

Tourist Attractions in North Tohoku Region of Japan: A Network Analysis

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Abstract

This paper discusses the characteristics of tourist attractions in the northern Tohoku region of Japan using network analysis. This study analyzes the characteristics of tourist attractions in three prefectures using network analysis. Data from the Kanko Shigen Daicho (the register of tourist attractions) published by the Japan Travel Bureau Foundation (JTBF) was utilized for the network analysis. These data are based on criteria established by JTBF to define tourist attractions and classify and rank them according to their features. The network analysis was carried out to show the relationship between tourist attractions and places. The results indicate that events and festivals are connected to several places, as well as the central city, in the network of Akita Prefecture. Meanwhile, both Aomori and Iwate prefectures show that several attractions are connected to the central urban area. These results reveal that in Aomori and Iwate, a large number of tourists visit the urban areas, but tourism in the countryside may not be as strong. Further, Akita has a lesser variety of tourist attractions. Based on the analysis, it is suggested that finding and developing new tourist attractions could help further develop the prefecture.

Keywords: Network analysis, Tourist attractions, Northern Tohoku, Location Tendency

INTRODUCTION

Recently in Japan, rapid population ageing and depopulation has become a critical concern all over the nation. Several prefectures are especially affected by this issue at a local level. Although there are many different problems identified in each of the regions, social and economic challenges, such as a scarcity of job opportunities, are common issues.

The Tohoku region, located in the northeastern part of Japan, also faces the same challenge. In many regions, tourism promotion was carried out as a means of regional development. For example, a transportation system was developed around these areas after the introduction of the bullet train (high-speed train) from Tokyo. Previous studies have studied the impact of this innovation on tourism development and found that it boosted tourism in the connected regions (Egawa 2015). Other studies looked at the local impact of this increased tourism and found that while there are positive consequences such as businesses having more customers, residents also have to face negative impacts such as environmental damage. Therefore, some studies concluded that regional development must give importance to community development. It must take residents' concerns into account and promote a dialog between residents and stakeholders (Kurahara 1998; Hatuzawa 2017; Iwama 2017).

Tourism is one of the crucial means of helping a region develop, and the tourist appeal of a place depends on the abundance, diversity, and quality of tourist attractions. Therefore, it is necessary to seek and develop tourist attractions with a strong tourist appeal.

Some previous studies have discussed the characteristics of tourist attractions (Mizoo et al. 1975, Sugimoto & Kikuchi 2014). Although these studies evaluate the attractiveness of tourist attractions all over Japan, the analysis of small units such as small cities, towns, and villages has been neglected.

This paper discusses tourist attractions in the Northern Tohoku region using network analysis. While previous studies conducted analyses on a national scale, this paper focuses on regional units such as cities, towns, and villages since such analysis is necessary for capturing the complete picture of the characteristics of tourist attractions in each region. This study applied network analysis to discuss the relationships between tourist attractions and places.

STUDY BACKGROUND

The Japan Travel Bureau Foundation (JTBF) defines a tourist attraction as a place that is utilized for tourist activities, provides an interesting experience to tourists, and is recognized by many people as a tourist attraction. The JTBF's evaluations, which they have been carrying out since 1968 (JTBF 2021), are based on this definition. They mainly classified tourist attractions into two categories: nature-based and culture-based. They identified 24 types of tourism attractions in total, of which, 10 are nature-based and 14 are culture-based.

They also ranked the attractions from S to A, wherein S, the highest rank, indicates an international appeal, A represents attractions showcasing the identity and pride of Japan, and B represents attractions of local importance. These categories and classifications have

mainly been utilized for tourism planning and marketing since the start of the JTBF project.

Some previous studies on tourist attractions in Japan utilized the classification established by JTBF. Mizoo et al. (1975) selected 392 tourist attractions and used 14 measurements to examine their characteristics. In that study, five factors were extracted. Finally, they composed the discriminant analysis model along with the ranked category to determine the relationships between the characteristics of tourist attractions based on the results of factor analysis. On the other hand, Sugimoto and Kikuchi (2014) found the characteristics of geographical distribution. Their study used the rank-evaluated data in Table 1 and calculated the weighted value to show the regional dispersion among the prefectures. These studies discussed the regional characteristics of tourist attractions and highlighted their importance. However, they only focused on national-level analysis, and did not consider smaller units such as cities, towns, and villages.

In terms of tourism studies, regional data focused on small units such as cities, towns, and villages, despite varied socioeconomic data (such as demographics). Previous studies have applied these data to show the characteristics of these regions. To show the characteristics or relationships, multivariate analyses, such as principal component analysis or factor analysis, are often used. The perspectives of studies are diverse, such as factorial ecology (Ogata 1985, Wakabayashi 1987), transportation or migration networks (Hayashi 1974, Momose 2005), and urban systems (Sung 1977, Joo 1982). These studies are commonly discussed in the context of urban areas to determine geographical patterns. Multivariable analysis is suitable to demonstrate the regional characteristics or patterns of interactions since socioeconomic variables are diversified. On the other hand, tourism data such as tourist attractions are unsuitable because there are not enough types of variables.

Instead of multivariable analysis, such as factor analysis or principal component analysis, this paper attempts to apply the method of network analysis to determine the regional characteristics of tourist attractions. Network analysis is utilized to examine the relationships between the nodes and links. Previous studies, for instance, have conducted network analysis on transportation systems such as bus or airplane networks to show the linkage or passenger flows between places (Kuzuya 1980, Murayama 1982, Montis et al. 2010). Furthermore, mobility surveys have recently been applied to GPS tracking data (Sugimoto et al. 2019). Meanwhile, network analysis is also carried out to demonstrate social networks, such as the relationships of institutions or stakeholders in tourism destinations (Kwon et al. 2009, Restrepo et al. 2021).

This study also applies network analysis to examine the relationship between tourist attractions

along with the JTBF criteria and locations such as cities, towns, and villages. As mentioned above, the network is composed of nodes and links. This paper takes the position that network analysis is more effective and suitable for showing the linkages between tourist attractions and places, than multivariable analysis.

DATA DESCRIPTION AND TOURISM ATTRACTION POINT

Table 1 shows the matrix for the categories and ranks of tourist attractions. Tourist attractions are classified into three categories from S to B. Tourism attraction points are transformed into weighted values based on their categories, such as, S class for three points, A class for two points, and B class for one point. According to the table, the total number of tourist attractions in Japan is 2780. The S rank is just 1.8% in nature-based tourist attractions and 2% in culture-based tourist attractions.

Figure 1a and 1b show the map of tourist attraction points based on the JTBF criteria. Both figures are also divided into two categories—nature-based tourist attractions and culture-based tourism attractions.

The total points on the maps are shown for each region. Towada City in Aomori Prefecture has 12 points, which is the highest in the category of nature-based tourist attractions, as shown in Figure 1a. Lake Towada and Oirase river, which are parts of the Towada-Hachimantai National Park, are located in this city. Although the national park is surrounded by three prefectures, famous locations are located around this city.

In terms of culture-based tourist attractions, Aomori has the highest score, as shown in Figure 1b. This city has well-known tourist attractions, such as archeological sites and traditional festivals. The Sannai-Maruyama site is a popular archeological site where ancient settlements dating back to 3900–2200 BC were discovered. The museum is also located around this site. Meanwhile, the Aomori Nebuta festival is a traditional summer festival that takes place in August. It is a very well-known festival and attracts many tourists.

Morioka City in Iwate prefecture and Senboku City in Akita prefecture got a high score in each prefecture. Morioka is the capital city of Iwate prefecture. Wanko Soba is a famous noodle dish in this area and an iconic dish of Iwate prefecture. Morioka is one of the places of origin of this noodle. Senboku is a city located in Akita prefecture near Iwate prefecture. Kakunodate is a historical location in this city. It is a popular tourism site in this area since it features the historical building where Samurai (Japanese warrior) lived.

The tendency of each prefecture is shown from the statistical map of tourist attraction points. However, the regional characteristics of tourist attractions are yet to be investigated. In the next chapter, network analysis is applied to show the relationships between location and characteristics.

Table 1 Category of Tourism Attractions and the Number of Each of Rank

Type of Attractions	Classification	S	A	B	
Nature-Based Tourism Attractions	Mountains	5	32	132	
	Plateau, moor, the wilderness	1	13	26	
	Wetlands	1	13	47	
	River, gorge	2	18	68	
	Waterfall	0	5	29	
	The shore, cape	3	22	100	
	Rock, cave	0	6	56	
	Animal	0	11	21	
	Plant	3	14	165	
	Natural phenomenon	0	9	15	
		Subtotal	15	143	659
Culture-Based Tourism Attractions	Historic spot	1	6	62	
	Shinto shrine, temple, church	13	59	529	
	The Site of Castle, Castle, Palace	4	14	66	
	Village, Town	3	19	112	
	Native District scenery	2	20	90	
	Garden, Park	1	12	40	
	Building	0	13	125	
	The Annual Events (Festival, Traditional Event)	5	26	219	
	Zoo, Aquarium	0	3	63	
	Museum, art museum	4	15	89	
	Theme park, Theme facilities	1	4	34	
	Hot spring	2	31	74	
	Meal	2	19	98	
	Entertainment, Performance	2	12	69	
		Subtotal	40	253	1670

Sources: Japan Travel Bureau Foundation (JTBF)

Score of Nature-Based Tourism Attractions

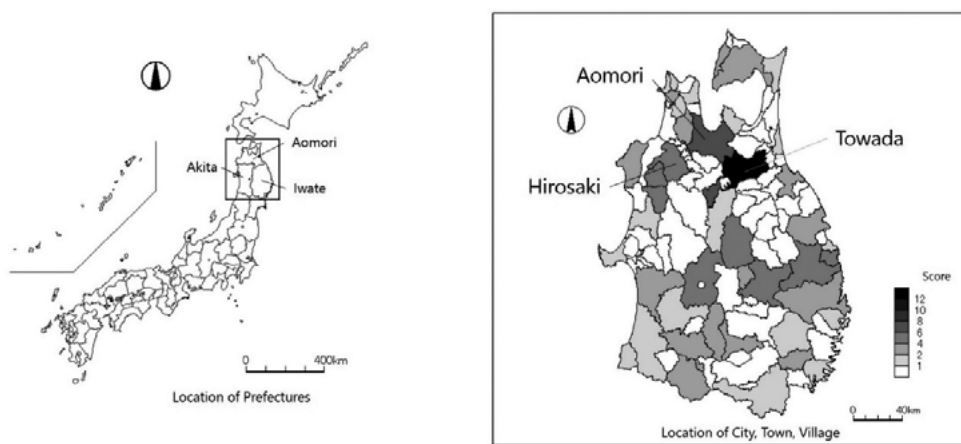


Figure 1a Score of Nature-based tourism attractions

Note: Score is calculated based on rank of JTBF

Score of Culture-Based Tourism Attractions

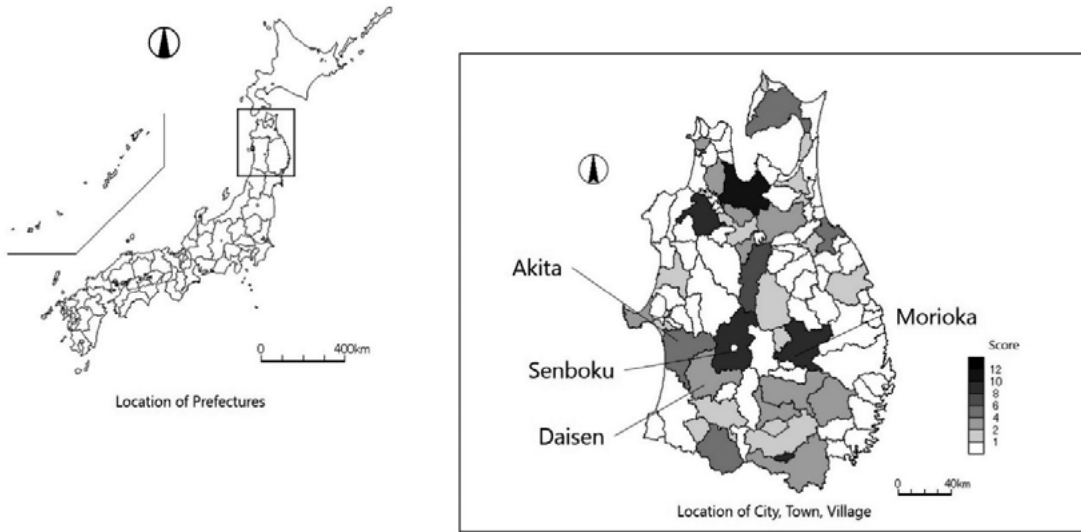


Figure1b Score of Culture-based tourism attractions
 Note: Score is calculated based on rank of JTBF

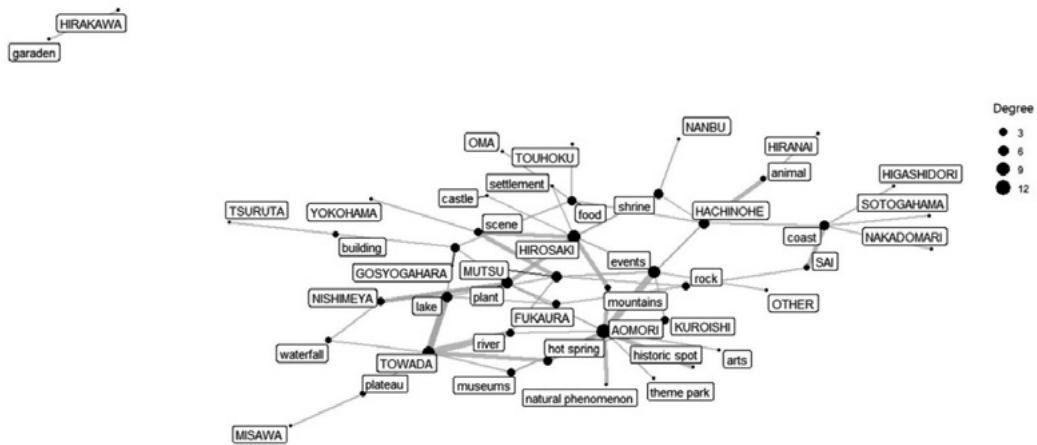


Figure2 Network of Aomori
 Note: Capital letter is for places such as city, town, village. Small letter is tourism attractions.

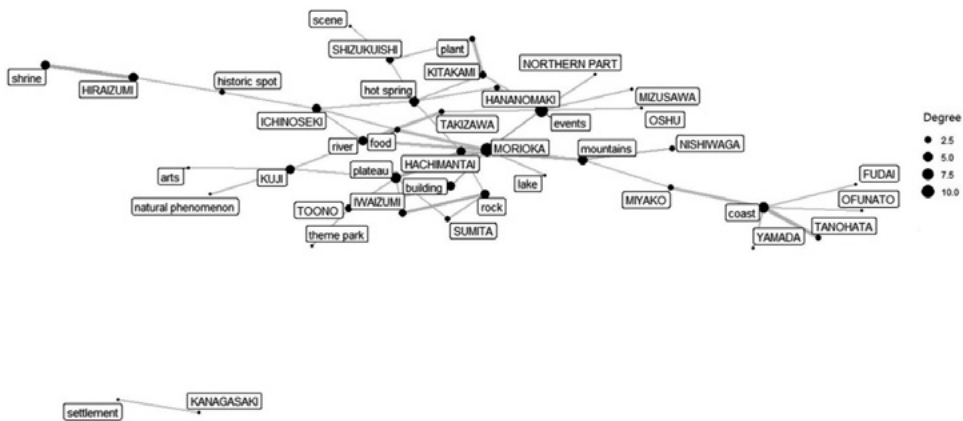


Figure3 Network of Iwate
 Note: Capital letter is for places such as city, town, village. Small letter is tourism attractions.

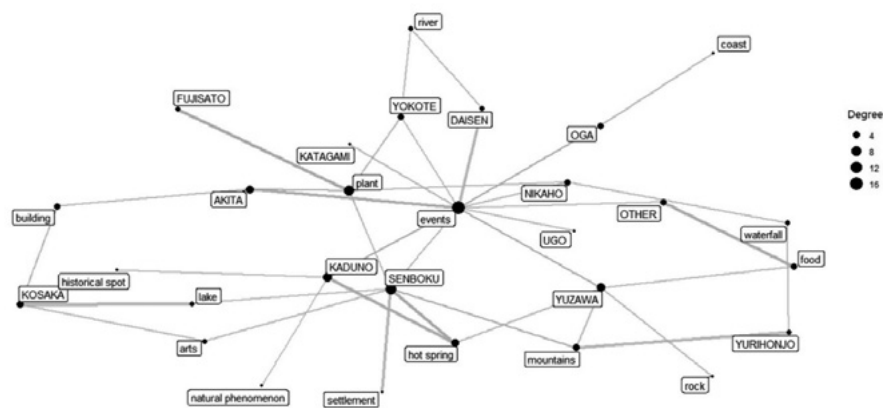


Figure 4 Network of Akita

Note: Capital letter is for places such as city, town, village. Small letter is tourism attractions.

THE RESULT OF NETWORK ANALYSIS

Figures 2 to 4 show the links between tourist attractions and places. The results for Aomori prefecture in Figure 2 show that the links are concentrated in Hirosaki City and Aomori City in each. Hirosaki City, which is one of the central cities in Aomori prefecture, connects nine links to tourist attractions and is relatively dominated by culture-based tourist attractions such as castles or temples. Furthermore, the scenery of the apple field is highly evaluated and ranked A. In Aomori City, several tourist attractions are also located, and the number of links is 12. Culture-based tourist attractions are also numerous, similar to Hirosaki City. The festival and historical heritage are representative tourist attractions, although nature-based tourist attractions such as mountains are also located in this city.

Figure 3 shows the network of tourist attractions and places in Iwate prefecture. As the network shows, Morioka, which is the capital city here, has several tourist attractions and has 11 links to tourist attractions. Although culture-based tourist attractions such as food and architecture are abundant, nature-based tourist attractions, such as rivers, are also present. In terms of tourist attractions, nature-based tourist attractions such as coasts and capes and plateaus, moors, and forests are connected to several places. Although national parks are well known in this prefecture, as mentioned in the previous chapter, the Ria coast is also formed in this area. The Sanriku coast, extending from Aomori to Miyagi prefecture, is located in Iwate prefecture.

The results of Akita Prefecture in Figure 4 shows that the festival was connected to several places. The number of links is 16 for the event node, which is “The Annual Events” in Table 1. In Akita prefecture, there are many festivals, such as the Akita Kanto festival or fireworks in Daisen City. The Akita Kanko festival is held in August in Akita City as a sort of prayer for a good harvest. This festival is regarded as one of the best-known festivals in the Tohoku region, and it attracts many tourists. Meanwhile, Daisen City has a fireworks

competition, which also occurs in August. In this festival, fireworks manufacturers assemble and show off their fireworks. Furthermore, Daisen City is connected to 10 tourist attractions in the network. A major observation about Akita prefecture is that the capital city does not have many tourist attractions. Akita City, which is the central city in this prefecture, has five links. This is fewer than the capital cities of Aomori (12 links) and Morioka (11 links) prefectures.

DISCUSSION

The results of the network analysis show that tourist attractions in both Aomori and Iwate are relatively concentrated in urban regions. Generally speaking, the Tohoku region is rich in nature-based tourist attractions, such as lakes, mountains, and coastlines. Although the network shows the abundance of nature-based tourist attractions, culture-based tourist attractions are also substantially connected, particularly in the city area. The accessibility of these areas, especially from Tokyo, has improved since the construction of the railway. This has benefited the tourism industry here, although disasters are still a concern. However, the countryside with its poor accessibility is likely to be at a disadvantage when compared to urban areas because tourists are more likely to visit urban regions as they are well-connected. In Tohoku, aging and depopulation are major issues; some villages in the region have already disappeared because of depopulation. From this perspective, limiting tourism promotion to urban areas might have a negative impact on society.

The structure of the network of Akita prefecture shows that tourist attractions are not concentrated in the capital city. One of the tourist attractions, “The Annual Events” is connected to several places. Akita City has better accessibility but fewer tourist attractions than other capital cities in Tohoku such as Aomori and Morioka. Furthermore, Akita prefecture does not have as much diversity of tourist attractions as other regions, which makes it less attractive to tourists. Therefore, this

prefecture could benefit from the development of new tourist attractions. However, the development plans must take challenges such as population ageing and depopulation into account.

CONCLUSION

In the last few years, sustainable development has gained immense importance all over the world. The tourism industry is also expected to align itself with the goals and methodologies of sustainable development. In Japan, an ageing society and depopulation are critical challenges. To promote tourism and community-based development, it is important to develop tourist attractions representing regional culture and characteristics.

In this paper, the characteristics of tourist attractions in the northern Tohoku regions are shown using network analysis. The results show that the patterns of tourist attractions are different. Aomori and Iwate prefectures, which comparatively have many tourist attractions, show that tourist attractions are concentrated in the central urban area. In general, it is considered that culture-based tourist attractions are concentrated in urban areas, and these prefectures have plenty of them. However, nature-based tourist attractions are also located in these cities. Therefore, these places located near cities might be attractive to tourists. Meanwhile, faraway remote areas with poor connectivity with urban areas may be at a disadvantage for tourism promotion.

On the other hand, tourist attractions in Akita prefecture are less concentrated in capital cities. Furthermore, the concentration of tourist attractions is one-sided in the network of this prefecture. Although events and festivals are well-represented (in fact, some traditional festivals and events attract many tourists), the diversification of tourist attractions is less than in other prefectures. Thus, it might be necessary to create a greater variety of tourist attractions to help this region develop further. The results demonstrate the possibility of development in this area.

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