Exploring the Clustering Location of Accommodation Units through the Tourism Development in the Cing Jing area of Taiwan

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Abstract-- This research, taking the example of accommodation units in the Cing Jing area, examined the clustering location of accommodations through the temporal-spatial process based on Butler’s TALC tourism development model. From the time series data of the tourists’ number in the Cing Jing area, this research investigated the stage of TALC model of tourism development, and defined the characteristics of clustering location of accommodation points by using GIS spatial analysis method.

Index Term-- TALC, clustering location, GIS, accessibility, landscape, serenity

I. INTRODUCTION

Many studies explored the concept of TALC model proposed by Butler (1980) (Choy, 1992; Cooper, 1992; Getz, 1992; Gordon & Goodal, 1992; Benedetto et al., 1993; Digance, 1997; Tooman, 1997; Papatheodorou, 2006; Cole, 2012). Johnston (2006) revised Butler’s TALC model (1980; 2005a; 2005b) with S-shaped curve to line segment with obvious turning points in different stages. Furthermore, the y-axis variable of Butler’s TALC model represents the number of tourist arrivals instead of the number of accommodation units available at the destination. The slop of any particular segment was to show a relative relationship of speeding up of accommodation units in different stages. To mark the turning points of sequence of stages, S-shaped curve is more difficult to distinguish than line segment, so in this research we use the latter for analysis the TALC model of Cing-Jing area.

Porter’s Diamond Theory indicated that spatial cluster of geographical phenomenon refers to the geographic cluster of companies and institutions in certain industries which results in complementary production and excellent customer distribution channels. Many clustering regions, combining relevant government agencies such as universities and vocational training institutions, provide specialized training, education, information, research and technical support (Porter, 1998:78-79). Many scholars have mentioned that the clustering of tourism-related industries can promote the development of tourism (Gray, 1996; Enright &Roberts, 2001). Pavlovich (2003) analyzed the tourism development of Waitomo Caves in New Zealand from the viewpoint of networks, and pointed out that Waitomo Caves, as a single destination, attracted tourists with its unique karst limestone terrain. In its early phase, visitors stayed for a relatively short period of time, but with the increase of free and independent travelers (FITs), local tourism-related industries began to
develop so that Waitomo Caves became more attractive to tourists with its strong tie with a variety of industries. As a result, the tourism development system turns into an organic operation network. In its system, many related industries take up an organizational nodal position. That is, the interdependent network formed by tourism-related industries promotes the tourist development of the Waitomo Caves.

Telfer (2000) also indicated that the cluster of related industries such as liquor and food industries serves as an important factor in promoting the tourism development in Nicaragua, Canada. According to Michael (2002), antiques retailing in Australian rural areas attracts visitors, promotes regional economic development and results in obvious regional location industrial clustering phenomenon. Different regions can generate different tourist niche markets to meet the local social and economic needs. Taking the three wine regions in New Zealand-Central Otago, Hawkes Bay and Marlborough for example, Hall (2005) suggested that industrial clusters of intellectual property, network, brand, and talent were an important factor in the development of food tourism, and also explored the formation of the cluster network.

Thus, the concept of clustering can be extended to two dimensions: spatial level and organizational level. For the former, it is related to geographical proximity among different locations, whereas for the latter, it focuses on how people shape cooperative relationships among industries by connected relationships in a certain region. This research explores the clustering concept based on the spatial clustering and industrial clustering of accommodations in the Cing Jing area, and the research purposes are as follow:

1. To examine the spatial clustering pattern of accommodations in the Cing Jing area.
2. To explore the locational characteristics of accommodations clustering in the Cing Jing area.
3. To analyze the relationship between the spatial clustering of accommodations and tourism development in the Cing Jing area.

II. MATERIALS AND METHODS

The 100 legal accommodations related data in this research is provided by Nantou County Government, using these data which can be specified to X, Y coordinates of GPS locations of accommodations in TWD97 coordinate system so as to facilitate the GIS processing, and the analysis of spatial distribution and clustering pattern. In order to demonstrate the time series and locational conditions of accommodations clustering, a semi-structured questionnaire survey is adopted to conduct in-depth interviews with accommodations owners. The contents of in-depth interview include: 1. Time when accommodation owner began to run his accommodation 2. Relationship between accommodation owner and the nearby tourism-related industries 3. Reasons for accommodation to locate here.

In this research, the average nearest neighbor analysis is adopted to examine the spatial distribution pattern of accommodations. The average nearest neighbor analysis refers to statistical results of point to point distances, which provides the nearest neighbor index Z values indicating the clustering degree of points. If Z value \( > 1 \), it indicates that spatial clustering pattern reduces to dispersed distribution; if Z value \( < 1 \), it indicates that spatial clustering pattern reduces to clustering distribution; and if Z value approaches to 1, it means random distribution.

Point density analysis of GIS is an analysis tool based on the raster layer, according to which the number of points on each cell is presented as the cell value. In this research, the cell size of 25 meters x 25 meters is adopted as the unit of analysis. The researcher calculates the cell value within a searching radius of 200 meters, and then classifies the cell
value into five classes by means of the natural-break classification method. The bigger the cell value, the higher the degree of point density, that is, the clustering area of accommodations is demonstrated. This research also using buffer analysis tool analyzed the neighborhood of clustering area of accommodations within different ranges, for example, taking the Taiwan 14-A Route as the butter center, comparing the percentages of accommodations within the range of 100 meters, 200 meters and 300 meters, respectively.

Cing Jing area is located between 4 km and 12.5 km on the way of Taiwan 14-A Route, which covers an area of about eight hundred hectares and is divided to the three districts-Song-Gang District, You-Shi District, and Cao-Yuan District. Most land in Cing Jing area was originally owned by Forestry Bureau of government, with few native reservations and private-owned lands. After 2001, some of the lands have been converted into private ones for accommodations. The altitude of this area is between 1,600 to 2,100 meters, with beautiful scenery, fresh air and year-round fog. The hot tourist spots include Livestock Center, Qing-Qing Grassland, Shou-Shan Park, Little Switzerland Garden, Maple Grove, Wu-Li-Po Viewing Platform, Butterfly Park, Guan-Shan Pastoral District, Xin-Cheng-Ze-Ling (Literally, as you wish), Song-Gang Cultural Center, trekking walks, etc.

III. RESULTS AND DISCUSSION

Spatial distribution of accommodation units in time series

There are totally 100 legitimate accommodation units in the Cing Jing area, with 43 in Song-Gang District, 53 in You-Shi District, 4 in Cao-Yuan District. According to Rogers classification, from 1990s to 2003, the cumulative percentage of accommodation units reached 14% of the total, which can be defined as the primary stage of accommodation units increasing; from 2003 to 2005, the cumulative percentage of accommodation units reached 56%, which can be defined as the development stage of accommodation units increasing; from 2005 to 2011, the cumulative percentage of accommodation units reached 100% so as to the maturity stage (Table 1).

Primary stage of accommodation development (1990s ~ 2003)

There were a total of 14 legitimate accommodations in the Cing Jing area at this stage, with the cumulative curve rising to a small extent. The earliest accommodation units in the Cing Jing area appeared in the Bo-Ai New Village of Song-Gang District. Bo-Ai New Village is the most representative military dependents’ village where the Minority Culture of Yunnan, China was also preserved. In the 1980s, privatization of land brought the opportunity for the development of accommodation units. The landscape, environment and air in the Cing Jing area, after being reported by the news media, e.g. with the high-lighted title of “Migrate to the mountainous areas” in Business Week, have attracted many people who are tired of urban life to settle down.

Development stage of accommodation development (2003 ~ 2005)

There were a total of 74 legitimate accommodations in the Cing Jing area at this stage, and newly built accommodation units were mainly distributed in You-Shi District. In 1990s, the increasing of accommodation units in You-Shi District were respectively not so many as in Song-Gang District in this stage because of a large accommodation establishment available-National Hotel located here in You-Shi District. After the 2000s, many celebrations and festival activities such as Cing Jing Windmill Festival and Torch Festival were held by government in You-Shi District, attracted a large number of travelers, and thus promoted accommodation units emerging. In other words, the more increasing number of travelers in the Cing Jing area,
the more accommodation units emerged in You-Shi District.

Saturation stage of accommodation development (2005 ~ now)

There were a total of 100 legitimate accommodations in the Cing Jing area at this stage. At this stage, newly built accommodation units were mainly distributed in Song-Gang District, since there were no longer suitable lands to construct for accommodation in You-Shi District. The accommodation units clustered in Song-Gang District and You-Shi District from the primary stage to the saturation stage, which respectively revealed different regional competitiveness through the tourism development. With the altitude range of 500 meters between Song-Gang District and You-Shi District, Song-Gang District featured snowing scenery in winter, while You-Shi District distinguished its special characteristics-with ethic traditions, a wide range of recreational facilities, catering services, the earliest convenience stores and coffee chain shops. There was a large park lot and Swiss style garden in You-Shi District, which were crisscrossed by many footpaths, by way of which you may walk around to enjoy the fresh air. Not far up, you would see the Qing-Qing Grassland, and along the way there were a lot of vendors and stores, where travelers could buy souvenirs and local agricultural products. Because of the limited land and water resources, Cing Jing area began to suffer negative impact at the saturation stage, such as the conflicts for demand of water supply and the problem of soliciting customers.

By using mean nearest neighbor analysis, we found out the spatial pattern of accommodation distribution in the Cing Jing area is to approach cluster pattern (Z value <1 ), and then in the processing of point density analysis we clarified two clustering zones of accommodation units-Song-Gang District and You-Shi District ( Figure 1). When using mean center analysis, two centers-the Green Finger Resort and the National Hotel were defined in the two clustering zones.

In Song-Gang District, with Green Finger Resort as 500 meters buffer analysis center, there are 27 accommodations in buffer neighborhood, accounting for 23% of the total; while there are 46 accommodations for 1,000 meters buffer analysis, accounting for 40% of the total. In You-Shi District, with National Hotel as 500 meters buffer analysis center, there are 25 accommodations in buffer neighborhood, accounting for 22% of the total; while there are 53 accommodations for 1,000 meters buffer analysis, accounting for 46% of the total. The buffer analysis indicates that nearly half of the accommodations are respectively distributed in the buffer neighborhood of 1,000 meters from the centers, Green Finger Resort and National Hotel (Table 2, Figure 2). According to the buffer analysis along Taiwan No. 14-A Road, 94% of the accommodations are mainly clustered in the buffer neighborhood of 200 meters (Table 2, Figure 3). 200 meter usually is the limited range for people walking which also reveals accessibility play important role on the accommodation clustering. When overlaid the layer of accommodations distribution, DTM layer, road layer and river layer, we defined the clustering location of accommodation units limited to be on the side of river valley with natural landscape, serenity and accessibility (Figure 4).

IV. CONCLUSIONS AND RECOMMENDATIONS
Although the curve of TALC model, being approached line segment, is not S-shaped, the TALC stage of tourism development in the Cing Jing area, approximately accordance to Butler’s TALC model. Using GIS buffer analysis, the accommodation units emerging from 1992 during the development stage of TALC were originally clustered in Youth District, as the increasing of travelers arrival then stretched to Song-Gang District along the main travel linkage-Taiwan 14-A Route. Using the point density analysis, we realize accommodation units and tourist spots is not associated
(Figure 2), and when further practicing the overlay analysis, the places with best of mountain views scored significantly higher than the places with noisy tourist spots (Figure 4). This suggested that the more growth of the tourism industry, the more accommodation units clustered on the locations of being able to appreciate sea of clouds, snow scene, and cherry blossoms and enjoy serenity instead of noisy crowds. Thus, accessibility, landscape and serenity are the location factors of influencing the accommodation clustering in the Cing Jing area.

REFERENCES


Table I

<table>
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<th>year</th>
<th>Accommodation facilities</th>
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<tr>
<td>2011</td>
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Table II
Buffer analysis of accommodations units in the Cing Jing area

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<th>Buffer Center</th>
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<td>Taiwan 14-A Route</td>
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<td>110</td>
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</tr>
<tr>
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<td>27</td>
<td>23%</td>
</tr>
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<td>46</td>
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</tr>
<tr>
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<td>500</td>
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<td>22%</td>
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<td>National Hotel</td>
<td>1000</td>
<td>53</td>
<td>46%</td>
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Fig. 1. Point density analysis for accommodation units
Fig. 2. Buffer analysis of accommodation clustering
Fig. 3. Buffer analysis of accommodation clustering

Fig. 4. Overlay with accommodation layer, DTM layer and river layer
Highlights

- The TALC tourism development model in the Cing Jing area approximately is accordance to Butler’s TALC model.

- The more grow of the tourism industry, the more accommodation units clustered on the locations of being able to appreciate sea of clouds, snow scene, and cherry blossoms and enjoy serenity instead of noisy crowds.

- Using the method of GIS spatial analysis, we realize accessibility, landscape and serenity are the location factor of influencing the accommodation clustering in the Cing Jing area.