

## Article

# Are Grassroots Sports Events Good for Migrant Cities' Sustainable Development? A Case Study of the Shenzhen 100 km Hikathon

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**Abstract:** Compared to official sports mega events, grassroots sports events are attractive to participants because of their universality, accessibility, and casual nature. Taking the Shenzhen 100 km Hikathon as an example, this study investigates the effect of grassroots sports events on sustainable development in migrant cities through residents' perceptions of such events, and how these affect support. We collected 59 questionnaires in a pre-survey and 612 surveys for formal analysis, and used SPSS and AMOS software to construct a structural equation model. The results indicate that the Hikathon's popularity, low media impact, small scale of investment and construction, and short duration had fewer negative effects and was beneficial to sustainable development for the migrant city. Residents perceived more positive benefits (improved city image and economic, environmental and cultural benefits) and less negative costs (environmental and traffic costs), which lead to broader support for such events. Among residents' sociodemographic characteristics, only age was found to moderate the relationship between perceived effects and support. The findings suggest that residents generally perceive grassroots sports events positively, especially in migrant cities, such as Shenzhen, where community events are considered to serve an important role in the construction of place identity.

**Keywords:** grassroots sports events; residents' perceptions; residents' support; sustainable development; Shenzhen city

## 1. Introduction

Sports mega events have assumed an important role in wider urban and regional development strategies since the 1990s, for instance, in global cities such as Los Angeles, Seoul and Barcelona. Hosting mega events has become an important symbol of urban modernisation, integrating government interests and infrastructural development [1]. Governments view stadium construction as a key economic development tool, yet its effectiveness is controversial [2,3]. Mega events are coveted for their catalytic effects on infrastructural development (not only stadiums, but also related facilities, such as roads and the electrical grid) and international (re)branding, as was the case with the 1992 Barcelona and 2008 Beijing Olympic Games. From a microcosmic aspect, the hosting of mega sports events also affects leisure spaces, community and practices of local established sporting communities [4].

Given that such mega events are usually funded with public money, public reception and support are vital to an event's success. Evaluation committees (such as the International Olympics Committee)

assess resident and community support when awarding hosting rights [5]. Startling examples of residents' disapproval have led to cities wholly abandoning bids, as in Denver's rejection of the 1976 Winter Olympics, Berne's withdrawal after being shortlisted for the 2010 Winter Olympics, and Oslo's withdrawal after being shortlisted for the 2022 Winter Olympics. Residents' support for an event can thus have a profound influence on its success. Conversely, community involvement and residents' support for successful event implementations have also been documented [6]. Any long-term impacts and sustainable legacies from these events depend on consultation with, and communication of, developmental plans to residents before, during and after such events [5,7]. While active opposition may lead to abandonment, public debates, interruptions or even legal action, participation is likely to lead to active support, which is vital for lasting positive effects for host cities and local communities [6,8].

There is a rich body of research on residents' support for sports mega events [9–13]. These studies can generally be categorised into two main areas. The first examines residents' perceptions of events' impact [10,12–15] and the second explores the relationships between residents' perceptions and their support for the events [6,16–18]. This work has focused predominantly on official sports events (e.g., the Olympic Games, the FIFA Football World Cup, or the Tour de France), while only limited attention has been paid to residents' perceptions and support for large-scale grassroots events. 'Grassroots sports' is a broad term covering all non-professional sport activities and is sometimes referred to as 'sport for all' [19]. There is no explicit definition of grassroots sports, but some Chinese scholars have attempted to describe their understanding of these events. For instance, Tu [20] understands grassroots sports as those that exist in citizens' daily life without high levels of organisation, institutionalisation or specialisation. Grassroots sports can also be divided into traditional and non-traditional, depending on how traditional they are.

Grassroots sports can bring significant social, cultural and economic benefits [21]. Compared to mega events or even large-scale sports events, the universality, accessibility and casual nature of grassroots sports generally attract high rates of participation and support. Grassroots sports events have been gaining popularity in China recently, but there are no official statistics about participation. According to the National Fitness Program statement issued by the State Council, the number of people who exercise weekly will reach 700 million by 2020 as a result of citizens' growing awareness of the importance of physical exercise.

Residents' perceptions are often used as a measure of support for sports events [5,16–18]. With past research focusing predominantly on mega events or large-scale sports events, this study fills a gap by exploring residents' perceptions of grassroots sports events. Specifically, this study examines whether residents' perceptions and support for mega events also applies to grassroots sports events. Having less official resources for support, grassroots sports events usually have a greater need for residents' involvement and support (both as participants and non-participants). With the majority of resident perception studies having been conducted on sports events held in Western countries, this study provides an additional perspective from Asia, using the 2016 Shenzhen 100 km Hikathon (hiking marathon) as a case study. In doing so, the research also responds to criticism of resident perception studies in terms of the generalizability of their results. Scholars [22–24] have argued that community participation is a highly political process, and that the extent to which such studies' findings can be applied is dependent on the political environment and context of the host country.

This study thus addresses the following questions. (1) What are the dimensions of residents' perceptions of grassroots sport events? (2) What are the residents' perceptions of and support for grassroots sports events? We first provide a review of the literature pertaining to residents' perceptions and support for sports events, including an overview of the annual Shenzhen 100 km Hikathon. We then use convenience sampling to collect questionnaires from Shenzhen residents, with 612 valid datapoints obtained from a total of approximately 100,000 event participants. Next, the structural equation model used to identify and test components of residents' perceptions and support for

grassroots sports events is introduced. The results are then presented, and implications and suggestions for future research directions are provided.

## 2. Background

### 2.1. Definition and Impact of Sports Events

There is no uniform definition of large- and small-scale sports events. Bowdin et al. [25] argued that sports events are generally classified according to their size and scale, and have been referred to as hallmark events, mega events, and major and minor events. Sports events are unique, temporary, short-term and obtrusive, and likely to impact the immediate and wider political and economic environments where they are held [6,26,27]. Such events, and particularly large-scale or mega events, have the potential to leave legacies that impact the host city for much longer than the duration of the event itself. Some legacies include increased economic regeneration, international publicity and recognition, rebranding, new and/or refurbished infrastructure development and facilities, urban (re)development and community pride [11,28]. As such, cities and countries compete assiduously for a chance to host large-scale international sporting events.

As large-scale and small-scale sports events differ in size, appeal and significance, they are likely to produce different impacts and/or outcomes for the host communities [29]. Compared to large-scale sports events, small-scale amateur sporting events, including grassroots events, can also leave positive impacts on the local community [30,31]. As amateur events, grassroots sports are generally more manageable because they are smaller and require less financial and infrastructural support because they tap into existing resources and infrastructure [32]. They are also far less controversial than large-scale or mega events. Yet, for the same reasons, grassroots events are unlikely to leave any direct physical legacy. Being small, they are usually organised more frequently and with greater community involvement and participation than large-scale events. Consequently, community contributions and involvement are more likely to result in social impacts than economic effects, such as civic pride, community cohesion [30] and feel-good factors [33].

Event impacts, both positive and negative, are generally categorised as economic, social, cultural and political [15,34]. Economic benefits include improvement of the local economy through tourism income, tax revenues, increases in commercial activities and business development, and the creation of job opportunities [17,26,35–37]. Regarding social and cultural impacts, such events provide considerable opportunities for sociocultural exchanges between hosts and guests [38], improved quality of residents' lives and the preservation of local heritage sites and the natural environment [17]. Such events may also improve the image of the host city and enhance awareness of the region as a domestic and/or international travel and tourism destination. As witnessed in the transformation of Barcelona and Beijing with their respective Olympic Games, events have served to rebrand the international image of host cities [39]. Similarly, by hosting the International Olympic Committee (IOC) meeting in 2005, Singapore reinforced its international reputation, particularly its public image [40]. Events are also exceptionally useful for opening up public purses for urban (re)development and soliciting public–private partnerships for the host cities' infrastructural and economic development [41].

However, while such events can bring about positive impacts, they can also have significant negative consequences. As documented in a number of studies [42,43], hosting a mega event or large-scale sports event is expensive, due to the event's scale, and the need to develop supportive infrastructure and facilities. Economically, public funding expenditures for a one-off event can be controversial, as witnessed in the 1976 Montreal Olympics Games and the 2014 Rio Olympic Games, for instance. Environmentally, (perceived) damage can include the destruction of the natural environment and increased pollution [43], as when the 2014 Rio Olympic Games required the construction of a golf course in an environmental reserve. Socially, there can be overcrowding, congestion, inconvenience and tension, pressure on local services, a rise in crime rates [37], and an

over-commercialisation and transformation of the culture [34]. With no sports facilities or other infrastructural development required, grassroots sports events can avoid some of these negative consequences, particularly economic impacts. They are, however, subject to environmental concerns (e.g., pollution, temporary overcrowding and traffic congestion), in addition to intangible social impacts, albeit on a smaller scale and shorter-term basis.

In view of this potential for both positive and negative impacts, the success of any given event depends largely on local residents' support—whether the community believes it will benefit from and/or bear the costs of an event [28,44,45]. Research shows that this support is critical for three reasons. First, support creates a friendly atmosphere for the event. Second, community involvement is likely to prolong the positive impacts and help foster positive legacies. Finally, support mitigates residents' perceptions of the possible negative impacts of an event, such as tax increases or the disruption of local lifestyles [6,44]. With the potential to influence decision-making and shape outcomes, local residents' support for large-scale events has been widely recognised and well researched. By contrast, very few studies examine support for grassroots sports events. We therefore seek to fill this gap by expanding research on residents' perception of mega events to understand whether similar dynamics affect grassroots sports events. The next section provides an overview of studies on residents' perceptions of sports events.

## 2.2. Residents' Perceived Impacts and Support for Events

Residents' perceptions of large-scale sports events and their implications have been widely recognised as crucial for community support. Most studies draw on social exchange theory (SET) to analyse resident perceptions [6,37,46]. Though this theory has its limitations, with ignoring some latent variables such as trust [47], it is still applicable to this paper considering we are just concerned with the relationship between residents' perception and support for grassroots sports event. Previous literature has provided strong evidence that positive perceptions tend to positively affect residents' support, whereas negative perceptions have a negative influence. Residents expecting to benefit from an event are more likely to support hosting the event than those expecting to receive little or no benefit [18]. This potential impact thus acts as a moderator on residents' perceptions and, ultimately, their support for an event.

Opposition from residents can also arise if the benefits of mega events are perceived to be offset by negative economic, environmental and social impacts. Grassroots events are generally smaller in size, scale, scope and reach than their 'mega' counterparts; however, like mega events, grassroots events may be recurrent, with considerable costs and benefits [48,49]. Researchers have suggested that such events offer sustainable alternatives for development because they can contribute to the smaller communities' economic, social and environmental goals [50,51]. Although limited in their economic impact, any benefits accrued are likely to be retained within the communities [52]. Socially, grassroots events can generate stronger feelings of community belonging and empowerment [53]. Local grassroots sports events thus have the potential to provide benefits without the vast financial expenses of infrastructural development. Since they are smaller and shorter in duration, they require fewer resources and the costs associated with staging are generally much lower. Perceived costs from economic impacts (e.g., exceeding the budget, tourism displacement) and environmental concerns (e.g., pollution, damage) are therefore less likely to affect residents in their support for a grassroots event.

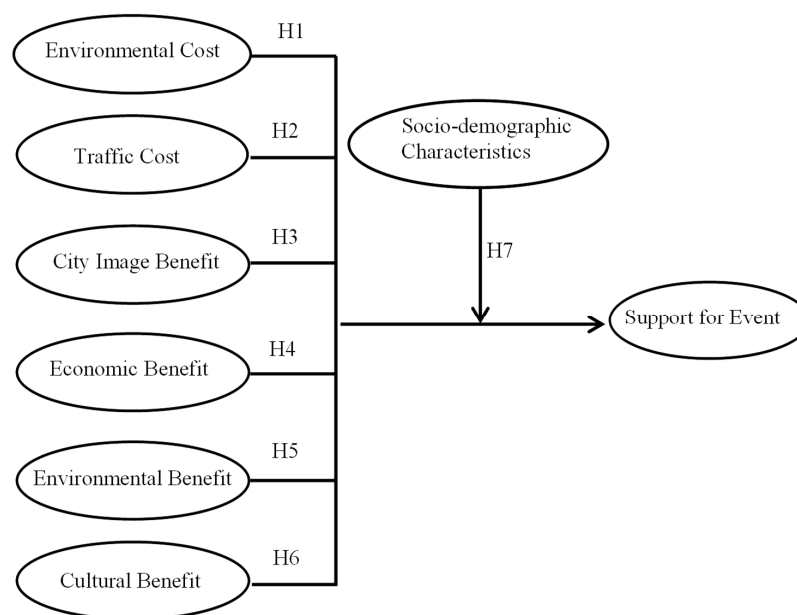
Based on the above discussion, we make the following predictions, which are also shown in Figure 1:

**Hypothesis 1.** Support for grassroots sports events is unrelated to the event's perceived economic costs.

**Hypothesis 2.** Support for grassroots sports events is unrelated to the event's perceived traffic costs.

Although the potential for negative impacts is higher for large-scale events, there is also research to suggest local communities value the ‘feel-good’ aspects of large-scale events and will therefore tolerate short-term inconvenience and disruption, “because of the excitement which they generate, and the long-term expectation of improved facilities and profile” [25]. In his study of the 2000 Sydney Olympic Games using SET, Waitt [13,54] found that residents who gained social benefits considered those benefits to outweigh the associated costs and were more accepting of the use of public funds to host the Games. Gursoy and Kendall [6] provided an explanation for this, suggesting that residents often view mega events as world-class, once-in-a-lifetime occasions and, as a result, view the benefits to be had as worth the costs likely to be incurred.

Studies on residents’ perceptions of large-scale events generally agree that the potential positive outcomes generate a positive attitude among residents, resulting in their support for the events [6,17,55,56]. Ritchie and Lyons [57], in their study of resident perception of the 1988 Calgary Winter Olympic Games, showed that the community appreciated the place recognition, increased tourism, economic benefits and facilities associated with the Games as benefits. Waitt [13] similarly found that a majority of residents considered event-related benefits, including community and national spirit, international promotion and future financial investment, as outweighing the costs. Gursoy and Kendall [6], in their investigation of residents’ support for the 2002 Salt Lake City Winter Olympic Games, found a direct positive relationship between perceived benefits and support for mega events.



**Figure 1.** The proposed model.

Following this argument, we propose the following hypotheses:

**Hypothesis 3.** Support for grassroots sports events is positively correlated with perceived benefits associated with the city’s public image.

**Hypothesis 4.** Support for grassroots sports events is positively correlated with perceived economic benefits.

**Hypothesis 5.** Support for grassroots sports events is positively correlated with perceived environmental benefits.

**Hypothesis 6.** Support for grassroots sports events is positively correlated with perceived cultural benefits.

In addition, the extrinsic/intrinsic model that Faulkner and Tideswell [58] developed is useful given that several intrinsic variables, such as the host community's sociodemographic characteristics, can affect how residents perceive tourism's cultural impact. In the literature, these variables have been widely recognised as affecting residents' behaviours [59,60]. It is therefore also hypothesised that age, gender and length of residence are likely to moderate resident perceptions of the impact of, and support for, grassroots events. This discussion thus leads to the following hypothesis:

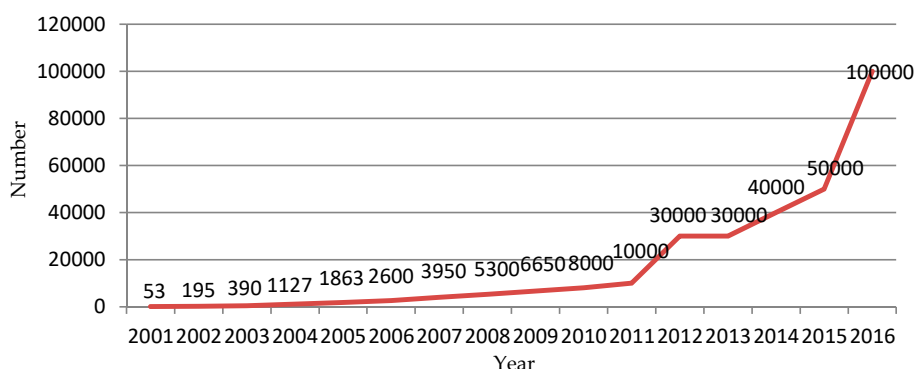
**Hypothesis 7.** Social-demographic features moderate resident perceptions of an event's impact and their support.

### 3. Methodology

#### 3.1. Shenzhen 100 km Hikathon

Prior to Shenzhen's designation as the first Special Economic Zone in China in 1980, the region's population was about three million; by 2017, the city's population had reached 10.75 million [61], more than 95% of which was comprised of in-country migrants and foreign immigrants. As China's largest annual long-distance hike, the Shenzhen 100 km Hikathon originated from an outdoor adventure forum known as 'The Mill', where various sports and adventure activities are organised by grassroots volunteers. The first Hikathon was organised by hiking enthusiasts in 2001 with only 52 participants and has continued annually since. Each year features a different outdoor theme. Over the years, the event has gained traction and attracted participants from all over China, with the number of participants reaching into the tens of thousands. In 2015, to ensure participants' security and safety, the organising committee capped the number of participants at 27,000. However, enthusiasts who failed to register for an official spot participated in the event as casual followers and the reported number of participants (registered and non-registered) totalled 50,000 [62]. In 2016, the 16th Shenzhen 100 km Hikathon attracted 60,000 registered participants, while the actual number reached 100,000 according to organisers' statistics (see Figure 2). This popularity earned the Hikathon a reputation as South China's largest outdoor event and, indeed, has become synonymous with Shenzhen itself.

The expansion of the Hikathon has severely increased demand on local resources and the environment, increasing the impact that the event has on the local communities. This brings into focus the objective of the study, to explore residents' perceptions and support for grassroots events, i.e., 'Will they be the same as those for large-scale or mega events?'



**Figure 2.** Number of participants over the years (the source of the data is from the hosting company BBS, <http://www.doyouhike.net/>).

The Shenzhen 100 km Hikathon is a traditional, public interest, non-commercial, free-joining hiking activity. The activity involves walking 100 km in 24 h. It is a voluntary, self-help hiking activity, not a competitive game, and participants can quit anytime and anywhere. The 100 km Hikathon is held annually on the third weekend of March in Shenzhen. Although the route is altered every



year, it generally takes place in the suburbs, far away from the city centre, to minimise its negative impacts. The starting point of the 2016 Shenzhen 100 km Hikathon was the Shenzhen Bay Sports Park, and the end point was Dapeng Square (Figure 3). Participants register as teams of 4–8 members; the captain is responsible for signing up with his/her identity card and provide team members' information. All participants register on the official website and are advised to purchase accident insurance in advance. Participants hail from different areas of China. Organisers post on the official website to recruit volunteers, who serve the participants. Repeat participants usually apply to be volunteers without subsidy, as the activity is non-profit. Volunteers, who assist the event by signing up participants, guiding the way and collecting garbage, report being pleased to serve because they have a special feeling for the activity. The inclusive society of Shenzhen city, non-commercial profit nature of the activity, team spirit and sense of self-challenge make the Shenzhen 100 km Hikathon popular.

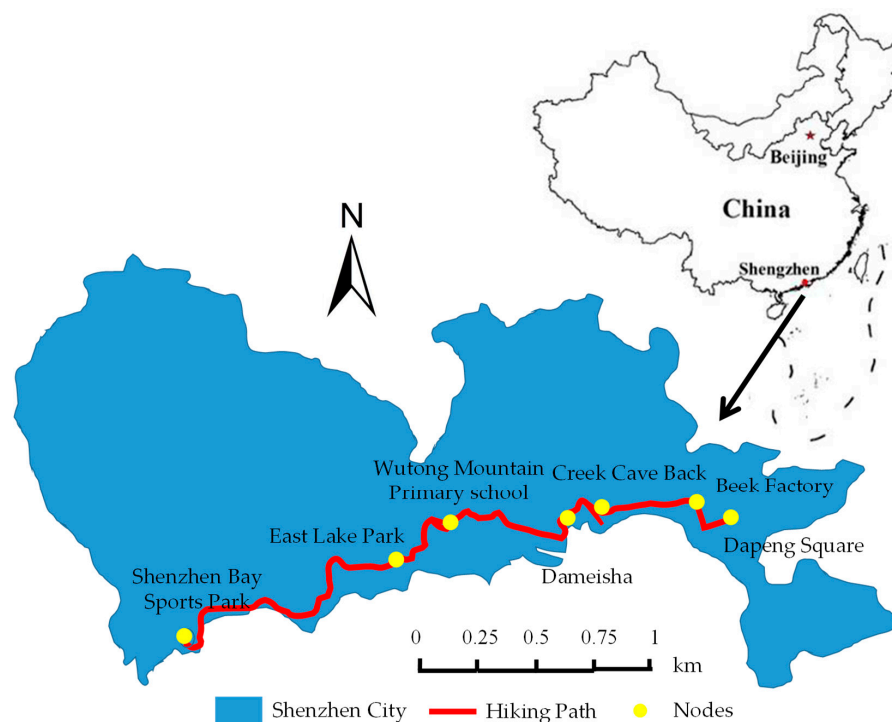


Figure 3. Map of where data were collected along the route.

### 3.2. Questionnaire Development

To test our hypotheses, a survey questionnaire was used for data collection. We developed the questionnaire based on analyses of earlier resident perception studies. For the proposed conceptual model (see Figure 1), the construct for measuring perceived benefits used four summated scales: city image enhancement (five indicators), environmental benefits (four indicators), cultural benefits (four indicators) and economic gains (five indicators). The perceived costs construct was measured using two summated scales: environmental costs (four indicators) and social cost (six indicators). A five-point Likert-type scale (1 = Strongly Disagree to 5 = Strongly Agree) was used to measure the constructs. The items in the questionnaire were adapted from Gursoy, et al. [63], Gursoy and Rutherford [35], Kim, et al. [64], Kim and Petrick [14], and Prayag, et al. [11] for measuring perceived benefits, and Gursoy, et al. [63], and Gursoy and Rutherford [35] for the perceived costs.

### 3.3. Data Collection

The questionnaire was provided only in Chinese, considering the contextual backdrop of the study and linguistic background of the community. This also helped maximise representation of the targeted population and facilitated data collection. To ensure the validity of the questionnaire and the

rigor of the data collected, the questionnaire was pre-tested on 59 community residents in Shenzhen Bay Sports Park, a venue along the route of the Hikathon, in March 2016. Responses were assessed for any potentially misleading and/or unclear items in the instrument, and the questionnaire was improved based on resident suggestions and comments. Formal data collection took place at four venues along the Hikathon route, including Shenzhen Bay Sports Park, East Lake Park and Dapeng Square, to ensure good representation of the community. A total of 789 face-to-face questionnaires were administered, with a valid dataset from 612 responses (77.57%).

Due to time limitations owing to the expansive nature of the event, convenience sampling was used [58]. Respondents were chosen primarily via an intercept questionnaire based on accessibility and proximity to the event.

## 4. Results

### 4.1. Pre-Survey Analysis

We used SPSS 24.0 for descriptive data analysis and factor analysis. We then used the structural equation model (SEM) and AMOS 21.0 data software to test the fit of the conceptual model and to calculate the path coefficient between the variables. Reliability and validity of the measurements was also assessed.

We collected 59 pre-survey questionnaires, which can be regarded as statistically sufficient and reliable; the questionnaire contained 31 survey items. Data were recorded and analysed with SPSS. The Cronbach's alpha coefficient was 0.778, the Kaiser–Meyer–Olkin KMO coefficient was 0.556, the approximate chi-square was 1055.265, the Bartlett sphericity test (df) was 465 and the significant value (sig.) was 0.000, indicating that the pre-survey data reliability was good and formal investigation could be carried out. In addition, the SEM requires that the sample size be at least five to 10 times the number of items measured; the total of 612 questionnaires collected during the main data collection can therefore be considered sufficient for the use of SEM. Respondents' demographic characteristics are shown in Table 1. More than half the sample (57.9%) were males, with a majority (31.1%) aged 27 to 35 years old. Among the respondents, 35.7% had an undergraduate degree, 92.4% were currently employed and 65% had lived in Shenzhen for less than 10 years.

**Table 1.** Local residents' demographics in the Shenzhen 100 km Hikathon ( $n = 612$ ).

Variable	Category	Number	Percentage
Gender	Male	363	59.3
	Female	249	40.7
Age	≤26	189	30.9
	27–45	342	55.9
	≥46	81	13.2
Educational background	Junior high school and below	57	9.3
	Senior high school	132	21.6
	Junior college	154	25.2
	Undergraduate	226	36.9
	Graduate and above	43	7
Length of residence	≤10 years	387	63.2
	>10 years	225	36.8
Occupation	Government staff/civil servant	24	3.9
	Enterprise staff	237	38.7
	Manager	106	17.3
	Farmer	51	8.3
	Private business owner	55	9
	Institutional staff	50	8.2
	Student	33	5.4
	Soldier	3	0.5
	Retired	13	2.1
	Other	40	6.5



## 4.2. Evaluation of Measurement Models

We divided the final sample of 612 surveys into two groups. The first ( $n = 200$ ) was analysed with exploratory factor analysis (EFA), and the second ( $n = 412$ ) tested the confirmatory factor analysis (CFA). Prior to factor analyses, the items' psychometric properties were tested to check the data's distribution. We chose asymmetry (Kolmogorov–Smirnova), kurtosis statistics and item–total correlation. The results indicate that the sig. of kurtosis (KS) and values of item–total correlations were greater than 0.5, and values of the kurtosis statistics were around 0, indicating that our sample of 612 conforms to normal distribution.

In Table 2, the Kaiser–Meyer–Olkin (KMO) was examined to measure sample adequacy, and the KMO value for 200 responses was 0.865 ( $>0.5$ ). Bartlett's test of sphericity was used to ensure that there were sufficient correlations between the variables, which was found to be the case ( $df = 378$ ,  $p < 0.001$ ). The EFA was tested using a principle component analysis with varimax rotation method; items with high cross-loadings ( $>0.5$ ) or low factor loadings ( $<0.5$ ) were deleted. Factor loadings for all items were higher than 0.5 and, thus, 28 items remained, which were subjected to EFA. After the six-factor structure was identified, the internal consistency was estimated. The Cronbach's alpha values ranged from 0.798 to 0.846 ( $>0.7$ ), showing good reliability and internal consistency among the items within each factor.

**Table 2.** Residents' perceived impacts of the 100 km Hikathon-EFA (exploratory factor analysis) ( $n = 200$ ).

Constructs and Items	Means (SD)	Factor Loadings	Cronbach's Alpha
<b>Environmental costs</b>			0.844
Damage the natural environment	2.58 (0.99)	0.715	
Increase littering	3.17 (1.01)	0.711	
Affect flora and fauna survival	2.61 (1.03)	0.811	
Erode footpath	2.37 (1.10)	0.707	
Increase water pollution	2.40 (1.10)	0.709	
<b>Social cost</b>			0.815
Increase noise pollution	2.61 (1.09)	0.588	
Affect communication signals	2.32 (1.10)	0.586	
Cause traffic jam	2.92 (1.16)	0.768	
Damage the road	2.21 (1.01)	0.657	
Make parking difficult	2.86 (1.22)	0.778	
<b>City image improved</b>			0.838
Foster pride among Shenzhen residents	4.01 (0.88)	0.691	
Boost Shenzhen's popularity	4.14 (0.87)	0.742	
Boost Shenzhen's media exposure	4.01 (0.87)	0.711	
Improve Shenzhen's city image	4.26 (0.83)	0.783	
Reflect Shenzhen's public interest spirit	4.30 (0.83)	0.688	
<b>Economic benefits</b>			0.828
Attract more tourists to Shenzhen	3.89 (0.90)	0.588	
Attract more investment for Shenzhen	3.51 (0.93)	0.723	
Increase business opportunities	3.60 (0.91)	0.771	
Provide local employment opportunities	3.47 (0.93)	0.826	
Increase governmental tax	3.23 (1.08)	0.729	
<b>Environmental benefits</b>			0.846
A low-carbon and environmentally friendly lifestyle	4.50 (0.73)	0.815	
Broadcast environmental philosophy	4.53 (0.66)	0.861	
Raise environmental awareness	4.40 (0.73)	0.722	
Make us know nature better	4.32 (0.79)	0.564	
<b>Cultural benefits</b>			0.798
Enhance local cultural protection	4.10 (0.87)	0.588	
Strengthen local community bonds and cohesion	4.30 (0.72)	0.756	
Highlight Shenzhen's cultural image	4.19 (0.78)	0.636	
Set an example for Shenzhen citizens to organise cultural activities spontaneously	4.32 (0.74)	0.576	
<b>Support for event</b>			0.811
I think Shenzhen should improve hiking infrastructure like footpaths	4.26 (0.55)	0.905	
I think Shenzhen should improve guidance information for footpaths	4.35 (0.58)	0.893	
I think Shenzhen should broadcast the 100 km Hikathon and make it a city brand	4.14 (0.61)	0.763	

CFA was conducted on a second group ( $n = 412$ ), and principle component analysis was used again. Based on our exclusion criteria discussed above, 26 items remained. According to Anderson

and Gerbing [65], the reliability, aggregation validity and discriminant validity of the main constructs should be identified before examining the structural model. Reliability relates to the degree that measurement items yield consistent and identical results over repeated measures [66]. The reliability of the constructs was determined using a combination of assessments.

In Table 3, the combined reliability of all indicators was found to be above the recommended threshold of 0.7 (from 0.708 to 0.886), indicating that our measures are valid and reliable. Factor significance and average variance extraction (AVE) were used to assess the degree of polymerisation. The results suggest that the factor load was greater than 0.54 and significant ( $p < 0.05$ ). The average variance extraction was above 0.497 (with the path coefficient recalculated where  $>0.50$  is considered a good fit), and the measured polymerisation efficiency was confirmed. The discriminant validity was compared with the square root of the AVE constructed by the individuals in the latent variable correlation.

**Table 3.** Residents' perceived impact of the 100 km Hikathon-CFA (confirmatory factor analysis) ( $n = 412$ ).

Constructs and Items	Factor Loadings	CR	AVE
<b>Environmental costs</b>	<b>0.876<sup>a</sup></b>	<b>0.886</b>	<b>0.53</b>
Damages the natural environment	0.736		
Affects the flora and fauna	0.807		
Erodes footpaths	0.808		
Increases water pollution	0.777		
Increases noise pollution	0.632		
Affects communication signals	0.581		
Damages the road	0.724		
<b>Traffic costs</b>	<b>0.719<sup>a</sup></b>	<b>0.708</b>	<b>0.55</b>
Causes traffic jams	0.801		
Makes parking difficult	0.677		
<b>City image benefits</b>	<b>0.82<sup>a</sup></b>	<b>0.831</b>	<b>0.497</b>
Fosters pride among Shenzhen's residents	0.702		
Boosts Shenzhen's popularity	0.77		
Boosts Shenzhen's media exposure	0.705		
Improves Shenzhen's city image	0.723		
Reflects Shenzhen's philanthropic attitude	0.616		
<b>Economic benefits</b>	<b>0.83<sup>a</sup></b>	<b>0.849</b>	<b>0.535</b>
Attracts more tourists to Shenzhen	0.544		
Attracts more investment for Shenzhen	0.733		
Increases business opportunities	0.811		
Provides local employment opportunities	0.828		
Increases governmental taxes	0.705		
<b>Environmental benefits</b>	<b>0.822<sup>a</sup></b>	<b>0.838</b>	<b>0.567</b>
A low-carbon and environmentally friendly activity	0.774		
Promotes environmental conservation	0.813		
Raises environmental awareness	0.807		
Helps us know nature better	0.597		
<b>Cultural benefits</b>	<b>0.785<sup>a</sup></b>	<b>0.786</b>	<b>0.551</b>
Strengthens local community bonds and cohesion	0.711		
Highlights Shenzhen's cultural image	0.742		
Sets an example for Shenzhen citizens to spontaneously organise cultural activities	0.772		
<b>Support for event</b>	<b>0.727<sup>a</sup></b>	<b>0.659</b>	<b>0.852</b>
I think Shenzhen should improve hiking infrastructures like footpaths	0.867		
I think Shenzhen should improve guidance information for footpaths	0.852		
I think Shenzhen should broadcast 100 km Hikathon and make it a city brand	0.707		

**Note:** Factor loadings of items on factors to which they belong. <sup>a</sup> Cronbach's alpha.

For sufficient discriminant validity, the values of diagonal elements should exceed the off-diagonal elements, as shown in Table 4. By comparing the square root of the AVEs of all of the correlation coefficients in Table 4, the data were found to have good discriminant validity. Table 4 also shows that the means of the four dimensions of perceived benefits (city image benefit, economic benefit, environmental benefits and cultural benefits) are higher than the means of the two dimensions of cost perception (environmental and social costs). Specifically, in the four dimensions of perceived benefit, the mean of the environmental benefit was the highest, followed by cultural benefits and city image benefits, respectively, while economic benefits had the smallest mean. This is consistent with the Hikathon's slogan of "Safety, Eco-friendly, Self-Help", which reveals an awareness of environmental costs and is reflected in the mean of the perceived cost.

**Table 4.** Inter-construct correlations, means, and standard deviations.

Construct	Environmental Cost	Traffic Cost	City Image Benefit	Economic Benefit	Environmental Benefit	Culture Benefit	Support for Event	Mean Value	SD
Environmental cost	0.73 <sup>a</sup>							2.30	0.83
Traffic cost	0.532 **	0.74 <sup>a</sup>						2.94	1.06
City image benefit	−0.143 **	−0.04	0.71 <sup>a</sup>					4.28	0.62
Economic benefit	0.03	−0.03	0.498 **	0.73 <sup>a</sup>				3.66	0.79
Environmental benefit	−0.218 **	−0.129 **	0.436 **	0.232 **	0.75 <sup>a</sup>			4.51	0.63
Culture benefit	−0.159 **	−0.07	0.520 **	0.296 **	0.522 **	0.74 <sup>a</sup>		4.44	0.63
Support for event	−0.097 *	0.00	0.378 **	0.243 **	0.290 **	0.358 **	0.78 <sup>a</sup>	4.40	0.61

Note: \*\* significant at the 0.01 level; \* significant at the 0.05 level. <sup>a</sup> Square root of average variance extracted (AVE).

#### 4.3. Structural Model

The fit of the conceptual structure model (Figure 1) is shown in Table 5, with both absolute and relative fit indices used to confirm the fit. The recommended value for comparative fit index (CFI) is greater than 0.90. The tucker-lewis index (NNFI / TLI) belongs to the relative fit index, which is generally underestimated when the sample size is small, with the recommended value being greater than 0.90. The AGF is an absolute fit index which is affected by the sample size when the proposed value is greater than 0.90. The RMSEA of the approximate error is an absolute fit index affected by the sample size and the suggested fitting value is <0.05. Overall, the goodness of fit indices support the appropriateness of the structural model. The indices are presented in Table 5; the SEM of the 26 items in six factors was better.

**Table 5.** Goodness-of-fit indexes for the measurement.

Index	Absolute Fit Index						Relative Fit Index			
	$\chi^2/df$	RMR	GFI	AGFI	RMSEA	NNFI (TLI)	NFI	RFI	IFI	CFI
Critical value	1~3	<0.08	>0.9	>0.9	<0.08	>0.9	>0.9	>0.9	>0.9	>0.9
28-item six factor ( <i>n</i> = 200)	1.815	0.055	0.823	0.786	0.064	0.882	0.797	0.771	0.897	0.896
26-item six factor ( <i>n</i> = 412)	1.801	0.045	0.913	0.89	0.044	0.943	0.897	0.879	0.951	0.951
Support for event ( <i>n</i> = 412)	1.48	0.05	0.918	0.901	0.034	0.961	0.901	0.888	0.966	0.965

Using multiple group analysis for the categorical variables, the moderating effect of the social-demographic characteristics (gender, age and length of residence) can be judged according to two aspects: the standardised output of the model diagram and text output. We first test the moderating effect of gender on six constructs of support for an event. From the standardised path diagram of the grouping comparison, some fit indices were found to have no significant change in the constrained and unconstrained model, and both the  $\chi^2/df$  are below 2. Second, the absolute and relative fit indices in the text output are up to the standard of critical value, which verifies a good model fit. According to the baseline comparison results, there is no significant change in the indices,

which suggests that the moderating effect of gender on residents' perceptions and support for event is not obvious. Similarly, the length of residence (above 10 years and below 10 years) demonstrates no adjustable effect. Third, it is noteworthy that age (below 26 years old, 26–45 years old, above 45 years old) has a partial moderating effect. The results show that the *p*-values in the model comparisons are below 0.05 (environmental cost to support: 0.049; city image benefit to support: 0.028; environmental benefit: 0.007; cultural benefit: 0.006). Respondents 25 and younger paid more attention to the city image benefits (the standardised regression coefficient was 0.872), while those between 26 and 45 were interested in environmental effects, both in terms of benefits (0.697) and costs (−0.231); those 46 and older were most concerned with cultural effects (0.937). These results do not reflect the findings of prior research [67] and can be explained by the fact that in the case of a high mobilised city, such as Shenzhen, most citizens are outsiders and hold a more tolerant attitude for the events.

Table 6 presents standardised path coefficients from the proposed structural model. An analysis of the estimated standardised path coefficients reveals the significance, strength and direction of each hypothesised relationship. The path coefficients of environmental cost were also significant ( $p < 0.05$ ), while traffic costs were found to have no correlation with support for the event. Thus, hypothesis H1 was supported while H2 was rejected. The path coefficients for the city image benefits, economic benefits, environmental benefits and cultural benefits were all significant ( $p < 0.05$ ), lending support to hypotheses H3, H4, H5 and H6. Only age was found to moderate residents' perceptions and support, suggesting that H7 was partially supported.

**Table 6.** Results for the hypothesised model.

Paths	Standardised Path Coefficient	<i>p</i> -Value Result	Hypothesis Testing
H1 Environmental cost → Support for event	−0.269	***	Supported
H2 Traffic cost → Support for event	−0.142	0.041	Not supported
H3 City image benefit → Support for event	0.771	***	Supported
H4 Economic benefit → Support for event	0.401	***	Supported
H5 Environmental benefit → Support for event	0.699	***	Supported
H6 Cultural benefit → Support for event	0.865	***	Supported
H7 Social-demographic characteristics → Support for event			Partial supported

Note: \*\*\* Significant at the 0.001 level.

## 5. Discussion

The findings of this research reveal that residents' positive perceptions of the Hikathon are significantly higher than their negative perceptions. This is consistent with findings from previous studies, which suggest that residents often ignore negative impacts while glorifying the positive [6,14,28]. Although not measured in this study, the fact that the event had a grassroots origin and has managed to grow in size and popularity over the years seems to suggest a strong sense of community involvement. Being a grassroots event, organised entirely by community volunteers, the collective experience has likely provided opportunities for social bonding, which enhance a sense of community among residents [68]. This, in turn, could be reflected in residents' positive perceptions of the Hikathon and their willingness to put up with the event's negative externalities. Relatedly, the results of the positive correlation between resident perceptions and support for grassroots sport events generally concurs with existing research [6,17,26]. This suggests that like mega sports events, residents show high levels of support for grassroots sport events, as they perceive them to be associated with significant benefits.

The influence of community perceptions of and participation in grassroots sport events has in general been underreported and under-researched [49]. The findings from this study could be valuable to event planners and local directorates that seek to understand how residents in the community perceive the impacts of grassroots sports events and how their perceptions influence support for such events in their communities. Given that grassroots events require minimal resources but are still capable of generating positive community impacts, including social and cultural benefits [49],

more could be done to promote grassroots sport events. The potential for closer social networks and connectedness within the local community makes these findings particularly useful for stakeholders, from local directorates to participants, volunteers, destination marketers and event organisers.

Residents' support for an event is influenced by how they perceive its impacts. This study confirms that positive and negative perceptions are not mutually exclusive. A change in perception of an event's positive impacts (i.e., benefits) from the Hikathon influences perceptions of negative impact (i.e., costs). These findings are consistent with previous studies [6,18], although the directionality of the relationship is unknown. This suggests that if residents are more concerned with an event's benefits, then they may overlook the associated costs, which supports our earlier discussion of residents' willingness to put up with or even ignore short-term inconveniences and disruptions in view of perceived benefits.

It should be noted that the relationship between cost perceptions and resident support was not found to be significant. This supports previous findings [6,69] that the insignificant impact of perceived costs relates to the type of event held. The Hikathon is a lower-tier event compared with mega events; residents are therefore likely to perceive the associated costs as inconsequential, as the event lasts only 24 h and has minimal disruptions (e.g., from noise, traffic congestion and parking). This outcome may also be attributable to the demographic composition of Shenzhen city and the cultural values that residents hold. Located immediately north of Hong Kong, Shenzhen is best known as an immigrant city, partially due to this proximity and the extensive trade relationships the region maintains with Hong Kong. As mentioned previously, Shenzhen city is a migrant city, which is reflected in the respondents' demographic characteristics, with 65% of our sample having only lived in Shenzhen for 10 years or less (see Table 2). In 2014, Shenzhen, with its broad, open culture, was voted as the city most favoured by migrant workers after Shanghai [70]. Being well-known as one of China's most inclusive cities has most likely contributed to residents' support for local events, notwithstanding the costs.

## 6. Conclusions

This study examined the effects of grassroots sports events on sustainable developments in a migrant city through the lens of residents' perceptions and support. The proposed model in this study offers new insights into how residents perceive a large-scale community event. We applied constructs used adapted from research on mega events to a grassroots sports event to understand whether similar dynamics affect smaller-scale events. Since grassroots sports events differ from their large-scale counterparts in scale and size, residents' perceptions of costs and benefits also differ: the perceived impact of cost does not necessarily have the same ramifications as a mega event. This study also provides empirical validation of the role of perceived benefits in residents' support for an event, which is consistent with previous findings for sport mega events. Overall, the study highlighted some unique features of grassroots sports events and the role that resident perceptions play in its impact.

There are limitations to the study. Care must be exercised when generalising, as the findings may be limited by the specificity of the research context. Resident responses may also be shaped by the unique culture and values of the Shenzhen Hikathon participants, therefore further limiting generalizability. Additionally, the study only included limited dimensions of perceived costs and benefits; measuring other variables, such as community attachment and attitude variations that impact residents' support for grassroots sport events, would likely yield further insight. Finally, given that there is not much empirical research on residents' perceptions of and support for grassroots sports events, future research could take this study as a starting point. A broader agenda for research into community sports events could be developed, for instance, using a longitudinal study design to understand long-term variation in the reception of similar grassroots events.

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