Evaluation on the Potential of Hot Spring as Nature Tourism Attraction in Lojing Highlands, Kelantan, Peninsula Malaysia

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Abstract. Natural hot springs are a common occurrence in Malaysia. These natural hot springs occur when water seeps into the earth and is heated by magma and pressure causes the water to rise again as a heated pool or hot springs. Some locals believe that these natural hot springs have curative effects and can cure skin ailments such as rashes, pimples and fungi infections. Whether this is true or not remains to be scientifically proven, but these places have become a magnet for tourists and those seeking healing. Some of Malaysia’s natural hot springs have developed into modern tourists’ attractions with shops, rest houses, restaurants and changing rooms built nearby to accommodate visitors who are interested by this natural phenomenon and the best example is the Poring Hot Springs, in Ranau, Sabah. Consequently, the objective of this paper is to briefly highlight the potential of Lojing’s hot springs as nature tourism attraction for the state of Kelantan. This paper provides a broad insight into the demand for services and facilities, location and characteristics of Lojing’s geothermal and natural mineral water resources, the opportunities available to expand and establish new facilities and an indication of the success of Sabah’s developments with the potential to be replicated in Lojing. Based on the content analysis done using Leximancer, it is apparent that Lojing’s hot spring requires intervention in terms of strategies that aimed at increasing tourist satisfaction. It is suggested that the theme “leisure” to be concentrated as the pull factor for Lojing hot spring-based tourism.

1. Introduction

Geothermal and natural mineral water have long been associated with mental and physical health, be it by bathing or consumption, and there are many examples where major tourist attractions and resorts have been built around these resources [17]; [18]; [23]. Malaysia’s geothermal water and mineral spring resources are widespread, largely accessible for tourism purposes. In several instances, these groundwater resources are already recognized for their therapeutic values, thus providing further opportunity to build on an established destination or brand [14]; [19]; [25].
Geothermal water use goes back several thousands of years. There is proof that the Japanese used hot springs from 11,000 BC for bathing and cooking, and also that the Native American Indians settled about 7,000 BC near hot springs in North America and that they used them for bathing and medicinal purposes. The use of geothermal water for bathing by the Roman Empire expanded throughout much of Europe and was well known by the first century BC [1]; [6]; [33]; [34].

Consumer demand for health and wellness-oriented leisure activities is expected to display significant growth and this is driven by several socio-economic and lifestyle shifts. If Lojing is to be successfully advertised as a tourism destination for hot springs, its appeal would have to be superior to what is available in alternative destinations. This is particularly true in the case of the foreign market. The goal of this study is to discover the expectations domestic tourists have about Lojing as a tourist destination for hot springs, representing the first and important step in a better understanding of how to improve and extend its attractiveness to the international market. The particular goals of this analysis are to investigate the destination attributes that will contribute to the attractiveness of the hot springs tourism sector, to determine the perceived importance of these determinants of destination attractiveness to hot springs visitors; and to explore the relationship between determinants of destination attractiveness and frequency of visitors to hot springs.

2. Methodology
The hot springs are adjacent to Sg. Ber, Lojing Highlands, Kelantan with an area of 210 hectares. The study was conducted during the Lojing Highlands Scientific Expedition 2008 by carrying out series of field surveys that were done to observe the hot springs in Lojing, Kelantan and Poring, Sabah (see Figure 1).

An analysis of the related research has shown that researching the specific qualities of a destination and examining the experiences of those who were drawn by them is the most common approach to the evaluation of destination attractiveness [7]; [9]; [11]; [13]. A demand-side investigation, therefore, seems appropriate as people are pulled by destination attributes to make a “where to go” decision. The respondents were conveniently sampled in this study using an on-site intercept system. During preliminary research efforts, this non-probability approach is also used to get a gross estimate of the findings, without incurring the cost or time required to select a random sample [31]. The semi-structured interview was done at villages around Lojing Highland and Gua Musang. The interview was conducted from 26th May – 10th June 2008. By using a convenient sampling method, a total of 35 respondents...
were interviewed. The interview session for each respondent lasted for 30 minutes till 1-hour depends on the interviewee convenient. Questions enquiries about their perceptions of a new hot spring tourism destination and destination attributes were made. Respondents’ responses are then transcribed and translated into English language without altering the meaning of the sentence structure. The data then were analysed using Leximancer - a software program that automatically extracts semantic networks from qualitative data, identifying the connections among themes and concepts [32]. To construct a concept map with themes and definitions relevant to the expectations of respondents about Lojing as the new hot spring tourism destination, the semantic analysis was performed using Leximancer. Specifically designed for textual content analysis, Leximancer revealed the data as a concept map. The concept map provides a visual display of the concepts that appear in the text and their relationships to each other most frequently. The scale of the dot of a concept represents its connectivity with the map's other concepts. To help comprehension, terms that frequently appear together in the same pieces of text are grouped into higher-level “themes” and are displayed on the chart in coloured circles [36]. Themes are mapped to reflect their meaning, with the most important themes denoting hot colours (red, orange) while cool colours (blue, green) denoting the less significant ones. Each theme is given a name according to the most connected concepts within that circle.

An observation of the study area was also conducted to identify potential characteristics of the area to be developed into one of Kelantan’s tourism hubs by looking into its tourism opportunities. The observation of the area was based on [38] cited from [35] guidelines on criteria to assess potential tourism area. The criteria include; i) Flagship attractions, ii) Complementary and support attractions, iii) Accessibility and regional infrastructure, and iv) General political and social framework. The evaluated criteria are then translated into the table.

### 3. Results and Discussion
As seen in Table 1, over 65.7% of the respondents were male. Most respondents (28.6%) were between 31 and 40 years old and very few were between 15 to 20 years old (14.3%). In terms of educational background, a high proportion of respondents (40.0%) had college or university education and only 5.7% had a graduate education. Concerning travelling characteristics, a large majority of the respondents (60.0%) had been to a local hot spring. It can be inferred that visiting hot springs has been widely accepted by the public and is now one of the most popular tourist activities in Malaysia. Among them, majority of the respondents (45.7%) reported that they had been to a hot spring site at least one or two times during the past one year, and 8.6% had visited a site five or six times. The average number of visits per 6-month period is approximately 2, which is less than once a month. The low visit frequency indicates that there is room for improvement, and ongoing efforts are needed to increase visitation.

### Table 1. Respondents’ demographic and hot springs travelling profiles.

| Gender       | Frequency | %     | Prior Experience with Bathing in Hot Springs | Frequency | %     |
|--------------|-----------|-------|---------------------------------------------|-----------|-------|
| Male         | 23        | 65.7  | Yes                                         | 21        | 60.0  |
| Female       | 12        | 34.3  | No                                          | 14        | 40.0  |

| Age          | Frequency | %     | Frequency of Visits to Hot Springs          | Frequency | %     |
|--------------|-----------|-------|---------------------------------------------|-----------|-------|
| 15 - 20      | 5         | 14.3  | 0                                           | 5         | 40.0  |
| 21 - 30      | 7         | 20.0  | 1-2 times                                   | 11        | 45.7  |
| 31 - 40      | 10        | 28.6  | 3-4 times                                   | 2         | 5.7   |
| 41 - 50      | 4         | 11.4  | 5-6 times                                   | 3         | 8.6   |
| 51 - 60      | 6         | 17.1  | 7-8 times                                   | 0         | 0.0   |
| 61 and above | 3         | 8.6   | 9 times above                               | 0         | 0.0   |

| Education level | Frequency | %     |
|-----------------|-----------|-------|
| High school     | 8         | 22.9  |
| College/University | 14   | 40.0  |
| Graduate        | 2         | 5.7   |
| No school       | 11        | 31.4  |
The existence of a potential tourist attraction is the most important precondition for promoting an area for nature tourism purpose in a forested area. There are four categories of criteria by [25], cited from [23] which were used to assess the suitability of Lojing’s hot springs and the surrounding area as a tourism attraction. Data were compiled as shown in Table 2.

### Table 2. Criteria used to evaluate the potential of Lojing’s hot springs as a nature tourism attraction.

| CRITERIA                              | LOJING’S HOT SPRINGS | PORING’S HOT SPRINGS |
|---------------------------------------|----------------------|----------------------|
| i. Flagship attractions              |                      |                      |
| • The uniqueness of species and natural elements of the landscape | +                    | +                    |
| • Manifold landscapes (forest types, rivers, mountains) | +                    | +                    |
| • High biodiversity (flora and/or fauna) | +                    | +                    |
| • Large animals                       | -                    | +                    |
| • Easily observable animals           | -                    | +                    |
| ii. Complementary and supporting attractions |                      |                      |
| • Opportunity for outdoor and adventure activities (hiking, jungle trekking, fishing) | +                    | +                    |
| • Opportunity for swimming (waterfall, rivers) | +                    | +                    |
| • Indigenous culture (ethnic groups, villages, handicrafts, folklore) | +                    | +                    |
| • Archaeological and historical sites/features |  -                   | +                    |
| • Visitor centre (exhibitions, museum, lectures, library) | -                    | +                    |
| • Accommodation/catering facilities in different price categories | +                    | +                    |
| • Tourist guides and porters          | +                    | +                    |
| iii. Accessibility and regional infrastructure |                      |                      |
| • Access (roads, domestic flights)    | +                    | +                    |
| • Distance to international airport or major tourism centre | +                    | +                    |
| • Communication facilities/medical care | -                    | +                    |
| • Other interesting natural and/or cultural attractions in vicinity | -                    | +                    |
| • Interesting landscape en route      | +                    | +                    |
| iv. General political and social framework |                      |                      |
| • Stable political/social structure in the state/country/region | +                    | +                    |
| • Conflict of land use                | +                    | -                    |
| • Threats to tourists (criminality, transportation) | -                    | -                    |
| • Acceptance of tourism by local communities | +                    | +                    |
| • Promotion and advertisement        | -                    | +                    |

Source: [38] and [40]

+ = existing, favourable, high, positive
- = lacking, unfavourable, low, negative

### 3.1 Flagship attractions

Flagship attractions refer to the attractions of tourism site in natural areas that offer distinctive features of natural elements found in such a site and are the main reason for tourists to visit the place [4]. The growing worldwide focus on health and wellbeing has led to an enormous increase in hot springs facilities. This has created another flagship attraction in the tourism industry [26] and this has been evident in Poring, Ranau, Sabah. Poring Hot Springs in Ranau, Sabah is presently one of the most popular natural mineral water destinations where a resort known as Sutera Sanctuary Lodge, provide a wide range of hydrotherapy treatments. Demand for balneotherapy (treatment of physical ailments by bathing in natural mineral waters), at Poring Hot Springs, continues to exceed the capacity of the existing facility at peak times (see Figure 3).

Similar to Poring Hot Springs, Ranau, Sabah, Lojing’s hot springs can also be developed as the flagship attraction in Sg. Ber, Lojing area, as the beautiful panoramic views of the hot springs will give a different level of experience and satisfaction to tourists (see Figure 4). However, replication of the
successful economic significance of Poring Hot Springs cannot be done, as there are significant distinctions between Lojing’s Hot Springs and Poring Hot Springs. This can be seen in the context of biodiversity. There are non-observable animals or flora that can be seen around Lojing’s Hot Springs area (Figure 5). Therefore, it is not suitable to replicate the same tourism plan as what has been done and developed in Poring Hot Springs, Ranau, Sabah. However, Lojing Highlands is well-known for its rafflesia and had been declared as having the world’s second-largest rafflesia after a species native to West Sumatera, Indonesia [12; 20]. The rafflesia of Lojing can be found along the Rafflesia Trail near the settlement of aboriginal people (orang Asli) of Temiar ethnic in Kampung Jedip, Lojing Highlands, around 15 km from Cameron Highlands, a famous tourism destination in the neighbouring state of Pahang (see Figure 2) [21]. This area is located at the foot of the Main Range (also called the Titiwangsa Range) and is covered with the highland tropical rainforest which is rich of flora, fauna, and local communities who live harmoniously with nature [2]; [30]. So, beside Rafflesia, this area has more to offer, either biotic or abiotic components or the combination of both will attract domestic and international tourists. Hence, there will be an opportunity to complementary the hot spring-based tourism within the rafflesia tourism.

3.2 Complementary and supporting attractions
Complementary sights discuss with the natural or cultural parts of a specific space. However, as flagship sights [4], they don't have the same degree of importance or strong point. Complementary sights raise the attraction of a location, leading to an extra exceptional lavishness and collection of activities for ecotourism [40]. While supporting attractions are synthetic elements which might be necessary for offering tourists to give a boost to and services and products wanted or demanded [4]. In any case, they do not seem to be intrigued to constitute the elemental function of visiting a selected place. For the case of Lojing’s hot spring, there are opportunities for outdoor and adventure activities such as hiking, jungle trekking, quad biking as well as swimming. The nearest aboriginal settlement to Lojing’s hot spring is the Temiar Village or known as Pos Hendrop, creating an opportunity for the aborigines to participate in the tourism industry in the form of porters, tour guides, handicraftsman, caterer and even a prospect to highlight the Temiar’s traditional culture.

3.3 Accessibility and regional infrastructure
Generally, the infrastructure development in Lojing’ hot spring is satisfactory. [27] indicate that site infrastructure is one of the basic development catalysts in the tourism industry. A destination can have many resources and attractors, but support for other elements such as infrastructure is necessary to attract tourists [10]. The areas in which ecotourist activities are carried out must be available to tourists and be able to respond to their fundamental needs [5]. As a nature tourism site attraction, it is important to keep Lojing hot spring area as natural as possible with less development. According to [22] stated that through nature tourism will offer tourists an insight into the impact of human beings on the environment. But essential facilities such as communication and medical care are required in a natural setting with the nearest town is 30 km away from Cameron Highland and 70 km from Gua Musang town, it is utmost important to have such facilities in terms of emergency. Another way to appreciate Lojing’s hot spring is through “walking tourism”. Walking tourism is now one of the most popular ways to experience a destination. It allows tourists to better engage with local people, nature and culture. It can bring about social and economic benefits to residents and communities if properly developed and managed [37]. However, at the moment, there is no such accessibility yet developed to connect the hot spring with its adjacent natural and cultural attractions.

3.4 General political and social framework
The attractive aspect of tourism in the social, economic and political factors [39]. Political turmoil and crime, and a failure resulting from political instability, are seriously affecting the tourism industry, as visitors spend their time and money for comfort, fun and peace. Security and the risk of loss caused by political instability are also important considerations for the selection of destinations for all forms of
tourism in the decision making phase [28]. Therefore, political uncertainty is expected to potentially impact the growth of the tourism industry. In Malaysia, the total number of tourists coming from China, Hong Kong and Taiwan decreased by almost 80% due to the outbreak of severe acute respiratory syndrome (SARS). Via fear of SARS and bird flu in the area [15], the tourist arrivals in Malaysia decreased to 10.58 million compared with 13.29 in 2012 and the government lost some 1.5 billion US$ in revenue. In addition to the Malaysia-based tourism industry, false reports on some incidents in Islam countries, including Malaysia, had a more negative effect. The cover of Time Magazine’s 11 February 2002 issue revealed a shadowy profile of Osama bin Laden superimposed on Malaysia's flag. Thus, Malaysia was said to be a hotbed of terrorism [16]. These incidents had caused quite a stir in Malaysia’s tourism industry. Due to this matter, “word-of-mouth” is a powerful tool in delivering information and knowledge about a country situation. The ‘word-of-mouth’ advice will play a greater role in determining a tourist in choosing destinations than in ads.

In the case of Lojing’s hot spring, it is more than just ‘word-of-mouth’, as the area has yet fully developed as a nature tourism destination that can create unforgettable experiences and memories to the tourists. According to [8], ‘word-of-mouth’ created from extraordinary experiences and memories that transformed into satisfaction.

![Figure 2](image_url)

**Figure 2.** Lojing Highland is well-known for its rafflesia and the aboriginal people known as the Temiar.
Figure 3. Poring Hot Springs, Ranau, Sabah.

Figure 4. Lojing hot spring, Kelantan in 2008.
Figure 5. Lojing hot spring, Kelantan in 2019.

Table 3. Concept counts and probabilities.
Table 3 lists the frequency of occurrence of concepts overall in the data and also provides ranked lists of concepts for the respondents’ perceptions about the destination attributes and attractiveness that can encourage frequent visitations. The numbers in the count column describe the number of comments referring to each concept. The scores in the likelihood column give the proportion of comments relating to that concept in that particular time frame. For example, “tourism” and “destination” were much more likely to be mentioned when describing the hot spring. From viewing Table 3, it can be concluded that ‘hot Spring’ was the top-ranked concept within the data, therefore, most relevant in visitors’ consideration of the Lojing’s destination image.

Figure 6 depicted the themes and concepts among respondents’ descriptions of the Lojing’s hot spring. Eleven themes were identified that are “spring”, “leisure”, “tourism”, “destination”, “tourists”, “attributes”, “hotels”, “development”, “customer”, “food” and “business”. The theme “spring” with 100% connectivity with the destination attributes was related to the concepts “hot”, “experience” and “wellness”. This illustrated that visitors came to Lojing’s hot spring because to experience the thermal water as well as to experience the element of wellness associated with the hot spring. While the theme “leisure” with 56% connectivity had indicated quite a strong relevance to Lojing’s hot spring. This articulating that Lojing’s hot spring is correlated with leisureliness. If the eleven themes were combined, the respondents are signifying that Lojing’s hot spring has the destination attributes as the new hot spring tourism destination in Malaysia. However, development in terms of facilities and services need to be taken into consideration as such development is very crucial to secure visitation as well as a business opportunity.

![Figure 6. Leximancer concept map showing the respondents’ perceptions about the destination attributes and attractiveness that can encourage frequent visitations](image-url)

- **Theme** | **Connectivity** | **Relevance**
- **spring** | 100% | 7
- **leisure** | 56% | 6
- **tourism** | 42% | 5
- **destination** | 25% | 4
- **tourists** | 17% | 3
- **attributes** | 12% | 2
- **hotels** | 11% | 1
- **development** | 10% | 0
- **customer** | 6% | 0
- **food** | 6% | 0
- **business** | 2% | 0

**Figure 6.** Leximancer concept map showing the respondents’ perceptions about the destination attributes and attractiveness that can encourage frequent visitations.
The theme “leisure” was the most important theme in the respondents’ responses after the theme “spring”. Figure 7 shows how Leximancer quantified and displayed the conceptual structure of the “leisure” theme. Most of the “leisure” theme concepts were connected to attractiveness, destination, attributes, competitiveness, tourism, development, health, spa, hotel, tourists, visitors, wellness, hot, spring, experience, food, business, facilities, safety, access, culture, nature and recreation. This demonstrates that Lojing’s hot spring need to become a “leisurely” hotspot as its destination competitiveness indicator. “Leisure” was particularly strongly connected with the word recreation (see Table 4) that portrayed the strong evidence of hot spring with recreational-based tourism. This is supported by the research done by [3], that hot spring with health-related services must shift from the conventional health spa and wellness to must include the recreational-based activities to ensure long-term success and sustainability of the hot spring-based tourism.

Figure 7. The conceptual structure of text for the theme “leisure”.
4. Conclusion
Tourism is one of the several economic forces that can bring changes to the landscape of Lojing Highlands, Kelantan. Lojing Highlands presently sustained a diversified agricultural economy based on vegetables and fruits. The effects of tourism, however, are mixed throughout Lojing and Cameron Highlands. Some communities with proximity to Cameron Highlands has been invigorated by the introduction of new jobs, services and facilities while others have fallen into poverty. However, due to the findings of Lojing’s Hot Springs, it is hoped that the found attraction can contribute as one of Kelantan’s tourism generic products that can help in bringing economic significance as well as conservation value to Lojing Highlands and its community. Nevertheless, wellness tourism development in Lojing Highlands, Kelantan cannot replicate the development that has been made for Poring Hot Springs in Ranau, Sabah. Different strategic and management plan should be made by the Kelantan State’s tourism development and master plans. Unlike Poring, Ranau, Sabah that concentrates on biodiversity, Lojing Highlands are lacking biodiversity. Therefore, it is of utmost importance for any potential new tourism destination to understand destination attributes and competitiveness of a new area to ensure long-standing and sustainability of the tourism destination. For the case of Lojing Highland’s hot spring, it is essential to recognize the pull factor of the hot spring. Based on the results, it can be concluded that “leisure” and “recreational” plays a major role in ensuring the sustainability of Lojing Highland’s hot spring-based tourism. The earlier statement also supported by a study done by [29] that affirmed destination loyalty was enhanced by positive destination image and in this case, Lojing hot spring’s attributes and recreational products. Visitation and repeat visitation by tourists are highly motivated by destination image and experiences. Therefore, the findings suggest that the cognitive image of Lojing hot spring needs to be further developed using strategies that aimed at increasing tourist satisfaction.

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