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DEVELOPING IMPACTS AND INDICATORS FOR SUSTAINABLE EVENT MANAGEMENT USING A TRIPLE BOTTOM LINE APPROACH: A STUDY OF AUTO EXPO

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Marked by the pressing need to make events sustainable, this study aims to develop impacts and indicators for a special category event—The Auto Expo—one of the largest automobile events hosted in India. The study begins with literature review of event evaluation on key indicators of triple bottom line (TBL): economic, social, and environment. Historical roots of Auto Expo is also reviewed, which is then followed by a Delphi survey of experts from event organizers to auto professionals, and from academia to domain experts. A rigorous three-phase Delphi analysis is conducted following which resulted into 18 impacts and 25 indicators related to Auto Expo. The study also delves into potential methods that could be employed for holistic TBL evaluation of Auto Expo. Key challenges and issues in this regard are mentioned as well as discussing the implications of the research for stakeholders toward the end.

Key words: Auto Expo; Economic; Environment; Social; Sustainable event management; Triple bottom line (TBL)

Introduction

It is a well-documented fact that the staging of any major event benefits the economy of the host country immensely. It also offers the host country a global platform to showcase itself on the world stage (Gursoy, Kim, & Uysal, 2004) and brings home benefits like enhanced trade and travel, flourishing tourism, and a vibrant economy. This demonstrates the increased importance accorded

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by various states/governments to the organizers of many major events in different areas of sports, culture, and business (Crompton, 2006). Other positive developments associated with event hosting are infrastructure development, refurbishment and maintenance of facilities, social harmony, community entertainment, and inculcation of national pride, which although is intangible, nonetheless has crucial benefits for the countries (Crompton & Lee, 2000). That said, the negative impacts of the event are well documented also, though these demerits hardly come into light. The competitiveness of these mega-events in making destinations attractive for the tourists and businesses in the long term is also a matter of debate. Kruger, Heath, and Du Preez (2012) found that even a mega-event such as FIFA 2010 World Cup couldn't invoke a positive response from all the related stakeholders about its contribution in making South Africa (host country) an attractive tourist destination. Although government stakeholders acknowledged the role of mega-events in the socioeconomic transformation of the country, most of the private stakeholders expressed their disappointment about the long-term influence of FIFA in attracting tourists and augmenting businesses.

Any event, whether global or local, attracting large numbers visitors in rather small areas creates huge environmental implications in the form of congested traffic, high noise pollution, and exploitation of natural and manmade resources (Warnick, Bojanic, Mathur, & Ninan, 2011). Additionally, there are large financial risks associated with these events; especially the funding done by the exchequer is under high scrutiny and lately the concerns about the safety and security of global events have also risen to prominence amid altering geographical political conditions (Moscardo, Pearce, Morrison, Green, & Oleary, 2000).

The review of event evaluations research reveals that most of these assessment reports are single-mindedly focused on the economic aspect. This holds specifically true in the case of events being organized in developing economies, as the emphasis is placed on development by these countries rather than focusing on the social and environmental contexts (Swart, Robinson, & Cohen, 2003). It is no surprise then that the extant literature followed the same approach with most of the previous research adopting the economic route to assess the impact of the events until recently. The new and emerging trend in event impact assessment has signified a subtle shift towards holistic event evaluation—an approach adopting a balanced viewpoint while allocating weightage to economic, social, and environment aspects (Swart et al., 2003). This also explains why triple bottom line (TBL) reporting—a comprehensive approach covering economic, social, and environmental dimensions—has gained recognition across the globe. Another reason favoring the adoption of the TBL approach is the fact that the environment stability of a place is largely dependent on its socioeconomic framework, and hence calls for the equal weightage for all three dimensions of TBL: economic, social, and environmental (Swart et al., 2003). China's example fits the bill completely in this regard as the country is making considerable policy and institutional changes in its socioeconomic framework under the project Low Carbon City Pilots (LCCPs) to reduce its carbon levels from high to low (Wang, Song, He, & Qi, 2015).

TBL assessments have made strides in different disciplines across industries though their use in event assessment and more specifically to auto events is yet to materialize. Thus, this study is focused on developing the impacts and indicators for an event like Auto Expo based upon TBL approaches. Taking a cue from the literature, it delves into possible mechanisms to aggregate the result on each domain of TBL. This study will not only facilitate TBL evaluations of Auto Expos as an industry sector, but also help the government and related statutory and funding bodies in making important decisions due to crucial implications for related stakeholders including society at large.

Literature Review

The literature evaluating tourism impacts on societies in general is quite rich as a large number of studies have evaluated the effect of tourism on a broad socioeconomic framework (Burns, Hatch, & Mules, 1986; Dwyer, Mellor, Mistilis, & Mules, 2000; Stynes, 1997). The results of these studies are well documented and backed by reinforcing research and empirical analysis; however, the same doesn't hold true when it comes to events and their

impact analysis. Not much is offered by the extant literature and, barring few studies, the event impact evaluation largely depends on the inferences drawn from tourism studies for reference. Recently, however, authors have started paying attention to the impact analysis of events and their related influence on the social, economic, and environmental domain. The study by Du Preez and Heath (2016) depicted the relationship between social dimension and the environmental responsible behavior of cycling spectators. Authors found that social norms play an important role in deciding the spectators' intention towards the environment and more specifically, the factor of place attachment comes out as a precursor driving the spectators toward environmentally responsible behavior.

Another issue with scant literature available on event impact assessment is the concentration of research (e.g., McAuley, 2001; Walker, 2003) on one specific discipline among the economic, social, or environmental fields. As argued by Clifton, O'Sullivan, and Pickernell (2012), it is essential to have a robust and holistic impact assessment system in today's evidence-based evaluation culture; however, factors like lacking policy initiatives, undefined quality parameters, and more importantly, the resource compulsion have made holistic impact evaluation optional in nature. The contribution of Brown, Getz, Pettersson, and Wallstam (2015) in developing the holistic model for event evaluation and impact assessment is worth mentioning here and our study has taken a number of cues from the model while developing the impacts and indicators for a special type of event organized in India—The Auto Expo event. Once developed, we posit that these impacts and indicators can be used for the holistic evaluation of the Auto Expo event on all the three fronts—economic, social, and environment.

Economic Impact Assessment

Economic impact is defined as a change in income and expenditure of the residents, and employment generation as a result of the event organization (Crompton, 1995; Konstantaki & Wickens, 2010). Typical benefits of economic impacts include direct and indirect benefits in addition to the induced effects taken into consideration (Ritchie, Shipway, & Cleeve, 2009; Stynes, 1997). Literature on economic impact evaluation of events is quite rich with authors such as Bull and Lovell (2007), W. Kim and Walker (2012), and Konstantaki and Wickens (2010) contributing significantly to the literature on economic impact assessment. The literature suggests a variety of economic impact assessment models for evaluating economic impacts, although scholars differ in their viewpoint about the effectiveness of these models to provide accurate results (Crompton & Lee, 2000; Crompton, Lee, & Shuster, 2001; Dwyer, Forsyth, & Spurr, 2004; W. Kim & Walker, 2012). Still, the three highest rated models on the economic assessment are as follows:

1. Input–output model (I/O model)
2. Tourism satellite account (TSA)
3. Computable general equilibrium (CGE) (Stynes, 1997).

The I/O model is designed to examine the economic effect of the input (spending) on a particular event in terms of output (benefits) it generates for them. The evaluator can decide on the number of indicators to be included in the output scenario. The comprehensive I/O model should use a large output dimensions and also correlate these dimensions so that a holistic picture can be conceptualized on the economic front (Homafar, Honari, Heidary, Heidary, & Emami, 2011). The second model (i.e., TSA) makes extensive use of the statistical packages and mathematical techniques to ascertain the economic effect of a particular event. The use of sophisticated software and computational tools make the use of this model a bit expensive; however, the accuracy of the results and the overall scenario is far more dependable than the outlook given by the I/O model (Homafar et al., 2011; H. Kim, Gursoy, & Lee, 2006). The third model of economic impact assessment (i.e., CGE) is considered the best model that can predict the economic impact of tourism activity accurately (Dwyer, Forsyth, & Spurr, 2006). The CGE model is based upon the I/O model; however, comprehensive improvements were made while conceiving this model. For example, the CGE model considers the impact of the event on the whole economy, takes input as a direct measure of economic impact, and does away with some unrealistic assumptions

that are an essential part of the I/O model (Dwyer et al., 2006).

Social Impact Assessment

Compared to rich and prosper literature on the economic front, studies on the social impacts of events are scant (W. Kim & Walker, 2012). However, now this dimension has caught the imagination of researchers. One reason the lack of exploration in the social domain is the intangible nature of impacts which, unlike economic, are hard to quantify (H. Kim et al., 2006). Literature throws diverse viewpoints on the social impacts of events. Glasson (1994), Marcouiller (1997), Crompton (2006), and W. Kim and Walker (2012) advocated that the social impact of events overall is positive. On the contrary, authors such as Weaver and Oppermann (2000) contended that events exert negative impact on the social strata as they tend to alter the existing dynamics of society.

Giving one of the most comprehensive definitions of social impacts, Teo (1994) defined social impacts in terms of change in the value system, individual conduct and behavior, and traditional expressions. Doxey's (1975) attempt to test the irritation of local residents towards tourism led to the development of the Irridex model. Using the same model, Teo (1994) conducted a study in Singapore and found that there existed a high level of intolerance for tourists. Local residents associated tourist activities with increasing crime rates, and hence had hostile attitudes toward tourists. Adding to the negative effects, Weaver and Oppermann (2000) contended that behavioral and cultural differences between locals and tourists affect their interactions and as does the financial inequality. Contrary to these downsides, Marcouiller (1997) argued that one of the important social impacts of tourism is the development of local community pride, a sense of well-being, and belongingness. These social engagements or characteristics are considered as social capital, which is in fact increasingly recognized as an important factor for a prosperous society (Onyx & Leonard, 2000). Even the aforementioned study of Teo (1994) found that cultural heritage of any location was preserved due to tourism through local residents. Past research has principally relied on the three methods for assessing social impacts of the events: survey, social impact assessment, and choice modeling and contingent valuation. Survey research is the most common method to evaluate the events' effect on a society (Johnson, 2002). Social impact assessment (SIA) is another method for gauging the social consequences resulting from new project developments or policy initiatives (Burdge & Vanclay, 1996). The method of choice modeling and contingent valuation has also been employed in the social impact assessment. These techniques involve assigning monetary weightages to the social impacts by enquiring residents about their willingness to pay in order to avoid or ensure the organizing of an event or development of tourism (Lindberg, Andersson, & Dellaert, 2001).

Environment Impact Assessment

After the establishment of the Brundtland commission in 1984, research into environment sustainability picked up a healthy pace. Interestingly, a review of extant literature revealed that although the sustainability agenda continues to find favor among researchers, the environment impact analysis of events hasn't received the attention it deserves. As argued by Bond and Morrison-Saunders (2011), the reason behind this underwhelming attention is the difficultly to conduct environment impact assessment (EIA) of the events pertaining to their varying nature, objective, size, and scale. Further, there is no standard scale or tool that has been agreed upon as a universal indicator for the EIA of the events. Some assessment methods propose to quantify the EIA of events on parameters such as carbon dioxide emissions, waste generation, and resource consumption (Byon & Zhang, 2010; Collins, Flynn, Munday, & Roberts, 2007; Hacking & Guthrie, 2008; Jeong, 1998), while others advocate the inclusion of qualitative aspects like use of natural resources, low emission mediums of transport, and emphasis on green policies (McLennan, Becken, Battye, & Fung So, 2014; Weed, 2005). Among the primary indicators of EIA of events, literature reveals an exploration on the air quality (Case, 2013), venue selection (Hunter & Shaw, 2007), emission levels (Weed, 2005), waste generation (Hacking & Guthrie, 2008), and resource consumption (Byon & Zhang, 2010). Further, past studies have developed methods for EIA of events though

none of these methods are universally acceptable. For example, the interaction matrix, which is developed to investigate the effect of venue selection on the environment as it is limited to go beyond the parameters of the venue. Similarly, the checklist method of assessing environmental impact is another widely used method, though it is criticized for its nonformalized approach and lack of predefined relationships. Among these methods, the environmental indices tool that was given by Ott (1978) is considered the most credible method for EIA. These indices can be correlated with the available information and form systemic base for the assessment of different activities of any given event on the environment. However, a more proper approach today lays emphasis on the eco-planning of the events, which recommends the inclusion of all environmentally friendly measures while planning and conceptualizing the broad framework of events (Jones, 2014).

Holistic Event Evaluation

Although the majority of past event evaluation studies belong to either one of the aforementioned areas, there have been some attempts made to arrive at a holistic evaluation encompassing different perspectives. Burns et al. (1986) were early adopters of the holistic approach when they conducted a holistic cost–benefit analysis of the Australian Grand Prix held at Adelaide in 1985. It gave overall direction to comprehensive evaluation by providing a framework measuring a host of intangible social and environment indicators along with tangible economic parameters. Critical parameters like traffic intensity, noise pollution, road mishaps, and property damage were assessed and assigned monetary value to make the assessment easy, an example is the value of each lost hour due to traffic was calculated monetarily. Other social benefits of the events are the national pride, feel-good factor, and amalgam of entertainment and excitement. It is termed as psychic income and expressed monetarily by calculating psychic income, wherein the majority of the spectators benefitted equal to or matching to the cost incurred by them. Undoubtedly, the work of Burns et al. (1986) had a seminal influence on event evaluation studies. Dwyer et al. (2000) used qualitative evaluation of social and environmental along with traditional aspects like business and trade development, appreciation in property rates, business interruption, crime rate, exodus of local residents, and associated costs. Still several issues regarding the measurement of these impacts are unresolved like excessive emphasis on converting impacts into monetary terms has undermined the importance of indicators that can only be defined descriptively. Also, none of the approaches arrive at a comprehensive value for the overall impact of an event.

Triple Bottom Line (TBL) Evaluation

One of the key aims of TBL evaluation is to incorporate performance on three parameters, namely, economic, social, and environmental. Although economic indicators can be easily measured in monetary terms through expressing social and environmental indicators monetarily, the process is laced with several issues and challenges. Researchers are often confronted with questions such as how far is it feasible to measure the dollar value of social capital or ecological harm caused by a particular event, what are the methods to monetize the social and environment impacts, and whether these impacts can be measured accurately with the existing tools and techniques? A fully operational TBL evaluation model requires a mechanism through which all the indicators can be brought together to synthesize a single assessment value, which also allows the comparison of similar natured events on different economic, social, and environmental indicators. This could be done by assigning weights to indicators and then aggregating them separately for each dimension (Bell & Morse, 2003). Fredline, Jago, and Deery (2003) addressed the challenge of modeling the TBL evaluation including the difficulties faced in combining a range of different indicators into one common measurement parameter, by monetizing or measuring all the values in monetary terms. Although this can overcome the issue related to one common unit of measurement, there will be issues of ethical and philosophical considerations about attaching monetary value to social and environment indicators like cultural degradation, loss of biodiversity, damage to wetlands, or soil erosion, etc. Other factors like

learning from conducting the event and making the most of the business linkages made during the event can be taken into account (Fredline, Deery, & Jago, 2005). This implies that the TBL evaluation model should be flexible to accommodate a range of other inclusive measures in addition to its core areas of economic, social, and environmental indicators.

Extant literature reveals that principally there are two methods to operationalize TBL indicators and arrives at an overall evaluation of the event. The first method, called indicators normalized at indicator level, represents itself as a spider diagram and warrants all indicator values to be normalized to a dollar value (Foran, Lenzen, & Dey, 2005). A second model uses the normalization technique at the dimensional level rather than what the first model does at an indicator level. This means there are different aggregations that can be applied; that is, economic indicators can be expressed in dollar value, social indicators into ratings, and environment indicators as part of the ecological footprint. Many authors supported this approach (e.g., Korhonen, 2003), although the challenge here is one of mapping each dimension on one scale or tangent after being evaluated on different scales initially. Fredline et al. (2005) discussed a possible solution of this challenge by proposing a conceptual model where each dimension is plotted on a separate scale and rated on scores ranging from 0 to 10. Thus, for this study, a second evaluation framework is more appropriate, as a wide variety of indicators are to be integrated and aggregation at the dimensional level would be a more efficacious approach. Development of a fully operationalized TBL model is beyond the scope of this study, but the aim is to contribute to the body of knowledge by developing impacts and indicators of an Auto Expo event, which will help aid the decision-making process.

Methodology

This study is focused on the Auto Expo, which is a biennial automobile event held in India and counted among Asia's largest automotive shows. Its latest 13th edition was jointly organized by the Society of Indian automobile manufacturers (SIAM), the automotive component manufacturers association of India (ACMA), and the confederation of Indian Industry (CII) in the Nation's capital region of Delhi and witnessed 65 manufacturers displaying their products to over 7 lakh visitors (Economic Times Auto, 2016). Now to develop Auto Expo impacts and indicators, the Delphi technique will be used as this approach is one of the most widely-used methods for such developments. Literature reveals that across different disciplines the Delphi technique remains one of the preferred methods, although when it comes to the event industry, this approach has been quite underutilized (Sherwood, Jago, & Deery, 2004). Further, as the developments of the Auto Expo impacts and indicators are being done to improve their hosting parameters as well as enhancing their benefits in the future, the Delphi method makes a strong case for itself (Sherwood et al., 2004). The Delphi method has also received a positive recommendation from Brown et al. (2015), owing to its strong conceptual and systemic characteristics of implementation. The development of Auto Expo impacts and indicators has been completed in three stages:

1. In the **first stage**, the experts are asked to develop the **impacts** of the Auto Expo as related to economic, social, and environmental domains and then rate these impacts according to their importance.
2. In the **second stage**, panelists are asked to suggest the **indicators** that can be used to measure the impacts of the Auto Expo developed in the first round.
3. In the **third and final** stage, experts are asked to **reflect on** the suggested indicators to accept, modify, or reject each indicator.

Selection of Expert Panel

The very success of the Delphi technique depends on the careful selection of experts (Chan, Yung, Lam, Tam, & Cheung, 2001). In choosing the panel of experts, equal and balanced representation is desirable and in line with the observation, the following criteria were used to select experts from different disciplines:

Table 1
Discipline-Wise Details of Experts

Discipline	Number of Experts
Automobile professionals	17
Event organizers	12
Automobile reviewers	14
Academicians	14

- Practitioners working in the domain of automobiles, managing/strategizing the business, or closely associated with the industry as consultants/analysts/reviewers for more than 5 years.
- Experts working in the event industry and organizing events at both the state and national level for more than 5 years.
- Academicians who have published articles or conducted research in the domains of business sustainability/automobiles.

Based upon these criteria, a list of 68 experts was initially synthesized and potential members were contacted to inquire after their desire to participate. Out of the total, 57 experts agreed to participate with categorization (Table 1).

Phase I: Survey Administration

The objective of the first round of the survey was to determine Auto Expo impacts and then rate these impacts according to their importance. Each of the 57 experts who agreed to participate was sent a survey form along with a brief description of the background and scope of the study. The panel members were given 2 weeks to complete the survey and a reminder call was made after the first week. After the completion period, 3 additional days were also given for the completion of the survey.

Phase I Result

All the experts in the panels were asked to develop impacts of Auto Expo in the field of economic, social, and environment separately. From a total of 57 experts, 47 completed the survey while 3 responses were incomplete. The average time taken by the respondents was 8 days with an overall response rate of 82% (Table 2).

Out of the 47 complete responses, a list was synthesized with impacts segmented into categories of economic, social, and environmental domains. Special care was taken to categorize these impacts and to avoid any overlapping. A total of 19 impacts were then finally listed with eight corresponding to economic, six corresponding to social, and remaining five corresponding to environmental domains (Table 3).

Phase I: Rating the Impacts

In the second round of phase I, experts were sent the list of 19 impacts developed through the initial survey and asked to rate these on a 5-point Likert scale with responses anchored between *unimportant* (1), *little importance* (2), *moderate importance* (3), *important* (4), and *very important* (5). Again, a period of 2 weeks was provided for the experts to complete the survey with an additional 3 days given after time expired. Out of a total of 57 experts, 42 reverted back with an overall response rate of 73% (Table 4).

A mean of the ratings was calculated and the results showed the net income generation (4.5), the cost of staging the event (4.4), and business development (4.2) rated highest among the economic impacts. In social context, life quality improvement (4.2) and community pride (4.0) were two highly rated impacts while highly rated environmental impacts included the effect on natural resources

Table 2
Experts' Disciplines and Response Details: Development of Impacts

Discipline	Panel Members	Response	Response Rate
Automobile professionals	17	15	89%
Event organizers	12	9	75%
Automobile reviewers	14	11	78%
Academicians	14	12	86%

Table 3
List of Auto Expo Impacts

Economic impacts
1. Business development
2. Visitor expenditure
3. Generation of employment
4. Skill development
5. Net income generation
6. Infrastructure development cost
7. Inflation pressures on economy
8. Cost of staging event
Social impacts
1. Community pride
2. Change in quality of life
3. Overcrowding and traffic congestion
4. Crime rate and women safety
5. Celebration and entertainment
6. Inculcation of values and ethics
Environmental impacts
1. Effect on natural resources
2. Air and noise pollution
3. Waste generation
4. Recycling practices
5. Consumption of water and energy

Table 5
Rating Details of Impacts

Impacts	Mean Rating
Economic impacts	
1. Business development	4.2
2. Visitor expenditure	3.9
3. Generation of employment	4.0
4. Skill development	3.9
5. Net income generation	4.5
6. Infrastructure development cost	3.8
7. Inflation pressures on economy	3.7
8. Cost of staging event	4.4
Social impacts	
1. Community pride	4.0
2. Improvement in quality of life	4.2
3. Overcrowding and traffic congestion	3.8
4. Crime rate and women safety	3.9
5. Celebration and entertainment	3.8
6. Inculcation of values and ethics	3.4
Environmental impacts	
1. Effect on natural resources	4.4
2. Air, water, and noise pollution	4.0
3. Waste generation	3.9
4. Recycling practices	3.5
5. Consumption of water and energy	4.2

(4.4), consumption of energy and water (4.2), and air and noise pollution (4.0) (Table 5).

Phase II: Development of Indicators

The objective of phase II of the survey was to develop indicators that could be used to measure the 18 impacts generated in the first phase. As with the first phase, a survey form was sent out to experts with summary results of the first phase and instructions for the development of indicators. A period of 3 weeks was given to complete the survey and a reminder call was made after 15 days. After the completion of this period, 5 additional days were given for the completion of the survey. In the second phase, the average response time was 12 days with an overall response rate of 74% (Table 6).

The panel members were requested to suggest indicators for each impact. To facilitate the process, guidelines and instructions along with a set of example TBL indicators (Sustainable Measures, 2005) supplied to the experts. As per the instructions, impact indicators could be expressed in any form including numbers, percentages, or ratios. The majority of the respondents replied back with at least two sets of indicators, resulting in a large number of different indicators in the final list. Out of all the indicators developed in the second phase, the indicator selection process SMART, proposed by Sandhu-Rojon (n.d.), was used to retain the most effective indicators for the third and final phase. SMART is an acronym that stands for specific, measurable, attainable, relevant, and trackable. Some of the indicators proposed in this list lacked

Table 4
Experts' Disciplines and Response Details: Rating of Impacts

Discipline	Panel Members	Response	Response Rate
Automobile professionals	17	13	77%
Event organizers	12	10	84%
Automobile reviewers	14	9	65%
Academicians	14	10	71%

Table 6
Experts' Disciplines and Response Details: Phase II

Discipline	Panel Members	Response	Response Rate
Automobile professionals	17	12	71%
Event organizers	12	9	75%
Automobile reviewers	14	10	72%
Academicians	14	11	79%

specificity, and hence failed to qualify for the third round. Some of the indicators could not meet the criteria of measurement and relevance while some failed on attainability. Finally, the indicators that survived the grilling of the SMART process were discussed separately with a group of experts. These were scrutinized for their specificity and overall applicability in the context of Auto Expo. Accordingly, some indicators were modified, refined, and finally a list of indicators emerged (Table 7).

Phase III: Achieving the Consensus

The third and final round was crucial as it was aimed at getting a consensus from the expert panel on the indicators developed in the preceding round. As with round two, 3 weeks were given to complete the survey with a reminder call being done after 15 days. After the completion of this period, 5 additional days were given for the completion of the survey. The highest response rate was recorded for the Academia as 12 out of 14 experts completed the survey and returned the form. Automobile professionals were at the bottom of the response rate while event organizers secured the second position with 83% responding to the survey (Table 8).

The panel members were given three choices to accept, modify, or reject each indicator. If the option of modify was chosen, panel members were given a space to advise how modification should be carried out. The results of the Phase III are indicated in Table 9.

As per the recommendations of experts, the final consolidated list of 18 impacts (7 Economic, 6 Social, and 5 Environmental) and 25 indicators emerged. All these impacts and indicators have the consensus of the entire expert panel, which indicates the relevancy aspect of these parameters (Table 10).

Discussion and Conclusion

Through the use of comprehensive Delphi Analysis technique, the study has developed impacts and indicators for Auto Expo event. A broad range of experts were consulted, from industry, academia, event organizers, and automobile experts to develop a set of impacts and indicators on TBL dimensions for the Auto Expo event. The whole development was done in three successive stages. In the first stage, the experts were asked to develop the impacts and then rate these in order of importance. In the second stage, panelists were asked to develop the indicators for each impact and in the third and final phase, experts reflected on the suite of developed indicators to make recommendations whether to accept, modify, or reject the indicator. Based upon these recommendations, a final pool of indicators was developed and presented in Table 10. This will help to further knowledge and lends some crucial support to future research in this regard.

On the economic dimension, the study has been able to build a consensus on the seven impacts, which can be assessed through 10 different indicators. The results are in line with the past studies (Dwyer et al., 2006; Dwyer et al., 2000; Sherwood et al., 2004; Stynes, 1997) though the number of impacts and indicators developed in this study is fewer in numbers compared to the past researches. These indicators are unique to the nature of events such as Auto Expo, which caters to a special group of audience. There are six social impacts of the Auto Expo event that can be accessed through eight different indicators. This finding is aligned with the literature (Burdge & Vanclay, 1996; Fredline et al., 2005; Fredline et al., 2003; Gursoy et al., 2004; Lindberg et al., 2001) and unlike the economic dimension the number of impacts and indicators are at par with past studies. A similar observation can be made about the number of environmental impacts and

Table 7
Initial List of Developed Indicators

Impacts	Mean Rating	Indicators
Economic impacts		
1. Business development	4.2	Number of business contracts signed during the event
		Boost for economy and/or new business developments
2. Visitor expenditure	3.9	Increased hotel occupancy and rise in food and beverages revenues during the Auto Expo
3. Generation of employment	4.0	Number of full-time jobs created by Auto Expo
		Number of local youth temporarily employed at Auto Expo event
4. Skill development	3.9	Number of people trained specifically for the Auto Expo event
		Types of skills learnt during the training for Auto Expo
5. Net income generation	4.5	Total income generated from the Auto Expo and net collection of taxes by the government
		Impositions and other duties, Rise in gross domestic product and per capita income due to Auto Expo
6. Infrastructure development cost	3.8	Total cost incurred on developing infrastructural and basic facilities specific to Auto Expo
7. Inflation pressures	3.7	Inflation/price rise due to staging of Auto Expo
8. Cost of staging event	4.4	Total cost incurred in hosting the event including rental cost, operational cost, and performance cost
Social impacts		
1. Community pride	4.0	Media coverage/articles about the Auto Expo in local, national, and international media
		Impact of the event on local community's pride and sense of belongingness
2. Improvement in quality of life	4.2	Improvement in quality of life of local community due to Auto Expo
3. Overcrowding and traffic congestion	3.8	Number of business hours lost in the traffic congestion due to Auto Expo
4. Crime rate and women safety	3.9	Increase in crime rate/women molestation during the Auto Expo
5. Celebration and entertainment	3.8	Ratio of locals to outside visitors to Auto Expo event
		Entertainment and amusement facilities availed by the Auto Expo visitors
6. Inculcation of values and ethics	3.4	New values and ethical behavior inculcated by Auto Expo visitors
Environmental impacts		
1. Effect on natural resources	4.2	Degradation of land resources and soil erosion caused by auto expo
2. Air, water, and noise pollution	4.0	Increase in air, water, and noise pollution level due to hosting of Auto Expo event
3. Waste generation	3.9	Waste generated and quantity of waste sent to landfill from Auto Expo venue
4. Recycling practices	3.5	Recycling practices adopted by the Auto Expo organizers
5. Consumption of water and energy	4.2	Volume of water used during Auto Expo
		Total electricity consumed during Auto Expo
		Portion of used energy generated from renewable sources

indicators synthesized by the study. A total of five impacts with seven indicators is in line with the past research conducted by Burns et al. (1986), Hunter and Shaw (2007), Hacking and Guthrie (2008), and Bond and Morrison-Saunders (2011).

The Auto Expo event has assumed a significant importance of late and is now counted among the leagues of top global motor shows like Detroit Motor Show, Geneva Motor Show, and Beijing Motor Show. The scale and size of the event has impressively grown within the past decade in India, which warranted a shift in its location from Pragati Maidan (Delhi) to the much larger and sophisticated venue "India Expo Centre" (Greater Noida)

Table 8
Experts' Disciplines and Response Details

Discipline	Panel Members	Responses	Response Rate
Automobile professionals	17	12	71%
Event organizers	12	10	83%
Automobile analysts/strategists/reviewers	14	11	79%
Academicians	14	12	86%

in 2014. The case for Auto Expo is self-evident of the fact that holding/organizing such mega-events in the heart of a city like Delhi is not a sustainable idea anymore. With expectations of further growth in this sector, this study assumes great significance for both researchers and practitioners.

This study makes several unique contributions to the body of knowledge. First, many researchers in the past have explored the impact of range in these events, from sports to the cultural and economic to the social, but most of these attempts remain focused on the economic significance of the events and to some extent, their impact on the social strata (Brown et al., 2015). Rarely have studies undertaken a systematic approach and followed a holistic procedure to develop impacts and indicators for an event like Auto Expo. More importantly, the procedural framework adopted by the study (based on the conceptual framework of Brown et al., 2015) is certain to motivate researchers, irrespective of the event domain and discipline, to adopt the more holistic framework for event impact assessment, which goes beyond the economic significance and covers all three dimensions of TBL. This is the first study of its kind to be carried out to develop impacts and indicators for a specialized event, Auto Expo.

Secondly, the list of impacts and indicators synthesized in this study can be useful for a variety of stakeholders. Although the government and administrative authorities have a clear picture of the economic impacts of Auto Expo, social groups and environmentalists can easily assess the social and environmental impact of organizing such events. This will also pave the way for clear, concise, and fair comparison of the benefits and costs associated with organizing such events. Additionally, these indicators will help assess the improvements over the period.

With the exponential rise of the participating companies and the huge turnover of visitors, there is an important and urgent need to assess the impacts of such biennial events on TBL dimensions. This study is a significant step forward in this direction. Researchers can expand on the impacts/indicators developed in this study by conducting validation studies to further scrutinize the authenticity and applicability of these parameters. Another important area for future research lies in the development of holistic models for evaluating the impact of Auto Expo. Very little progress has been made on this front even with generic events, let alone the Auto Expo, and indeed concerted efforts are required to conceptualize, operationalize, and standardize such holistic models.

For event organizers this study holds special significance. Auto Expo organizers can make use of these indicators to prioritize the areas where they are lagging and use them in sustainable reporting (Henderson, & McIlwraith, 2013). This is particularly relevant in social and environmental domains where the absence of tangible parameters hampers progress (Brown et al., 2015). The list of impacts and indicators developed in this study can be used for assessing, evaluating, and modifying the approach, making large and mega-events more sustainable. Even other stakeholders such as event planners, participating companies, service providers, government, and visitors can be educated and made aware of the impacts of their actions. Event planners can develop a list of "Do's and Don'ts," while participating companies can use the indicators to fine tune their exhibition strategies and tools. By adopting eco-friendly practices and use of renewable energy sources within their own stalls, companies can certainly build brand equity and project a sustainable image in front of prospective buyers and partners. Sustainability-related initiatives

Table 9
Indicator Selection Results

No.	Comments, Feedback, and Decision on Indicators	Result of Survey	
1	**Indicator**: Number of business contracts signed during the Auto Expo event	Accept	24
	Comment: The experts consented on this crucial economic success indicator as it directly relates to the business activities stimulated by event	Modify	9
		Reject	2
	Decision: Indicator included in final list unchanged		
2	**Indicator**: Boost for economy and/or new business developments	Accept	8
	Comment: Many panel members felt that this indicator lacked in specificity as study purview was exclusively related to local area and economy. Modifications were suggested to make it more specific and hence, local business term had been added	Modify	18
		Reject	6
	Decision: Modified indicator *Boost for local economy and/or new business developments ensued from the Auto Expo event* made to the final list		
3	**Indicator**: Increased hotel occupancy and rise in food and beverages revenues during the Auto Expo	Accept	27
		Modify	8
	Comment: Indicator found favor with most of the panelists though some suggested precaution must be taken while recording the hotel occupancy and estimating revenues as other reasons too contributing to these effects	Reject	4
	Decision: Indicator made it to the final list unchanged.		
4	**Indicator**: Number of full-time jobs created by Auto Expo	Accept	28
	Decision: Indicator made to the final list unchanged.	Modify	5
		Reject	2
5	**Indicator**: Number of local youth temporarily employed at Auto Expo event	Accept	18
	Comment: Panelists suggested the modification to include all the people who got temporary employment in and around Auto Expo event	Modify	17
		Reject	6
	Decision: Rephrased indicator *temporary employment generated by the Auto Expo* made to the final list		
6	**Indicator**: Number of people trained specifically for the Auto Expo event	Accept	29
	Decision: Indicator got place in final list unchanged	Modify	6
		Reject	4
7	**Indicator**: Types of skills learnt during the training	Accept	26
	Decision: Indicator got place in final list unchanged	Modify	4
		Reject	3
8	**Indicator**: Total income generated from the Auto Expo and net collection by the government from taxes, impositions and other duties	Accept	29
		Modify	3
	Decision: Indicator got place in final list unchanged	Reject	2
9	**Indicator**: Rise in gross domestic product and per capita income due to Auto Expo	Accept	9
	Comment: Although relevant at macro-level, majority of panelists were against the inclusion owing to the difficulty in measuring the stand-alone impact of Auto Expo on GDP and per capita income.	Modify	13
		Reject	18
	Decision: Indicator was rejected and didn't make to the final list		
10	**Indicator**: Total cost incurred on developing infrastructural and basic facilities specific to Auto Expo	Accept	25
		Modify	4
	Decision: Indicator got place in final list unchanged	Reject	2
11	**Indicator**: Inflation/price rise due to staging of Auto Expo	Accept	7
	Comment: Majority of experts advocated the rejection because of difficulty of its operationalization and measurement of independent impact Auto Expo has on inflation	Modify	11
		Reject	21
	Decision: Indicator was rejected and didn't make to the final list.		
12	**Indicator**: Total cost incurred in hosting the event including rental cost, operational cost, and performance cost.	Accept	9
		Modify	18
	Comment: Some experts advised the inclusion of miscellaneous cost to include all other types of cost incurred by the event organizers.	Reject	6
	Decision: The modified indicator *total cost incurred in hosting the event including rental cost, operational cost, performance cost, and miscellaneous cost* made to the final list		
13	**Indicator**: Media coverage/articles about the Auto Expo in local, national, and international media	Accept	19
		Modify	6
	Decision: The indicator made to the final list unchanged	Reject	4

(*continued*)

Table 9 (Continued)

No.	Comments, Feedback, and Decision on Indicators	Result of Survey	
14	**Indicator**: Impact of the Auto Expo on local community's pride and sense of belongingness **Comment**: Experts are unanimous about importance of this indicator but suggested to take due care while measuring this perception-based parameter **Decision**: The indicator made to the final list unchanged	Accept Modify Reject	21 4 2
15	**Indicator**: Improvement in quality of life of local community due to Auto Expo **Comment**: Panelists suggested modification and emphasized on replacing the word "improvement" by "impact". Use of word impact is desirable as it can measure both positive and negative side while improvement only indicates the positive side **Decision**: Modified indicator *impact of Auto Expo on quality of life of local community* made to the final list of indicator	Accept Modify Reject	13 11 3
16	**Indicator**: Number of business hours lost in the traffic congestion due to Auto Expo **Comments**: Some panelists have concern about the measurement part though importance of the indicator was acknowledged across the panel **Decision**: Indicator made to the final list unchanged	Accept Modify Reject	12 16 6
17	**Indicator**: Increase in crime rate/women molestation during the Auto Expo **Decision**: Indicator made to the final list unchanged	Accept Modify Reject	22 6 4
18	**Indicator**: Ratio of locals to outsiders visitors to Auto Expo event **Decision**: Indicator made to the final list unchanged	Accept Modify Reject	24 4 3
19	**Indicator**: Entertainment and amusement facilities availed by the Auto Expo visitors **Decision**: Indicator made to the final list unchanged	Accept Modify Reject	28 4 2
20	**Indicator**: New values and ethical behavior inculcated by Auto Expo visitors **Comments**: Some experts apprehended whether short event like Auto Expo can help the visitors to inculcate new vales although majority recognize this indicator as important social measure **Decision**: Indicator made to the final list unchanged	Accept Modify Reject	22 8 4
21	**Indicator**: Degradation of land resources and soil erosion caused by auto expo **Decision**: Indicator made to the final list unchanged	Accept Modify Reject	28 3 1
22	**Indicator**: Increase in air, water, and noise pollution level due to hosting of Auto Expo event **Decision**: Indicator made to the final list unchanged	Accept Modify Reject	22 8 4
23	**Indicator**: Waste generated and quantity of landfill sent from Auto Expo venue **Decision**: Indicator made to the final list unchanged	Accept Modify Reject	22 8 4
24	**Indicator**: Recycling practices adopted by the Auto Expo organizers **Comments**: Experts suggested to modify the recycling practices to environment friendly practices as it will enlarge the ambit and include the allied processes like reducing and reusing of waste material along with recycling **Decision**: Modified indicator *environment-friendly practices adopted by Auto Expo event organizers*	Accept Modify Reject	14 17 3
25	**Indicator**: Volume of water used during Auto Expo **Comments**: Experts suggested to change indicator to include aspect of recycled water and calculation must be done per visitor to evaluate the impact precisely **Decision**: Modified indicator *volume of water used and recycled water per visitor* made to final list unchanged	Accept Modify Reject	13 18 4
26	**Indicator**: Total electricity consumed during Auto Expo **Comments**: Experts suggested to calculate total electricity consumed per visitor to make evaluation more specific and precise **Decision**: Modified indicator *total electricity consumed per visitor* made to final list	Accept Modify Reject	12 16 2
27	**Indicator**: Portion of used energy generated from renewable sources **Comments**: Panelists suggested modification to make the indicator clearer and recommended rephrasing of the indicator **Decision**: Modified indicator *percentage of total used energy generated from renewable resources* made to final list	Accept Modify Reject	16 14 2

Table 10
Final Consolidated List of Auto Expo Impacts and Indicators

Impacts	Mean Rating	Indicators
Economic impacts		
1. Business development	4.2	Number of business contracts signed during the event Boost for economy and/or new business developments
2. Visitor expenditure	3.9	Increased hotel occupancy and rise in food and beverages revenues during the Auto Expo
3. Generation of employment	4.0	Number of full-time jobs created by Auto Expo Temporary employment generated by the Auto Expo
4. Skill development	3.9	Number of people trained specifically for the Auto Expo event Types of skills learnt during the training
5. Net income generation	4.5	Total income generated from the Auto Expo and net collection by the government from taxes, impositions, and other duties
6. Infrastructure development cost	3.8	Total cost incurred on developing infrastructural and basic facilities specific to Auto Expo
7. Cost of staging event	4.4	Total cost incurred in hosting the event including rental cost, operational cost, performance cost, and miscellaneous cost
Social impacts		
1. Community pride	4.0	Media coverage/articles about the Auto Expo in local, national, and international media Impact of the event on local community's pride and sense of belongingness
2. Improvement in quality of life	4.2	Impact of Auto Expo on quality of life of local community
3. Overcrowding and traffic congestion	3.8	Number of business hours lost in the traffic congestion due to Auto Expo
4. Crime rate and women safety	3.9	Increase in crime rate/women molestation during the Auto Expo
5. Celebration and entertainment	3.8	Ratio of locals to outsiders visitors to Auto Expo event Entertainment and amusement facilities availed by the Auto Expo visitors
6. Inculcation of values and ethics	3.4	New values and ethical behavior inculcated by Auto Expo visitors
Environmental impacts		
1. Effect on natural resources	4.2	Degradation of land resources and soil erosion caused by auto expo
2. Air, water, and noise pollution	4.0	Increase in air, water, and noise pollution level due to hosting of Auto Expo event
3. Waste generation	3.9	Waste generated and quantity of landfill sent from Auto Expo venue
4. Recycling practices	3.5	Environment-friendly practices adopted by Auto Expo event organizers
5. Consumption of water and energy	4.2	Volume of water used and recycled water per visitor Total electricity consumed per visitor Percentage of total used energy generated from renewable resources

are highly valued by governments and customers. Additionally, these initiatives should be included as part of the corporate social responsibility (Henderson & McIlwraith, 2013). Government can apply social and environmental indicators to develop policy frameworks and to justify its spending on developing infrastructure and related facilities for such events. Economic indicators such as growth, creation of employment, and impact on the local economy can provide solid evidence for spending by state exchequer to support such events.

The impacts and indicators developed in this study need further testing and validation in other context and cultures. Case studies can be conducted to validate the impacts/indicators developed for Auto Expo on other auto events. As the Auto Expo is primarily an event related to automobile manufacturers and suppliers, the use of these impacts

and indicators on events focused on other industries should be used cautiously. Though the impacts (economic, social, and environmental) may be the same in future studies, indicators to measure these impacts could vary considerably depending on the nature and the scale of the event. Substantial research and participation of key stakeholders is required to formulate the set of impacts and indicators for benchmarking and assessment purposes.

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