

IMPACTS OF INTERNATIONAL CRICKET STADIUMS ON COMMUNITY PERCEPTION OF NEIGHBORHOOD; WITH SPECIAL REFERENCE TO PALLEKELE INTERNATIONAL CRICKET STADIUM

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Abstract : In recent years urban Sportscape or sports landscape have developed aiming at urban rejuvenation, economic growth, and tourism. Stadiums are a key element of these sportscares. Therefore, the infrastructure including stadiums required for the growth of sports has gradually increased in the country. Cricket, as a subculture within the Sri Lankan context has influenced neighborhood communities with significant tangible and intangible impacts. Therefore, stadium neighborhood is a significant sub-cultural landscape within the urban environs. This study focuses on perception of neighborhood community on the impacts of the international cricket stadiums (ICS). Pallekele ICS (newer stadium in sub-urbs) was selected as a case study to represent cricket stadiums in Sri Lanka. Environmental and spatial perceived impacts were identified through literature survey and justified through pilot survey. Survey for the spectator responses was conducted during an ODI match. Post-match on-site field surveys were carried out for assessing the perceived impacts for the neighborhood community. Collected data were statistically analyzed by using SPSS 22.0 tool. This research concluded that stadium neighborhood landscapes act as a platform for public spaces and the neighbors' perceptions may be used in minimize the impact on and uplift the neighborhood landscape when constructing future ICSs.

Keywords : *Environmental impacts; Cricket stadiums; Community perception; Neighborhood sportscape; Spatial impacts*

1. Introduction

Sport landscape or sportscape can be considered as one of the major urban typologies which addresses urban form and space including transportation, parking strategies, active living, and city planning. Sport stadiums, sport facilities and sport neighborhood can be taken as one system in terms of space, place, and landscape (Tangen, 2004). Stadium atmosphere and neighborhood landscapes build up a spatial interconnection while creating a multipurpose community landscape responsible for providing sports facilities and game amenities.

Cricket is a subculture within the Sri Lankan context and therefore cricket stadium neighborhood becomes a cultural landscape and changes the look of the city by creating continuous changes, adjustments to the demand for different amenities and landscape function as a site of engagement by spectators and neighboring community. There are many researchers conducted so far on the topics sports facilities, stadium facilities and related instances on sports landscape but less research have ever been conducted regard on the topic Cricket stadiums as a sports landscapes as well as did not discuss under the Sri Lankan cultural context.

The objective of this research is to identify landscape parameters within the spatial layout of cricket stadium and surrounding to improve the utilization rate of those resources to open good spatial and environmental benefits which helps to uplift the life of neighboring community and good spectator experience. With the conclusion of literature survey and the pilot survey identified spatial and environmental impacts were measured using pool of 10 impact item variables. Findings of the pilot survey were used for the visual documentation to reinforce the identified impacts by providing real practical proofs.

According to Sports Geographic analysis, out of 7 International Cricket Stadiums in Sri Lanka, Pallekele International Cricket Stadium was selected as the case study. Gathered qualitative data were immediately quantified into quantitative data by using SPSS 22.0 statistical tool to represent and analyze the data. The perceived impacts were treated as independent variables and dependent variable is Overall impact. Using statistics in landscape architecture or architecture relate research is very rare but it is more effective.

2. Background

Sportscape or sports landscape (Wakefield & Blodgett, 1996) is also known as the servicecape framework (Bitner,

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1992) in a sport surrounding environment where spectators consume services. The relationship between a sports stadium and the neighborhood is discussed when discussing on sports landscape influence a particular location, and also how sport, geography, and territorial planning are all related. Cricket has become the only mega sport event in Sri Lanka which is the most popular and most watched game during last few decades in Sri Lanka. Therefore, with the development of required facilities for Cricket, many opportunities for host cities were grown.

Stadiums have struggled to incorporate their structures into the urban fabric where landscapes around the stadium plays a huge role (Azzali, 2019). This is a rare phenomenon in urban life because a sports stadium is one of the few venues in a city where a huge crowd can assemble frequently. As a result, the stadium sportscape serves as both a stage of the city and one formed by it, as well as an enlargement of the city's streets and street life during the game days (Nielsen, 2022). Therefore, understanding how a stadium may affect its surrounding is significant to recognizing the wider context of these interpretations.

Cities are greatly impacted by stadiums, which have unique structures to accommodate their vast capacities and scale. By being incorporated into the overall urban fabric of mixed uses and high-quality public spaces, the stadium has the potential to interact with the neighborhood's urban environment while giving the city an opportunity to redefine itself on a national or even international scale. Moreover, Designers have strived to use stadiums as a catalyst for gentrification to transform urban neighborhoods (Bryant, 2008).

Neighborhood landscape has been closely tied with the stadiums as it can be considered as a major part of the sports landscape. According to event literature, host community neighbors' reactions to event activities have various impacts on them and lead to different event-related behaviors (Ma et al., 2013). Therefore, identification of community perception on the impacts of international cricket stadium on surrounding neighborhood may help for the future events. According to Preuss (2004), host cities benefit from spatial and environmental locations, and large-scale events might generate interest in natural landscapes that support local cultural preservation and the preservation of the physical environment.

Many positive spatial impacts can be gained due to the development of infrastructural base throughout the city, causing changes in the routine and mobility of the population (Zouain et al., 2019). Moreover, another issue to be concerned about is the deterioration of the physical and natural environment (Lorde et al., 2011).

3. Method

This is qualitative research as mainly foundation of the study is built upon focusing on neighborhood community perception. This research aims to build an evidence-based discussion by conducting survey.

3.1 SITE SELECTION

There are seven International Cricket stadiums in different contexts in Sri Lanka which can be considered as international cricket sportscares in Sri Lanka. According to the sports geographic analysis, Pallekele International Cricket Stadium can be considered as the only stadium built in the location with proper sports geography as the stadium setting has the potential to enhance the spectator experience due to the sub urban stadium location with easy access and good connectivity to the transport infrastructure for crowd safety and management.

Pallekele International Cricket Stadium which is in Kandy, cricketing culture city oriented stadium was selected as the case study which is modern newly built stadium for 2011 cricket world cup. The instrument was developed for study by looking at neighborhood community perception on impacts of international cricket stadiums during the season of cricket events. Items of the questionnaire survey were adapted from existing literature regarding previous studies and sorted out by conducting pilot survey during the period of Australia vs Sri Lanka One day international cricket match held on Pallekele International Cricket stadium on 14th June 2022 to identify real practical implication of impacts.



Figure 1: Aerial view of Pallekele International Cricket Stadium
Source: Google Pro, Modified by author

3.2 SURVEY INSTRUMENT

Both Pilot survey and Field study surveys were done as an onsite survey as this study is mainly concerns about the neighborhood community.

3.2.1 Field Study 01

Field study 01 was done as a pilot survey even prior to the literature survey and field study process and it was a great opportunity as it could provide the real impacts for the neighborhood during the cricket match day. Observations were done and collected during the pilot survey as photographs will be used for a photographic analysis.

3.2.2 Field Study 02

Field study 02 will be the main data collection and it will be done for the neighborhood community as a major selected sample. There were two sections in the questionnaire. First section of the questionnaire is about how it may influence neighborhood community perception towards the impacts of International cricket stadiums. The second section investigated a wide range of factors which influence for the impacts. Each impact was discussed using 5 items.

3.3 ANALYTICAL FRAMEWORK FOR FORMING THE BACKGROUND FOR IMPACT VARIABLES

The analytical framework presents the previous studies done relate to this study area. The framework is arranged as a table presenting different mega events worldwide and their impacts as identified under the literature survey.

Table 1: Formulation of perceived mega event impacts

AUTHORS / YEAR	Environmental Impacts	Spatial Impacts
Impacts of the FIFA2002 World Cup Seoul (Kim & Petrick, 2005)	1.Air quality control 2.Waste management	1.Improving night lighting 2.City beautification
Impacts of the ICC Cricket World Cup 2007 on Barbados (Lorde et al., 2011)	1.Conservation of natural resources	
The Kaohsiung and 2009 World Games (Lee, 2014)	1.Noise pollution	1.Recreational opportunities 2.Improve city beauty 3.Environmental effects
2000 Sydney Olympics (Waite, 2003)	1.Limited ecological impact 2. Protection of threatened environment and endangered species	1.Iconic venues as tourist attractions 2.Improved quality of public spaces 3.Infrastructure improvement 4.Improved tourism facilities 5.Underused venues ('white elephants')
2012 London Olympic Games (Ritchie et al., 2009)	1.Increase littering 2.Noise pollution 3.Traffic congestion 4.Damage the natural Environment	1. Redevelopment of towns and cities 2. Improve the provision of public services

Table 2: Landscape relate environmental and spatial attributes of event impact

Authors/ Year	Mega events	Impacts	
(Kim & Petrick, 2005)	Impacts of the FIFA2002 World Cup Seoul	Urban and infrastructure	Environmental
(May, 1995)	1992 Winter Olympics France	Environmental	
(Waite, 2003)	2000 Sydney Olympics	Spatial	Environmental
(Ritchie et al., 2009)	London Olympics 2012	Environmental	

(Park & Joelle, 2010)	Eden Park Stadium 2011 Rugby World Cup	Environmental	Infra structure development
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Pool of ten impact items with five impact items for each perceived impact to measure neighborhood community perception were identified here. The neighborhood landscape was the only factor considered while sorting out these impact items.

Environmental impacts

- 1) Environmental pollution
- 2) Waste management problems
- 3) Preserve physical landscape
- 4) Noise pollution
- 5) Deterioration of natural resources

Spatial impacts

- 6) Improve quality of public spaces
- 7) Consider underused venues
- 8) Parking facilities
- 9) Infrastructure improvement
- 10) City beautification

3.4 VISUAL DOCUMENTATION

Environmental impacts and Spatial impacts defined above will be analyzed under visual documentation.

3.5 STATISTICAL DATA PROCESS AND ANALYSIS

The data gather in this research are qualitative data. These data were quantified into quantitative data by using SPSS 22.0 statistical tool to represent and analyze the data. When analyzing the data collected through the questionnaire, the number of statistical tools namely mean, frequencies, descriptive statistics, ANOVA, Correlation analysis were utilized to present the underlying neighborhood community perceptions toward the mega events and predictions further reference for sports authorities to consider when planning new cricket stadiums. Using statistics in landscape architecture or architecture relate research is very rare but it is more effective.

3.5.1 Statistical hypothesis

It is necessary to first define the hypotheses and organize the study strategy before collecting reliable data for statistical analysis. A key component of what is considered to as statistical inference is hypothesis testing. Making conclusions about a population based on a sample of the population is the focus of statistical inference.

H0: Null hypothesis

H1: Alternative hypothesis

3.5.2 ANOVA tables

ANOVA statistical tool is used to compare the variables through numerical data collected which use mean value. In this table P value is calculated as a standard measuring scale undertaken to examine the significant differences exist between different neighborhood communities on impacts factors.

Common general term for the Mean value of different communities on impact factors can be shown as;

M_{ij} = Mean ith impact on jth neighborhood community type (1)

i= Impact factors as 1,2

1= Environmental

2= Spatial

j= Neighborhood community type as 1,2,3,4

1= Residential

2= Commercial

3= Industrial

4= Public space

P values are used to produce ANOVA tables. If ratios of p value must be less than 0.05 ($p \text{ value} < 0.05$) in order more reliably we can reject the null hypothesis that a particular parameter is not significant.

H0 hypothesis is rejected

Therefore, it shows that there is significant difference exist between different neighborhood communities on impacts.

$H_0 \neq M_1=M_2=M_3=M_4$
 $H_1 = M_1=M_2=M_3=M_4$

Table includes the results of the one-way ANOVA tests together with the mean scores, F values and P values for the dependent variables in each of the community types.

3.5.3 Correlation Analysis

Correlation is a statistical measure that indicates how two variables are related and shows that when one variable's value changes. The Pearson Correlation is a parametric measure. The bivariate Pearson Correlation produces a sample correlation coefficient, r , which measures the strength and direction of linear relationships between pairs of continuous variables. In correlation analysis information can be interpreted as follows;

Positive correlation : The two variables move in the same direction when there is a positive correlation simply when one variable increases as the other increases.

Negative correlation : When two variables are negatively correlated, they move in the opposite way that means if one variable increases as the other decreases, and vice versa.

4. Results and Discussion

The analysis comprises a series of statistical tabulations that have been developed by using 65 useable responses among 4 major neighborhood community socio demographic subgroups namely, residential, mixed commercial, mixed scale industrial and public space communities which were obtained during the onsite survey conducted in Pallekele International Cricket Stadium as the case study.

4.1 ANOVA FOR COMPARISON OF PERCEPTIONS OF COMMUNITIES ON IMPACTS FOR DIFFERENT NEIGHBORHOOD COMMUNITY TYPES

Table 3: ANOVA Table

Impacts	Mean – Square (Between Groups)	F- Value	p-value
Environmental	3.012	18.542	0.000
Spatial	0.209	0.427	0.734

Environmental impacts

H_0 = Environmental impact for different neighborhood community types is not different

H_2 = Environmental impact for different neighborhood community types is different

P value for the Environmental impact is 0.

p value < 0.05

Therefore, above H_2 was accepted and H_0 (null hypothesis) was rejected of the research.

Environmental impact for all different neighborhood community type is different.

That means, all sorts of neighborhood communities have not a similar environmental impact.

Spatial impacts

H_0 = Spatial impact for different neighborhood community types is not different

H_4 = Spatial impact for different neighborhood community types is different

P value for the Spatial impact is 0.734

p value > 0.05

Therefore, above H_0 (null hypothesis) was accepted and H_4 was rejected in the research.

Spatial impact for all neighborhood community type is not different. In terms spatial impact, which was perceived similarly by residential, mixed commercial, industrial and public space community.

4.2 CORRELATION ANALYSIS OF OVERALL IMPACT WITH ENVIRONMENTAL AND SPATIAL IMPACTS

Given below two tables (Table 4. and Table 5.) are generated with SPSS output of correlation table which represent the perceptions of 65 neighbors on overall impact. Overall impact is a combination of both spatial and environmental impacts to identify landscape parameters within the layout of cricket stadium and surrounding to improve the utilization rate of those resources to open good spatial and environmental benefits.

Table 4: Correlation between Overall impact with environmental impact in Palallekele. ICS

		Overall Impact	Environmental Impact
Overall Impact	Pearson Correlation	1	-.284*
	Sig. (2-tailed)		.022
	N	65	65
Environmental Impact	Pearson Correlation	-.284*	1
	Sig. (2-tailed)	.022	
	N	65	65

*. Correlation is significant at the 0.05 level (2-tailed).

The relationship between overall impact with environmental impact is -0.284. This relation is a negative relationship (-). This correlation is significant at the Sig. (2-tailed) 0.05 level. It can be concluded that decrease of environmental impact is significantly related to the decrease of overall impact. Therefore, this table automatically generate the statement.

Table 5: Correlation between Overall impact with spatial impact in Palallekele.ICS

		Overall Impact	Spatial_Impact
Overall Impact	Pearson Correlation	1	-.075
	Sig. (2-tailed)		.552
	N	65	65
Spatial_Impact	Pearson Correlation	-.075	1
	Sig. (2-tailed)	.552	
	N	65	65

The relationship between overall impact with spatial impact is -0.075. Neighbors' perception on the spatial impact is negative (-). This correlation is not significant because the Sig. (2-tailed) is 0.552 greater than 0.05 level.

4.3. MEANS SCORES AND STANDARD DEVIATIONS (SD) ON NEIGHBORHOOD COMMUNITY PERCEPTION ON IMPACT ITEMS

65 useable responses were obtained during the onsite survey conducted Palallekele International Cricket Stadium. Respondents may offer a Likert- type scale to express their opinions on impact items. The results are tabulated in Table 6.

Table 6: Means and Standard Deviations (SD) of neighbors' perception

Impact items	Palallekele International Cricket Stadium						
Environmental	1	2	3	4	5	Mean	SD
1.. Environmental Pollution	06	01	00	35	23	4.046	1.124
2.Waste management problem	01	01	07	17	39	4.421	0.864
3.Preservation of physical landscape	06	09	31	09	10	3.156	1.125
4.Noise pollution	00	16	29	05	15	3.265	1.085
5.Deterioration of natural resources	23	04	25	09	04	2.546	1.263
Grand mean						3.486	
Spatial							
16.Improve quality of public spaces	00	03	09	20	33	4.281	0.875
17.Consider underused venues	02	00	05	24	34	4.353	0.873
18.Lighting effects at night	19	04	18	05	18	2.984	1.566
19.Infrastructure improvement	14	12	25	02	12	2.784	1.340
20.City beautification	09	10	30	15	01	2.830	0.993
Grand mean						3.446	

Given below visual documentation provides the example imageries for the results which conveys better understandings and identifications of this research through the data extracted from the personal observations gathered during the Australia vs Sri Lanka 1st ODI match held on Palallekele International Cricket Stadium as forms of photographs which will help for the reader to grab the essence of the research through visual representation.

4.3.1 Environmental Impacts

Environmental pollution

Figure 2. is the typical image for the post-event environmental impact on the local community was considerable. Streets near the stadium, public areas, and residences were contaminated the environment pollution.

As a result of this environmental pollution, the destruction of the natural and physical environment, it causes negative environmental footprints on local eco-systems. Table 6 indicates the neighbors' feedback for the Environmental pollution.



Figure 2: Environmental pollution within the neighborhood landscape
Source: Waidyarathne K

Waste Management problem

Neighborhood community disappointed on mega event as waste management problems were occurred as a negative post event environmental impact. This photograph would provide the practical implication of this matter.

In table 6, the highly ranked environmental impact item was "Waste management problem" ($M=4.421$).



Figure 3: Improper disposal of garbage Source: Waidyarathne K

Preserve Physical landscape

The physical landscape around the stadium was well maintained by the stadium authorities. The aesthetics of the stadium may promote a positive image of the host city, which has a significant impact on the neighborhood. Furthermore, this will lead to create comfortable environment for the neighbors as this may help to cool the surroundings.

Respondents showed the mean value for perception on this impact item as ($M=3.156$) in Table 6.



Figure 4: Natural physical landscape of stadium entry Source: Waidyarathne K

Noise Pollution

Sport events unavoidably produce noise as a byproduct. The noise pollution can be taken as a negative environmental impact produced from spectators, equipment, and game amenities around sports stadiums. Neighborhood community around the stadium are affected by the noise. In order to manage this situation for future events, it is vital to consider the perception of neighboring community. Table 6 indicates the neighbors' feedback for the noise pollution.

Deterioration of natural resource

Due to the game amenities and behaviors of some spectators cause huge deterioration of the natural resources. Actions would need to be taken to avoid this negative impact. Some designated sites must be established to carry on these game amenities without disturbing the existing natural resources.

In table 6, the lowest scored environmental impact item was "Deterioration of natural resources" with mean value as (M=2.546).



Figure 5: Causing harm for the nature due to game amenities Source: Waidyarathne K

4.3.2 Spatial impacts

Consider underused venues

The Figure 6 is the typical image shows the way how underutilized space within neighborhood landscape was used during the game day which may improve the livability of these venues and sites. Typically, during the match season, neighborhood underutilized, abandoned pieces of the city, and other parts of the city transform into temporary facilities that help to prevent the spread of white elephants and placelessness.

Table 6. indicates the highly perceived impact item on spatial impact is "Consider underused venues" with M= 4.353 mean value.



Figure 6: Improve livability of underused venues Source: Waidyarathne K

Improve quality of public spaces

Public spaces within the neighborhood land-scape also converted into temporary facility providing spaces named as servicecape. Due to the improvement of the quality of public spaces, it directly enhances the livability and support for bettering low-quality neighborhoods and spatial development in cities.

Table 6 indicates the neighbors' feedback for this typical impact item with $M = 4.281$ mean score.



Figure 7: Spatial development of public spaces within the neighborhood
Source: Waidyarathne K

Lighting effect at night

There was no lighting effect for the immediate neighborhood. However, the lack of lighting in the immediate neighborhood may result in social issues. Therefore, concerning neighborhood perception is important.

Respondents showed the mean value for perception on this impact item as ($M = 2.984$) in Table 6.



Figure 8: Lighting effect for the neighborhood Source: Waidyarathne K

Infrastructure Development

Infrastructure around the stadium neighborhood was improved prior to the event to make it comfortable for the user. Some of the infrastructures are sidewalks, lighting, roads, parking spaces, easy access etc. The best advantages of this infrastructure improvement are taken by the neighborhood community as it may support their day to-day life.

In table 6, the lowest mean value ($M = 2.784$) was for infrastructure development.



Figure 9: Expansion of sidewalks on street Source: Waidyarathne K

City beautification

The Figure 10 shows enhancement of city beauty around the stadium to welcome the teams as well as the tourists. City beautification was done as a part of urban revitalization where main aim was to attract more tourists and spectators for the event.

Respondents showed the mean value for perception on this impact item as ($M=2.830$) in Table 6.



Figure 10: Displaying flags of two countries Source: Waidyarathne K

5. Conclusion

5.1 DISCUSSION

Table 7: Interpretation of the researcher on the comparison

Impacts	Pallekele International Cricket Stadium
Environmental impact	Negative
Spatial impact	Negative

This study statistically found that perception of community on the overall impact around Pallekele International Cricket stadium neighborhood is negative.

5.2 RECOMMENDATIONS

Designers, landscape architects, and architects must utilize statistical analysis in future research before making any plans to evaluate sites, landscapes etc. Analysis conducted through site observations is insufficient for any type of designer because the results are unreliable from a scientific perspective.

5.3 CONCLUSION

Regarding environmental and spatial impacts, landscape has emerged as one of the important concerns of the sportscares and it may be utilized as an integrated part for evaluating neighborhood since landscape indicates how people perceive their surroundings. Therefore, by identifying neighborhood community perception on this urban phenomenon, lead to a conclusion that how their attachment to the event, and community concern on impacts and degree of environmental sensitivity to create the urban landscape. The involvement and support of the neighborhood community should be essential when transforming this incident into a more significant urban experience.

Perception of neighborhood community around Pallekele concerned more on their surrounding environment and spatial impacts. Therefore, their measures on impacts are negative. This research shed some light on one factor for consideration of underused venues around stadiums of physical landscapes. The findings of this research provide enough information about there is a strong relationship of cricket stadiums with their neighborhoods and supported to get true reading of neighborhood community perception to uplift the attachment of the neighborhood community on this mega event experience to transform it to a more significant urban experience for both neighboring community and guests specially spectators by converting the sports landscape into a cultural destination. One of the significant things realized from this research would be that, when planning future cricket stadiums, the community's perception on environmental and spatial impacts around the international stadiums must be taken into consideration.

6. References

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