Measuring Urban Tourist Spillover Effect Toward Rural Area

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Abstract*:- Melaka tourism has attracted huge number of domestic and international tourist every year and becoming a great source of income for the state. However, tourism in Melaka is mostly centralized on the city area of Melaka Tengah causing socioeconomic deprivation and inequality of people in sub urban and rural areas. Consequently, rural tourism work as a solution of development of economic and part of the rural community's diversification policies. Hence, this research is aim to determine the tourist spillover effect from urban exert to rural area. Global and Local Moran, I am used to analysis the data to show the phenomena of spillover of tourist's flow by correlation. The secondary data is obtained from Tourism Melaka and Department of Statistic Malaysia for further data analysis. The result has shown that tourist spillover happened from Melaka tourist attractions to rural area. Therefore, the tourism in Masjid Tanah a mukim in Alor Gajah district can be expand and innovate to be one of the attraction in Melaka. This suggestion of development will grow the socioeconomic at the rural area by establish more employment apart from agriculture sector, diversify the income of the local citizens as well as encourage them to take part in entrepreneurship.

Index Terms: Rural tourism, socioeconomic deprivation, tourism hot spots, tourist spillover effect.

I. INTRODUCTION

Melaka is one of Malaysia's states which located in the southern region of Peninsular Malaysia. Melaka has split into three administrative districts namely Alor Gajah, Jasin, and Melaka Tengah with a total geographical area of 1,658 km^2. Melaka nominated as one of the UNESCO World Heritage City which have lots of tourism destinations since decades ago. The UNESCO recognition of a World Heritage has bring huge impact to domestic and international inbound visiting tourists to this geographical area [1]. Substantially, tourism becomes a great drive to Melaka economy.

After the recognition by UNESCO, Melaka has become a node for domestic and foreign visitors which have attracted 13.711 million visitors in 2012. In the same year, domestic tourists were effectively drawn with 1.366 million due to the recognition by UNESCO compared with 3.512 million in 2007. As a matter of fact, the domestic visitors grow quicker from 4.857 million in 2007 to 10,199 million in 2012 after the UNESCO recognition. Tourism has a favorable impact on the Malaysian economy in terms of increasing foreign exchange earnings and employment possibilities [2]. In the tertiary sector, tourism has stated as the largest economic sector in Melaka, accounted for 46.6 percent of GDP [3].

Melaka tourism has becoming a great source of income for the state. Melaka fall at the top sixth monthly median income by state, recorded RM5,588 in 2016 compare to RM5,029 in 2014. According to the Report of Household Income and Basic Amenities Survey 2016, monthly median income of Melaka was above the national level of RM5,228. The Gini Coefficient also declined to 0.399 compared to 0.401 back in 2014. It has shown that Malaysia's household income distribution has been raise. The income distribution of urban strata decreased from 0.391 (2014) to 0.389, while the household income distribution in rural strata increased from 0.355 (2014) to 0.364. Melaka Tengah and Jasin were ranked in the top 20th administrative district for mean monthly household income in 2016, recorded RM7,142 and RM6,296. Yet, Alor Gajah was not in the list due to the household income distribution for rural strata and the land of Alor Gajah is mainly used for plantation. Alor Gajah was ranked at the last after Melaka Tengah and Jasin for the level of material deprivation in 1991 [4]. In fact, tourism in Melaka are mostly centralized on the city area of Melaka Tengah causing socioeconomic deprivation and inequality of people in sub urban and rural areas [5].

In order to raise the household income in Alor Gajah, a broad range of existing literature highlights on the direct and indirect economic advantages because of the effect of tourism development. Tourism development contributes to the growth of economic through foreign currency income, attracts global investment, increases tax revenues and creates extra job possibilities [6]. The Ninth Malaysia Plan (2006-2010) and Tenth Malaysia Plan (2011-2015) have pay attention in the priorities of economic upgrading in rural tourism as efforts to lower rural communities ' poverty.

Besides, in [7] mention that rural areas as ideal places to escape from the tension of modern urban-industrial life in which for some to rekindle the human spirit. Part of the growth in rural tourism development is due to the growing demand for visitors who love the natural environment that is available in rural environments which the locals still retain cultural heritage [8]. Hence, Masjid Tanah as a mukim in Alor Gajah is selected as the research location since it has several tourist attractions for outdoor activities such as Turtle Information Centre, Tanjung Bidara and Pengkalan Balak Beaches, Sungai Udang Recreational Forest, and The Al-Khawarizmi Astronomy Complex.

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Therefore, this research is aim to measure the tourist spillover effect from Melaka Tengah to Masjid Tanah. Thus, this research includes two objectives: (1) to determine the tourist attractions and (2) to measure the tourist spillover effect from the nearby region exert to Masjid Tanah.

II. LITERATURE REVIEW

A. Rural tourism

Rural tourism takes place in rural fields, involving the creation of natural and anthropogenic tourism resources in rural regions, economic and social activities that benefit local communities [9]. The Rural Tourism Master Plan (RTMP) describes rural tourism as "a tourism that provides visitors with access to rural and rural attractions, experiences Malaysian culture and heritage, thereby provides social and economic benefits to local communities [10].

Over the past decades, the tourism industry is growing fastest due to the support of the rural tourism [11]. In [8] categories rural tourism that takes visitors back to nature, roots, and the return to origins. In order to improve the economic development, rural tourism has been seen as one of the key solution [12] and part of the rural community's diversification policies [8].

B. Tourism lead economic growth

According to previous research, tourism has made a huge contribution to the economies due to its capability to generate incomes, taxes, currency exchange and jobs [13]. The result from World Travel and Tourism Council stated that tourism has aggressively boosting the GDP (Gross Domestic Product) of European country. As a result, the tourism industry has become the European country's main sector.

Not only at European country, the government of Malaysia also has identifies tourism as a main industry in revitalizing the long-term economic growth of Malaysia. In particular, Malaysia's 10th Plan (2011-2015) acknowledged tourism as the economic sectors in National Key Economic Areas (NKEAs) to turn Malaysia into a high income country by 2020 [14]. This is because, tourism is frequently seen as a crucial engine in many countries for economic growth and development [15], help improve the economic well-being of the local population. In many cases, the tourism industry has been effectively introduced, thereby improving local economic impacts to positive such as Langkawi, Kinabalu Park, Cameron Highlands, Genting Highlands, Melaka, where tourism resources are prominent and unique. [16].

Tourism has a great degree of involvement in economic sectors which is needed by the entrepreneurial sector due to its rapid global international market growth. Through the development of tourism, the community has the chance to diversify income by involving into entrepreneur activities [17]. The community will acquire sustainable economic growth through entrepreneurship in term of incomes increase, living standards improve, investment opportunities increase, and tax bases expand, specially through technological development, skill development, formalization, and generate employment [18]. Hence, entrepreneurship is one of the strategies in the country development, supporting factors and strategies for rural tourism development [19]. Hence, entrepreneurship is seen as a catalyst to overcome problems related to economic growth, social inequality and employment opportunities [20]. Local communities have the opportunity to provide the services or sell products to domestic and international tourists through the growth of tourism.

Furthermore, tourism industry has the rapid growing trend that also increasing employment opportunities for the population [18]. Tourism was promoted primarily to provide local individuals with extra work possibilities where other economic possibilities are restricted [16]. In 2013, the total contribution of Travel and Tourism to the worldwide economy increased to 9.5% of worldwide GDP. In other word, Travel and Tourism contributed almost 266 million jobs (8.9% of total employment) back in 2013. The tourism sections is expected to be provide 296 million jobs in global economy by 2019 although the global economic and social crisis affected the international tourism [21]. Therefore, tourism industry is capable of becoming the major job creator compare to other sector such as agriculture.

C. Tourist spillover effect

As stated by Yang & Wong, geographic spillover is an unintentional spatial interaction that a region's tourism industries exert on tourist flows to other nearby region. When the positive spillover effect in the region means that it can benefit from the growth of tourism in the neighborhood [22]. In the past decade, a large number of literatures have studied the tourism spillover effects, mainly on the spillover effect of tourist flows [23].

Many studies have empirically proven that attractions help attract visitors to the area where the attraction is located [23]. The spillover effect of attraction relates to the impact on the tourism demand of destination by the attraction endowments of locations surrounding a destination. The spillover effect of attraction may be positive or negative. In [24] study is the first to claim that attractiveness of the nearby area will significantly increase the number of visitors to the destination, which means the spillover effect is positive. The positive spillover effect of the attraction becomes most apparent when visitors cannot directly access the attractions of the nearby area and must select a specific area as a stopover point.

III. METHODOLOGY & RESULT

A. Moran's I

Moran's *I* static is a weighted correlation coefficient used for detection deviations with spatial characteristics in the random distribution of the variable. It enables to determining whether adjacent regions are more comparable to each other on the same variable. In [22] research used Moran's *I* on spatial distribution of tourist flows, formation of clusters in tourism. Besides, the spatial spillover effects in regional tourism development and the issues of spatial interactions between tourism destinations in Polish districts have been discuss in the research. In this research also use weight matrices, W is the neighborhood matrix which Moran's *I* based on it. W matrix depicts the level of spatial relatedness between *i* and *j* [22]. W bring out the value of W_{ij} and [25]:

$$W_{ij} = \begin{cases} 0 \ when \ region \ i \ and \ j \ are \ not \ neighbors \\ 1 \ when \ i \ and \ j \ are \ neighbors \end{cases}$$

The Local Moran's *I* Statistic of spatial association is given as:

$$I_i = \frac{x_i - \overline{X}}{S_i^2} \sum_{j=1, j \neq i}^{n} W_{i,j}(x_j - \bar{X})$$

where xi is an attribute for feature i, $\overline{X}$ is the mean of the corresponding attribute, Wij is the spatial weight between feature i and j, and:

$$S_i^2 = \frac{\sum_{j=1, j \neq i}^{n} (x_j - \bar{X})^2}{n-1}$$

with *n* equal to the total number of features. The $z_{\hat{I}}$ score for the statistics are computed as:

$$Z_{I_i} = \frac{I_i - E[I_i]}{\sqrt{V[I_i]}}$$

where

$$E[I_i] = -\frac{\sum_{j=1, j \neq i}^{n} W_{i,j}}{n-1}$$
$$V[I_i] = E[I_i^2] - E[I_i]^2$$

B. Global Moran's I

The Global Moran's *I* statistic for spatial autocorrelation is given as:

$$I = \frac{n}{S_0} \frac{\sum_{i=1}^{n} \sum_{j=1}^{n} W_{i,j} Z_i Z_j}{\sum_{i=1}^{n} Z_i^2}$$

where z_i is the deviation of an attribute for feature *I* from its mean $(x_i - \overline{X})$, $w_{i,j}$ is the spatial weight between feature *i* and *j*, *n* is equal to the total number of features, and S_0 is the aggregate of all the spatial weights:

$$S_0 = \sum_{i=1}^{n} \sum_{j=1}^{n} W_{i.j}$$

The z_I-score for the statistic is computed as:

$$z_I = \frac{I - E[I]}{\sqrt{V[I]}}$$

where:

$$E[I] = -\frac{1}{n-1}$$

$$V[I] = E[I^2] - E[I]^2$$

C. Data collection

Quantitative method is used in this research in order to explain for certain phenomenon from the numerical result. Besides, this research mainly relies on secondary data from Tourism Melaka and Tourism Satellite Account 2015 which were obtained from DOSM (Department of Statistics Malaysia). The distance, longitude and latitude were gathered from OSS (Open Source Software) like Google Map.

IV. RESULTS AND DISCUSSION

A.Visualization analysis

The secondary data will be study and analysis to ease the visualization process. The tourist hot spot is identified and located its position from its address. The researcher uses the longitude and latitude of the tourist hot spots from the address through the application of latlong.net. From the longitude and latitude reading the tourists hot spot can be plotted out in the map for the visualize purpose. The data is shown in the Table 1 and the tourist hot spots is then visualized on the Google My Map as shown in Fig. 1.

From Fig. 1 reveals that those tourist hot spots are linked with the line to the green spot which is Masjid Tanah as the focus of this research. After the visualization on map, researcher identified the distance from each tourist hot spot towards Masjid Tanah. The distance data is tabulated in table 2. The reading is tabulated in the form of distance travel and Euclidean distance for each tourist hot spot as shown in Fig. 1.

Table 1: Latitude and longitude reading of tourist hot spots in Melaka

Tourist hot spots	Latitude	Longitude
Melaka River Cruise	2.207829	102.2518
Perzim (Muzium)	2.193169	102.2487
Menara Taming Sari	2.190836	102.2471
Water World	2.442089	102.2106
Animal World Safari	2.442089	102.2106
Cowboy Town	2.445803	102.208
Memorial Kemerdekaan	2.191919	102.2509
Zoo Melaka (Siang & Malam)	2.231637	102.2824
Melaka International Bowling	2.273003	102.2872
Air Panas Jasin	2.290546	102.376
Mealaka Wonderland	2.280863	102.2945
Taman Buaya Melaka	2.27693	102.2978
Melaka River Pirate's Park	2.192567	102.2466
Hutan Rekreasi Tanjung Tuan (P)	2.412256	101.8559
Muzium Baba & Nyonya	2.195338	102.2467
Air Panas Gadek	2.408638	102.2389
Taman Rama-Rama	2.299667	102.3113
Melaka Duck Tours	2190809	102.2475
Taman Mini Malaysia & Asean	2.282455	102.3038
Balai Cerap Al-Khawarizmi	2.294631	102.084
Melaka Planetarium	2.271439	102.287
Melaka Bird Park	2.285601	102.296
Muzium Penjara	2.188535	102.2628
Melaka Tropical Fruit Farm	2.290949	102.1311
Kampung Buku Malaysia	2.284929	102.2983
Muzium Budaya Cheng Ho	2.195076	102.2485
Taman Botanikal	2.278781	102.2973
Villa Sentosa	2.302257	102.1304
Macoa Gallery Melaka	2.20252	102.2514
Hutan Rekreasi Sg. Udang	2.221363	102.2555
Hutan Rekreasi Bukit Batu Lebah	2.280702	102.3006

Fig. 1: Map plotted with tourist hot spot towards Masjid Tanah

Table 2: Distance travel and Euclidean distance from tourist hot spot to Masjid Tanah

Tourist hot spots	Travel Distance (km)	Euclidean Distance (km)
Melaka River Cruise	29	25.29207
Perzim (Muzium)	31	23.476337
Menara Taming Sari	31	23.55762
Water World	24	14.093053
Animal World Safari	23	14.411752
Cowboy Town	25	15.113125
Memorial Kemerdekaan	32	23.74403
Zoo Melaka (Siang & Malam)	32	23.4614
Melaka International Bowling	28	21.683736
Air Panas Jasin	44	30.482495
Mealaka Wonderland	29	22.096105
Taman Buaya Melaka	29	22.599675
Melaka River Pirate's Park	29	23.375437
Hutan Rekreasi Tanjung Tuan (P)	39	28.915706
Muzium Baba & Nyonya	30	23.15323
Air Panas Gadek	19	15.74067
Taman Rama-Rama	30	23.248179
Melaka Duck Tours	31	23.586375
Taman Mini Malaysia & Asean	31	23.013314
Balai Cerap Al-Khawarizmi	9.5	6.95074
Melaka Planetarium	28	21.730244
Melaka Bird Park	30	22.071062
Muzium Penjara	32	24.91841
Melaka Tropical Fruit Farm	8.8	7.216648
Kampung Buku Malaysia	30	22.339231
Muzium Budaya Cheng Ho	31	23.304185
Taman Botanikal	32	22.473166
Villa Sentosa	29	22.924283
Macoa Gallery Melaka	29	21.807012
Hutan Rekreasi Sg. Udang	7.3	6.025224
Hutan Rekreasi Bukit Batu Lebah	32	22.745411

B. Global Moran and Local Moran, I statistics analysis

After the distance data is being identified, the distance and the weight matrix which is neighborhood region are used to test the statistical significant of spatial interdependence towards Masjid Tanah. Hence, researcher identified the tourist spillover effect. Specifically, the researcher assessed the value of the Global Moran and Local Moran, *I* statistics in the relation to the total number of tourists visit to tourist hot spot in Melaka state in 2016 as well as identified the occurrence spatial autocorrelation of the variable in Melaka state towards Masjid Tanah.

C. Global Moran, I

For the Global Moran *I*, it's including concern of the distance hence the latitude and longitude table is combined with the number of tourists visit to the tourist hot spots in Melaka state. The weight inside model is decided by the neighborhood. From the map has shown that Melaka districts' boundaries is touched and linked. So this shown that the weight is always 1. The analysis is undergone using RStudio software.

Below is the output of RStudio for the Global Moran *I* analysis:

$observed
[1] 0.01002383
$expected
[1] -0.03333333
$sd
[1] 0.05424147
$p.value
[1] 0.4240956

Since the observed value is 0.01002383 which represent the computed Global Moran I. The expected value of Moran *I* under null hypothesis is -0.03333333. Standard deviation value of Moran *I* under null hypothesis is 0.05424147. P value of the test is 0.4240956. This indicate that no clustering happened which the tourist will visit tourist hot spot randomly.

D. Local Moran I

The data of number of tourist visit is the variable which relate with Local Moran *I*. The formulas of local Moran *I* static is implemented and processed using Microsoft excel. The Local Moran *I* = 0.283241, Z-score is 1.128 while p-value is 0.13. The result indicates that there is similar value between features and surrounding features. In other words, there is a similarity that tourist visit Melaka hot spot will also visit Masjid Tanah.

V. CONCLUSION

This research determines the urban tourist spillover effect towards rural area which in this research is Masjid Tanah, Melaka. The tourist spillover effect is tested using the Moran model since that Moran model concerned about the clustering region. From the results, Masjid Tanah as a rural area has the potential to develop in tourism sector and become a tourist attraction in Melaka. The reading shown that the tourists visit the tourist attractions in Melaka will also visit to Masjid Tanah. This result encourages the local community to involve tourism activity since the tourist spillover effect happen in Masjid Tanah. But there are others factor can bring effect to the development of the tourism of a certain area. Therefore, further study and planning is necessary.

This research reveals that, 31 tourist hot spots are identified in Melaka. These tourist hot spots were listed in the report of Tourism Melaka 2017 with the head count of the tourist arrival.

Based on the table 3, the maximum Euclidean distance for the tourist hot spots is 30km. A 30km radius of circle is drawn on the map where all of the tourist hot spots included inside the circle. This result reveals that all the administrative districts of Melaka are link to each other as a neighborhood.

Since the tourists visit tourist attractions randomly that do not follow the region and the tourists visit Melaka's tourist attractions will also visit to Masjid Tanah. This is the tourist spillover effect happened in the nearby region exert to Masjid Tanah.

From the result, it can conclude that Masjid Tanah has the potential to be developing as the next tourist attractions in Alor Gajah, Melaka. In the same time, tourism development can boost the economy growth in Masjid Tanah by creating more employment apart from agriculture sector, diversify the income of the local citizens as well as encourage them to involve in entrepreneurship such as accommodation, food and beverage. The tourism developments in rural area enable the sustainable growth of economy and improve the living standards of the local citizens where the distribution of household income in Alor Gajah can be increase as well.

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