

Commensurability and sustainability: Triple impact assessments of a tourism event

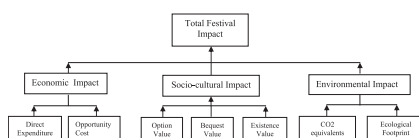
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HIGHLIGHTS

- ▶ The study demonstrates a possibility to produce a sustainability impact analysis in a uniform monetary metric.
- ▶ Measured in a monetary terms, socio-cultural impacts have a value almost equal to the direct economic impacts.
- ▶ The low market values of emission rights make environmental concerns negligible in an economic perspective.
- ▶ Issues related to scope of the assessment, commensurability and opportunity cost are important for the result.

GRAPHICAL ABSTRACT



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ABSTRACT

In this study, a model for measuring impacts of a tourist event from sustainability perspectives and in a common monetary metric is developed. The aim is to achieve commensurability. The proposed model is tested on a three-day music festival and the results demonstrate a possibility to produce a sustainability impact analysis in a uniform metric. Measured in monetary terms, socio-cultural impacts carry weight just as economic impacts do whereas environmental impacts have little importance for the total assessment. This illustrates how the low market value of emission rights make environmental concerns negligible from an economic perspective. Finally, issues related to scope of the assessment, commensurability and opportunity cost are discussed and possibilities for future studies are suggested.

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1. Introduction

Impact analysis of festivals and events has been a central theme in event studies for decades. Recently, there has been a growing

interest in wider perspectives, which include other factors than purely economic impact. Greater attention has been paid to social, cultural and environmental impacts. A number of studies have examined both tangible and intangible impacts of festivals and events from a socio-cultural (e.g. Deery & Jago, 2010; Walker et al., 2013) and environmental (e.g. Dolles & Söderman, 2010; May, 1995; Ponsford, 2011) perspective.

A sustainability perspective incorporating economic, social and environmental impacts has been proposed for tourism impact

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analysis (e.g. Cernat & Gourdon, 2012) as well as event impact analysis (Fredline, Raybould, Jago, & Deery, 2005; Sherwood, 2007). However, the challenge of adding up the three types of impacts to produce an overall assessment of sustainability has not yet been fully addressed. It becomes problematic if social and environmental impacts are not measured in units comparable to economic impacts, therefore more research is needed to answer a call for holistic analytical frameworks (Getz, 2009). The issue of commensurability, i.e. of measuring socio-cultural, environmental as well as economic impacts in a uniform metric is therefore the focus of this study.

The main objective of this article is to develop, test and discuss a measurement model based on a sustainability approach, including social, cultural, environmental as well as economic perspectives. This also implies a comparison in monetary terms between impact categories to achieve commensurability. Market values of emission rights, shadow cost of environmental resources, contingent valuation analysis of socio-cultural impacts and estimates of direct expenditure and opportunity cost provide methodological approaches to produce input for a holistic assessment of the sustainability of a music event in monetary terms.

2. A theoretical framework

There are several approaches to understanding impacts of events based on multiple perspectives and on an aggregated level. In the 1960s the concept of Carrying Capacity (cf. Getz, 1983) was developed. In the early 1980s this gave way to the Limits of Acceptable Change framework, which is a management process based on local stakeholders' perceptions of *acceptable* change related to limits to growth (Ahn, Lee, & Shafer, 2002; McCool & Lime, 2001).

Another approach based on multiple perspectives that has been discussed within sociology, political science, and economics, considers different types of capital assets (Bourdieu, 1973). On an aggregated as well as on an individual level, event impacts can be discussed in terms of investments in, or depreciation of, capital assets such as social capital, financial capital, natural capital or human capital. In tourism this method has been applied within the Sustainable Tourism Livelihood Approach which typically identifies five to seven different types of capital asset (cf. Bennett, Lemelin, Koster, & Budke, 2012; Shen, Hughey, & Simmons, 2008) and which has also been used for analysing festivals (Mykletun, 2009).

Cost-benefit analysis (CBA) produces analyses of event impacts on an aggregated level and in terms of changes in social welfare, including both tangible and intangible impacts on society. Changes in social welfare are, as far as possible, measured in monetary terms (willingness-to-pay) using the contingent valuation method (CVM). Proponents of CVM are optimistic about the feasibility of measuring the value of socio-cultural impacts in monetary terms (Armbrecht, 2012; Noonan, 2003).

The Triple Bottom Line approach – TBL, (cf. Elkington, 1997; Sherwood, 2007) is a similar analytical framework based on multiple perspectives that in its original set up includes economic, social and environmental impacts. It has later been revised to include cultural impacts (Getz, 2009; Lundberg, 2011). TBL originates from the business sector where it has been used as a holistic reporting tool that adds social and environmental bottom lines to the traditional financial bottom line. It has also been applied and developed for tourism and more specifically for events and festivals (Fredline et al., 2005; Sherwood, 2007).

A sustainable development approach is based on multiple perspectives and the following, normative definition of sustainable tourism has been suggested:

Tourism should maximize benefits and minimize negative costs regarding:

- Economic impacts on the local community;
- Social impacts on the local community;
- Cultural heritage; and
- The environment.

(Global Sustainable Tourism Council – an organization with its origin within the United Nations; www.sustainabletourismcriteria.org).

2.1. Economic impacts on the local community

Several approaches to economic impact analysis have been applied to festival and event research, such as *ex post* econometric analyses (e.g. Baade & Matheson, 2004), cost-benefit analyses (e.g. Burgan & Mules, 2001), input–output analyses (e.g. Crompton, Lee, & Shuster, 2001; Daniels & Norman, 2003), and computable general equilibrium analyses (e.g. Dwyer, Forsyth, & Spurr, 2005; Meng, Siriwardana, & Pham, 2013).

A common approach is to describe the financial inflow from tourists to the country, region or destination as an impact of an event or a festival. This financial flow is referred to as the *direct economic impact* and measures of injections of “new” money are normally based on surveys of visitor expenditure linked to the festival or the event.

Multipliers can be applied on the direct economic impact (preferably calculated in terms of value added) to determine the total economic impact on the local economy. The use of erroneous, inflated or out of date multipliers has, however, been a widely discussed problem in economic impact analysis (Archer, 1973; Archer & Fletcher, 1990; Crompton & McKay, 1994; Wanhill, 1988). It has therefore been argued that using a simple direct economic impact estimate will avoid debates on complex methodologies and debates on the inclusion or exclusion of multipliers. Direct economic impact (also called “in-scope expenditure”) works well as a basis for straightforward comparisons to other events. Furthermore, if deemed necessary, it is still possible to use the direct economic impact estimate for further analysis. It is the benefits associated with keeping the numbers simple and easily comparable that influence many researchers to use measurements of direct economic impact (Sherwood, 2007).

An assessment of opportunity cost is, meanwhile, imperative for complete estimations of economic impact (Crompton, 1995). Visitor expenditure always has an alternative use that can be identified by collecting information, albeit highly hypothetical, about what visitors would have done if there had not been a festival. Thus it is possible to identify *casuals* and exclude expenditure from these visitors in the impact analysis (cf. Crompton et al., 2001). Another type of opportunity costs depends on the timing of a festival. A festival organized in peak season, when hotels would have been full anyway, will generate considerable opportunity costs relating to *displaced* visitors.

2.2. Socio-cultural impacts on the local community

Reviews of research on specific social and cultural impacts of festivals and events have been undertaken by e.g. Deery, Jago, and Fredline (2012) and Robertson, Rogers, and Leask (2009). Social Exchange Theory has been adapted and developed within a tourism context by Ap (1992), Lee (2013), and Zhou and Ap (2009) to explain the host populations' perceptions of social impacts whereby the residents weigh individual and societal benefits against the societal costs of an event or festival to shape their attitudes towards the event. Social Exchange Theory is thus based on an economic rationale.

Socio-cultural impacts may also be linked to theories of social and cultural capitals (Arcodia & Whitford, 2006; Misener & Mason,

2006; Moscardo, 2008; Mykletun, 2009; Schulenkorf, 2009). Snowball and Willis (2006) perform choice experiments in order to understand a South African art festival's creation of cultural capital. Measurement methods developed in other research domains (Grootaert, 2004) could lead to a more objective view on socio-cultural impacts, measuring e.g. volunteer activity and more cultural activity.

Most measurement models focus on local residents' perceptions and attitudes linked to festivals and events. Scales such as the Festival Social Impact Attitude Scale by Delamere, Wankel, and Hinch (2001), inspired by the Tourism Impact Attitude Scale by Lankford and Howard (1994), present ways of understanding socio-cultural impacts (see also Garcia, 2005; Pasanen, Taskinen, & Mikkonen, 2009; Small, 2008; Wood, 2005). These scales are typically based on surveys with a large number of items measured by ordinal scales in order to apply cluster and factor analyses. Small, Edwards, and Sheridan (2005) developed an evaluation process of both ex-ante and ex-post evaluations with their Social Impact Evaluation Framework and Social Impact Perception framework. This is also the indirect result of studies based on expectancy-value and value-attitude models (Lindberg & Johnson, 1997). However, measures based on item scales or measures of activities are difficult to compare to measures of economic impacts and do not address the commensurability issue.

An alternative approach to measuring socio-cultural impacts has been applied by e.g. Lindberg, Andersson, and Dellaert (2001) using contingent valuation methods (CVM) to estimate residents' willingness-to-pay (WTP). In their study they also estimated a value of negative social tourism impacts. WTP and other stated preference techniques, such as the willingness-to-accept (WTA), where respondents are asked to assign a monetary value to a scenario linked to e.g. a music festival or a sporting event, have been used in the festival and event context (Walton, Longo, & Dawson, 2008).

In environmental economics and cultural economics, values estimated by contingent valuation methods have been divided into use and non-use values. Use values are ascribed to users (or consumers) of a particular good or service. Non-use values are attributed to citizens who are affected by externalities. In an event or festival context, Non-use value would mainly be generated for the local population at the destination where the event is hosted (Frey, 2003).

Non-use value in the context of an event can be further categorized. *Option value* represents the value that non-users, i.e. local residents, attribute to having the possibility of attending a festival (now or in the future). *Bequest value* is the value local residents assign to the preservation of the music festival for younger generations, i.e. a possibility for other people to enjoy a festival (Andersson, Armbricht, & Lundberg, 2012; Frey, 2003) and is closely linked to altruistic motives (Mitchell & Carson, 1989). Finally, *Existence value* is the value local residents ascribe to the pleasure or pride of the image change that the music festival will give to their community (Throsby, 2001). When using CVM, the reproducibility should be tested by assessments of validity and reliability (Venkatachalam, 2004).

Non-use values thus comprise the overall valuation of all externalities that can be linked to socio-cultural impacts based on the local residents' perceptions of benefits such as cultural exchanges as well as costs such as social problems and traffic congestion. This mélange of local residents' attitudes to socio-economic and socio-cultural impacts are part and parcel of an estimate of Non-use value (Kim, Gursoy, & Lee, 2006).

2.3. Environmental impacts

Negative impacts on the environment from tourism have been described in several studies that have become more and more

sophisticated and technical over the years. In festival and event research, studies of the environmental impacts have not been as prominent as studies looking at festivals' and events' socio-cultural impacts (Getz, 2008). However, there has recently been an increasing interest in understanding environmental impacts within the event field (e.g. Dolles & Söderman, 2010; Ponsford, 2011).

Ecological Footprint Analysis is one frequently used measurement method to assess the use of resources, such as land and water needed for a specific activity or destination. The resources used are measured in terms of global hectares (gha) and compared to the bio-capacity of a place, nation or the planet (also measured in gha), in order to understand the relative importance of the resources used (Wackernagel et al., 2002). Ecological footprint analysis has been used in several tourism studies (Gössling, Hansson, Hörstmeier, & Saggel, 2002; Gössling et al., 2005; Hunter, 2002; Hunter & Shaw, 2005; Patterson, Niccolucci, & Bastianoni, 2007). Calculation of carbon emissions is another method to assess environmental impacts with a particular focus on the greenhouse effect. This method also has the advantage of using one single measurement unit, namely tons of carbon dioxide emissions produced by activities. Carbon dioxide emissions are included in a complete ecological footprint analysis.

Despite their technical nature, both methods are easy to administer with "footprint calculators" available on-line. There are also event-specific calculators available on-line which can be used at no cost. Ecological footprint analysis produces output at a detailed level, indicating tourism activities with negative impacts on the environment (e.g. transport, food consumption and accommodation). Another advantage of using global hectares is the measurability and quantification of improvements achieved in reducing environmental impacts. This is a particularly interesting aspect for politicians, institutions and businesses, as it enables them to manage changes with the help of measurable indicators (see McManus & Haughton, 2006).

From a commensurability perspective these measures of environmental impact in terms of global hectares and/or tonnes of CO₂ emissions provide a step towards a solution. It also opens an opportunity to find a monetary value since environmental impacts may be measured as the *shadow cost of resources*, expressed as the monetary value of the best alternative use of a resource (a global hectare or the right to emit a ton of CO₂ emissions). With a well-functioning market for e.g. CO₂ emission rights, the market price would provide an acceptable approximation of the shadow cost of CO₂ emissions. The European emissions trading scheme (EU ETS), offers an opportunity to estimate monetary costs related to carbon dioxide emissions (<http://ec.europa.eu/clima/policies/ets/>). Ecological Footprint analysis is, however, a more complete measurement of environmental impacts, including costs of CO₂ emissions, although market prices for global hectares are lacking.

3. Measurement model

The literature review paves the way for a measurement model aimed at measuring economic, socio-cultural, and environmental impacts from a festival in monetary values in order to address the commensurability problem. The model is illustrated in Fig. 1.

The proposed model which follows suggests that an assessment of the net economic impact of a festival can be based on Direct Expenditure and Opportunity Cost:

- *Direct Expenditure* is based on an estimate of all expenditure that festival visitors incur related to the festival visit. This is estimated through a survey that enables a calculation of average expenditure, which can then be multiplied by the total number of festival visitors.

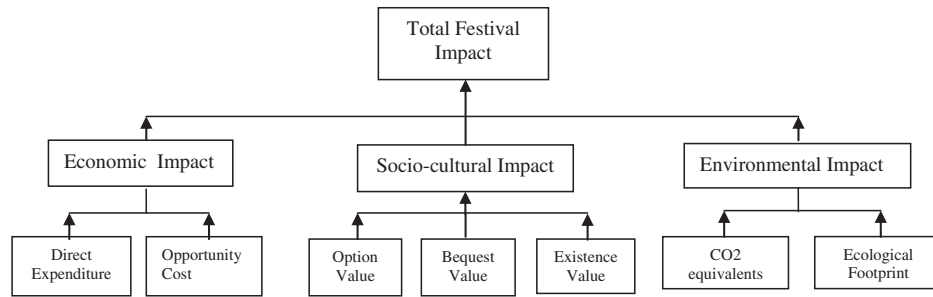


Fig. 1. A measurement model describing the total impact from a sustainability perspective.

- *Opportunity Cost* is based on an assessment of the amount of money that would have been spent by event visitors in the city/region even if the festival had not taken place.

Socio-cultural impacts reflect externalities and can be estimated in monetary terms as a Non-use value that accrues to local residents at the event destination. This value can be analysed in terms of:

- *Option value*, which measures on residents' perceived value of the fact that they have an opportunity to visit the festival this year or future years.
- *Bequest value*, which describes residents' perceived value attached to the provision of culture and entertainment for the younger generations.
- *Existence value*, which is related to residents' perceived value of the effect that the festival has on the image and on the development direction of the city.

Environmental impacts will be estimated using two concepts:

- *The Ecological Footprint* is measured in terms of global hectares needed to produce e.g. the water, energy and food consumed at the event as well as the hectares needed to offset the emission of CO₂ equivalents. The ecological footprint will, in this study, be converted into a monetary measure by estimates of land lease cost per hectare land in the area where the event takes place. This is suggested as an acceptable approximation of the shadow cost of the global hectares needed for the event according to an ecological footprint analysis.
- *Carbon Calculations* focus on greenhouse gas emission expressed in tons of CO₂ equivalents, which can be converted into a monetary value using market prices of "carbon credits" or equivalent units traded on the market.

4. Method

The empirical study which follows includes three components: measuring economic impacts, measuring socio-cultural impacts, and measuring environmental impacts. The data collection process will be discussed and the samples described, but first the study object, the Way Out West music festival (WOW), is briefly presented.

4.1. Study object

The music festival Way Out West features different genres. It appeals to a relatively young audience (average age of 26 years, cf. Table 1) and has been organized in a large city park every summer since 2007 in the city of Gothenburg in Sweden. Each year the attendance has increased and in 2010, the festival attracted 26 347 paying visitors in the course of its 3 days. The festival is organized by

a private promoter (Luger) in close co-operation with the city of Gothenburg (mainly through its Destination Management Organization, *Gothenburg & Co*). Luger has as a vision for the festival to organize an environmentally friendly festival which has rendered them a "green" eco-certification from the city of Gothenburg. Luger has also initiated a Nordic festival co-operation around environmental and sustainability issues together with Roskilde music festival in Denmark and Øja music festival in Norway.

4.2. Data collection process

Two surveys were distributed after the festival. Survey A was addressed to paying festival visitors, and contained questions about consumption, expenditure, travel, and socio-demographic data. Survey B was addressed to local residents of Gothenburg and contained questions which elicited values (WTP and WTA) and also socio-demographic information. Secondary data for the footprint analysis and carbon calculation was collected predominantly via Luger and official statistics (Statistics Sweden).

A similar data collection process was applied to Survey A and B. Volunteers were taught sampling methods by the authors. For Survey A every fifth visitor was approached at the entrance gate for random sampling. The selected visitors were informed about the aim of the survey and invited to participate. If they agreed, their e-mail address or mail address were collected and the survey was sent to them one day after the closure of the festival. For Survey B a similar procedure was applied. Six spots around the city were selected assuming that the probability for any local resident of Gothenburg to pass by during the three days of the data collection is non-zero. A screening question was first used asking presumptive respondents if they were aware of Way Out West taking place or not. Those who did not know about the festival were omitted from the sample. Thus the sampling frame includes local residents that were aware that Way Out West had taken place.

Table 1
Socio economic characteristics of the two samples used in this study.

Sample	Survey A festival visitors	WOW 2009 (Rubin Research)	Survey B local residents	Official statistics Gothenburg
Sample size	719	1414	648	N/A
Gender	56% (female) 44% (male)	54% (female) 46% (male)	59% (female) 41% (male)	50.3% (female) 49.7% (male)
Age (mean)	26	27.5	33	39
Income (median)	€ 29,000	€ 26,500	€ 21,000	€ 24,000
Education	32% Sec. school	N/A	27% Sec. school	38% Sec. school
Employment	64% University 43% Student 47% Employee	33% Student 49% Employee	69% University 32% Student 49% Employee	41% University 20% Student 48% Employee

4.3. Samples

In Survey A, 1467 respondents were recruited and 719 completed the survey after two reminders (49% response rate). For Survey B, 2104 respondents were recruited leading to 648 complete survey responses (31% response rate). In [Table 1](#), some descriptive statistics are presented to understand the representativeness of the two samples.

For Survey A, the sample seems to represent the paying festival visitor rather well when compared to an earlier study of the festival, although students may be overrepresented. In Survey B there is an over-representation of young, female university-educated students. This might be a result of the assumedly representative spots chosen for this survey, but also the screening question concerning the awareness of Way Out West (WOW). Although only 1.7% stated that they were unaware of the festival being organized in Gothenburg they were considerably older (46 years old). A non-response analysis also shows that respondents who denied participation in Survey B for several reasons (“time”, “ethical”, “did not want to”, “unawareness” etc.) had an average estimated age of 37.5.

4.4. Questions asked about tourist expenditures and opportunity costs

Questions were asked about categories of expenditure such as accommodation, travel, restaurant and café, food and beverage, local transport, other attractions both within the festival area and in other parts of Gothenburg during the stay.

To estimate the opportunity cost, respondents were asked where they hypothetically would have been during the festival dates, had the festival not been organized this year. This was in order to understand an alternative scenario and the extent to which Way Out West was the primary motive for the visit. This is in line with standard research on visitor expenditure (cf. [Frechting, 2006](#)).

4.5. Questions asked to local residents about socio-cultural impacts

To achieve a monetary evaluation of socio-cultural impacts, CVM questions focused on local residents' perceptions of the impacts of Way Out West. The first question asked served as a screening question to identify a category that were favourable towards the event and had a positive willingness-to-pay: “If Way Out West needed public funding from the municipality of Gothenburg to survive would you then think that the municipality should grant this?”

If the answer to this question was affirmative, taxes were used as a payment vehicle following the practice of several other CVM-studies (e.g. [Bateman, Willis, & Garrod, 1994](#); [Hansen, 1997](#); [Lindberg & Johnson, 1997](#)) to estimate the willingness-to-pay: “What would be the maximum yearly increase of your local tax that you would accept in order to support Way Out West?” and answers were further elaborated to estimate the relative shares of *option*, *bequest* and *existence* values.

Respondents who were against public financial support were asked to answer a willingness-to-accept question: “My local tax should decrease with at least – € per year in order for me to endure the negative aspects of the festival”. It was of course also possible to answer “nil” to both the WTP and the WTA question. In this way it is possible to evaluate both negative (using WTA) and positive (using WTP) Non-use values.

The content validity of the WTP measure depends partly on the elicitation format and when cast in the form of willingness-to-pay a tax, this has many advantages according to the NOAA panel ([Arrow et al., 1993](#)). The theoretical validity was assessed by correlating the measure of local residents WTP with answers to attitudinal questions (measured on a 1–7 scale) and significant

correlations were found between WTP and “The festival should be arranged in the city for many future years” (positive); “The festival disturbed the daily life of local residents” (negative), “The festival provided more entertainment opportunities for local residents” (positive) and several other attitudinal variables. Convergent validity is supported when local residents' estimates of the annual per person Non-Use Value of the Way Out West festival (€ 6 cf. [Table 3](#) below) are compared to similar annual per person estimates such as e.g. “Cleaning Lincoln Cathedral more often” £15 ([Pollicino & Maddison, 2001](#)); “Support for the Royal Theatre in Copenhagen” USD 11 ([Hansen, 1997](#)) or “Increasing domestic TV programming by 10%” AUD 12 ([Papandrea, 1999](#)).

4.6. Data used for calculations of ecological footprint & CO₂ emission

Data for calculations of the ecological footprint (as well as the CO₂ emission) were collected primarily from the festival organizer and through the survey of visitors. The following five categories of resource-use were described:

- **Energy use** where data came exclusively from the event organizer.
- **Transport** data, based partly on information from the event organizer and partly on data from the survey of visitors regarding travel to and from the festival as well as local transport within the city.
- **Waste** data, based on information from the event organizer as well as the recycling company Renova.
- **Consumption of food and lodging**, based on data from the survey of festival visitors.
- **Total surface** of the area used for the festival, based on information from the event organizer.

The above categories of data were collected and fed into an on-line EPA Event Calculator, (www.epa.vic.gov.au/ecological-footprint/calculators/event/introduction.asp) to calculate the ecological footprint in terms of gha ([Fredline et al., 2005](#); [Gössling et al., 2002](#); [Sherwood, 2007](#)) as well as carbon emissions in terms of tons of carbon dioxide equivalents (CO₂e). The “EPA Event Calculator” uses direct impact as input data but also calculates indirect effects of consumption based on Input-Output Analysis ([EPA Victoria, 2005](#)). Thus not only energy requirements for the direct consumption, but also indirect energy requirements for energy embodied in food and other goods and services are included in the calculations. The technical background to the “EPA Event Calculator” is well described and available on-line ([EPA Victoria, 2005](#)).

The “EPA Event Calculator” also describes how global hectares are classified into four types of land (energy land, forest, cropland, grazing land and built-up land). A representative for The Federation of Swedish Farmers estimated reasonable annual land lease costs for various types of land in the western part of Sweden. These estimates were subsequently used to estimate a shadow cost for the global hectares.

5. Results

This section will discuss economic impacts, followed by socio-cultural impacts and, finally, environmental impacts.

5.1. Economic impacts

Following the recommendation by [Sherwood \(2007\)](#) to focus on basic expenditure data (*direct economic impact*), no indirect or induced economic impacts are presented here. The issue of

opportunity cost will be estimated, however, in an effort to isolate economic impacts caused by the music event.

Direct expenditure: Table 2 describes the results of the expenditure survey categorised according to the home residence of the visitors. The average expenditure displayed in Table 2 has been calculated based on the total number of respondents (719). Thus e.g. "Accommodation" (€ 16.45) does not describe the average room rate but the average accommodation cost for all visitors.

Local residents from Gothenburg are included, contrary to the recommendation of Crompton (1995). One reason is that the analysis of opportunity cost will show that a considerable number of the local event visitors would not have stayed in Gothenburg between the 12th and 14th of August, had it not been for the music event.

According to the organizers there were 26 347 event visitors, and 37% of these were local visitors living in Gothenburg. Only 3% were international visitors, but 60% came from other regions in Sweden. A calculation based on average direct gross expenditure and number of visitors generates a total direct gross expenditure of € 223 × 26 347 = € 5.9 million.

Opportunity Cost: The hypothetical question asking respondents where they think they would have been during the days of the event if there had not been an event in Gothenburg helped to identify *casuals* who did not visit Gothenburg as a direct result of the event. Out of the 60% visitors from other regions in Sweden, 9% were categorised as *casuals* and out of the 3% visitors from abroad, 1% were *casuals*. Twenty-eight per cent of local residents, representing 37% of all visitors, reported that they would probably have stayed in Gothenburg even if there had not been a music event. The opportunity cost related to *casuals* can therefore be calculated as: $26.347 \times (28\% \times € 184 + 9\% \times € 242 + 1\% \times € 331) = € 2.0$ million.

The net direct expenditure € 3.9 million is therefore calculated by deducting the opportunity cost (€ 2.0 million) from the gross direct expenditure which is € 5.9 million.

5.2. Socio-cultural impacts

Before asking questions about willingness-to-pay and non-use values, local residents answered a screening question used to find out whether respondents were positive or negative towards (hypothetically) supporting the festival with local tax money if needed. Answers to this screening question reflected a positive attitude among local residents towards the festival since it turned out that 58% were willing to support the festival with tax money if needed whereas 42% were negative.

Out of the 42% negative only 3% thought it appropriate to have a tax reduction to compensate for the disturbances created by the festival, whereas the remaining 39% considered that inappropriate. The amount of tax reduction that the 3% considered

Table 2
Average expenditure per festival visitor (€) related to attending the event.

Where do you live?	In Gothenburg (n = 269)	Elsewhere in Sweden (n = 432)	Abroad (n = 18)	Total (n = 719)
Type of expenditure	Mean	Mean	Mean	Mean
Travel to Gothenburg	0	32.51	152.91	24.16
Accommodation	0	25.71	15.39	16.45
Food & beverage	64.73	78.39	118.5	74.38
F & B (within the festival area)	[43.66]	[27.42]	[53.74]	[32.43]
Local transport	6.41	12.35	20.49	10.44
Other (incl. festival ticket)	113.23	126.03	176.71	122.42
TOTAL (excl. travel to G-burg)	184.37	242.48	331.09	223.69

Table 3
Non-use values calculated as averages for the local Gothenburg resident.

Non-use value (€)	N	Min	Max	Mean
Bequest value (WTP)	628	0	211	3
Existence value (WTP)	633	0	211	2
Option value (WTP)	625	0	395	3
Negative value (WTA)	625	-316	-1	-2
Non-use net	648	-316	526	6

necessary to regard the festival as acceptable provided an estimate of negative residents' willingness-to-accept (WTA). The 58% of respondents that were positive towards public financial support for the festival were asked what amount of annual tax increase they were willing to pay (WTP) in order to (hypothetically) rescue the festival from financial failure. Table 3 describes the average Non-use values per citizen calculated in € as averages for the whole sample to enable inferences to be drawn for the total population of Göteborg.

Bequest (€ 3) and Option (€ 3) values are both higher than Existence (€ 2) value. This seems to indicate that respondents attach a high value to having the festival in town as an opportunity to visit one day either for oneself or for coming generations. Existence value, interpreted as the value of giving the city an image of being a music hub, seems to be comparatively less important. The sample bias towards young citizens should be borne in mind here as it may have an impact on these differences.

The total positive Non-use value created by the festival, as illustrated in Table 3, is on average €8. The frequency distribution of the estimates of WTP indicates that 40% of the answers given were €1 or less and the mode (most frequent) answer, given by 24% of the respondents, was €10. Four values were classified as outliers and deleted (all of them € 100,000). The average of the negative estimates of WTA given by 3% of the sample is comparatively high (€-2) when calculated as an average for the total sample. The few respondents gave high negative estimates (€-532 calculated as an average for the 3% who answered the question). It has been frequently reported that estimates of WTA are large compared to estimates of WTP (Andersson, Rustad, & Solberg, 2004). The net Non-Use value, considering positive as well as negative experiences among local residents, is thus positive and estimated to be € 6 which clearly indicates a positive assessment of socio-cultural impacts, further supported by the fact that 58% of the respondents were prepared to subsidize the festival with public money if this hypothetically would be necessary.

Non-use value to a large extent reflects socio-cultural impacts that the festival has on local residents. Although the value per average citizen is small (€ 6), the survey estimates the average impact on each one of the 507 000 citizens of Gothenburg. When the average values are multiplied by 507 000, the result is an estimate of the total socio-cultural impact assessed in monetary terms based on Non-use value as illustrated in Fig. 2.

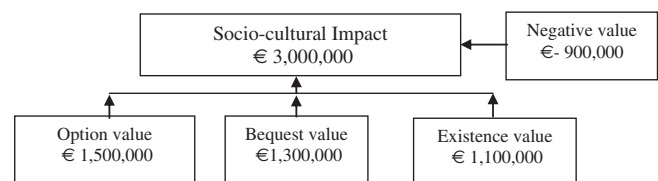


Fig. 2. An estimate in monetary terms of the socio-cultural impact of a music festival based on the components of non-use value.

5.3. Environmental impacts

The use of resources is described in Table 4 which is based on data collected from festival visitors (survey A), the event organizer and the local waste entrepreneur.

Ecological Footprint as well as Carbon Equivalent Emissions were calculated by feeding data from Table 4 into the Event Calculator. The output in terms of the total ecological footprint for the event is 1918 global hectares and in terms of total carbon emissions for the event 773 tons CO₂ equivalents as illustrated in Fig. 3.

5.3.1. The ecological footprint

The global estimate is that there are 11.9 billion productive hectares on the earth, including both land and water. If there are 7 billion people on earth, this gives an average of 1.7 global hectares per human being. The resource use per festival visitor corresponds to 0.073 global hectares during the festival which, considering that the average length of stay is 2.44 days, indicates a resource use of 10.9 global hectares if festival visitors used resources at the same rate throughout the year. This is more than 6 times the amount of resources that the average human has at his/her disposal. It is, however, roughly equal to the Swedish biocapacity per person of 9.75 gha, but still 85% more than the average ecological footprint of 5.88 gha for Swedes (Global Footprint Network, 2010).

The ecological footprint analysis also describes what type of land resources will be used. “Energy Land” represents around 45%

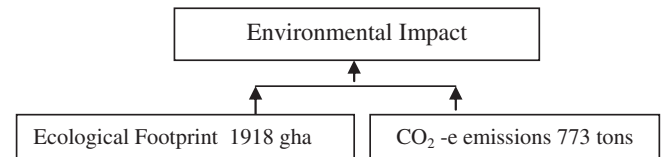


Fig. 3. Measures of environmental impact from the festival way out West.

of total gha needed followed by “Occupied, built-up land”, 30%, “Cropland”, 13%, “Grazing Land”, 11% and “Forest Land”, 1%.

5.3.2. Carbon emissions

The dominance of “Energy Land” in the ecological footprint is related to the need for land to neutralize carbon dioxide emissions. The estimated total emission of 773 tons CO₂ equivalents includes emissions of all greenhouse gases such as methane, perfluorcarbon and nitrous oxide. It is important to underline that the calculation of the ecological footprint above includes the resources needed to offset the impact of CO₂ emissions.

5.3.3. The cost of environmental impacts

A satisfactory economic approach to assess the cost of using global hectares and tons of CO₂ equivalents would be to determine the shadow cost of limited resources. In a well-functioning market, the market price would be an acceptable approximation of the shadow cost. There is a market for emission rights with a market

Table 4

Total resource use related to the music festival way out West 2010. Consumption values are estimated in \$ AUS as required in the EPA event calculator.

Category	Data type	Data source	Data
Energy	Electricity usage (kW h)	Way out west	16,299 kW h
	% Green electricity (from renewable sources)	Way out west	100%
	Fuel consumption for generators (diesel, biodiesel etc.)	Way out west	11,317 L (biodiesel)
Transport	Lorries and other vehicles used to transport supplies for the build-up of the festival (number, size, distance)	Way out west	3840 km small truck, 3840 km large truck
	Transport for artists (type, distance)	Way out west	Bus 710,975 km Train 5,293,431 km
	Transport for festival visitors (type, distance, carpooling)	Survey A	Car 2,538,355 km Dom.flight 263,726 km Intn'l flight 444,190 km
	Transport in Gothenburg for festival visitors (type, distance) based on an assumed estimated distance of 5 km/visitor	Survey A	Walking 66,265 km Cycling 10,670 km Public transport 140,165 km Car 14,095 km
Waste	Waste to disposal site (type, volume/weight)	Way out west/Renova (local waste treatment entrepreneur)	7888 bins (240 L) 5.2% Paper & cardboard 1.3% Glass 3.8% Plastic 3.8% Aluminum & steel 20.7% mingled (paper, Glass, aluminum, steel) 65.2% Food & organic waste 100%
	Recycling (type of waste, volume/weight)	Way out west/Renova	
Water	Water usage (volume)	Europeans' attitudes towards climate change, 2008, EU	5057 kL (estimate of daily consumption)
	Wastewater produced (volume)	N/A	N/A
Consumption	Recycling of wastewater	N/A	N/A
	Food & beverages (amount)	Survey A	\$ AUS 2,140,035
	Textiles & clothing	Way out west	\$ AUS 73,700
	Accommodation	Survey A	\$ AUS 86/night Bed nights: 22,975 at home 22,500 VFR 4693 hotel & hostel
Other	Total surface (m ²) used for festival area	Way out west	26 000 m ²

price for the right to emit one ton of CO₂ equivalents, although how well this market is functioning is subject to debate (see Grubb & Neuhoﬀ, 2006; Okereke & McDaniels, 2012). The market price for the right to emit a ton of carbon dioxide equivalents was €12 in August 2010 when the music festival took place.

The cost of the greenhouse gas emissions from the festival Way Out West can thus be assessed by the use of the market price for emission rights as of August 2010 (€12 per ton) for 773 tons of carbon dioxide equivalents giving a total of €9 276.

There is no market for global hectares that can be used to estimate the shadow cost of land resources used for the music festival, which is understandable considering the vast global variation in hectare prices. The EPA Event Calculator has, however, specified the 1 918 global hectares to comprise 862 ha “energy land”, 574 ha “occupied, built-up land”, 250 ha “cropland”, 230 ha “grazing land”, and 2 ha “forest”. In most countries there are market prices for lease arrangements where tenants pay an annual amount of money for the right to use the land. There are of course wide differences in prices for lease arrangements, and it is difficult to determine on what basis the shadow cost should be assessed.

Is it reasonable to argue that the global hectares used for a music festival in Sweden can be offset by land in a developing country? Arguably land is often productive in tropical and sub-tropical areas although lease costs are lower. However, the resources used for a music festival in Sweden are more likely to claim limited land resources in the same area. It is therefore argued in this study that lease costs for land tenants in Sweden are more appropriate as an estimate of shadow cost for global hectares needed for the resources used at the music festival in Sweden. Interviews with representatives for The Federation of Swedish Farmers indicate that a reasonable annual land lease in the western part of Sweden in 2010 amounted to €172 for cropland, €127 for grazing land and €42 for forest land. “Energy land” is a resource primarily needed to absorb carbon dioxide which is performed by forests and “the carbon footprint is calculated as the amount of forest land required to absorb given carbon emissions.” (Global Footprint Network, 2010, p. 14). Therefore, the lease cost of energy land is equal to the lease cost of forest land.

Similarly, the lease cost for built-up land is calculated based on lease cost of cropland “It is assumed that built-up land occupies what was previously cropland” and “The equivalence factor for built-up land is set equal to that for cropland.” (Global Footprint Network, 2010, p. 14). The total shadow cost for 1 918 global hectares will therefore be €209 374 based on an assessment of lease cost for 1 918 ha in the part of Sweden where the music festival is arranged (cf. Table 5).

As illustrated in Table 5, the cost of CO₂e emissions is less than a third of the shadow cost of “energy land” which is required not only to offset CO₂ emissions but also to produce energy. It should be noted that a calculation of the ecological footprint includes the cost of emitting carbon dioxide equivalents. The values calculated based

Table 5

Two approaches to assessing the shadow cost of gha and CO₂e.

Monetary evaluation method of ecological impact	Ecological footprint	CO ₂ equivalent emissions
	1918 gha	773 t.
Market value of emission rights		€ 12 × 773 = € 9276
Shadow cost based on average land rents in the western part of Sweden	“Energy land”: € 42 × 862 ha = € 34,398 “Built-up land”: € 172 × 574 ha = € 102,684 “Cropland”: € 172 × 250 ha = € 43,000 “Grazing land”: € 127 × 230 ha = € 29,210 “Forest land”: € 42 × 2 ha = € 82 Total lease cost = € 209,374	

on the market price of emission rights are therefore merely for comparisons. The value suggested to cover total cost of the environmental impact is therefore €209 374, which is an estimate of the cost of the biologically productive land and water area needed for the resources that the festival consumes and to absorb the carbon dioxide emissions it generates with today’s technology and resource management practices.

6. Conclusions and implications for research

The objective of this study has been to develop and test a model for measuring, in monetary terms, the impact of an event not only from an economic, but also from a social, cultural and environmental perspective. To conclude, it is appropriate to reflect critically on what has been achieved, what has not been achieved and what needs further research. Three major issues will be discussed before needs for further research are identified. First, results achieved will be summarized and discussed. Second, the scope of the measurements will be critically discussed and particular attention will be given to the concept of opportunity cost in this context. Third, the concept of commensurability will be revisited in the light of the results of this study.

6.1. Measures of economic, socio-cultural and environmental impacts

The results of the estimations of the monetary value of economic, socio-cultural and environmental impacts are summarized in Fig. 4. Total impact is evaluated as €6.69 million with the largest share of this being economic impact, an almost equally large share being socio-cultural impacts and an almost negligible cost from environmental impacts.

Economic impact represents more than half of the total impact. This measure is based only on the expenditure that visitors

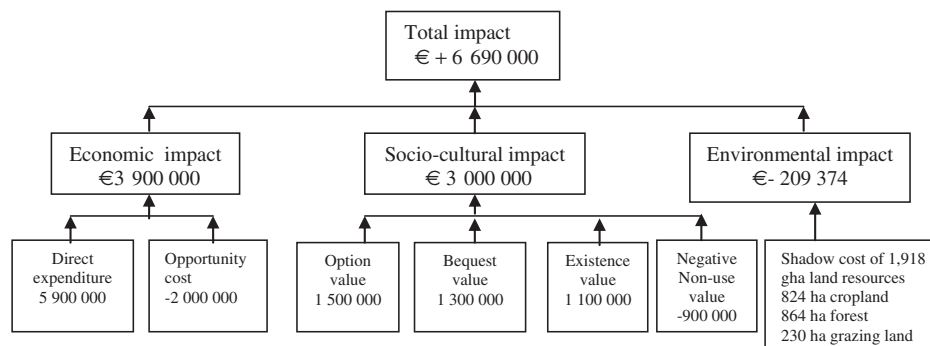


Fig. 4. A total estimate in monetary terms of the sustainability impact of a music festival.

incurred as a result of attending the festival. About 45% is ticket expenses followed by food, travel and accommodation. It is worth noting that the opportunity cost represents 34% of direct expenditure when, as is the case in this study, expenditure by local residents has been included in direct expenditure.

Socio-cultural impact has been assessed in terms of willingness-to-pay and not in terms of actual payments. It is thus not a financial measure although it is represented by an economic value. The size of the impact reflects a positive attitude towards the music event from local residents. A comparison of the four components of socio-cultural impact shows that the opportunity to visit a music festival in town either for oneself (option value) or for the younger generation (bequest value) is slightly more important than the value of an enhanced image of the city (existence value).

A socio-cultural value that is not included in the analysis is related to the "Use-value" experienced by local residents attending the festival. If the experienced use-value is higher than the actual expenditure that these local residents incurred, a consumer surplus is generated. This value could be included as a positive socio-cultural impact of the music festival for the region.

Only 3% of the surveyed local residents reported that they would ask for a monetary compensation for the inconvenience caused by the music festival (willingness-to-accept). The amounts suggested were large, however, which resulted in a negative non-use value almost 25% the size of the positive non-use value. This degree of difference in assessments of WTP and WTA is frequently reported in similar studies.

The importance of the environmental impact measured in monetary terms is surprisingly low considering the political attention that environmental issues are given. The environmental costs as measured in this study represent less than 4% of the total impact. Besides the conclusion that the importance of environmental issues is exaggerated in political discussions, a more correct (also politically correct) conclusion is probably that monetary measures underestimate environmental costs. This is the case despite the fact that the shadow cost of global hectares, which was the method used in this study, produces a cost estimate more than 20 times higher than the cost of emission rights, which is frequently referred to as a method to put a price on environmental impacts. If the price on the European market for emission rights (EU ETS) had been used to price the environmental costs of the festival, these would only have amounted to less than 0.2% of the total impact.

6.2. *Scope of assessment*

The concept of sustainability may owe part of its success to the magic number three and to the fact that three perspectives provide an acceptable complexity. It has been suggested that more than three dimensions should be included (e.g. Vanclay, 2004), but only with limited success. An important issue is of course whether important perspectives are missing in a three dimensional sustainability approach.

A Cost-Benefit Analysis, which is similar to the approach used in this study, is all inclusive but only implicitly so. The estimate of Non-Use value made in this study should include all aspects and "externalities" caused by the music festival. The estimate is, however, based on a rather crude monetary assessment of residents' perceptions and it can hardly be claimed that the results of this study describe effects in terms of the seven capitals (cf. Bennett et al., 2012; Mykletun, 2009) at any detailed level. Similarly, it is difficult to claim that all socio-cultural values generated by a festival will be captured by the measurement of Non-use value (Throsby, 2003).

Another issue related to the scope of assessment is the extent to which the impact assessment describes not only direct but also

indirect effects. This was explicitly discussed in the economic assessments where the impact explicitly was measured in terms of direct economic impact, in line with the recommendation from Sherwood (2007). Using multipliers in this study would produce a higher value of the economic impact whereas a careful examination of leakage out of the region would reduce the regional economic impact. The extent of these effects, and whether they would cancel each other out, has not been analyzed.

Limiting the economic assessment to direct expenditure also eliminates the difference in scope between economic and socio-cultural impact analyses. Socio-cultural impacts, as measured in this study, can be considered as direct impacts. These impacts will affect the peace of mind and quality of life of the local residents, which may later on also influence their desire to continue living in the area. Although these chains of socio-cultural impacts would in theory be relevant for an impact assessment, describing them empirically does not seem practicable. For example, apart from spending time at the festival the visitors may be inspired to pursue an interest in music, which may have indirect positive cultural impacts.

6.3. *Opportunity cost*

It has been strongly argued that in order to achieve an acceptable quality of an economic impact analysis, opportunity cost must be considered. It is equally important for a socio-cultural and environmental analysis. Not discussing the opportunity cost is equivalent to assuming that participants, spectators and others involved in a music festival would be living in a vacuum with nil economic expenditure, nil socio-cultural activity and nil environmental impact if they did not participate in the music festival. This would, of course, be an incorrect assumption and might severely distort the result. The issue of opportunity cost is closely related to whether the aim with of the impact assessment is to describe gross impacts or net impacts.

Take as an example a local resident who takes the tram to the city centre to the music festival. This will in fact have a large positive net environmental impact if the alternative was to go on a weekend trip to London. It would also have a large positive net regional economic impact, for although less money is spent at the music festival than for the London trip. It is spent locally rather than being leaked out of the regional economy. It is also interesting to discuss the net socio-cultural impact by comparing the music festival to a weekend in London. The point being made is that the issue of opportunity cost related to an alternative activity cannot be overlooked in a festival impact assessment and it is equally important for a correct analysis of environmental, economic and socio-cultural impacts. Empirically, regional statistics describing average environmental impact, social and economic activity will facilitate an approach to consider opportunity cost in calculations of net impact.

6.4. *Commensurability*

Commensurability has been lacking in assessments of the sustainability of events and other types of projects, thereby leaving room for political judgements to be used to assess the relative importance of e.g. positive economic impacts in comparison to negative socio-cultural impacts. One suggested solution to this issue was presented by Fredline et al. (2005). There is, however, a subjective element in the method for giving sustainability indicators a number between 0 and 10. In order to avoid a subjective interpretation of indicators, this study has proposed and tested an approach based on monetary values. While there is a danger of appearing 'economistic' and naïve in proposing this approach, the prospect of coming closer to a holistic solution makes such an effort

worthwhile. One advantage of using monetary measures is that the economic impacts are already expressed in monetary units and that monetary units are universally understood and universally accepted measurement units.

It should, however, be pointed out that three types of monetary measures have been used. First, direct expenditure is measured in financial terms describing actual market transactions and consumer surplus is not included. Second, Non-use value is measured in terms of willingness-to-pay, to reflect a stated preference which is only hypothetically linked to a market transaction (as tax payments). Third, the shadow cost of land (global hectares) is based on previous market transactions and average land lease rates, although no actual land transactions take place as a consequence of the music festival. It is assumed that the shadow cost of land represents the value foregone by using resources for the festival instead of the best alternative activity.

6.5. Future research

Our understanding of economic impacts of large sport events has been advanced through *ex post* analyses (Baade & Matheson, 2004), where the impacts have been studied some years after the event took place by an analysis of regional economic statistics for the particular year an event took place. In most of these studies economic impacts turn out to leave much smaller traces in the regional economic statistics (regional domestic product) than was predicted by the use of expenditure data and input–output analyses. A development of *ex post* analyses also of socio-cultural and environmental impacts would be a fruitful approach to learn more about how correct and reliable *ex ante* assessments of economic, socio-cultural as well as environmental impacts are (cf. Baldock, Maes, & Buelens, 2011).

Theory which holds that various forms of capital (Mykletun, 2009) are both depreciated and accumulated as a consequence of a festival holds the promise of providing a consistent framework where a particular festival leaves an impact on all types of capital. Such an approach might also clarify the difference between capital and flow. There are also recent developments in the methodology for measurement of social and cultural capital which in the future might be integrated into assessments of sustainability (e.g. Bennett et al., 2012; Moscardo, 2008).

The results of this study raise a concerns about what seems to be a severely distorted market price of environmental impacts. With a well-functioning emission rights market, music festivals will be able, just like other industries, to work with market prices for environmental emissions and to integrate an environmental strategy with an overall economic and socio-cultural strategy. This solution is hopefully not too far away (Grubb & Neuhoff, 2006). A fully fledged cost-benefit analysis will then be feasible and impact assessments of a music festival can be integrated, not only in the long tradition of cost benefit analyses from a wide range of industries, but also in the well-established theoretical framework of welfare economics.

Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.tourman.2012.12.015>.

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