

Sci-Tech Lighting for High-Performance Architecture: A Bridge to Sustainable Development in Touristic Destinations

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Abstract

The nature of tourism destination has been the theme of many research papers, which covers a wide range of areas including socio-cultural relationships at one end and geographical concerns at the other end of the spectrum. The focus of the current study is lighting architecture viewed as an essential tool to endorse sustainability in tourism destination. For this purpose, two Likert Scale questionnaires were created and completed by five experts of tourism-related fields. The questionnaires targeted lighting, sustainability and social development effects on energy efficiency, aesthetics, and ergonomic aspects. Data were gathered and tabulated and eventually analyzed by means of SPSS software. The results revealed that lighting had significant impacts on ergonomic and aesthetic aspects of tourism, but the effect was minimal when it came to energy efficiency. Also, it became clear that sustainability greatly affected aesthetic, ergonomic and energy efficiency aspects. According to the participants, energy efficiency in lighting architecture influenced economic, social and environmental development. Overall, the application of high tech lighting technology in architecture can boost efficiency in many respects. Harmonious with various aspects of human life, lighting should be deemed a priority in policies formulated to ameliorate tourism industry.

Keywords: Tourism; Economic

Introduction

Today, many governments and developed societies are in search of sustainable development in tourism. This issue has become a crucial factor to support the environment, economy, and society. The idea of sustainability management in tourism destinations has not been addressed sufficiently. Although there have been numerous studies targeting sustainability in tourism, the challenges still exist in shifting theory into practice [1-5]. This shortage needs to be considered effectively, since current tourism has lead into socio-economic developments among various countries according to World Tourism Organization [6].

There is a significant increase in the number of international tourists, which increased from almost 8.6 million in 1995 to almost 32 million in 2012 [7]. This can definitely result in great opportunities for industries to find a niche in tourism along with huge amounts of investment on the part of stockholders. It should be mentioned that, based on literature review, it is easy to conclude that citizen participation has a lot to do with sustainability [8]. Sustainability is a valid guarantee in case of tourism destination which this article has raised lighting architecture as a practical solution to bridge these two. High performance in lighting architectures has the potentials to maintain sustainability in tourism and this issues needs to be paid more attention to. The significance of lighting architecture in tourism destinations is filling a gap to achieve more realistic sustainability in tourism.

The essence of tourism destination has been discussed by many researchers [9,10]. Eastern culture emphasizes on socio-cultural relationship as a determining factor in tourism and touristic destination attraction [11]. On the one hand, there are some who considered tourism destination as a pure geographical issue [12-19]. Others view tourism destination as a product which presents a united experience [20,21]. Yet with both perceptions, sustainability management in tourism destination is required [22]. In this paper, lighting architecture has been seen as an essential tool to enhance sustainability in tourism destination. Leading theories in urban management such as city prosperity, healthy environment, educating city emphasize on significance of sustainable tourism [23,24].

Literature Review

Nowadays more than ever, the role of morphology of buildings and cities in better thermal comfort for tourism, understood in the literature [25,26]. The issue of lighting in architectures has become an interesting subject for persuading tourists to travel to a specific country and helping the phenomenon of sustainability in touristic destination. Mahdaveinejad et al. [27] conducted a research named Dilemma of Green and Pseudo Green Architecture Based on LEED Norms- a case in Developing Countries on architecture in the Middle East countries to figure out their adaptability to the real conception of sustainability targeted in the specific countries. The result of their research was that sustainability rating system such as LEED could bring more efficiency in architecture attraction. In another case study entitled Daylight Parameters and Operation Quality, Mahdaveinejad et al. [28] investigated the impacts of light on architecture and design. They intended to settle a relation between natural light and higher quality in architecture.

Tourism industry needs to be considered as an integrated issue to maintain sustainability which is a highlighted factor in tourism destinations. Utilizing modern lighting in architecture may optimize tourists' visiting in various areas of the world. Lighting architecture emphasizes three important elements: aesthetic, ergonomic and also energy efficiency.

Firstly, lighting architecture has great potentials for the provision of beauty in nature. In a case study Mahdaveinejad and Nagahani [29]

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did a research named The Impact of Visual Literacy on Perception of Beauty in Architectural Buildings. The importance of architectures' beauty in attracting tourists was discussed. The concluded that lighting with the aim of embellishing a building would bring more scientific influence. Moreover, they found out that the lighting of architecture could improve the process of designing the building- more effective for the visitors. Ergonomic influence of an architecture absorbs more tourists in a destination and they will be persuaded into travelling to a place where essential elements of designing and efficiency have been applied in its building. Thirdly, energy efficiency can be brought up by modern lighting technology in city architecture to increase the rate of sustainability in tourism destination. As Mahdaveinejad [30] discussed, the use of fossil fuel in Iran is highly significant in comparison with other countries, and energy efficiency was not paid enough attention to in Iran. As a result, the use of energy should be highly considered in lighting to prevent energy waste.

Methods and Data Analysis

The current survey includes five participants which are all tourism experts. In order to measure the variables in this study two Likert Scale questionnaires (one 6 and the other 9 questions) were made by the researchers. Descriptive statistics were chosen for analyzing the data using SPSS. The Table 1 shows that 65% of responders agreed that lighting architecture has very little influence on energy saving (Figure 1).

According to Table 2 the majority of responders (70%) agreed that lighting in architecture has very much influence on Aesthetic aspects (Figure 2).

The above Table 3 shows that the majority of responders (75%) agreed that lighting architecture has much influence on Ergonomic aspects and almost 15% also believed that it has very much effect on Ergonomic aspects (Figure 3).

According to above Table 4 the majority of responders (70%) believed that sustainability has much effect on energy saving and there were 15% who believed that it has both medium and very much effect on energy saving (Figure 4).

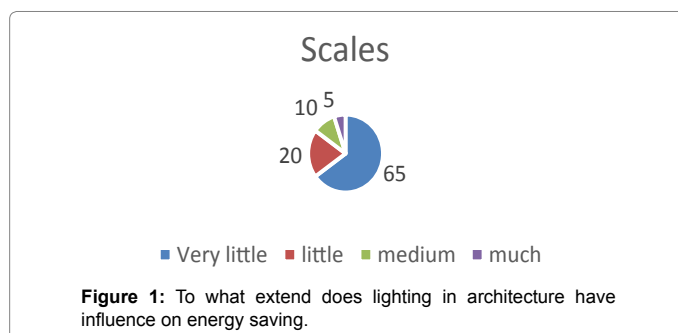
According to above Table 5 the majority of responders (75%) believed that Sustainability has very much influence on Aesthetic aspects and also 20% believed that it has medium effect on Aesthetic aspects (Figure 5).

The above Table 6 shows that the majority of responders (60%) agreed on much influence of sustainability on Ergonomic aspects and almost 25% of them believed that there is very much effect on ergonomic aspects (Figure 6).

The above Table 7 shows that the majority of responders (75%) believed that energy efficiency in lighting architecture has very much influence on economic development. Also, 15% of them believed that it has much effect of economic development (Figure 7).

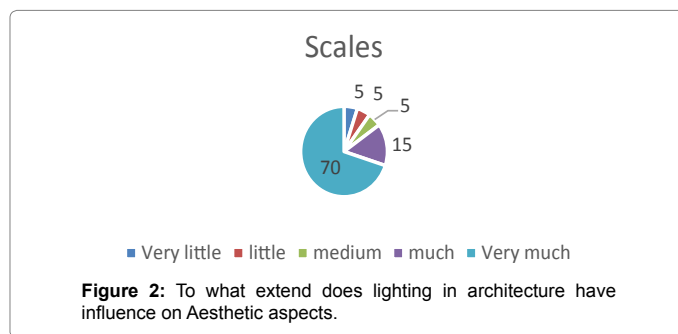
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Very little	13	65.0	65.0	65.0
little	4	20.0	20.0	85.0
medium	2	10.0	10.0	95.0
much	1	5.0	5.0	100.0
Total	20	100.0	100.0	

Table 1: To what extend does lighting in architecture have influence on energy saving.



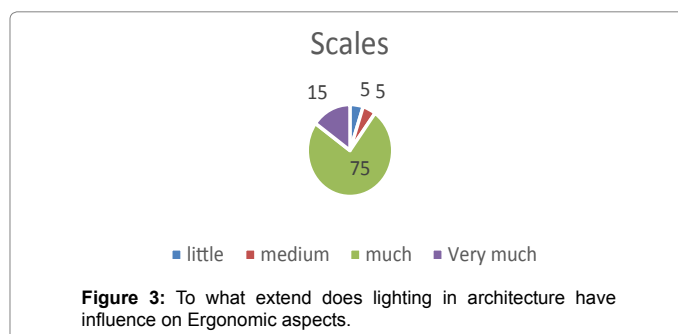
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Very little	1	5.0	5.0	5.0
little	1	5.0	5.0	10.0
medium	1	5.0	5.0	15.0
much	3	15.0	15.0	30.0
Very much	14	70.0	70.0	100.0
Total	20	100.0	100.0	

Table 2: To what extend does lighting in architecture have influence on Aesthetic aspects.



Valid	Frequency	Percent	Valid Percent	Cumulative Percent
little	1	5.0	5.0	5.0
medium	1	5.0	5.0	10.0
much	15	75.0	75.0	85.0
Very much	3	15.0	15.0	100.0
Total	20	100.0	100.0	

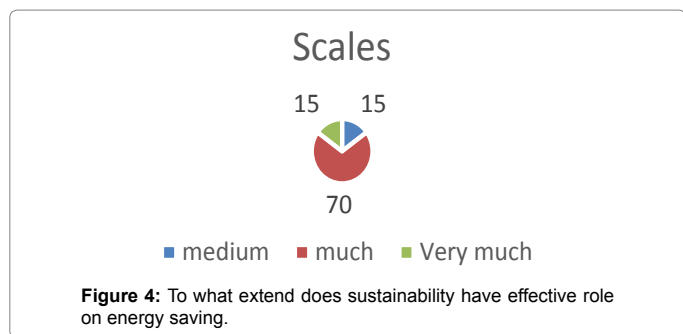
Table 3: To what extend does lighting in architecture have influence on Ergonomic aspects.



The above Table 8 shows that the majority of responders (85%) agreed on very much influence of energy efficiency in lighting architecture on social development. And also 10% agreed that it has much effect on social development (Figure 8).

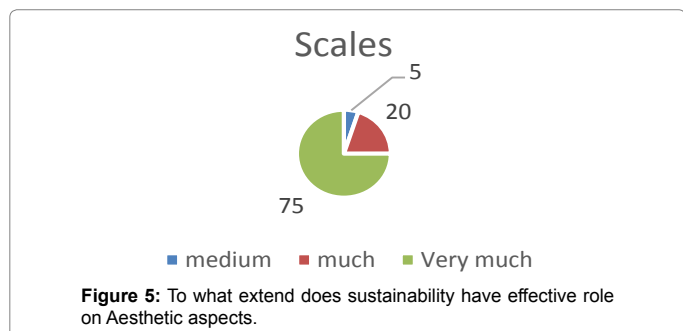
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
medium	3	15.0	15.0	15.0
much	14	70.0	70.0	85.0
Very much	3	15.0	15.0	100.0
Total	20	100.0	100.0	

Table 4: To what extend does sustainability have effective role on energy saving.



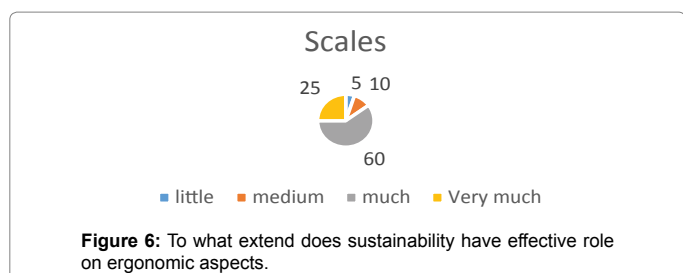
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
medium	1	5.0	5.0	5.0
much	4	20.0	20.0	25.0
Very much	15	75.0	75.0	100.0
Total	20	100.0	100.0	

Table 5: To what extend does sustainability have effective role on Aesthetic aspects.



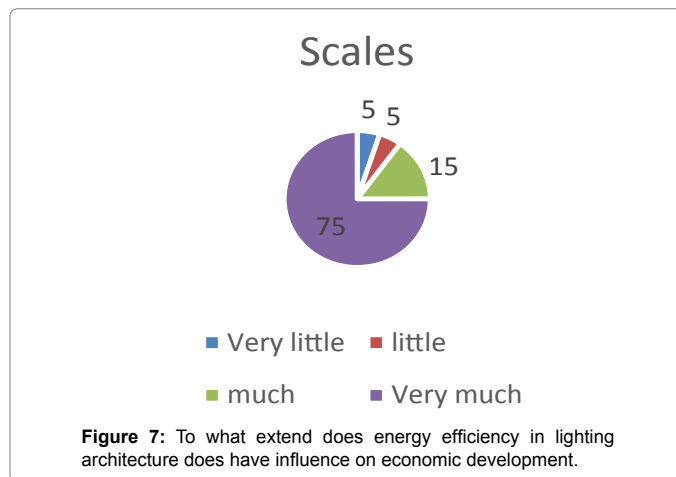
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
little	1	5.0	5.0	5.0
medium	2	10.0	10.0	15.0
much	12	60.0	60.0	75.0
Very much	5	25.0	25.0	100.0
Total	20	100.0	100.0	

Table 6: To what extend does sustainability have effective role on ergonomic aspects.



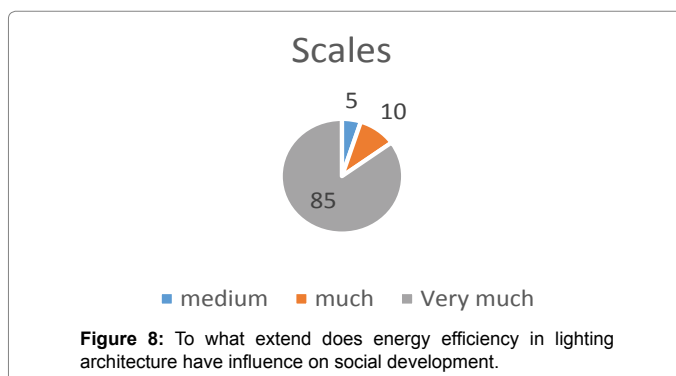
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Very little	1	5.0	5.0	5.0
little	1	5.0	5.0	10.0
much	3	15.0	15.0	25.0
Very much	15	75.0	75.0	100.0
Total	20	100.0	100.0	

Table 7: To what extend does energy efficiency in lighting architecture does have influence on economic development.



Valid	Frequency	Percent	Valid Percent	Cumulative Percent
medium	1	5.0	5.0	5.0
much	2	10.0	10.0	15.0
Very much	17	85.0	85.0	100.0
Total	20	100.0	100.0	

Table 8: To what extend does energy efficiency in lighting architecture have influence on social development.



The above Table 9 shows that the majority of responders (60%) believed that energy efficiency in lighting architecture has very much effect on environmental development. Also, 20% of them believed that it has much effect on environmental development (Figure 9).

According to above Table 10 the majority of responders (65%) believed that Aesthetic aspects in lighting architecture has very much influence on economic development. Also, 15% of them believed that it has much effect on economic development (Figure 10).

According to above Table 11 the majority of responders (70%) believed that Aesthetic aspects in lighting architecture has very much

effect on social development. Also, 20% of them believed that it has much influence on social development (Figure 11).

According to above Table 12 the majority of responders (55%) believed that Aesthetic lighting architecture has very much influence on environmental development. Also 25% believed that it has much influence on environmental development (Figure 12).

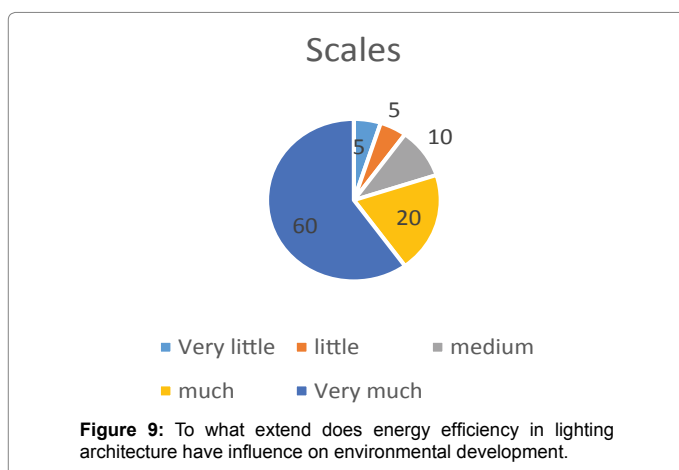
According to above Table 13 the majority of responders (70%) believed that Ergonomic aspects in lighting architecture has very much influence on economic development and also 25% believed that economic development has much influence on economic development (Figure 13).

According to above Table 14 the majority of responders (55%) believed that Ergonomic aspects in lighting architecture has very much influence on social development and also 30% believed that it has much influence on social development (Figure 14).

According to above Table 15 the majority of responders (60%) believed that Ergonomic aspects in lighting architecture has very much influence on environmental development and also 25% believed that it has much influence on environmental development.

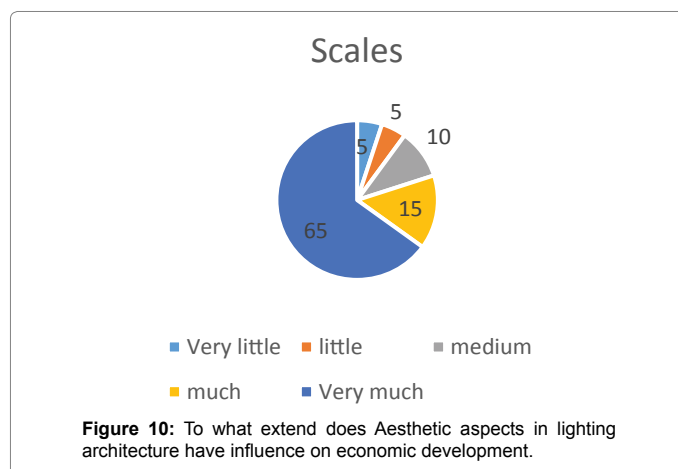
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Very little	1	5.0	5.0	5.0
little	1	5.0	5.0	10.0
medium	2	10.0	10.0	20.0
much	4	20.0	20.0	40.0
Very much	12	60.0	60.0	100.0
Total	20	100.0	100.0	

Table 9: To what extend does energy efficiency in lighting architecture have influence on environmental development.



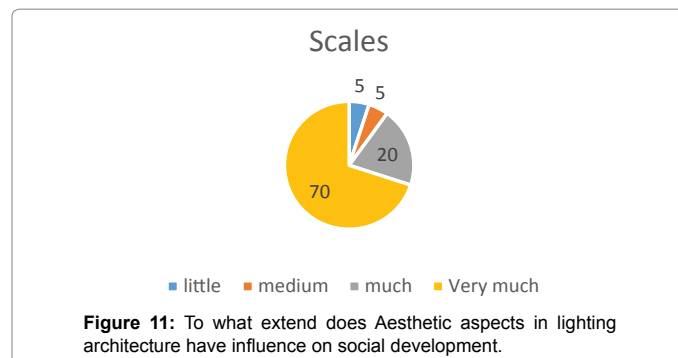
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Very little	1	5.0	5.0	5.0
little	1	5.0	5.0	10.0
medium	2	10.0	10.0	20.0
much	3	15.0	15.0	35.0
Very much	13	65.0	65.0	100.0
Total	20	100.0	100.0	

Table 10: To what extend does Aesthetic aspects in lighting architecture have influence on economic development.



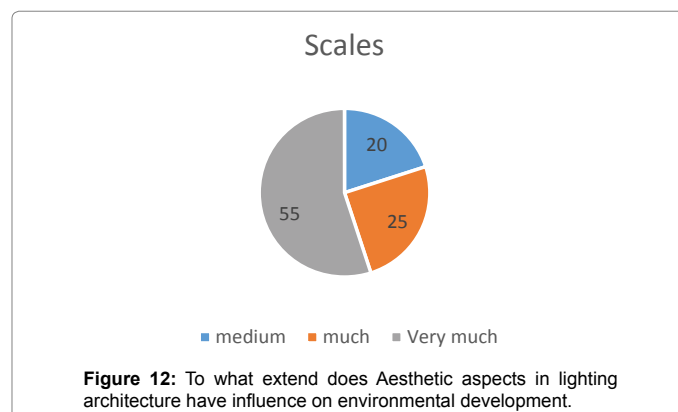
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
little	1	5.0	5.0	5.0
medium	1	5.0	5.0	10.0
much	4	20.0	20.0	30.0
Very much	14	70.0	70.0	100.0
Total	20	100.0	100.0	

Table 11: To what extend does Aesthetic aspects in lighting architecture have influence on social development.



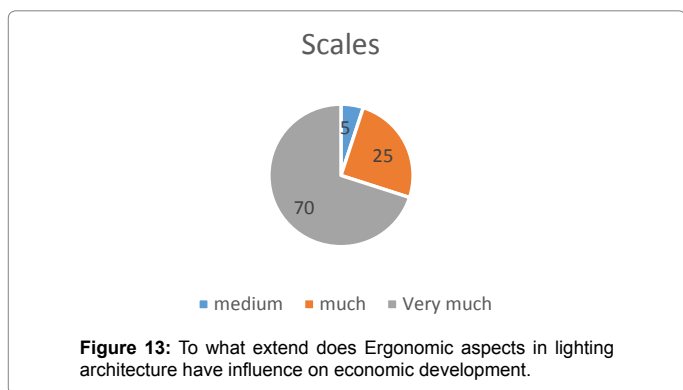
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
medium	4	20.0	20.0	20.0
much	5	25.0	25.0	45.0
Very much	11	55.0	55.0	100.0
Total	20	100.0	100.0	

Table 12: To what extend does Aesthetic aspects in lighting architecture have influence on environmental development.



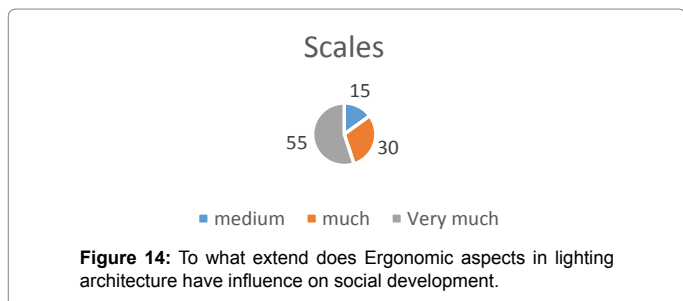
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
medium	1	5.0	5.0	5.0
much	5	25.0	25.0	30.0
Very much	14	70.0	70.0	100.0
Total	20	100.0	100.0	

Table 13: To what extend does Ergonomic aspects in lighting architecture have influence on economic development.



Valid	Frequency	Percent	Valid Percent	Cumulative Percent
medium	3	15.0	15.0	15.0
much	6	30.0	30.0	45.0
Very much	11	55.0	55.0	100.0
Total	20	100.0	100.0	

Table 14: To what extend does Ergonomic aspects in lighting architecture have influence on social development.



Valid	Frequency	Percent	Valid Percent	Cumulative Percent
medium	3	15.0	15.0	15.0
much	5	25.0	25.0	40.0
Very much	12	60.0	60.0	100.0
Total	20	100.0	100.0	

Table 15: To what extend does ergonomic aspects in lighting architecture have influence on environmental development.

Discussion

The results in this survey shows that most of experts believed that lighting in architecture has much effect on ergonomic aspects and aesthetic aspects, but it has very little effect on energy saving. Also, it became clear that sustainability has much effect on Aesthetic, Ergonomic and Energy saving aspects.

The results also show that most tourism experts believed that Energy efficiency in lighting architecture has very much effect on economic, social and environmental development.

In addition, most experts believed that Aesthetic aspects in

lighting architecture has much effect on environmental, social and environmental development.

Also, most participants believed that Ergonomic aspects in lighting architecture has much effect on social, economic and environmental development.

Conclusion

This study was an attempt to discover the effect of lighting in architecture which has crucial role in branding a tourism destination. The variables were chosen carefully and the results showed that using high tech lighting in architecture can provide higher level of efficiency in many aspects. Since it is harmonious with the different aspects of human life, it is concluded that the governments need to consider applying lighting in tourism destinations.

References

- Dodds R, Butler R (2009) Barriers to implementing Sustainable Tourism Policy in Mass Tourism Destinations. *TOURISMOS: An International Multidisciplinary J Tourism* 5: 35-53.
- Graci S (2007) Accommodating green: Examining barriers to sustainable tourism development. *TTRA Canada Conference*, Montebello, Quebec.
- Graci S, Dodds R (2010) Sustainable Tourism in Island Destinations. Earthscan, London.
- Hanrahan J (2008) Host Community Participation and Sustainable Tourism in Ireland: The Local Authority Perspective. PhD Thesis. Institute of Technology Sligo.
- Miller G, Twining-Ward L (2005) Monitoring for a Sustainable Tourism Transition: The Challenge of Developing and Using Indicators. CABI Publishing, Wallingford, UK.
- The World Tourism Organization (2010) Tourism Highlights. Geneva, Switzerland.
- Rostam, Nasim Gholami, Mojtaba Ansari, Mohammadjavad Mahdaveinejad (2018) A Scientometric Review of Citizen Participation Research: World Trend. *Theoretical and Empirical Researches in Urban Management* 13: 37-53.
- International Monetary Fund (2015) World Economic Outlook Database, IMF Data and Statistics; International Monetary Fund: Washington, DC, USA.
- Presenza A (2006) The Performance of a Tourism Destination. Who manages the Destination? Who plays the audit role? Campobasso, Italy: University of Molise.
- Pourjafar M, Amini M, Varzaneh EH, Mahdaveinejad M (2014) Role of bazaars as a unifying factor in traditional cities of Iran: The Isfahan bazaar. *Frontiers of Architectural Research* 3: 10-19.
- Presenza A, Sheehan L, Ritchie JRB (2005) Towards a Model of the Roles and Activities of Destination Management Organizations. *Journal of Hospitality, Tourism and Leisure Science* 3: 1-16.
- Carter R, Fabricius M (2006) Introduction to destination Management. Paper presented at World Tourism Organisation Seminar, Addis Ababa.
- Cho B (2000) Destination In: Jafari J (eds.) *Encyclopaedia of Tourism*. Routledge, New York.
- Dredge D, Jenkins J, Taplin J (2011) Destination planning and policy: process and practice. In: Wang Y, Pizam A (eds.) *Destination marketing and management: theories and applications*. CAB International, Cambridge, UK.
- Laws E (1995) *Tourist destination management: Issues, analysis, and policies*. London; New York.
- Longjit C (2010) *Managing a Mature Coastal Tourism Destination: The Case of Pattaya, Thailand*. A Thesis Submitted to the Victoria University of Wellington in Fulfilment of the Requirements for the Degree of Doctor of Philosophy in Tourism Management.
- Papatheodorou A (2006) *Managing Tourism Destinations*. Edward Elgar Publishing, Cheltenham, UK.
- Pearce D (1989) *Tourist Development*. (2nd edn.), Longman Group, Essex, UK.
- Ritchie JRB, Crouch GI (2010) *A model of destination competitiveness*

- sustainability: Brazilian perspectives. *Journal of Public Administration* 44: 1049-1066.
20. Buhalis D (2000) Marketing the competitive destination of the future. *Tourism Management* 21: 97-116.
21. Murphy P, Pritchard M, Smith B (2000) The destination product and its impact on traveler perceptions. *Tourism Management* 21: 43-52.
22. Commission EC (2013) European Tourism Indicator System for the Sustainable Management of Destinations.
23. Javanroodi K, Mahdavinejad M, Nik V (2018) Impacts of urban morphology on reducing cooling load and increasing ventilation potential in hot-arid climate. *Applied Energy* 231: 714-746.
24. Hadianpour Md, Mahdavinejad M, Bermanian M, Nasrollahi F (2018) Seasonal differences of subjective thermal sensation and neutral temperature in an outdoor shaded space in Tehran, Iran. *Sustainable Cities and Society* 39: 751-764.
25. Mohtashami N, Mahdavinejad M, Bermanian M (2016) Contribution of City Prosperity to Decisions on Healthy Building Design: A case study of Tehran. *Frontiers of Architectural Research* 5: 319-331.
26. Amini M, Mahdavinejad M, Bermanian MR, Varzaneh EH (2014) Developing a new paradigm for performance of educating city theory in advanced technology mega-cities, case: Tehran, Iran. *Journal of Architecture and Urbanism* 38: 130-141.
27. Mahdavinejad M (2014) Dilemma of green and pseudo green architecture based on LEED norms in case of developing countries. *International journal of sustainable built environment* 3: 235-246.
28. Mahdavinejad M, Gharaati M, Kermani YA (2014) Daylight Parameters and Operation Quality; Case Studies: Public Office Buildings in Kerman, Iran. *Journal of Energy Technologies and Policy* 4: 29-34.
29. Mahdavinejad M, Nagahani N (2012) The Impact of Visual Literacy on Perception of Beauty in Architectural Buildings. *Armanshahr Architecture and Urban Development Journal* 4: 51-62.
30. Heidari F, Mahdavinejad M (2017) High-performance Sonitopia (Sonic Utopia): Hyper intelligent Material-based Architectural Systems for Acoustic Energy Harvesting. *2nd International Conference on Green Energy Technology, Earth and Environmental Science* 83: 012021.