of Parties 11 (COP11) and the Fourth Municipal Leaders Summit on Climate Change. Montreal, Canada 2005**

The COP 11 event greening project used a green meeting approach. A green meeting strategy was used to address the environmental and social impacts of the event. The main emphasis was on pollution prevention this included, emissions, solid and liquid waste and energy and water waste. The implementing of recycling facilities at major venues was stressed, as was energy efficiency. All paper distributed at the COP 11 was printed on a 30% recycled paper content. A waste minimization process occurred, where reduction in packaging and disposable catering equipment was encouraged (Environment Canada, 2005). This conference was a fully carbon neutral conference, through conversion of emissions into credits. The credits were sterilized through wind energy generation projects. Canada did not count these credits towards its Kyoto targets, as this project was pursued as a leadership and showcasing mechanism to stimulate similar practice and create a precedent for future UN conferences (Hebert, 2006).

### **3.4.6 Torino 2006 Winter Olympic and Paralympics Games, Torino, Italy**

The main achievement of the sustainability strategy for the Torino Games was the success of the spatial planning. The Olympic Games was used as rationale to transform the historically segregated city. The city was transformed into a coherent sustainable urban centre, through the construction of networks of facilities, urban restyling and renovation and all connected by an improved street and railways network. The infrastructural changes and urban restoration for the Olympic Games were implemented in line with the '*Strategic Urban plan of Torino*' a strategy that started implementation in 1993 and will conclude in 2011. This sense of legacy is felt throughout the infrastructural developments both new and upgraded. Technological innovation and environmental quality improvements have created a region with a new identity, a literal re-launch of the image of the city internationally. This is expected to have lasting socio-economic benefits as a legacy of the event ([www.torino2006.org](http://www.torino2006.org)).

### **3.4.7 ICLEI 2006 World Congress. Cape Town, South Africa**

This congress took place in an already built facility known as the Cape Town International Convention Centre (CTICC). The size of this conference was dramatically smaller than other events featured in this thesis. The uniqueness of this event greening project was in the types of stakeholder engagement processes that occurred and the subsequent legacy this has left, especially in an emerging economy.

A set of ten sustainability principles were developed through a public participatory process. These principles were publicised prior to and during the staging of the event, as guidelines for exhibitors, participants and delegates. A full auditing process occurred, on energy, water and waste production as part of the monitoring and evaluation process. At the CTICC, 66% of solid waste was recycled. Training on event greening practice and rationale was conducted broadly to include the event management team, the city's marketing agency and the main venue's staff. Sustainable procurement processes tilted towards a more social agenda, trying to involve local, marginalised communities in the event and equalise the economic benefits of the congress. The entire event was run on green power sponsored by a corporate partner (Katzel, 2006).

### **3.4.8 The Commonwealth Games 2006, Melbourne, Australia**

The Commonwealth Games 2006 were the largest sporting, cultural and community event to be hosted by the State of Victoria. The sporting event was supplemented with a Festival Melbourne 2006. Melbourne has 62 000 residents the Commonwealth Games added 40 000 international guests and 50 000 interstate visitors to the city. The host city pursued an extensive stakeholder engagement process, mobilizing communities and NGO groups to participate voluntarily in the sustainability interventions. Sporting messages and sustainability messages were publicised prior to and during the staging of the event. The Commonwealth Games was seen as an important vehicle for stimulating behaviour change and respect for the environment and educating the community on sustainability in a practical relevant way ([www.melbourne2006.com.au](http://www.melbourne2006.com.au)).

This event greening strategy was based on three objective; Waterwise, Carbon Neutral and Low Waste. Environmental risk assessments were conducted to determine minimisation strategies. Water efficient appliances, grey-water and storm-water recycling were used at The Village. Use of native landscaping to ensure low water use and biodiversity conservation were key goals. 95% of construction and demolition waste was diverted from landfill, supplemented by an anti-litter communications campaign and environmental procurement criteria and guidelines to reduce waste. A carbon off –set programme occurred through a tree planting sequestration project (Tunney, 2004).

The following events have been included however they have not yet been staged, and are therefore assessed based on sustainability strategy documents and plans, interviews and academic writings. The assessment is based on potential of the event and show progressive sustainability planning for mega events.

### **3.4.9 Beijing 2008, Summer Olympic and Paralympics Games Beijing, China**

China is still classified as a developing country. This declaration implies an immense focus of the governments' strategy being related to poverty alleviation, economic growth and response to globalization. The push for economic development has been very forceful and has resulted in large industrialization specifically in manufacturing. This industrialization and push for economic growth has impacted tremendously on the environment (pollution and natural resource depletion being the fundamental issues). The Chinese government is aware of this impact and are continuously trying to find a balance between further industrialization and environmental protection (Borne', 2003).

Beijing is one of the world's top ten polluted cities. It has a local population of 13, 8 million permanent residences. The city is undergoing industrial urban development that is constantly altering the urban environment and increasing the city population. This natural urbanization phenomenon is contributing in and of itself to pressure on municipal infrastructure and resources (World Health Organisation, 2003). The hosting of the 2008 Olympic Games will further add to these pressures.

Beijing assured the IOC that in preparation for the 2008 Games, China would invest significantly in improving the environmental quality of Beijing. The cities main environmental problems are air, water and land pollution, from industry and automobile emissions. China has committed \$US17.9 billion to improve infrastructure and environmental quality in Beijing. The Government has an 'Action Plan for the Green Olympics' which focuses on programmes being initiated to ensure the 2008 Olympic Games are environmentally responsible. The "Action Plan" aims to turn the city into a "green city", by reducing emissions, protecting water, urban spatial planning modifications and improving city infrastructure (Sinton et al, 2001).

In 2005 the Beijing Organising Committee of the Olympic Games (BOCOG) developed the Environmental Guidelines for Renovated Venues and the Environmental Guidelines for Olympic Overlays. The BOCOG also promoted the use of eco-efficient technology for the venues under construction. The air pollution created from construction is being monitored by an air quality monitoring substation. Eight thousand tons of waste steel scraps have been used to construct the roadbed, 40 000 tons has been used in the underground structure of the National Indoor Stadium. Solar energy turf, court and street lamps have been used in the Olympic Village (BOCOG, 2005).

### **3.4.10 Vancouver 2010 Winter Olympics and Paralympics Games, Vancouver, Canada**

The Vancouver Olympics, according to bid material and strategies, will be the first Olympic Games to incorporate a balanced, integrated sustainability approach incorporating environment, social and economic realities. This is well defined in their sustainability policy which calls for environmental

stewardship, economic opportunity and social responsibility. The Olympic Games are being directed by the vision statement for the Vancouver Games which is *“To Create sustainable legacies for athletes, sport development our host communities, our province, our country and the global Olympic family by hosting an outstanding Olympic Winter Games and Paralympics Games”* this statement is guiding decision-making throughout the preparations for the Olympic Games (Jedras, 2004).

Environmental stewardship of this Olympic Games is centred on minimising impacts and further raising the Olympic bar. It includes resource conservation, pollution prevention and protection of natural systems. Buildings will be site selected according to sustainability, water and energy efficient. Clean transportation technology will be used, energy efficiency and green energy will be a top priority, integrated waste management will occur with an emphasis on reduction. It is anticipated that the Olympic Games will be carbon neutral (Baker, 2002).

Economic opportunities exist when hosting Olympic Games go beyond the direct investment discussed in most cost-benefit analysis. Vancouver aims to turn 17 days into 17 years of economic prosperity. The plan is to maximize the access of Canadian businesses to benefits from the Olympic Games, support trade and investment, improve social equity and strengthening partnerships between stakeholders. There is a large training and skills development programme underway. Procurement has been localized as much as possible; media will be leveraged for promoting tourism and investment into the city. Government is working on sector and community strategies to pull local business and people into the main economy (Baker, 2002). The long term economic benefits are a key driver in civil support for the hosting of the Games, and as such the sustainability strategy documents seem to suggest that this economic development is the central concern around which the rest of the strategy is being built.

Social responsibility entails delivering an inclusive, accessible and responsible Olympic Games and creating sporting legacies that promote healthy lifestyles. Communications campaigns will occur promoting diversity and celebrating cultural and national heritage. Awareness raising programmes to increase the understanding of sustainability and offer consultation and assistance for change will occur throughout the city. The city will benefit from additional affordable housing and recreational facilities (Baker, 2002).

Vancouver 2010 has gone through an extensive community involvement and public participation process. It is the first strategy that incorporates issues such as marginalization, housing stock and employment.

### **3.4.11 London 2012 Summer Olympics and Paralympics Games, London, United Kingdom**

The London 2012 Olympic Games may prove to be one of the most sustainable mega – events ever to be organised and staged. This statement is based on the literature available promoting the sustainability strategy for 2012. The application of sustainable development is at the core of the 2012 Olympic Games. This is demonstrated under the Games’ sustainability programme theme, ‘Towards a One Planet Olympics’ which aims to link the improvements at the local level (city) with initiatives that address global issues. The strategy has followed an integrated approach with set targets. These will be achieved through programmes and projects focused on five distinct themes: biodiversity, healthy living, inclusion, waste and climate change. These caption themes will form the sustainability strategic framework for 2012 (LOCOG, 2006)

The social development component to this strategy includes greater community inclusivity, involvement and accessibility to the direct and indirect benefits of the Olympic Games. The physical, economic and social regeneration of the Lower Lea Valley and surrounding communities will demonstrate the socio-economic benefits a mega-event can truly orchestrate. New infrastructure and facilities will be built employment, education and training will occur and the entire area will be uplifted to a modern, functional suburb of Greater London (LOCOG, 2006).

The Olympic Games is being set as a platform to show the world the challenges of climate change and accompanied long-term solutions to adapt and address this global issue. Climate change projects involve energy and water resource management, transport innovation, local food production and carbon offsetting. Energy efficiency and use of low carbon and renewable energy resources will be optimised in transportation and construction of infrastructure (LOCOG, 2006).

The LOCOG has a Sustainability Management System (SMS), which will draw upon the policies and targets of the local city sustainability strategy. It emphasises transparency and public reporting this will be assured by an independent authority. Partnerships are a major component of the SMS, and a sustainability steering committee will guide the processes and assist in achieving the ambitious targets (Environment and Meteorology 1:64-89, 2006).

The diversity of events chosen for this assessment is evident from the selected examples. This shows that many projects are being designed and implemented called event greening projects, and in fact they do all have event greening characteristics and components, however they are fundamentally different. This creates a circumstance requiring a formal analytical approach to determine what is meant by “greening”, and is there a basic standard that needs to be adhered to prior to calling an event a green event?

## 4 Chapter Four: Towards a measuring tool for event greening

Chapter three established the need for a tool to standardize or rate the effectiveness of event greening. This need is justified by the standardised branding of such diversely defined projects. This juxtaposition requires some kind of determination process so stakeholders are correctly informed of the realities. The author has chosen to use a rating system as a meaningful method for measuring the “greenness” of an event. An event would get assessed based on this rating system and given a percentage sustainability or percentage “greenness” as a way of illustrating the events degree of contribution to sustainability best practice.

This chapter illustrates the results of the analysis and brings the discussion back to assessing the aims and objectives of the research. It is a step by step proof of the hypothesis, and it goes further and responds to key objectives.

### 4.1 Scoring and data organization

Each event was scored according to the Sustainability Rating System. The scoring was simply a value of 1 for the presence of an indicator and 0 if that indicator was not demonstrated. Appendix 2 is a condensed matrix of the scores achieved by the different events. This scoring is completely subjected to the presence of information and at the interpretation of the author. The addition of the values of 1 provided each event with a number out of 62. This number was divided by 62 and multiplied by 100 to produce a percentage. The percentage represents the percentage of sustainability of that event, according to the methodology developed for this thesis. These scores and the calculated percentage sustainability were plotted in a few different graphs against different variables. These graphs and the statistical analysis which follow serve as proof for the hypothesis.

The scoring process did highlight problems with the criteria and indicators however this is not included in this thesis as this can be further refined in the intended future development processes. Each event was allocated a letter of the alphabet as a symbol to be used to easily represent the event in a graph or chart. Table 5 illustrates this data organisation and serves as a legend for the graphs which follow.



Selected Event	Symbol	Year	% sustainability	Score
Lillehammer 1994	A	1994	37	23
Sydney 2000	B	2000	65	40
WSSD 2002	C	2002	56	35
Forum 2004	D	2004	58	36
Montreal 2005	E	2005	55	34
ICLEI 2006	F	2006	50	31
Melbourne 2006	G	2006	66	41
Torino 2006	H	2006	65	40
Beijing 2008	I	2008	60	37
Vancouver 2010	J	2010	82	51
London 2012	K	2012	88	55

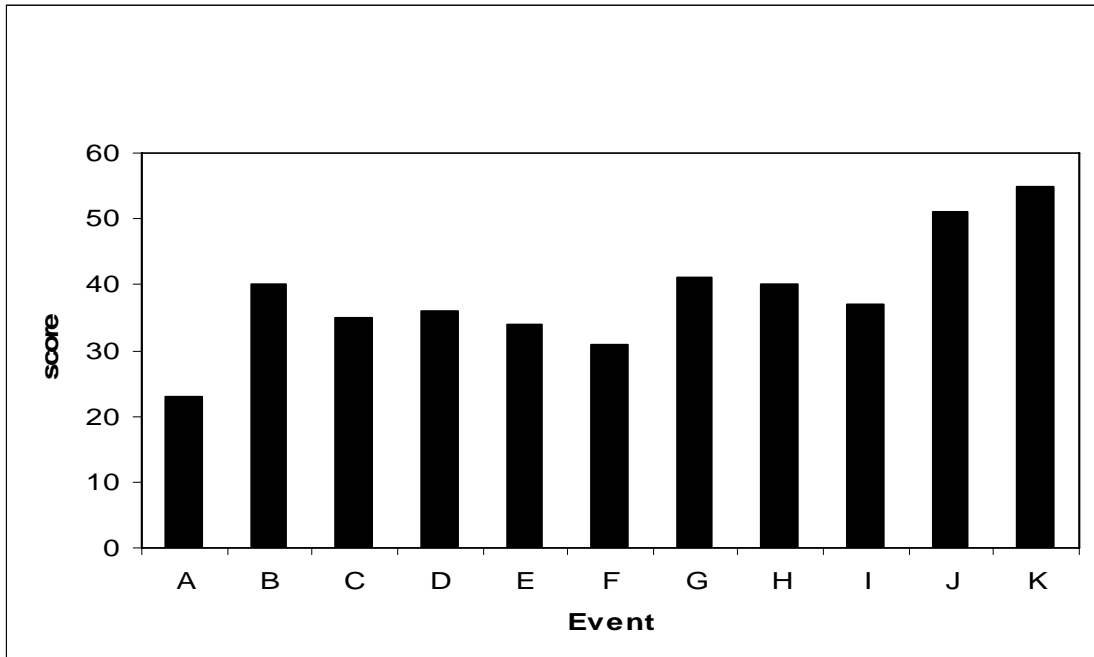
**Table 5: Data organisation and legend**

## 4.2 Data analysis

### 4.2.1 Comparability

In Graph 1 each event score as it was determined by the Sustainability Rating System is plotted against each other. This graph shows the different scores of each event. Comparing the different event scores will illustrate that event greening projects are improving and are becoming more sophisticated and all encompassing. Event K, London 2012 is predicted to be a high scoring event greening project, translating into programmes and interventions that should make a large contribution to sustainability.

The events selected for this analysis have scored on the Sustainability Rating System in a range of 20 to about 55. The majority of the selected events have scored between 30 and 40, this shows a consistency in the approach to event greening as depicted by Graph 1. Event B the Sydney Olympic Games sticks out as a high score among relatively lower scores, this shows that the Sydney Olympic Games set a high benchmark with regard to event greening projects. Event F ICLEI World Congress is showing a lower score which may be attributed to its size difference. Event A, Lillehammer was the first event greening project to be recorded and its low score may be attributed to its infantilism. If we compare all these events we can see that in comparison to Sydney the selected events that have already occurred have not managed to completely reach the high standard set by the 2000 Olympic Games. However the current plans for Vancouver and London Olympic Games suggest that these events will meet the Sydney standard and even raise the benchmark of event greening.



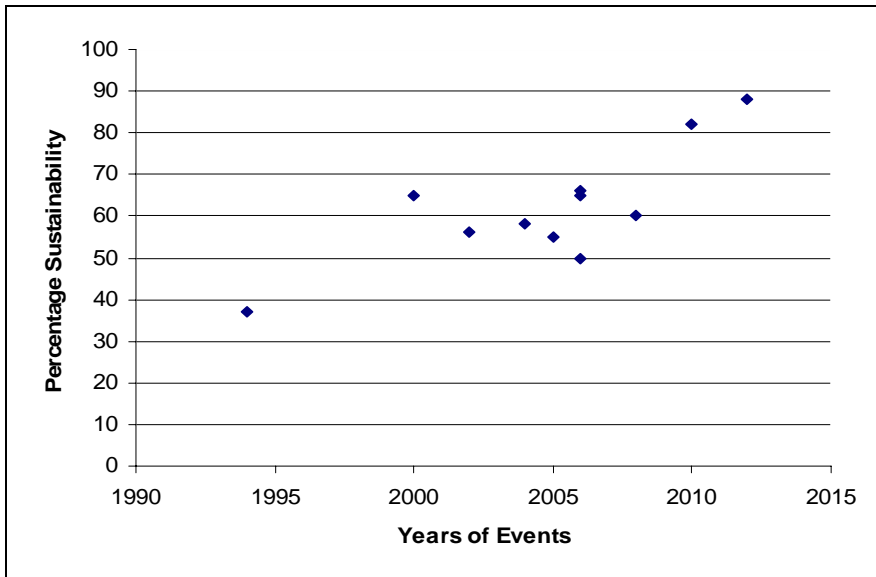
**Graph 1: Comparability of event scores**

#### 4.2.2 Tracking of the Evolution

The best way to ascertain whether event greening is evolving into a meaningful representation of sustainability best practice, is to track the scores of each event over time. The higher the score, or the higher the percentage sustainability the more evolved is the event greening project. The plotting of percentage sustainability over time, determines whether in fact event greening is becoming more refined and of higher quality and complexity. This is statistically determined through a correlation and regression analysis.

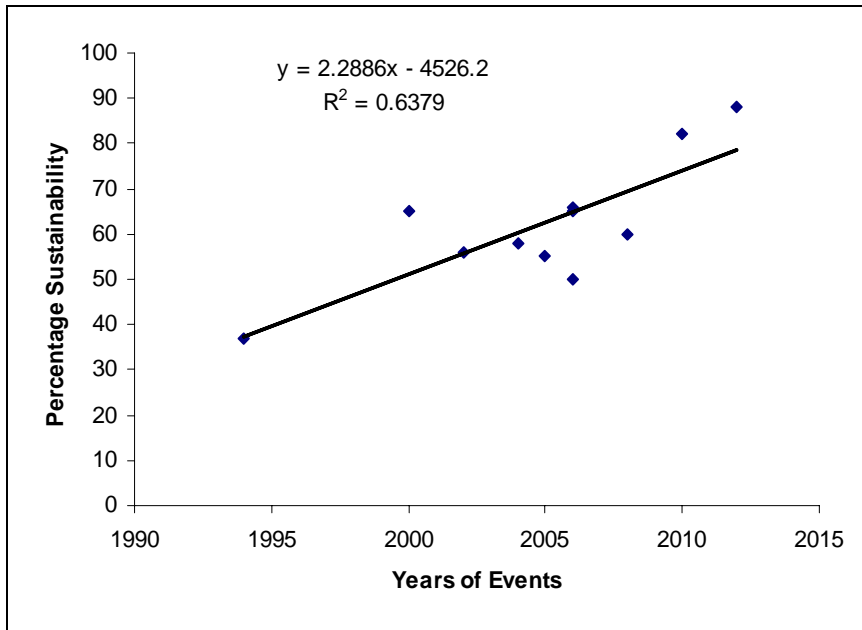
A correlation analysis quantifies how closely two variables are related, in this context the variables are percentage sustainability and time. The regression analysis is a statistical method used to predict trend. It is suggested throughout this thesis that event greening projects are becoming vehicles of sustainability best practice a regression analysis will determine if this is in fact the case and will predict if this trend will continue into the future.

For this analysis the score out of 62 is converted into a percentage. This percentage suggests the degree of sustainability achieved for that event. Graph 2 is a plot of the sustainability percentage against time. Graph 3 is the regression analysis to assess positive trend.



**Graph 2: Percentage sustainability over time**

Graph 2 shows a dramatic jump from 1994 to 2000 in the sustainability scope of events. It also shows that between 2000 and 2008 there is a cluster of percentage sustainability ranging from 50% to 68%. This indicates that there is a definite improvement in the quality of event greening projects being used for mega-events. It also suggests that more events are in fact being organised with event greening characteristics and components. There has been a marked improvement in the methods and in the amount of events applying sustainability principles. This could be owing to the hype created from Sydney 2000, which showed the world how to actually implement such principles. Another reason may be that the WSSD in 2002 put issues of sustainable development back on the global agenda and reinforced commitments from governments and organisations towards achieving sustainable development targets, and the results may be showing a response to this recommitment.



**Graph 3: Linear Regression Analysis**

Graph 3 is a regression analysis of the results in graph 2. Graph 2 shows a positive correlation coefficient ( $r$ ), this determines a slope that will rise from left to right. In this analysis  $r=0.79$  this shows a very high positive correlation between the percentage sustainability and time. The higher the percentage sustainability the more an event is in fact 'green'. There is definite increase in sustainability percentage over time, suggesting that the phenomenon of event greening is gaining momentum and has been doing so since the year 2000. It also suggests that the quality of event greening is improving over time and is evolving into a substantial management system that reflects sustainability best practice. When  $r = 0$  there is no correlation, the closer  $r = 1$  the more correlated are the variables. In that case of Graph 2 as time precedes so the sustainability percentage of event increases. An increase in time suggests an increase in sustainability percentage, this is the correlation.

The  $r^2$  value determines the ability to predict relationships between these two variables. Regression analysis shown trend over time and allows a prediction of circumstances based on the current evidence. In graph 3 the regression analysis suggests that over time, in the next few years the quality of event greening will be improved. Event greening projects will yield events that are truly 'green' and contribute to global sustainability best practice increasingly.

The use of the Sustainability Rating System and how it relates to global sustainable development issues is illustrated in Table 6. It shows the sustainable development issues that are associated with each of the indicators and criteria that were developed for this thesis. This table illustrates that the measuring of percentage sustainability of events or percentage 'green' has a direct relationship with global sustainability issues and as such can be used to prove the hypothesis.

Criteria	Sustainable Development Issue		Indicator
Policy and green/sustainability principles for the event	National strategies for sustainable development	1	A set of sustainability principles have been developed and adopted by the local organising committee
	Consumption and production Precautionary approach	2	Tenderers are required to demonstrate adherence to the sustainability principles and or policy
	Capacity building Education and awareness	3	The local organising committee or company have a sustainability person on the team
	Innovation	4	A sustainability or event greening initiative exists
	Mainstreaming of sustainable development	5	A sustainability or event greening initiative exists as part of the organising of the event
	Stakeholder engagement	6	A stakeholder engagement process exists
	Stakeholder engagement National strategies for sustainable development Public private partnerships	7	There is government buy in for the sustainability or event greening initiative
	Compliance	8	Local legislation is complied with
	Compliance Monitoring and evaluation	9	International commitments through multilateral agreements is complied with
Public transportation is encouraged	Sustainable mobility based on integrated transport systems	10	There is an efficient public transport system used for the event
	Energy efficiency Consumption and production Health and Safety Alternative energy resources Innovation Technology and science	11	Travel cards or tokens are easily and readily available
		12	Accommodation for the event is in close proximity to the venues
		13	Innovative transport types and projects are initiated
Waste Management system in place that adheres to sustainability principles		14	Non-polluting public transport is used (Bicycle and walkways)
	Sustainable human habitats Business development for sustainability	15	Recycling programme present
	Awareness raising and education Sustainable human habitat	16	Multibin system for waste separation is present
	Awareness raising and education	17	Information is given to patriots on how to use the multibin system
	Production and consumption Development of "green" industries and products	18	Biodegradable products are purchased where possible
	Production and consumption Awareness and education Standards and measurements Monitoring and evaluation Climate change	19	A sustainable procurement processes exists to minimise non recyclable waste to landfill
	Awareness raising and education	20	Educational material is used to minimise waste production and inform the participants
	Production and consumption	21	Separation bins are disposed off into correct recycling vehicles
	Innovation Monitoring and evaluation	22	Electronic alternatives are used for paper and posters
Reduced consumption of Natural Resources		23	Controls exist to ensure the recycling programme is as successful as possible
	Innovation Science and technology "green" services and products	24	Use of recycled construction materials and alternative environmentally acceptable materials
	Energy Climate change	25	Venues are designed with energy efficiency technologies and materials
	Water Biodiversity Human health Habitat	26	Venues are designed with water efficiency technologies and materials (dual flush toilets, irrigation systems)
	Climate change Energy Urbanisation Habitat	27	Construction techniques that minimise waste and air pollution are used
	Water Biodiversity Climate change	28	Biodegradable products are purchased for cleaning
	Climate change Energy Innovation Science and technology	29	Alternative types of renewable energy is used as much as possible (solar heating and lighting, wind energy)
	Local economic development Poverty alleviation Climate change Consumption and production Trade	30	Purchasing of local products (with in a set radius) is preferred through a sustainable procurement process
Water	30	Grey water is used in venues and hotels	

	Energy Biodiversity		
Combat Climate Change	Climate change Energy Awareness raising and education	32	A carbon neutral programme exists (voluntary)
	Climate change Biodiversity Production and consumption	33	A tree planting initiative exists
	Climate change	34	A green house gas and emissions account for the event has occurred
	Climate change Public private partnership Poverty alleviation	35	A sponsored carbon neutral programme exists for the event
Human health and well being	Fair and just labour practices Local economic development Human health Poverty alleviation Consumption and production	36	Workers on venues and for the event observed health and safety practices
	Biodiversity Water Human habitat Urbanisation Human health	37	There is an upgrade of public spaces such as parks, sidewalks, beaches and river basins
	Climate change Human health Urbanisation Biodiversity Water	38	Planting indigenous trees and plants and improving aesthetics of the host area
	Poverty alleviation Equality Access and benefits sharing Local economic development Awareness and education Climate change Capacity building	39	There is preferential purchasing of materials or goods produced by marginalised communities or the poor
Education and Awareness Raising on sustainability	Awareness and education Stakeholder engagement Human habitat Urbanisation Capacity building	40	Information is provided to participants on the event greening initiative seeking their participation and cooperation
	Poverty alleviation Awareness and education Capacity building	41	Information is provided to employees on the event greening initiative seeking their participation and cooperation
	Public private partnerships Consumption and production Water Energy Human habitat Poverty alleviation Climate change	42	The hospitality industry is involved with the event greening initiative
	Awareness and education	43	A public communications campaign on sustainability exists
	Innovation Awareness and education Technology and science Private public partnerships Stakeholder engagement Capacity building	44	Showcasing opportunities of sustainability issues and solutions exist
	Capacity building Poverty alleviation Awareness and education	45	Training programme for employees occurred/ is planned
	Capacity building Poverty alleviation Awareness and education	46	Training programme for volunteers occurred/ is planned
	Equity Awareness and education Poverty alleviation Stakeholder engagement	47	There is a cultural programme
Cultural integrity	Local economic development Equity Capacity building Urbanisation Private public partnerships	48	Local communities are involved with the event
	Equity Awareness and education	49	Volunteers are local communities of different ethnicity
	Local economic development Poverty alleviation Awareness and education	50	Participants are encouraged to contribute to the local economy

	Urbanisation		
Legacy Planning and aspects that last	Urbanisation Energy Water Human habitat Climate change	51	The facilities have been designed and constructed as multifunctional venues that can be used for more than one type of event
	Urbanisation Energy Water Human habitat Climate change Innovation Technology and science	52	Renovation of old facilities has incorporated sustainability best practice
	Urbanisation Energy Water Human habitat Climate change Innovation Technology and science Production and consumption	53	Venues have been designed to operate on low maintenance costs through technologies and design
	Poverty alleviation Local economic development Capacity building	54	Jobs are created for the local community
	Awareness and education	55	Information is published and accessible regarding event greening and sustainability
	Urbanisation Climate change Energy Water Human habitat Innovation Sustainable mobility	56	Urban renewal and regeneration is part of the event planning
	Climate change Biodiversity Water Human health	57	Biodiversity and ecosystem regeneration and preservation areas is part of event strategy
Monitoring and evaluation processes	Monitoring and evaluation Capacity building Innovation	58	A life-cycle assessment of the environmental and social impact been performed on purchases and venues
	Energy Monitoring and evaluation Innovation Consumption and production	59	Energy audits are conducted to ensure efficiency
	Water Monitoring and evaluation Innovation Consumption and production	60	Water audits are conducted to ensure efficiency
	Capacity building Innovation Monitoring and evaluation National strategy for sustainable development Stakeholder engagement	61	A report is compiled/intended as lessons learned
	Monitoring and evaluation Innovation Capacity building Stakeholder engagement	62	Reported results are verified/assured by an independent/external source

**Table 6: Sustainable development themes and the Sustainability Rating System**

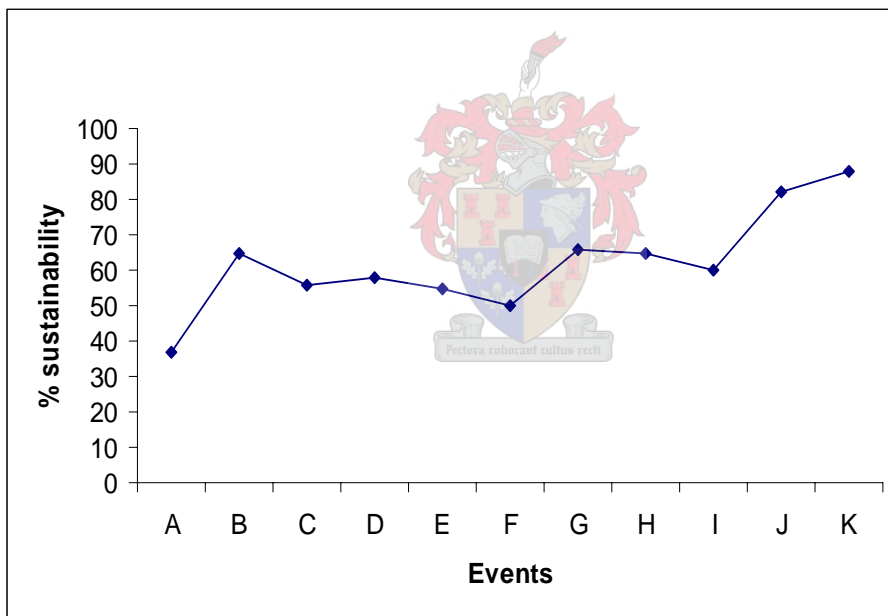
The table shows very clearly the types of sustainable development issues that are associated with each indicator. It is suggested that such an extensive list of issues may in fact determine that according to the Sustainability Rating System event greening is progressively becoming a mechanism for implementing sustainable development. The events that scored percentage sustainability above 50% are contributing to global sustainable development in numerous ways; through core and cross cutting themes as discussed in the Johannesburg plan of implementation.

Therefore this analysis hints at event greening projects as being robust mechanisms that can be employed to add to a host region or cities sustainable development targets.

### 4.3 Achieving the aim

The aim of this research is the development of an industry standard for evaluating the extent of sustainability and proving that event greening was contributing to sustainability best practice. The response to this aim was to use a rating system, developed by the author called the Sustainability Rating System. This system would serve as a standard to measure event greening projects against and assess their percentage sustainability. A simplistic scoring method was used.

Graph 4 shows the score as percentage sustainability plotted against the event. This percentage sustainability is per the developed Sustainability Rating System. It shows that some events have higher percentage sustainability than others, where 100% would be the standard.



**Graph 4: The percentage sustainability and the selected events.**

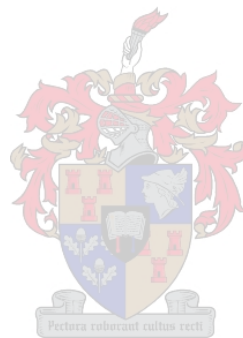
#### 4.3.1 Proving the Hypothesis

The use of the proposed Sustainability Rating System to determine the percentage 'green' or sustainability of an event greening project proves the hypothesis. The rating system shows how event greening projects are evolving over time to incorporate more sophisticated implementation techniques and technologies to ensure the negative impacts of events are reduced and opportunities are optimized. Table 6 shows the associated sustainable development themes which may be contributed to through the proposed Sustainability Rating System. This further justifies the



contribution of event greening to sustainability best practice globally. There is a knitting together of global sustainable development concerns with event greening processes and components.

The evidence in this chapter has concluded that events that are incorporating event greening programmes are contributing to sustainability best practice. The details and the amount and type of intervention determine the extent of sustainability of the event and the specific global sustainability theme. This standardisation and Sustainability Rating System will present a more transparent and accountable information framework for stakeholders and will set a benchmark for improvement and hence measurable sustainable development contribution of events.



## 5 Chapter Five: Conclusion

In the introduction of this thesis the author relayed the rationale behind investigating event greening. In the context of business tourism, events in all different sizes and intensity will be pursued as part of enhancing tourism growth. In South Africa large investment is being made into business tourism and event tourism particularly. The South Africa Tourism industry is progressively placing more and more prominence on its business tourism strategy and the country is being positioned internationally as a prime destination for MICE. The positioning of South Africa as an event destination is resulting in the country winning some enormous mega-events, such as the Soccer World Cup 2010. Large international conferences and cultural events are now being staged across South Africa. This evidently confirms that the event tourism industry is growing both locally and internationally. *'The event industry has come of age'* said Minister of Environment and Tourism of South Africa, at the annual Southern African Association of the Conference Industry (SAACI). In South Africa alone conferences and events support 12 000 jobs and contribute R2.6 billion a year to GDP. International events and conferences are worth R42 million in foreign exchange (Events, September 2006). The big question is will South African cities and provinces able to grow the business tourism industry and still subscribe to and meet their sustainable development commitments? This question was posed in a more generic stance at the beginning of this thesis. Conceptually, can sustainable development and event management be reconciled?

The idea of events especially mega-events, is difficult to reconcile with principles of sustainable development. It has been suggested that the apparent contradictions between these two paradigms allowed the events industry to grow globally with out any inclusion in the sustainable development debate. There is an apparent contradiction in event management and sustainable development however this thesis showed that a conscious empirical effort is being made to integrate sustainable development with in decision making processes for events (Furrer, 2002). The event industry contributes significantly to economic growth of regions; however events come with socio-economic and environmental impacts which may be quite negative. The success of an event should be a reconciliation of the cost of these impacts with the economic positives gains.

This thesis explored the practicalities of knitting together event management and sustainable development in a process that has become known as event greening. This process provides the host city or region with direction and tools to execute events in a manner that will contribute to long term sustainability and decrease the negative short term impacts of events. Event greening is the planning, organising, managing and staging of an event in manner that reduces the negative impacts and optimises the opportunities. It is about applying principles of sustainability best practice to the event management project plan. Event greening includes interventions that preserve the environment, respect social integrity and enhance economic growth. Some interventions

include; use of eco-efficiency technology and renewable energy, water conservation, transportation planning, integrated waste management and biodiversity conservation. Human health and the wellbeing of the local community is integral in event greening. Event greening promotes public participation. Local economic development is an important characteristic of event greening requiring inclusivity of marginalised communities and preferential procurement for local products. Green spaces can be included in the overall planning processes and protection of biodiversity through parks and natural spaces can serve environmental purposes and social recreational and health purposes. Events can contribute to the rehabilitation of otherwise polluted or abandoned land and water areas, contributing significantly to sustainability. Remediation of sites for event facilities or sports grounds is common as legacy aspects of event greening.

Tore Brevik, UNEP's Director of Communications and Public Information until 2002, assisted large scale events, such as the Olympic Games integrate concepts of environmental preservation and "green" ideas into their event planning. He says that 'greening the Olympics' had a breakthrough with the Lillehammer Winter Games in 1994. Lillehammer was the first city to demonstrate that it was possible to have a two week mega event and still show concern for the environment (Helseth, 2006). This event represented the start of an important process, and the feature of environment as a third dimension of the Olympics (Myrholt, 1996).

The idea of event greening has taken off since 2000. Event greening programmes have become more common and the extent of these programmes has become more advanced. This thesis has suggested that the combination of the Sydney Olympics Green Games success, the WSSD and the increase in events globally have contributed to this launch. The Sydney Olympics publicised their event greening programme through NGO's media and academic articles. They were significantly commended internationally and provided the world's event industry with a challenge regarding sustainable development and event management. This forced the industry to understand and adopt such principles and has led to numerous attempts at customising event greening per event. The WSSD reaffirmed commitments to achieving sustainable development. This event was a driver for the further development of event greening. This occurred both theoretically and pragmatically through the GWSSD which was a showcase that leveraged international exposure.

The costs for mega-events are increasing as resources become scarce and municipal infrastructure becomes stressed. Mega-events are reliant on the host cities infrastructure and local economy in order to stage a successful event. Event greening processes are seen as being long-term beneficial when it comes to costs of events and contribute to savings. This is achieved through upgrades of urban areas, and resource efficiency solutions. The high rate of urbanisation is putting many cities under extreme pressure as they attempt to catch up continuously with the growing demand on infrastructure and resources. Event greening provide opportunities to direct funding into

infrastructure development that is based on eco-efficiency and lower cost maintenance, regeneration of inner city areas and clean – ups.

Event greening has become a qualifying parameter for many mega-events. Cities bidding for the Olympic Games and ICLEI conferences must demonstrate their event greening strategy as part of the bidding process to host the event.

In light of these drivers, the world has seen an increase in event greening programmes for mega-events. However, there is no formal definition or standard for event greening. Many mega-events are implementing event greening projects but they are all completely different in their characteristic and components. In such a circumstance the question is posed, what in fact determines whether an event greening project is indeed an event greening project? What are the basic components required to classify as a green event? If one programme is only intervening with regard to environment and another is incorporating in addition socio-economic interventions is it fair to call both of these green events? It seems that some events are “greener” than others. It is in this chaotic climate of designation that this thesis was pursued.

## **5.1 The Synthesis**

Minister van Schalkwyk’s comment about the event industry maturing into a real, tangible economically beneficial sector of tourism provides urgency for the need to develop a standard and measuring tool for event greening. This combined with the current chaotic climate of definition and unclear determination of what constitutes a green event. A standard or measuring tool is necessary so the sustainability contributions of such events can be measured and performance of event greening projects can be improved.

This thesis has suggested that event greening contributes to global sustainability best practice. This suggestion was confirmed by using a Sustainability Rating System. The Sustainability Rating System was developed especially for this thesis as a way of analysing the extent of sustainability of an event. The indicators and the criteria were determined through a sustainable development appraisal framework and DIPSR Model. A selection of event greening projects were analysed for this thesis The Sustainability Rating System was used to score these event greening projects. These scores were converted into percentage sustainability for each of the selected events. The percentage sustainability calculations hinted at the extent to which each of these events could be classified as sustainable and therefore contribute to over all, global sustainable development. Each one called itself a green event, yet the components, processes and characteristics of each project was different. This difference illustrates the lack of standards and definitions for event greening.

The results showed progress and definite quality improvement in event greening projects from 1994 to 2012. The extent of sustainability increased over time, suggesting that current and future events are becoming mechanisms for sustainable development. The evolution of event greening from a nice to have environmentally-friendly programme to a sophisticated and measurable, all encompassing concept is illustrated in this thesis. This thesis suggests event greening is becoming mainstreamed into mega-event management plans.

This thesis began by describing the need for a standard for event greening. The need was owing to a lack of uniformity in the components and processes of event greening. The fear was that if anyone could host an event and claim it as a green event, the concept would become meaningless and perceived as an attempt at 'greenwash'. The thesis suggests that the way to avoid such an outcome is to develop a system whereby event greening projects can be assessed according to their contribution to sustainable development. In this way events could claim percentage sustainability. The event could use this information to improve performance, in public relations or to measure its contribution to the sustainability targets of the host. The main conclusions from the evidence presented in this thesis are;

- Event greening programmes or projects are becoming more sophisticated
- Event greening is contributing considerably to sustainable development
- Event greening as a concept and tool has progressed over the last fifteen years from a uniquely environmental angle to one incorporating long term socio-economic benefits with reduced environmental impact

The ability to measure the percentage sustainability of a green event, and determine a value for the events contribution to sustainability is important as the event industry grows and more stress is placed on the socio-economic and environmental aspects of the host staging that event. The thesis has illustrated that event greening contributes to sustainability best practice, and this contribution can be measured through the Sustainability Rating System. The Sustainability Rating System is a first step to developing a measuring tool for event greening and is a simplistic analytical tool. The intention of this thesis is for this simplistic model to be further developed and designed and scientific accuracy tested, so it could be utilised by the events industry to measure the sustainability contribution of the event to the city or region. In this way motivation for hosting an event could include aspects of sustainability in its entirety and not only owing to the potential economic prosperity.

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# 7 Chapter Seven: Appendix



## A Selected events

Type	Date	Name	Location	Participants	Duration
Sport	1994	Lillehammer Winter Olympic Games	Lillehammer, Norway	100 000	16 days
Sport and Culture	2000	Sydney Summer Olympic and Paralympics Games	Sydney, Australia	858 400	45 days
Multilateral Summit	2002	United Nations World Summit on Sustainable Development (WSSD)	Johannesburg, South Africa	381 285	30 days
Culture	2004	Universal Forum of Cultures	Barcelona, Spain	3,450, 000	141 days
Multilateral Summit	2005	United Nations Conference on Climate Change. Conference of Parties 11	Montreal, Canada	10 741	14 days
Conference	2006	ICLEI World Congress	Cape Town, South Africa	1000	10 days
Sport	2006	Torino Winter Olympics and Paralympics Games	Torino, Italy	1 034 100	25 days
Sport	2006	Commonwealth Games	Melbourne, Australia	100 000	14 days
Sport and Culture	2008	Beijing Summer Olympic Games	Beijing, China	2 781 000	43 days
Sport	2010	Vancouver Winter Olympic Games	Vancouver, Canada	291 200	21 days
Sport and Culture	2012	London Summer Olympic Games	London, United Kingdom	3 000 000	45 days

## B Score sheet of selected events using the Sustainability Rating System

Criteria	Indicator	1994	2000	2002	2004	2005	2006/1	2006/2	2006/3	2008	2010	2012	
Policy and green/sustainability principles for the event	1	1	1	1	1	0	1	1	1	1	1	1	
	2	1	1	1	0	0	1	1	1		1	1	
	3		0	1	1	1	0	1	1	1	1	1	
	4	1	0	1	0	0	1	0	1	0	1	0	
	5	1	1	0	1	1	0	1	0	1	1	1	
	6	1	1	1	0	1	0	1	1	1	0	1	1
	7	1	1	1	1	1	1	0	1	1	1	1	1
	8	1	1	1	1	1	1	1	1	1	1	1	1
	9	0	1	1	1	1	1	0	0	1	1	1	1
Public transportation is encouraged	10	1	1	0	1	1	0	1	1	1	1	1	
	11	0	1	0	1	1	0	1	1	1	1	1	
	12	0	0	1	0	1	1	1	1	0	1	1	
	13	0	0	0	1	1	0	0	0	0	1	1	
	14	0	0	0	0	0	0	0	0	0	1	1	
Waste Management system in place that adheres to sustainability principles	15	1	1	1	1	1	1	1	1	1	1	1	
	16	1	1	1	1	1	0	1	1	0	1	1	
	17	0	1	0	0	0	0	1	1	1	0	1	
	18	0	1	1	1	0	1	1	1	0	1	1	
	19	1	1	1	1	1	1	1	1	0	1	1	
	20	0	1	1	0	0	1	1	0	1	1	1	
	21	0	0	0	1	1	1	1	0	1	0	0	
	22	0	0	1	0	1	1	0	0	1	0	1	
	23	0	1	0	1	0	0	1	0	1	0	1	
Reduced consumption of Natural Resources	24	0	1	0	0	0	0	0	0	0	1	1	
	25	0	1	0	1	0	1	1	1	1	1	1	
	26	0	1	0	1	0	1	1	1	1	1	1	
	27	0	1	0	1	0	0	1	1	1	1	1	
	28	0	0	1	0	0	1	1	0	0	0	0	
	29	0	1	0	1	0	1	1	1	1	1	1	
	30	1	0	1	0	1	1	1	0	0	1	0	
	31	0	1	0	0	0	0	1	0	0	1	1	
	Combat Climate Change	32	0	0	1	0	1	1	1	1	0	1	1
33		0	0	0	0	1	0	1	1	1	0	1	
34		0	0	1	1	1	0	0	1	1	0	1	
35		0	0	0	0	0	0	0	1	0	0	0	
Human health and well being is considered	36	0	1	1	1	1	1	1	1	0	1	1	
	37	0	1	0	1	0	0	0	1	1	1	1	
	38	1	1	0	0	1	0	1	1	1	0	1	

	39	0	0	1	0	1	1	0	0	0	1	1
Education and Awareness Raising on sustainability	40	0	1	1	1	1	1	0	0	1	1	1
	41	1	1	1	0	1	0	1	1	1	1	1
	42	0	0	1	0	1	1	0	0	1	1	1
	43	0	0	1	1	0	0	1	0	0	1	1
	44	0	1	1	1	1	0	0	0	0	1	1
	45	1	1	0	1	1	1	1	1	1	1	1
	46	1	0	1	0	1	0	0	1	1	1	1
	Cultural integrity	47	1	1	1	1	1	1	1	1	1	1
48		1	1	1	1	0	1	0	1	1	1	1
49		1	1	1	0	1	1	0	1	0	1	1
50		0	0	1	0	0	1	0	1	0	1	1
Legacy Planning and aspects that last	51	0	0	0	1	0	0	0	0	1	1	1
	52	0	1	0	1	0	0	1	1	1	1	1
	53	1	1	0	1	0	1	1	0	1	1	1
	54		1	0	1	1	0	1	1	0	1	1
	55	1	1	1	1	1	1	1	0	1	1	1
	56	1	1	0	1	0	0	0	1	1	1	1
	57	0	1	0	1	0	0	1	1	1	1	1
Monitoring and evaluation processes	58	0	1	0	0	0	0	0	1	0	1	1
	59	0	0	1	0	0	1	1	0	1	1	0
	60	0	0	1	0	0	1	1	0	0	1	0
	61	1	1	1	1	1	1	1	1	1	0	1
	62	0	0	0	0	1	0	0	0	0	0	1
	<b>Score</b>		23	40	35	36	34	31	41	40	37	51

## C Glossary and Abbreviations

### 7.1 Abbreviations

EEA	European Environmental Agency
NOC	National Olympic Committee
OG	Olympic Games
UNEP	United Nations Environment Programme
UN	United Nations
NGO	Non-Governmental Organisation

### 7.2 Glossary

Aerosol Products	Products using specialized propellants to spray and disperse substances
Audit	An assessment of the efficiency of a system (water, energy, waste) against a standard
Bagasse	Fibrous remnants of sugar cane after the juice has been squeezed out
Biodiesel	Clean burning fuel derived from animal fats and vegetable oils. It can be used alone or combined with conventional diesel.
Biodiversity	Biological diversity is the variability among living organisms from all sources including terrestrial, marine, and other aquatic ecosystems. It includes diversity within species (genetic diversity), among species and within and among ecosystems.
Bowser	Tanker for supplying water
Carbon Tax	This is a payment which is made to counteract the emissions that are produced through a specific action, by promoting an alternative action that could reduce greenhouse gases.
Carbon Trading	A system in which organizations or governments are given quotas for carbon emissions. Quotas consist of a number of carbon credits which can be sold, bought or used.
Carbon Neutral Event	This is often an extension of an event greening project. It allows organizers to offset greenhouse gas emissions resulting from an event that cannot be reduced through other methods. The emissions are calculated based on equations which aggregate emissions from long and short distance travel, air travel, local accommodation and venues. The tonnage of emissions is converted to emission reduction credits which offset the emissions by being sterilized into renewable energy producing projects or CDM projects.

Carcinogen	Cancer causing substance
Climate Protection	It is the action to deliberately reduce the emission of greenhouse gasses in order to reduce the impact on our environment
Cornstarch Plastic	A biodegradable plastic-like substance made from renewable corn resources
Environmental best practice	Activities and actions that minimize negative environmental impacts as much as possible.
EIA	Environmental Impact Assessment are studies of the effects of proposed actions on the environment
Event greening	Hosting an event, and associated services, in such a way that it has a minimal effect on the environment and maximum benefit to the people
Exotic Species	Any species that is not native to an ecosystem
Fair Trade	Partnerships based on transparency and respect that seek greater equity in international trade and contribute to sustainable development by offering better trading conditions to and securing the rights of marginalized producers.
Fossil fuels	Non-renewable, incompletely oxidized and decayed organic material that can be burned or consumed to produce heat, electricity or light. (petroleum, natural gas, coal, charcoal, paraffin, petrol, diesel)
Green House Gasses (GHG)	<p>Atmospheric gases that have heat trapping properties. They may be naturally occurring or emitted as a result of human activity. They include carbon dioxide (CO<sub>2</sub>) methane, nitrous oxides (NO<sub>x</sub>), water vapour, hydro fluorocarbons, perfluorocarbons and sulphur hexafluoride.</p> <p>Green House Gasses are produced when any fossil fuel is burnt and which contributes to global warming and has a negative impact on the environment and on our lives.</p>
Grey Water	Any water that has already been used and has the potential for reuse without treatment
Indigenous plants	A plant belonging naturally to or occurring naturally in a country or area
ICLEI	International Council for Local Environmental Initiative, now known as Local Governments for Sustainability
Legacy Projects	A project that is used to promote a specific principle or good example long term
Organic products	Natural products, farmed according to principles of sustainability and without the use of chemicals or fertilizers that might be harmful to human health or the environment. These are certified through an international agency as organic.
Procurement	Acquisition of goods and services.

Retrofitting	The amendment of buildings and fittings to make it more sustainable. This often incorporates the use of eco-efficiency technological upgrades.
Sustainable Development	Meeting the needs of the present generation without compromising the ability of future generations to meet their needs.
Sustainable procurement	Purchasing of products, goods and services that have minimal negative impact on the environment, adhere to human rights with regard to labour practice and show concern for meeting sustainable development targets. This is a process that is also known as 'green' procurement, responsible procurement or clean and green buying.
WSSD	The United Nations World Summit on Sustainable Development (2002). It brought together leaders from government, civil society and business to assess sustainable development progress since the Rio Earth Summit (1992). It was held in Johannesburg, South Africa and produced a document known as the 'Johannesburg Plan of Implementation'.
Twin-bin system	These are bins used for the separation of dry and mixed recyclables (paper, glass, plastics, cans) together from the non-recyclable and wet waste fraction (soiled paper, napkins, food scraps, cling film, tissues).

