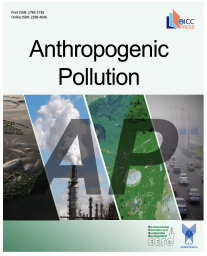

Volume 8, Issue 2, 082422 (1-9)

Anthropogenic Pollution (AP)

https://doi.org/10.57647/j.jap.2024.0802.22

Identifying and ranking indicators affecting the environment with the aim of providing a guide on the establishment and operation of exhibition sites using BWM multi-criteria decision making method

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Original Research

Received:
15 November 2024
Revised:
3 December 2024
Accepted:
25 December 2024
Published online:
27 December 2024

Abstract:

The exhibition industry serves as a huge platform for face-to-face participation and the formation of potential economic and business relationships in the current century. These gatherings cost greatly in terms of energy resources are responsible for the emission of greenhouse gases and other pollutants into the water, air, and soil. The present study seeks to investigate and identify the pollutant indices resulting from the activities of the exhibition industry, its respective services and preparing guide on the organization of exhibition sites. For this purpose, the most important environmental criteria influenced by the industry were first identified through the Delphi method and were then classified into nine main priority groups based on multi-criteria decision-making and the Best/Worst Method (BWM). The environmental index of the region was thus selected as the most important criterion whereas the social and economic indices were determined to be the least important criteria. Moreover, 58 sub-indices of the main indices were also weighed and prioritized based on the pairwise comparison. As a result, the sub-criterion of environmentally sensitive region ranked first while the sub-criterion of impact on the local and regional identity was identified as the least important influential sub-criterion. Weighing and prioritization of the indices were eventually the main foundation for the compilation of the exhibition site construction and operation instructions, and persistent monitoring of some indices such as the indoor air quality and consumed energy can reduce the negative environmental consequences of exhibition activities significantly.

Keywords: Pollutant indices; Exhibition industry; Criteria ranking; Construction and operation instructions; Exhibition sites; BWM

1. Introduction

Due to the sharp increase in growth rate of industrialization and global population, the climate change threat has been surged (Zhao and Rasoulinezhad, 2023; Shang et al., 2023). On the other hand exhibitions provide chances for physical demonstration and presentation of the newest services, products, studies, procedures, and market opportunities and act as a large platform for face-to-face participation and the formation of potential business relationships. Despite the emergence of the digital era which has provided the possibility to exchange ideas, the physical and the construction and attending exhibitions, expos, and events is still of great significance in the present era (Zhan et al., 2020). Based on Unique of industrial Fairs (UFI), the exhibition industry ranks 56th among the large industries of the world. UFI has announced that 32,000 exhibitions were held across the world in 2018, attracting over 303 million visitors for over a

million exhibitors in more than 180 countries in the world; also this industry has made a significant contribution to the global economy. In 2018, it generated € 275.1 ($325.0) billion in total output and supported 3.2 million jobs (UFI, 2019; Li et al., 2022). Asia ranks third in this regard with around 82 million visitors, 30% of whom traveled to foreign countries to visit exhibitions (Xi et al., 2021). These events cost greatly in terms of energy resources are responsible for the emission of greenhouse gases and other pollutants into the water, air, and soil. Furthermore, exhibitions can leave substantial environmental footprints through the consumption of water and energy, waste generation, water and air pollution, and contribution to climate change through greenhouse gas emissions. The construction of infrastructures required for exhibition sites such as buildings, halls, offices, and service facilities and the construction of parking spaces and access roads as well as supplying the power, water, and other requirements also need measures that leave essential impacts on the regional environment over the short term and long term. The measures taken in the operation phase should also be accounted for alongside the activities during the construction phase. The transfer of goods and services, visitor traffic, and other similar measures leave significant regional and global impacts on the environment in addition to their local effects (Xia et al., 2023; Nepal, 2019; Shen, 2012).

Environmental impacts are significant in places where large events are held. Researchers used several indices to assess the environmental impacts of an event including energy consumption, water consumption, transportation, recycling, and generated and recycled waste (Adrea et al., 2016). Regular industrial exhibitions are responsible for a large sum of the CO_2 emission and efforts must be invested in reducing their environmental impacts (Chiara, 2019).

More exhibition developers are choosing to hold more environmentally sustainable practices since environmental awareness has been raised and green development proves to confer a unique competitive advantage (Chen et al., 2024). Events are sometimes, by their nature, high profile and transient, with both positive and negative social, economic and environmental impacts. Thus, many international organizations have provided instructions and guides for sustainable events. This document has been drafted to help organizations and individuals to improve the sustainability of their event-related activities with an innovative perspective. Also this study attempts to fill the research gap identified by addressing the following research in identifying, ranking indicators affecting the environment and developing a guide on the establishment and operation of exhibition sites using BMW method.

2. Materials and methods

2.1 Designing the Delphi questionnaire

Various materials and methods can be used to identify and determine the indices affecting environmental quality due to the exhibition industry activities, among which referring to the experts of the industry and environment is one of the practical, standard, and scientific methods. The present study used the Delphi technique and expert opinions to assess and identify the most important criteria. To identify the most important criteria of the study based on the collected data, the proper parametric or nonparametric statistics were selected, and the consensus or agreement level regarding was also obtained based on the distribution of the collected data. For this purpose, the parametric statistical index of frequency distribution was used for the normal data while the Kendall correlation coefficient nonparametric statistical index was used for data lacking a normal distribution (Phichetkunbodee, Chantrawutikorn, et al., 2023; Drumm et al., 2022).

In the first Delphi round, the important criteria were extracted from the research literature and expert opinions and were then incorporated into a questionnaire scored on a five-point Liker scale. The questionnaires were then handed out to the available experts to conduct an initial review and the collected data were analyzed which indicated the construct validity of the questionnaire. In current study, 20 experts, including environmental experts from all over the country and the exhibition industries took part in focused group decision-making to assesment. Cronbach's alpha was also used to examine the reliability of the questionnaire. For this purpose, the mean value of expert opinions and the questionnaire spectrum were compared to the threshold index.

The results of the first Delphi round were used to design the questionnaire for the second round. For this purpose, the questions that were identified to be insignificant in the first round were eliminated from the questionnaire, and the new questionnaire was designed based on the remaining questions. In the next stage, the new questionnaires and results of the first Delphi round were provided to the experts and the collected data were analyzed, based on which the Cronbach's alpha of the second Delphi round was calculated. The normality of the data from the second round was confirmed based on the skewness and elongation values. All the questions or criteria of the study would be considered of the acceptable significance if the mean score assigned to all questions by the experts were higher than the threshold value. Considering that all questions were considered important at this stage and no new factor was added to the study, two of the three conditions for ending the Delphi rounds were met. The third condition was that the experts needed to reach a certain level of consensus over the questions (Karam et al., 2021; Fataei and Safavian, 2024). Given the data normality and according to Mckenna (1994), a consensus regarding a question is reached when at least 51% of the experts agree on it (Taghipoorreyneh, 2023). Thus, 58 criteria among the identified criteria were selected based on the results of the Delphi method.

2.2 Best/worst multi-criteria decision-making method

Multi-criteria decision-making is among the important indices of the decision-making theory. In this method, the best and worst (most and least important) indices are determined by the decision-maker, and pairwise comparisons are performed between the two indices (best and worst) and other indices. Then, a maximum-minimum problem is formulated and solved to determine the weight of each index. This method also includes a formula to calculate the incon-

sistency ratio to examine the validity of the comparisons (Moslem et al., 2024). One of the prominent advantages of this method over other multi-criteria decision-making methods is that it does not require comparative data as much and leads to more robust comparisons which means it yields more reasonable results (Thompson et al., 2024). Assuming that we have n criteria and want to perform a pairwise comparison between them using a $1/9-9$ scale. The resulting matrix will be as follows, where a_{ij} stands for the relative importance of criteria i over criteria j. $a_{ij}=1$ indicates that i and j are of the same importance. $a_{ij}>1$ indicates that i is more important than j. $a_{ij}=9$ indicates the absolute importance of i over j. Thus, the importance of criteria i over criteria j is demonstrated by a_{ij}. Matrix A will be reciprocal, provided that $a_{ij}=1/a_{ji}$ and $a_{ii}=1$ for all is and js.

Given the reciprocal feature of matrix A, $n(n-1)/2$ comparisons must be made to complete the matrix. If $a_{ik}\times a_{kj} = a_{ij}\ \forall\ i, j$, the pairwise comparison matrix A will be fully compatible (Rezaei, 2015, Badri et al., 2017).

$$A=\begin{bmatrix} a_{11} & \cdots & a_{1n} \\ a_{21} & a_{22} & a_{2n} \\ \vdots & \ddots & \vdots \\ a_{n1} & \cdots & a_{3n} \end{bmatrix}$$

Five steps are taken in the best-worst method to calculate the weight of the criteria. The first step is to determine the set of decision-making criteria in which the decision-maker needs to determine n criteria (C1, C2, ..., Cn) required for decision-making. The second step is to determine the best (most favorable or important) and the worst (least favorable or important) criteria. In this step, the decision-maker only specifies the best and worst criteria and makes no further comparison. The third step is to determine the importance of the best criteria to others using a number between 1 and 9. The Best-to-Others (BO) vector will be as follows:

$$A_B=(a_{B1}.a_{B2}...a_{Bn})$$

The fourth step is to determine the importance of all criteria over the worst criteria using a number between 1 and 9. The Others-to-Worst (OW) vector will be as follows:

$$A_W=(a_{1W}.a_{2W}...a_{nW})^T$$

where a_{jw} stands for the importance of criteria j over the worst criterion. The fifth and final step is to find the optimal weights of $(W1^*.W2^*...Wn^*)$.

Saaty nine-point scale is used to score the criteria. To assess and rank the main research criteria, the respective questionnaire was first designed using the best-worst method and handed out to the questionnaires. After the questionnaires were completed and the data were collected, the opinions of each expert were analyzed. The study sought to take advantage of the group opinions of the experts. The inconsistency ratio of the questionnaire data was obtained through the presented question and by dividing the model's target function value by the consistency index. The inconsistency ratio varies between zero and one, indicating higher consistency in values closer to zero and higher inconsistency in values close to one. In the case that the inconsistency ratio is unfavorable, the questionnaires must be returned to the experts to be revised. To determine the weight of the sub-criteria, pairwise comparison questionnaires were designed for each main criteria and delivered to the experts similar to the previous stage. The collected data were then analyzed, the final weight of each of the sub-criteria was calculated, and their final ranking was performed.

The present study took advantage of the opinions of two expert and influential groups including environmental experts across the country who had research experience in the field of social, economic, and industrial activities and construction of similar projects and experienced experts in the field of the exhibition industry and the respective services that held and managed various events and exhibition at the national and international levels.

3. Results

3.1 Identification of the influential criteria using the Delphi technique

The consensus over all the questions exceeded 51% in the first Delphi round. It can thus be suggested that the questionnaire gained a good level of consensus. Cronbach's alpha was also used to examine the reliability of the questionnaire. Table 1 demonstrates the Cronbach's alpha calculated for the questionnaire over the first Delphi round.

Table 1. The questionnaire's Cronbach's alpha over the first Delphi round.

Reliability statistics	
Cronbach's alpha	N of items
0.961	61

As shown, the questionnaire had a Cronbach's alpha of 0.961 in the first round which indicates that the questionnaire was reliable since the coefficient was larger than 0.7. Moreover, the skewness and elongation indices were in the range of $(-2,2)$ for all questions which indicate the normality of the questionnaire data distribution. It was also revealed that the sub-indices of parking space, potable water supply through drilling wells, and storage and transfer of raw sewage to another location got scores lower than the threshold limit (3) and were thus excluded from the study.

A Cronbach's alpha of 0.949 was obtained for the second Delphi round, and the normality of the data in this round was also confirmed given the skewness and elongation values. The mean expert scores exceeded the threshold for all questions in this round, which indicated that all the remaining research criteria or questions were of acceptable importance. Two of the three conditions for ending the Delphi rounds were thus met. The third condition was that the experts needed to reach a certain level of consensus over the questions. Thus, 58 criteria among the identified criteria were selected based on the results of the Delphi method.

3.2 Data analysis using the Best Worst Method (BWM)

The first step in completing the pairwise comparison questionnaire is the identification of the factors that are going

to be compared to one another –in this case, the environmental criteria and indices affecting the construction and operation of exhibition sites identified in the previous step. The next step in the best worst method is to determine the best (most important) and worst (least important criteria). The indices of infrastructure, energy, air, safety and hygiene, solid waste, water and sewage, and transportation were the next priorities following the environmental aspect of the region, respectively. Tables 2 and 3 demonstrate the importance of the best criteria over others and the importance of other criteria over the worst criteria.

The first step in data analysis after collecting expert opinions is to build the mathematical model of the problem. For this purpose, the mathematical model of the problem was developed based on the relationships provided in the best and worst methods and the data obtained from the experts as follows. The problem was then solved to obtain the weight of the main criteria, the value of the optimized target function, and the inconsistency ratio as Table 4 demonstrates.

The min of ξ

$$|\frac{w1}{W2}-6|\le\xi,\quad |\frac{w1}{W3}-2|\le\xi,\quad |\frac{w1}{W4}-3|\le\xi$$
$$|\frac{w1}{W5}-4|\le\xi,\quad |\frac{w1}{W6}-4|\le\xi\quad |\frac{w1}{W7}-3|\le\xi$$
$$|\frac{w1}{W8}-3|\le\xi,\quad |\frac{w1}{W9}-9|\le\xi,\quad |\frac{w2}{W9}-2|\le\xi$$
$$|\frac{w3}{W9}-6|\le\xi,\quad |\frac{w4}{W9}-4|\le\xi,\quad |\frac{w5}{W9}-3|\le\xi$$
$$|\frac{w6}{W9}-3|\le\xi,\quad |\frac{w7}{W9}-4|\le\xi,\quad |\frac{w8}{W9}-4|\le\xi$$

$\sum_{g=1}^{25} w_j = 1$ for all j.

Figure 1 demonstrates the ranking and importance of the main criteria. As observed, the criterion of the environemtnal aspect of the region got the highest weight and ranking, followed by the infrastructure criterion, while the socio-economic criterion has ranked last. The best-worst method was used to calculate the weights of the sub-criteria as well.

Table 2. Expert opinions regarding the importance of the best criteria compared to the other criteria of the study.

Criterion	The environemtnal aspect of the region	Transportation	Infrastructures	Energy	Solid waste	Water and sewage	Air	Safety and hygiene	Socio-economic
Best criteria: the environemtnal aspect of the region	1	6	2	3	4	4	3	3	9

Table 3. Expert opinions regarding the importance of other criteria over the worst criteria.

Criterion	The least important criteria: socio-economic
The environemtnal aspect of the region	8
Transportation	2
Infrastructure	6
Energy	4
Soiled waste	3
Water and sewage	3
Air	4
Safety and hygiene	4
Socio-economic	1

Table 4. The weight of the problem dimensions, optimal target function value, and the inconsistency ratio of the questionnaire.

Criterion	Symbol	Weight
The environemtnal aspect of the region	$W1$	0.2793198
Transportation	$W2$	0.04773694
Infrastructure	$W3$	0.1666667
Energy	$W4$	0.1072018
Soiled waste	$W5$	0.07746937
Water and sewage	$W6$	0.07746937
Air	$W7$	0.1072018
Safety and hygiene	$W8$	0.1072018
Socio-economic	$W9$	0.02973243
Target function value	ξ^*	0.1715729
Inconsistency ratio	Consistency Ratio = $\frac{\S^*}{\text{Consistency Index}}$ = 0.0746	

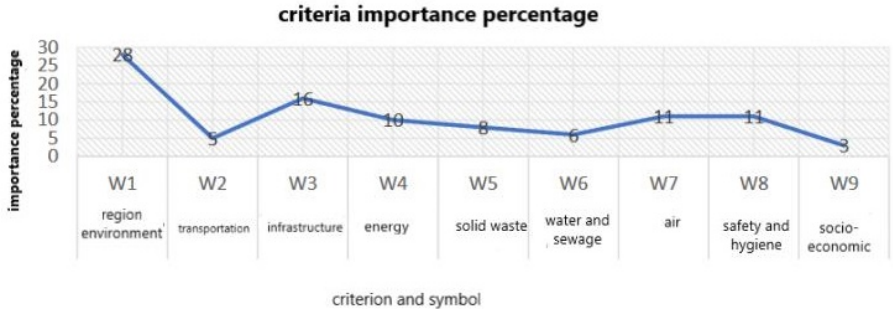

Figure 1. The weight and importance of the main criteria.

Figure 2 demonstrates a comparison of the sub-criterion of the environment to all the criteria, figure 3 illustrates the comparison of the transportation sub-criterion to other criteria, and figure 4 compares the weights of the energy sub-criterion compared to the other criteria.

3.3 Influential sub-criteria with the aim of providing a guide on the establishment and operation of exhibition sites

The influential sub-criteria were ranked and weighted similarly to the main indices of the study. The sub-criteria were weighed in their respective main criterion group and against the sub-criteria under all 58 sub-criteria. This is beneficial and practical in prioritizing the sub-criteria and developing the construction and operation instruction for exhibition sites. The comparisons were made using the best-worst method (the most and least important criteria). As shown in Table 5 the sub-criterion of sensitive environmental regions ranked first and was identified as the most important sub-criterion, and the impact on local and cultural identity ranked 58th and was identified as the least important criterion.

4. Discussion

4.1 Influential environmental criteria

As figure 1 demonstrates, the nine main criteria examined in the present study encompassed a wide range of environmental priorities. This result is consistent with the study on

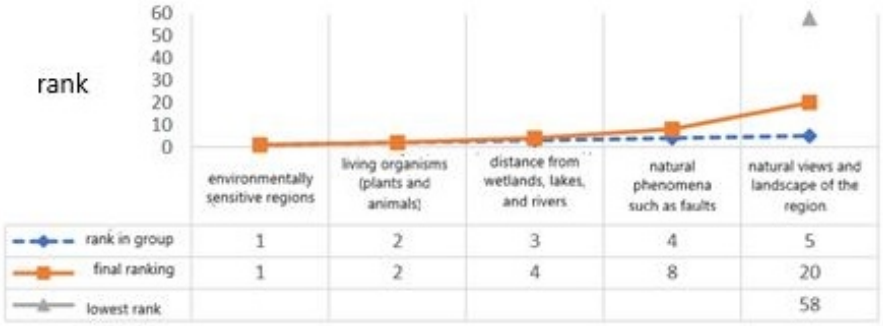

Figure 2. Comparison of the regional environment sub-criterion weight to other criteria.

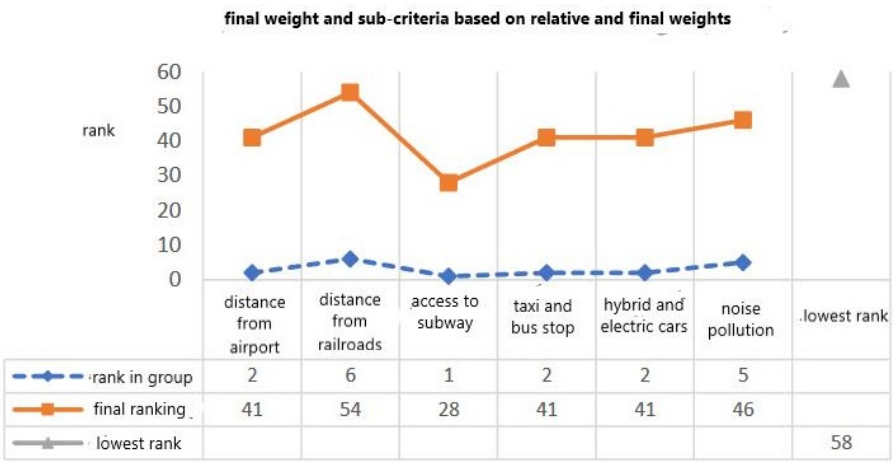

Figure 3. Comparison of the transportation sub-criterion weight to other criteria.

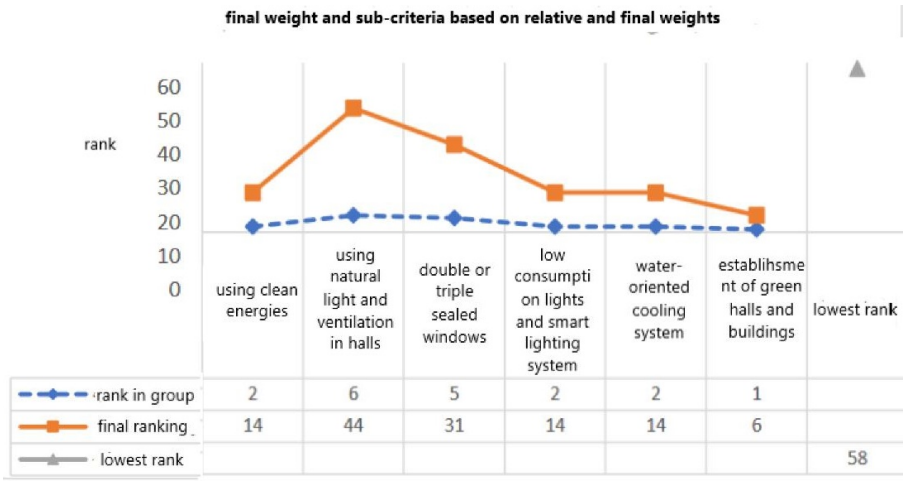

Figure 4. Comparison of the energy sub-criterion weight to other criteria.

Table 5. Final weight of sub-criteria and ranking based on relative and final weight.

Final ranking	Final weight	Rank	Relative weight	Sub-Criteria
1	0.120117374	1	0.4300353	Sensitive Environmental Area
2	0.065831822	2	0.2356862	Fauna and Flora
4	0.044462182	3	0.1591802	Distance from Swamp, Lakes and Rivers
8	0.032450453	4	0.1161767	Natural phenomena
20	0.016457956	5	0.05892155	Natural View
41	0.008039378	2	0.16841	Distance from the Airport
54	0.002894291	6	0.06063	Distance from the Railroad
28	0.01429244	1	0.2994	Metro Accessibility
41	0.008039378	2	0.16841	Bus and Taxi Station
41	0.008039378	2	0.16841	Electrical and Hybrid car
46	0.006431598	5	0.13473	Noise Pollution
5	0.043053009	1	0.258318	Roads
12	0.022096704	2	0.1325802	Distance to Population
13	0.021835271	3	0.1310116	Traffic
24	0.01593634	7	0.09561802	Parking
24	0.01593634	7	0.09561802	Communication and Telecommunication services
35	0.010037405	9	0.06022442	Emergency Light Service
21	0.015936342	4	0.09561803	Number of halls
21	0.015936342	4	0.09561803	Restaurants, Hotels
48	0.005898936	10	0.03539361	Parks
21	0.015936342	4	0.09561803	Public Services
14	0.018392924	2	0.1715729	Using of Clean Energy
44	0.006502879	6	0.06066017	Using of Natural lights in the Halls
31	0.011890041	5	0.1109127	Double or Triple Windows
14	0.018392924	2	0.1715729	Use of Energy saving lights and intelligent start-up system
14	0.018392924	2	0.1715729	Creating a water based cooling system
6	0.033630116	1	0.3137085	Creating green buildings
10	0.026702809	1	0.3446886	Reduce consumables
36	0.009884208	4	0.1275886	Reuse and recycling
26	0.015608722	2	0.2014825	Separation of waste from the source
36	0.009884208	4	0.1275886	Pneumatic collecting system
52	0.003658702	6	0.04722772	Incineration
33	0.011730714	3	0.1514239	Transfer to waste disposal or landfill centers
11	0.022556478	1	0.2911664	Drinking water supply from surface water and drilling wells
47	0.006256039	6	0.080755	Supply of drinking water with packaging bottles
38	0.008657086	4	0.1117485	Separate drinking water and non-portable water network
30	0.012005211	3	0.1549672	Inside waste water treatment
50	0.004879579	7	0.0629872	Primary waste water treatment
57	0.002401043	8	0.03099345	Feed raw sewage to the sewage collection network of nearby areas
29	0.012056852	2	0.1556338	Black water using
38	0.008657086	4	0.1117485	Rain water collecting
9	0.031241821	2	0.29143	Measurement of pollutants in exhibition halls
27	0.014360753	3	0.13396	Measurement of air pollution index in exhibition open area
40	0.008439998	4	0.07873	Measurement of air pollution index around the exhibition
3	0.053159229	1	0.49588	General climatic condition
14	0.018392924	2	0.1715729	Emergency and fire department development
31	0.011890041	5	0.1109127	Safety and health learning
6	0.033630116	1	0.3137085	Safety and health for visitors
14	0.018392924	2	0.1715729	Safety and hygiene requirements in the process of building
14	0.018392924	2	0.1715729	Noise pollution in halls
44	0.006502879	6	0.06066017	Light pollution in halls
34	0.010062545	1	0.3384367	Economic development region
55	0.002515637	5	0.0846092	Social impact on local communities
49	0.005031271	2	0.1692183	Increase employment
51	0.004846407	3	0.1630007	Impact on land use
58	0.00123529	7	0.0415469	Impact on cultural identity
53	0.003525642	4	0.118579	Traffic load and air pollution
55	0.002515637	5	0.0846092	Safety effect

the influential indices in the construction and operation of an exhibition site in New Delhi, India. In fact, given the use of expert opinions, not only are the results diverse enough, but they are also adequately comprehensive. It can thus be inferred that the selection of the criteria is among the most important stages in the identification and compilation of construction and operation instructions for exhibition sites based on environmental criteria, which has been achieved in the present study.

4.2 Ranking of the main criteria

It can be inferred in this section that the importance of the indices based on the obtained priorities must be considered the basis for the decision-maker's actions in the construction and operation of exhibition sites. However, the notable point from the pairwise comparison questionnaires is determining the importance and preference of each index over the others. Based on the aforementioned and as Table 2 demonstrates, the most important criterion –the environmental aspect of the region- is nine times more important than the least important criterion -socio-economic criterion. It can also be understood from this table that the environment has twice the importance of the infrastructure index. This indicates that the infrastructure index is of great significance in the exhibition industry as well and that those involved in the construction and operation of exhibition sites must prioritize this criterion. Moreover, the environment criterion had three times the importance of the energy, air, and safety and hygiene indices and four times the importance of solid wastes and water and sewage indices. In other words, it can be inferred that the indices associated with environmentally sustainable development are of greater significance. This confirms the UFI and the Bureau International des Expositions have sought in terms of environmentally sustainable construction and operation over the recent years. As mentioned earlier, the best-worst method also determines the importance of other criteria over the worst criterion through pairwise comparisons.

As Table 3 demonstrates, the least important criterion -the socio-economic criterion- was eight times less important than the environemtnal aspect of the region, six times less important than the infrastructure index, and only two times less important than the transportation index. This indicates how measuring the importance of other criteria over the least important criterion can help develop a better understanding of the prioritization of the indices.

Figure 1 demonstrates the importance percentage of each of the main criteria. As the chart shows, the criteria of region environment and infrastructure were the most important with 28% and 16% importance, respectively, whereas the criteria of socio-economic and water and sewage were the least important with 3% and 6% importance, respectively. The weight and priority of the indices based on the research method are essential in compiling the construction and operation instruction for exhibition sites.

Figure 2 compares the sub-criteria of the regional environment in their group and with the other sub-criteria. For instance, the sub-criteria of natural views and regional landscape ranked fifth in the environment group and 20th among all sub-criteria. This indicates that although this sub-criterion is significant in its group, it is not of much importance in the final ranking which is the main criterion for the compilation of exhibition site construction and operation instruction. Moreover, access roads ranked fifth in the final ranking.

Figure 3 demonstrates the ranking of the sub-criteria of region transportation to the other sub-criteria under the same criteria and those under other criteria. As observed, access to the subway is the most important sub-criterion in this group while the distance from the railroad is the least important sub-criterion. Access to taxis and buses, hybrid and electric cars, and distance from the airport all ranked second in the group and 41st in the final ranking. However, access to the subway got a final priority of 28th, and access to railroads got a final ranking of 54th. Subway public transportation consumes the least amount of energy and creates the least pollution given its capacity. Thus, the construction and operation of subway stations around an event such as expos or temporary or permanent exhibitions that are widely visited are the best, most cost-convenient, and least polluting mode of transport. The aforementioned and selecting a location for exhibition sites are to receive great attention as some of the most essential indices towards sustainable development.

Figure 4 demonstrates the ranking of energy sub-criteria in their group and across other groups. In this group, the construction of green halls and buildings was identified as the most important sub-criterion, while the use of natural light and ventilation was the least important index. Interestingly, the use of clean energy, low consumption lighting, intelligent lighting systems, and water-oriented cooling systems ranked the same under the energy criteria. Meanwhile, the construction of green halls and buildings ranked 6th among all sub-criteria which indicates the importance of establishing appropriate buildings –and especially green buildings- in exhibition sites that use the lowest amount of energy and take the best advantage of renewable energy.

5. Conclusion

Considering the aim of the present study which was to prepare an exhibition site construction and operation instruction based on environmental indices, Table 5 demonstrating the weight and importance of each of the main criteria and the final weight of the sub-criteria and the ranking based on their relative and final weights can be used to evaluate all permanent and seasonal exhibitions and international expos based on the 58 environmental indices extracted from the present study. Based on the environment department at UNEP placed the greatest emphasis on sustainability to held internationaml exhibitions, the obtained model and ranking from the present study can also be used to evaluate and rank the currently-held events. Ranking based on the determined indices is of social and economic importance to those involved in the exhibition industry as well. On the other hand as demonstrated in other Expo experiences such as Dubai Expo 2021 which was held in October 2021 due to the covid19 pandemic considered various approaches and goals focusing on environmental sustainability just aimed

to reduce 85% of the total waste produced and reuse, recycle, and convert waste into fertilizer. Therefore current ranking and instruction guide can be used in national and international levels. Also the present instruction can create an effective change in the exhibition industry and respective services, and draw this industry closer to eco-friendly industries by reducing environmental pollution and increasing resource productivity emphasizing sustainability.

Authors Contributions
Authors have contributed equally in preparing and writing the manuscript.

Availability of Data and Materials
All data generated or analysed during this study are available from the corresponding author upon reasonable request.

Conflict of Interests
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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