

## EARLY PLANNING FOR TOTAL SOLAR ECLIPSE EVENTS: FACTORS IN SUSTAINABLE TOURISM DEVELOPMENT

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**Abstract:** One gorgeous natural event which attracts tourists to a destination is an eclipse. This paper is an initial attempt to investigate the effective factors for early planning in destinations for a total solar eclipse. A qualitative-quantitative methods (with exploratory factor analysis) were used. The results reveal seventeen effective factors and five variables such as management and planning at different levels; setting up a news agency website and social networks to increase the level of public awareness and advertising; local involvement; organizing local festivals in nearby villages and cities; and public involvement as the main factors in early planning in destinations for a total solar eclipse. The results also illustrate that there is correlation between the identified variables. Eclipse events in a short period of time attract numerous tourists to a destination, and this is a form of mass tourism. Therefore, early management of the event plays an axial role in the sustainable development of the region.

**Key words:** Astronomical event, event, event management, solar eclipse, sustainable tourism

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### INTRODUCTION

Astronomical events such as a lunar eclipse, a moon halo, a meteor shower, the aurora, Mars opposition, etc. attract tourists to destinations. One of the most important astronomical events is a total solar eclipse. Solar eclipses are natural phenomena; a total solar eclipse is especially mesmerizing and can be considered a tourism resource. On the other hand, solar eclipse celebrations and gatherings in the host communities provide an opportunity to hold large-scale festivals, since a total solar eclipse as an event attracts tourists and investments to destinations. Eclipses are known as mega natural events and need sustainable management for promoting green festivals and reducing negative impacts in destinations.

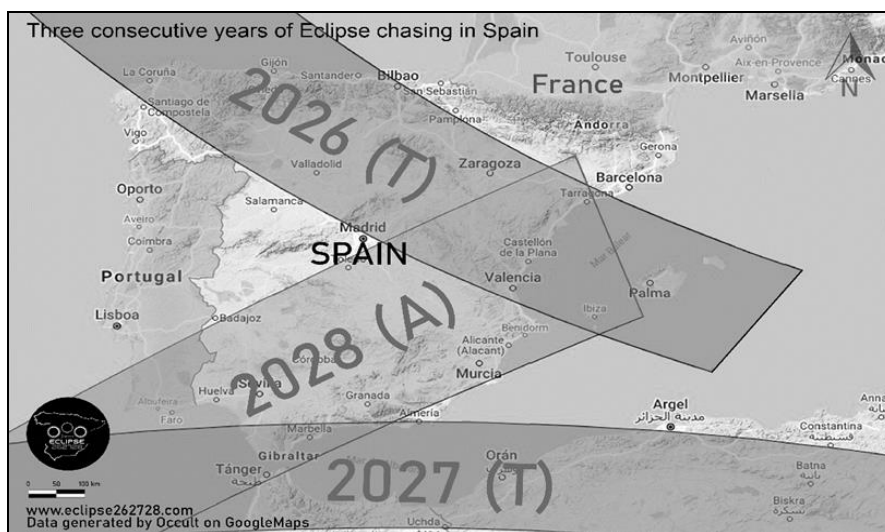


Figure 1. Three consecutive years of eclipse chasing in Spain (Source: www.eclipse262728.com)

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Total solar eclipses often take place in regions that have no living memory of seeing a total solar eclipse. Even the planners usually have never experienced the phenomenon. When it comes to the total solar eclipse in 2026, the Iberian Peninsula will experience its first totality since 1912. That is to say that the lack of experience and awareness on holding the eclipse festival will affect both observers and organizers. In the total solar eclipse of 2017 in the USA and the total solar eclipse of 2023 in Australia, these destinations were the focal points of eclipse celebrations around the world and the local community started planning for the eclipse festivals years in advance.

The result was successful in both host communities, a great number of international tourists travelled the path of the totality and significant benefit was achieved throughout the event. Both cases are crucial to study since destinations such as Spain and Portugal (2026) (Figure 1) and Iran (2034) (Figure 2) will also be the main destinations on earth to host eclipse observers. Since millions of visitors plan to travel to observe the total solar eclipse, it is crucial to manage accommodation for the visitors. On the one hand, solar eclipse events create a unique opportunity for the accommodation sector to host tourists and take advantage of the benefits, but on the other, management of the crowd and offering suitable tourist services is difficult and needs early planning. The major objective of this study is to investigate the effective factors for early planning in host destinations for a total solar eclipse event. The research presents a summary of works on astronomy and tourism related issues of eclipse chasing. It is noteworthy that the results of this paper can reinforce the literature in this regard and that effective factors for early planning in destinations for a total solar eclipse have not been identified or studied before and thus this study can fill a gap in the literature.

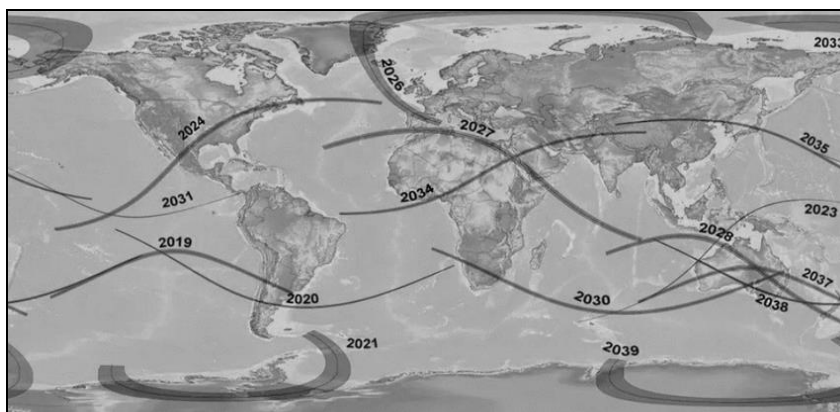


Figure 2. Paths of the total solar eclipses around the world from 2019 to 2039 (Source: <https://eclipsewise.com>)

## LITERATURE REVIEW

### The impacts of events on the destinations

The value of events is not restricted to one or a few aspects and economic approaches have been featured in the event-specific literature. Lundberg et al. (2017) discussed that events facilitate marketing and attracting tourists in the long-term as destinations try to take advantage of events to attract more tourists and repeat visits. Moreover, it is recognized that repeat visits simplify marketing efforts and help enhance revenues. Events are valuable for destination branding as they boost the number of visitors. The same authors believe that it would be a potential strategy to utilize events to ensure repeat visits and brand equity, and co-branding the destination together with the event. Also, as event goers tend to revisit the event to a larger extent than tourists do, good opportunities occur to market other activities in all seasons.

The benefit of events can be tangible such as attracting tourists, creating work opportunities etc. and intangible such as providing civic pride and community cohesion. Farber (1983) believes that events can reveal much about a community's symbolic, economic, social and political life, as they create links between people and groups in a community and between the community and the world. An aspect of the economic value of events is their direct and indirect role in creating employment within the local community, since their contribution generates temporary jobs in the tourism industry and other related sectors. In addition, Lundberg et al. (2017) emphasize the importance of the value of involvement, considering the recipients of this value. They argue that the community is often taken as the basis for judgements on the value of events, and community members are seen as the beneficiaries of events. As cited in May (2006) and Lundberg et al. (2017), it is important that involvement is seen as a process rather than merely passive inclusion. They believe that a festival must be considered as a series of activities rather than merely as an object or product to be consumed at a single point in time; thus, encouraging public participation in festivals and events at a meaningful level is a challenge. According to the same authors, involvement also needs to be considered from a local government perspective, since it is often the role of the local authority to establish and enhance the level of interest and engagement. At the destination, both residents and businesses can be participants, beneficiaries and hosts. It is crucial to have the residents involved in the event and give them maximum opportunities to promote themselves. In other words, local communities have a say in most events and are actively involved in their production, marketing and evaluation as well as attendance. According to Lundberg et al. (2017), as cited in Packer and Ballantyne (2010), festivals establish a sense of belonging and enable social integration during and beyond the event.

According to Andersson and Lundberg (2013), the values of events can be categorized into four dimensions: identity (happiness), cultural values, social and economic values (public education, health and welfare, environmental values) and conduct attitudes (health expenditure). In addition, Getz (2005) notes that events can act as place marketing, tourist

attractions, image makers, catalysts and animators in tourism destinations. Planning and managing events can be a challenging process which can lead to significant positive outcomes at the destination where they take place. Nwokorie (2020) explains that events need an experienced team of people with a range of skills, applicable to the type and scale of the event being planned, with clear lines of authority, decision-making and control. It is also necessary to identify and work with other stakeholders to ensure successful feedback and the ongoing sustainability of events.

Furthermore, community acceptance has a central role in event management (Nwokorie, 2020). According to Yeoman et al. (2006), the aims of an event may focus on one of three main categories: economic, social and cultural politics. They argue that most events, even not-for-profit ones, have economic aims. Economic aims may be direct or indirect and short or long term. When it comes to the long-term impacts of an event, they create permanent or temporary jobs, and generate direct economic benefits for the host community through increased visits and improved levels of visitor expenditure.

As cited in Moufakkir and Pernecky (2015) and Wood (2005), it is believed that events can be also used as a marketing tool to improve the host community's image. Getz (1991) revealed that events do not necessarily have to attract visitors to destinations and play a significant role in tourism development. He describes that in most cases, tourists look for something to do in an area even though they did not previously desire to visit it. Also, events can be used in conjunction with other attractions to heighten overall destination appeal. Event tourism is a relatively new term defined by Getz (1991) as systematic planning, *development and marketing of festivals and special events as tourist attractions, development catalysts and image builders for attractions and destination areas*. Lundberg et al. (2017) state that destinations use events to improve their image, stimulate urban development and attract visitors and investment. Goldblatt (2005) defines stakeholders as individuals or organizations who have invested in an event. The emphasis of this paper is on eclipse events. A total solar eclipse festival as a once-in-a-lifetime experience at the main viewing point can be considered as a mega-event based on the numerous and wide range of audiences and significant impacts of this phenomenon.

Lundberg et al. (2017) define mega-events, by way of their size or significance, as those that offer extraordinarily high levels of tourism, media coverage, prestige or economic impact for the host community, venue or organization. Sadeghi Shahdani et al., (2023) believe that the events are tools for educational tourism. Sustainability in organizing events is an important issue to consider in a prosperous achievement. Especially when it comes to special and mega-events, sustainability must be studied in depth since the bigger an event is, the more significant its positive and negative effects are. This issue can be studied in event management according to its three fundamental pillars: social, economic and environmental.

### **Astronomical events**

Pásková et al. (2021) named astronomical tourism as niche tourism, celestial ecotourism or dark sky tourism, in which an opportunity is created for environmental education, nature and space protection. Soleimani et al. (2019) also considered astronomical tourism as special-interest tourism in a nature tourism context, which includes dark sky observation and astrophotography. Iwanicki (2022) noted that the recently emerged concept of astro-tourism, astrotourism, astronomical tourism or astronomy tourism – all with the same meanings – is related to travel motivated by observations of celestial objects and the night sky, or visiting places related to astronomy (e.g., observatories, museums, planetariums, impact craters, or meteorites). Jiwaji (2016) introduced Tanzania as a destination for the viewing of stars and mentions setting up of fixed or mobile observatories especially in rural areas without light pollution and training local astro-tour guides as operational solutions for promoting astronomical tourism. Haristiani et al. (2016) discussed that the solar eclipse of 9 March 2016 attracted tourists to Indonesia and the results illustrate that the tourists not only travelled to see the solar eclipse, but they also wanted to get a sensation of myths and cultures in Indonesia during the solar eclipse. Furthermore, the authors argue that the solar eclipse event brought benefits for local communities.

The American total eclipse happened on 21 August, 2017 and covered 14 US states: Oregon, Idaho, Wyoming, Montana, Nebraska, Iowa, Kansas, Missouri, Illinois, Kentucky, Tennessee, Georgia, and North and South Carolina (Ma et al., 2020). Ma et al. (2020) introduced two tourists groups who travelled to visit the American total eclipse in 2017, such as opportunists and hardcore group I; tourists followed the “shortest-distance” pattern in their destination choices, presumably selecting convenient observation locations, with group II tourists being less affected by travel distance, and also different in their educational and financial characteristics. Group II tourists are more prevalent in communities with higher educational levels and financial affluence. Rao (2017) notes that there are no ticket sales for eclipse observations, so no one has a definitive count of how many people will attend, and the destinations should be prepared for major traffic jams. Therefore, destinations need a sustainable plan for defocusing crowded populations during solar eclipse events. It is noteworthy that, according to Agiesta (2017), about half of the US population planned to watch the eclipse.

Greenville news (2017) explained that the total solar eclipse that brought more than one million travellers to the state of South Carolina and left an additional \$269 million at the Palmetto state's door. This impact made the eclipse the greatest single tourist event on record in South Carolina, according to the research released by the South Carolina Department of Parks, Recreation and Tourism. Kline (2017) demonstrated that the US total solar eclipse in 2017 created economic benefits for local businesses and has added costs in many economic dimensions.

Fienberg (2019) describes how the American Astronomical Society (AAS) formed the Solar Eclipse Task Force to function as a think tank, coordinating body, and communication gateway to the vast resources available about the eclipse of 21 August 2017. The task force secured funding of about \$500,000 that was used mainly for the following purposes: 1. to build a website as a reference to offer basic information about solar eclipses, safe viewing practices, and eclipse imaging and video, along with resources for educators and the media; 2. to solicit, receive, evaluate, and fund proposals for mini-grants to support eclipse-related education and public outreach to under-represented groups; and 3. to organize a series of

multidisciplinary workshops to prepare communities for the eclipse and to facilitate collaboration between astronomers, meteorologists, school administrators, and transportation and emergency-management professionals.

Kunjaya et al. (2019) note that Belitong Geopark, Indonesia, organized the super blue blood moon event on January 31, 2018 and Mars opposition event on July 21, 2018 and the results illustrate that organizing astronomical events needs more effort and creativity to make these events more attractive and marketable for tourists. In addition, they pay particular attention to cultural heritage sites related to astronomical knowledge, such as Borobudur Temple. Dark sky parks are established in response to the negative aspect of light pollution and follow the Sustainable Development Goals. Izera Dark Sky Park, located on the Czech–Polish border, constitutes a good example (Iwanicki, 2022). Joseph et al. (2022) mention that Kerala, India, which hosted tourists in a solar eclipse in 2019 has great potential for astronomical tourism.

This paper aims to investigate the effective factors for early planning in destinations for a total solar eclipse event, oriented towards sustainable tourism. We considered a summary of work being carried out in the field of total solar eclipse and tourism. A critical review at a glance demonstrated that the majority of research emphasizes the benefits of astronomical events for local communities (Kline, 2017; Greenville news, 2017; Agiesta, 2017; Haristiani et al., 2016) and the other academic works explained about operational solutions for better management of astronomical events (Kunjaya et al., 2019; Fienberg, 2019; Rao, 2017; Jiwaji, 2016). Therefore, it can be said that there is a lack of academic research regarding the identification of the effective factors for early planning in destinations for a total solar eclipse event and the results of this study can reinforce the literature in this regard. The identification of the effective factors for early planning in destinations for a total solar eclipse have not been studied before and this study can fill this gap in the literature.

## MATERIALS AND METHODS

The goal of the present study is to determine the effective factors for early planning in destinations for a solar eclipse. In the first step, the authors interviewed elites and experts in the field of astronomy, urban management, planning and tourism to collect their knowledge, ideas, brainstorming and brainwaves regarding effective factors for early planning in destinations for a total solar eclipse event. A snowball sampling method was used to collect data and the data reached the saturation point in interview number 70. In the next step, the interviews were analysed and the open codes (effective factors) were extracted. The experts introduced seventeen effective factors for early planning in destinations for a total solar eclipse event. In the third step, we used a simple per cent agreement by two coders to determine reliability. The codes that were similar in the opinion of two people were marked as “agreement” and the codes that were not similar were marked as “disagreement”. Lastly, the coders reached agreement on an average of 100%. Hence, it can be said that the coding was highly reliable. The empirical part of this study was conducted from December 2022 to May 2023. In the fourth step, exploratory factor analysis through SPSS as a statistical technique was applied to reduce effective factors to a smaller set of summary variables and to explore the underlying theoretical structure of the phenomena. Principal component factor analysis method was used to determine the minimum number of factors and explain the maximum portion of variance in the original variables. Figure 3 illustrates the methodology framework for the present research.

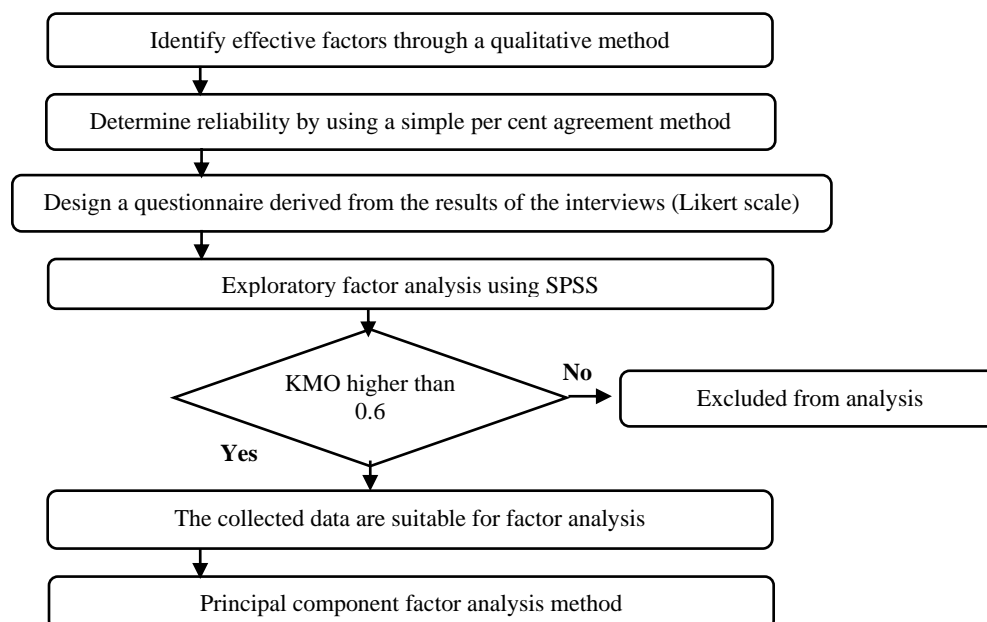


Figure 3. Methodology framework to determine the effective factors for early planning in destinations for a total solar eclipse

## RESULTS AND DISCUSSION

As mentioned before, the authors interviewed elites and experts in the field of astronomy, urban management, planning and tourism to collect their knowledge and ideas regarding effective factors for early planning in destinations for a total solar eclipse event. The demographic characteristics of the interviewees are shown in Table 1. The interviews were analysed, and seventeen effective factors were extracted (Table 2).

Table 1. Demographic characteristics of the interviewers who participated in the research

Demographic characteristics	Percentage	Demographic characteristics	Percentage
Gender	49% male	PhD in tourism	10%
	51% female	Master's in tourism	20%
Country	Iran 92%	Tourism guide	30%
	Portugal 4%	Astronomer	10%
	Spain 3%	University professor	20%
	Australia 1%	Municipal tourism planners	10%

Table 2. Effective factors for early planning in destinations for a total solar eclipse event (obtained from interviews)

V1	Management and planning at different levels (regional, provincial, national)	V2	Setting up a news agency website and social networks to increase the level of public awareness and advertising
V3	Local involvement	V4	Organizing local festivals in nearby villages and cities
V5	Public involvement	V6	Coordination of the involved institutions (formation of a coordination council)
V7	Training amateur astronomers	V8	Local empowerment
V9	Creating infrastructure and accommodation facilities in nearby villages and cities	V10	Linking regional capacities (produce, handicrafts, cultural heritage, etc.) with the eclipse event and empowering local communities in this regard
V11	Directing tourism flows to other places and balancing the flows by determining the tourism route	V12	Exploitation of cultural heritage and cultural sites related to astronomy (myths, sites, etc.)
V13	Creation of temporary camps for tourist accommodation	V14	Attracting funds at different levels to improve infrastructure, organize various activities, train tourist guides, support and educate local communities, etc.
V15	Training of human resources in tourism and astronomy skills	V16	Locating and planning for the construction of temporary markets to sell local products, handicrafts, local foods, etc.
V17	Organizing training workshops for the preparation of beneficiaries		

We used a simple per cent agreement to determine reliability of the results of codes extracted from interviews. An electronic questionnaire was designed and sent to elites and experts who participated in the interview to rate each item (effective factors) from "agreement" to "disagreement". It is worth mentioning that the sixty experts reached agreement on an average of 100%. Hence, it can be said that the effective factors (codes) were highly reliable and no item was removed. Exploratory factor analysis using SPSS as a statistical technique was then applied to reduce effective factors and determine the relation between variables. Before doing the exploratory factor analysis test, it should first be ascertained whether the number of samples are suitable for factor analysis. For this purpose, the KMO indicator and Bartlett's test were used.

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.778
Bartlett's Test of Sphericity	Approx. Chi-Square	325.419
	Df	136
	Sig.	.000

Table 4. Initial extraction of variables obtained from SPSS analysis (Method: principal component analysis)

	Commonalities	
	Initial	Extraction
V1	1.000	.801
V2	1.000	.781
V3	1.000	.898
V4	1.000	.836
V5	1.000	.764
V6	1.000	.567
V7	1.000	.807
V8	1.000	.854
V9	1.000	.782
V10	1.000	.843
V11	1.000	.856
V12	1.000	.817
V13	1.000	.704
V14	1.000	.796
V15	1.000	.555
V16	1.000	.651
V17	1.000	.715

Scree plot

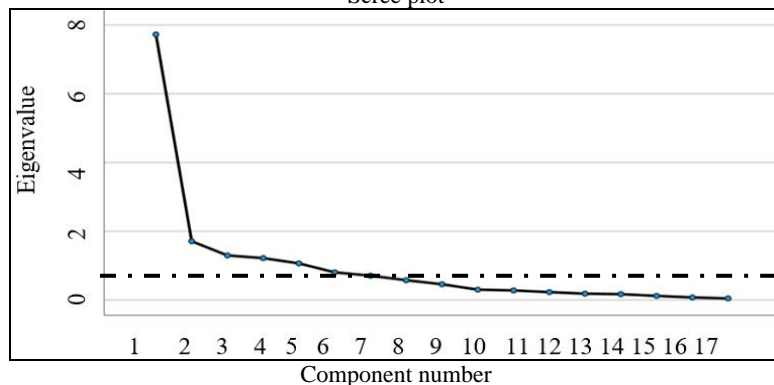


Figure 4. Scree plot for determining main effective factors for education of early planning in destinations for a total solar eclipse

According to the value of the significance level, it can be concluded that the desired data are suitable for sampling. The results of SPSS analysis (KMO = .778 and Sig = .000) (Table 3) illustrated that the number of sample data is suitable for factor analysis because the value of the KMO index is close to one (at least 0.6). In addition, Bartlett's test demonstrated whether the variables are related to each other. If the significance level in Bartlett's test is less than 5%, the correlation matrix will not be the same, which means there is a relationship between the variables. According to the table, the significance level of the test is 0.000, which means that the null hypothesis is rejected and there is a significant relationship between the effective factors mentioned by experts for education of early planning in destinations for a total solar eclipse. Table 4 indicated the common factors in non-rotating mode. The commonality of a variable is the square of the multiple correlation for the corresponding variable using factors, so it is a proportion of the desired test variance that is estimated by the common factors extracted in factor analysis. If the extraction values are smaller than 0.5, it can be removed due to its

low value. The results of the table demonstrate that none of the factors can be eliminated. Further analysis (Table 5), illustrates that among effective factors mentioned by experts and elites, five main variables are identified: management and planning at different levels (regional, provincial, national); setting up a news agency website and social networks to increase the level of public awareness and advertising; local involvement; organizing local festivals in nearby villages and cities; and public involvement. These were identified as the main effective factors for early planning in destinations for a total solar eclipse. Moreover, a scree plot (Figure 4) also illustrates that only five variables have specific values higher than one. It is noteworthy that there is a significant relationship between main effective factors and the other variables.

Table 5. Total variance explained for determining main effective factors (Extraction method: principal component analysis)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
V1	7.730	45.468	45.468	7.730	45.468	45.468	3.174	18.671	18.671
V2	1.711	10.066	55.534	1.711	10.066	55.534	3.135	18.439	37.110
V3	1.299	7.640	63.174	1.299	7.640	63.174	2.563	15.076	52.186
V4	1.220	7.179	70.353	1.220	7.179	70.353	2.171	12.771	64.957
V5	1.067	6.276	76.628	1.067	6.276	76.628	1.984	11.672	76.628
V6	.807	4.745	81.373						
V7	.710	4.174	85.547						
V8	.578	3.397	88.945						
V9	.460	2.704	91.649						
V10	.303	1.782	93.431						
V11	.280	1.650	95.081						
V12	.232	1.363	96.444						
V13	.186	1.094	97.538						
V14	.172	1.010	98.548						
V15	.122	.718	99.266						
V16	.076	.447	99.712						
V17	.049	.288	100.000						

According to the results of the rotated component matrix (Table 6), it can be concluded that setting up a news agency website and social networks to increase the level of public awareness and advertising (V2); linking regional capacities (produce, handicrafts, cultural heritage, etc.) with the eclipse event and empowering local communities in this regard (V10); directing tourism flows to other places and balancing the flows by determining the tourism route (V11); exploitation of cultural heritage and cultural sites related to astronomy (myths, sites, etc.) (V12); creation of temporary camps for tourist accommodation (V13); attracting funds at different levels to improve infrastructure, organize various activities, train tourist guides, support and educate local communities, etc. (V14), and organizing training workshops for the preparation of beneficiaries (V17) are categorized under the first main factor (management and planning at different levels (regional, provincial, national). Furthermore, organizing local festivals in nearby villages and cities (V4); local empowerment (V8); creating infrastructure and accommodation facilities in nearby villages and cities (V9); linking regional capacities (produce, handicrafts, cultural heritage, etc.) with the eclipse event and empowering local communities in this regard (V10); directing tourism flows to other places and balancing the flows by determining the tourism route (V11); exploitation of cultural heritage and cultural sites related to astronomy (myths, sites, etc.) (V12); creation of temporary camps for tourist accommodation (V13); and training of human resources in tourism and astronomy skills (V15) have good relationship with the second main factor (setting up a news agency website and social networks to increase the level of public awareness and advertising).

Table 6. Rotated component matrix for determining the correlation between variables for early planning in destinations for solar eclipse

	Component (a. Rotation converged in 19 iterations)				
	1	2	3	4	5
V1	.843	.232	.178	.061	-.036
V2	<b>.431</b>	.335	<b>.492</b>	.102	<b>.480</b>
V3	-.250	.199	.624	<b>.631</b>	-.092
V4	.257	<b>.866</b>	.094	.101	-.003
V5	.156	.173	.243	<b>.807</b>	.019
V6	.275	.142	<b>.648</b>	.106	.199
V7	.203	-.073	.247	.030	<b>.836</b>
V8	.114	<b>.691</b>	<b>.355</b>	<b>.380</b>	<b>.307</b>
V9	.045	<b>.453</b>	.032	.175	<b>.737</b>
V10	<b>.411</b>	<b>.514</b>	<b>.569</b>	.257	.141
V11	<b>.617</b>	<b>.456</b>	-.018	<b>.514</b>	.048
V12	<b>.336</b>	<b>.332</b>	<b>.749</b>	-.008	.181
V13	<b>.465</b>	<b>.631</b>	.100	.136	.246
V14	<b>.786</b>	.055	.225	.168	<b>.312</b>
V15	-.049	<b>.669</b>	<b>.311</b>	.082	.035
V16	.293	.088	-.083	<b>.698</b>	.250
V17	<b>.640</b>	.044	<b>.417</b>	.195	<b>.304</b>

Extraction method: principal component analysis. Rotation method: varimax with Kaiser normalization

Moreover, local involvement as the third main factor includes seven variables such as: setting up a news agency website and social networks to increase the level of public awareness and advertising (V2); coordination of the involved institutions (formation of a coordination council) (V6); local empowerment (V8); linking regional capacities (produce, handicrafts, cultural heritage, etc.) with the eclipse event and empowering local communities in this regard (V10); exploitation of cultural heritage and cultural sites related to astronomy (myths, sites, etc.) (V12); training of human resources in tourism and astronomy skills (V15); and organizing training workshops for the preparation of beneficiaries (V17).

Our results also illustrate that local involvement (V3); public involvement (V5); local empowerment (V8); directing tourism flows to other places and balancing the flows by determining the tourism route (V11); and locating and planning for the construction of temporary markets to sell local products, handicrafts, local foods, etc. (V16) are categorized under the fourth main factor (organizing local festivals in nearby villages and cities) and there is a high correlation between the fourth main factor and these five variables. In addition, the clearest result of the exploratory factor analysis with SPSS is that there is a correlation between the fifth main factor (public involvement) and six variables: setting up a news agency website and social networks to increase the level of public awareness and advertising (V2); training amateur astronomers (V7); local empowerment (V8); creating infrastructure and accommodation facilities in nearby villages and cities (V9); attracting funds at different levels to improve infrastructure, organize various activities, train tourist guides, support and educate local communities, etc. (V14); and organizing training workshops for the preparation of beneficiaries (V17).

## CONCLUSION

One of the natural events that attracts many domestic and international tourists to tourism destinations is a solar eclipse event. This pull factor and astronomical event, if not managed properly, can have many negative effects on the destinations, because in a short period of time, numerous tourists travel to a destination, and this is a form of mass tourism. Therefore, early management of the event plays a central role in the sustainable development of the region. In the present research, with an emphasis on the recent eclipse events in Australia, Spain, Portugal and Iran, the authors strive to investigate the effective factors for early planning in destinations for a total solar eclipse. In this regard, a qualitative-quantitative method was used.

The results of qualitative analysis determined seventeen variables: management and planning at different levels; setting up a news agency website and social networks to increase the level of public awareness and advertising; local involvement; organizing local festivals in nearby villages and cities; public involvement; coordination of the involved institutions; training amateur astronomers; local empowerment; creating infrastructure and accommodation facilities in nearby villages and cities; linking regional capacities with the eclipse event and empowering local communities in this regard; directing tourism flows to other places and balancing the flows by determining the tourism route; exploitation of cultural heritage and cultural sites related to astronomy; creation of temporary camps for tourist accommodation; attracting funds at different levels to improve infrastructure, organize various activities, train tourist guides, support and educate local communities, etc.; training of human resources in tourism and astronomy skills; locating and planning for the construction of temporary markets to sell local produce, handicrafts, local foods, etc. and organizing training workshops for the preparation of beneficiaries. It is worth noting that tourism planners should pay particular attention to these seventeen factors before total solar eclipse events.

Comparing our results to the literature review, we find that Lundberg et al. (2017) also emphasize the involvement factor for event management. Moreover, according to our results, exploitation of cultural heritage and cultural sites related to astronomy (myths, sites, etc.) was identified as an important variable and the finding of this paper provides some support for the findings of Haristiani et al. (2016) and Kunjaya et al. (2019). On the basis of the results of this research, training amateur astronomers can be seen as an crucial variable for education of early planning in destinations for a total solar eclipse and our results confirm the findings of Jiwaji (2016).

Further analysis through an exploratory factor test with SPSS demonstrated that among identified variables, five such as management and planning at different levels; setting up a news agency website and social networks to increase the level of public awareness and advertising; local involvement; organizing local festivals in nearby villages and cities; and public involvement are seen to be main factors for early planning in destinations for a total solar eclipse. Our results also indicate that there is a correlation between main factors and other variables.

Lastly, identifying the appropriate strategies for event management in destinations with total eclipse events and investigating marketing strategies for attracting tourists to nearby villages and cities of destinations with total eclipse events are the subjects recommended by authors for future research.

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