Applying GIS For Assessment Of Resident's Attitudes Toward Tourism In World Heritage Halong Bay, Vietnam

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Abstract: In this paper, we used questionnaires which were designed according the 5 Likert scale to gather informations about the resident's attitudes (400 samples) towards tourism development in the study area. Next step, we used SPSS to analyze the survey data, and verify the reliability of the samples. Finally, we used GIS as a suported tool to analyse the spatial distribution of resident's attitudes towards tourism development. The result showed that urban communities had more negative attitudes toward tourism development than rural communites.

Keywords: Community tourism, Assessment tools, Heritage tourism, Sustainable tourism, GIS Applied, Resident attitudes

1. Introduction

Almost of tourism's researcher strongly believed in good relationships between local residents and tourists are necessary for long term tourism development [1]-[3]. Consequently, the study of resident's attitudes in relation to tourism development has attracted the attention of the scientific community [5], [6], [7], [8], [11], [15], [17], [16], [20],[21]. Almost of this field studies have used the sociological survey method (questionnaire interviews, in-depth interviews) to collect information on local resident's perception, attitudes toward the positive and negative impacts of tourism. Based on that information, there are three major problems that researchers care about: firstly, analyzing the relationship between resident's attitudes and their demographic characteristics (age, education, sex, job, length of residency…) [13], [15], [16] …; secondly, analyzing the relationship between resident's attitudes and perceptions and level of tourism development [5], [8], [11], [21] …; thirdly, analyzing the relationship between attitudes and perceptions of local resident and their residence distance from the tourism core [7], [20] …The spatial distribution of resident's attitudes within a destination in this field studies becomes very important for proposing policies and solutions for effective and sustainable tourism development [7], [10], [12], [20], [22]. However, the previous studies which focus on this problem used space of residence units that was divided by subjective desire of authors or administration boundary (regional, town or neighborhood units) to compare attitudes and perceptions of host community between different regions (subregions of residence).   This may be the cause of conflicting results, when Pizam [19], Williams and Lawson [22], Harrill [10] and Devine et al [7] indicated that residents who live close to the core of tourism activity have more negative attitudes towards tourism development than who live further away. Contrastly, Pearce (1980), Sheldon & Var (1984), Korca (1998), Belisle and Hoy (1980) have found that residents living close to the tourism core have more positive attitudes toward tourism (cited as [20]). Infact,

resident's attitudes have been confounded by economic dependency [10], the level of experience in tourism [11]… Therefore, if we only used the residence distance to determine the spatial distribution of resident's attitudes may be lack of exactly.Infact, the investigation of resident's attitudes has only done with limited samples so the spatial distribution of resident's attitudes need to the support of suitable technology. In attempts to find solutions to this problem, scientists have used the support of GIS [12], [20], however, these previous results have just stopped at the mapping of resident's attitudes by research points which not yet outlined boundaries to divide research region into different attitude areas. We considered this paper as a next step following from in the previous direction of GIS application of Inbarakan et al (2006) và Raymond và Brown (2007). This research has used two main research methods. Firstly, questionares are used to gather informations from 400 residents of Halong bay area. After procssed (by SPSS), data survey was used to analyze level of resident's attitude toward tourism development. Secondly, we have used to suport of GIS to regional resident's attitude in Halong bay.

2. Study area, research methodology and research data

2.1. Study area

The study area is the entire administrative territory of Ha Long City and the sea areas of Ngoc Vung, Cong Dong and Cong Tay islands (Van Don District, Quang Ninh Province) that belong to the buffer zone of world heritage. It is located at the northeast marine of Vietnam, where far from Hanoi around 180 km in northeast. Total area is about 887 km2 (the water surface is about 67.4%) with a population of 242,000 in 2017. The average population density was 862 inhabitants /km2 [20]. There are 16 ethnic groups in this area, including the King, San Diu, Hoa, Tay, Nung, Han, Dao, Tho, Muong, Van Kieu, Cao Lan, San Chi, Thai, Pako, HMong, Thanh Y.

Kinh makes up the largest ethnic group at 90% of the population.

Halong city is the administrative and political center of Quang Ninh province, also known as an industrial city, gross output by industry and contruction (constant 2010 prices) was 43,049 billion VND (2.3 billion USD) by 2016 and contributed 69,9% to city's overall economy. While service sector contributed 29,5% and agriculture sector contributed 0,6% into gross output of this city. In 2016, there are 6.14 million tourists arrived to Ha Long city (2.62 million inbound tourists), revenue from tourism reaches 30,000 billion VND (1.5 billion USD) [20].

2.2. Research Methodology

In this report, we have used three main methodologies to achieve study objectives.Firstly, the traditional survey questions (questionnaire) was used to collect information from a random sample of 400 residents in research area. This questionnaire includes 12 items which were designed to measure the respondent's degree of agreement or dissagreement with various statements designed to assess attitudes toward tourits and tourism development. The responses were scored on a five-point Likert scale ranging from 0 for "strongly disagree" to 4 for "strongly agree." The questionnaire was built upon the scale (TIAS scale) of Perdue et al [18] and Lankford and Howard [13] consisted of six sections, included 2 statements and described as follows.

Section 1 was developed to measure level of the expectations of the host residents toward generating jobs from tourism development.

(III) - Tourism development Will Increase employment opportunities in your community;

(IV) - Employment from tourism are suitable for pepole in your community;

Table 1: The matrix of pairwise comparisons

Item	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Weight
I	1	1/3	1	1/3	1	1/5	1	1	1/3	1/7	1/3	1/3	0.0296
II	3	1	3	1	3	1/3	3	3	1	1/5	1	1	0.0806
III	1	1/3	1	1/3	1	1/5	1	1	1/3	1/7	1/3	1/3	0.0296
IV	3	1	3	1	3	1/3	3	3	1	1/5	1	1	0.0806
V	1	1/3	1	1/3	1	1/5	1	1	1/5	1/7	1/3	1/3	0.0285
VI	5	3	5	3	5	1	5	5	1	1/3	1	1	0.1379
VII	1	1/3	1	1/3	1	1/5	1	1	1/5	1/7	1/3	1/3	0.0285
VIII	1	1/3	1	1/3	1	1/5	1	1	1/5	1/7	1/3	1/3	0.0285
IX	3	1	3	1	5	1	5	5	1	1/3	1	1	0.1051
X	7	5	7	5	7	3	7	7	3	1	3	3	0.2684
XI	3	1	3	1	3	1	3	3	1	1/3	1	1	0.0877
XII	5	1	3	1	3	1	3	3	1	1/3	1	1	0.0951
RC= CI/RI = 0.031/1.5356 = 0.0202; RI (n=12)= 1.5356 0													

the host residents toward tourism development.

(X) - You will NOT agaisnt to buid new tourism facilities ;

(VII) - Building Infrastructure to service local community is NOT more important than for Tourism Development;

Beside the main 12 above items, key background information from the respondents was also included. The collected data were analysed using SPSS software (Cronbach's Alpha = 0.946.). Secondly, we have used integrated assessment method to classify resident attitudes into four level inculuded strongly positive, posivtive, less Positive and negative for tourism development in Halong bay area. The first step, the mean score of each sample toward tourism development was calculated by following formula:

$$Mh = \sum_{i=I}^{XII}(f_i * W_i) \qquad (1)$$

Where Mh is the mean score of hth sample; fi is the score of ith item (the score ranged from 0 - 4 point Likert's scale) in hth sample; Wi is the weight of ith item which was built upon Analytic Hierarchy Process (AHP) method. In order to determine factor weights (wi), ten experts, who include two tourism researchers, two psychologists, two social researchers, two tourism administrative managers, two tourism operators, were interviewed to contruct the matrix of the ratios of all weights (table 1).The second step, the ladder mean score was divided into four degree of attitude that is presented in table 2.

$$\Delta M = \frac{M_{max} - M_{min}}{4} \qquad (2)$$

Where ΔM is the interval among the degree of attitude, Mmax and Mmin the maximum and minimum score of each sample.

Table 2: The degree of attitude

Degree of Attitude	Means value (M)
Strongly Positive	$3 < M \leq 4$
Positive	$2 < M \leq 3$
Less Positive	$1 < M \leq 2$
Negative	$M \leq 1$

Thirdly, we used GIS (Arcgis) to analyse the collected data followed spatial territory method. As mentioned earlier, as apart of data collection, the postiotion of responses was determined by GPS (X - coordinate, Y- coordinate). All field data (spatial and attribute information) were entered into arcgis to creat single map of residents attitude for each item (12 maps) which was supported by Inverse Distance Weighting algorithm (IDW tool in Arcgis). This maps show the spatialization of resident's attitude for each item in questionare. After that, these 12 single maps were overlayed to produce a integrated map of residents attitudes showing areas available for tourism development in research area by degree of residents attitudes.

2.3. Research Data

We employed Yamane's formula (Taro Yamane, 1967) to calculate the sample size:

$$n = \frac{N}{1 + N(e^2)} \qquad (3)$$

where n = sample size, N = population, e = error tolerance (in this report is 5%).

The average population of the research area is 242,000 people in 2017 that came from statistics of Quang Ninh Provincial People's Committee. Therefore, the appropriate number of completes will be 400.Sampling methods: we

used random sampling to select respondents for this survey. The demographic profile of the respondents is as follows (table 3).

Table 3: The demographic profile of the respondents

Demographic	Category	Respondents	
		%	Person
Gender	Male	59.3	237
	Female	40.7	163
Age	<18 years old	4.3	17
	18-25 years old	18.3	73
	26-35 years old	24.5	98
	36-45 years old	22.3	89
	46-55 years old	14	56
	56-65 years old	48	48
	older 65 years old	19	19
Education	Primary education	7.3	29
	Intermediate education	64.3	257
	Tertiary or Postgraduate	28.4	114
Occuptions	Agricultural laborers group	25.8	103
	Officer group	12.3	49
	Soldier and police group	2.8	11
	Private services group	35.5	142
	Retied group	21.3	85
	Other	4	4
Length Residence	Over 15 years	59.3	300
	10 to 15 years	15	60
	less than 5 years	10	40

Map data: the background map of research area is based on the Topographic map of Quang Ninh province with a scale of 1: 50,000.

3. Result and Discusstion

3.1. Economic benefits expectations

The expectations of economic benefits of host community was measured by two items (figure 1 and figure 2). The analysis of data survey showed that 21.5% of respondents were strongly agree with statement of Tourism Development will Increase the Standard of Living in Your Community, 50.0% were in agree, 23% were in neutral and only 5.6% were in disagree and strongly disagree. 22.0% of respondents were strongly agree that participation in tourism will increase their income, 54.0% were in agree, 15% were in neutral, 8.5% were in disagree and strongly agree.
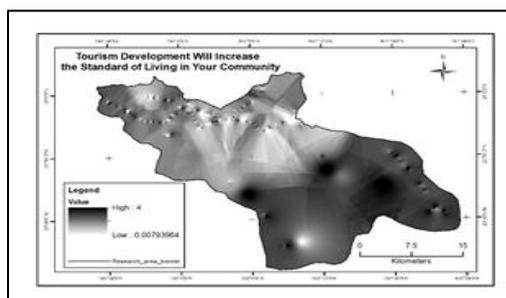

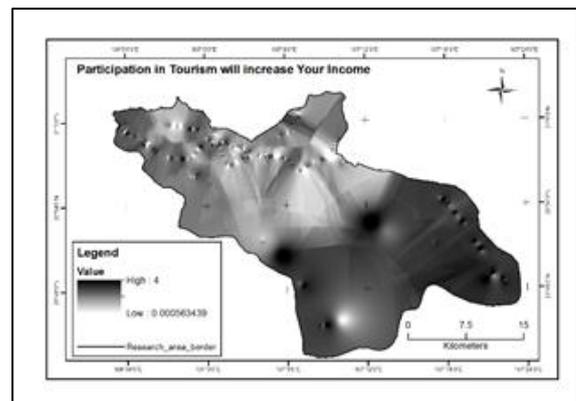**Figure 1:** The expectations toward the Standard of Living

Figure 2: The expectations toward the income

3.2. Career Expectations

This degree of attitude is measured by two items (The spatial distributive resident's attitude in this section was presented in figure 3 and figure 4) and analysis results point out that 36.0% of respondents were strongly agree with statement of tourism development will increase employment opportunities in your community, 30.8% were in agree, 23% were in neutral and only 10.3% were in disagree and strongly disagree. 31.5% of respondents were strongly agree that employment from tourism are suitable for pepole in your community, 35.3% were in agree, 27% were in neutral, 6.3% were in disagree and strongly agree..
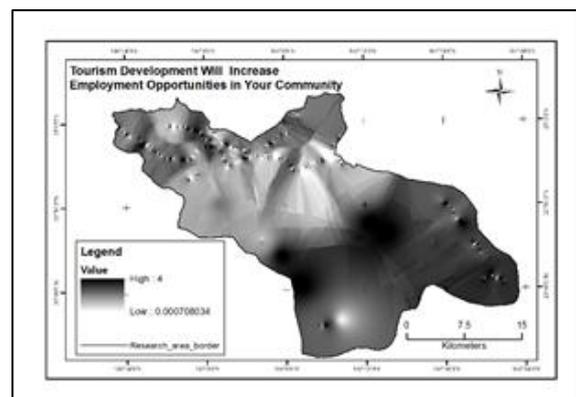

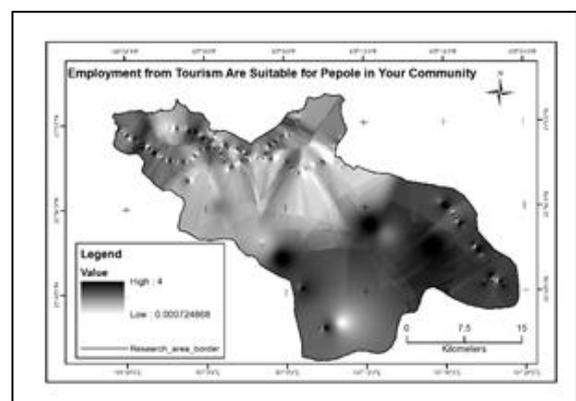**Figure 3:** The expectations toward employment opportunities

Figure 4: The expectations toward suitable employment

3.3. The Acceptance of Tourism Development

The acceptance of host community toward tourism development was measured by two items (The spatial distributive resident's attitude in this section was presented in figure 5 and figure 6). The analysis of data survey showed that 19.0% of respondents were strongly agree with statement of tourim will play major economic role, 27.8% were in agree, 38.3% were in neutral, 13.8% were in disagree and only 1.3% were in strongly disagree. 42.3% of respondents were strongly agree that You willing to participate in tourism sector, 18.5% were in agree, 29.8% were in neutral, 9.5% were in disagree and strongly agree.

3.4. The Expectance Toward Utilities

This degree of host community toward utilities from tourism development was measured by two items (The spatial distributive resident's attitude in this section was presented in figure 7 and figure 8). The analysis of data survey showed that 18.8% of respondents were strongly agree with statement of shopping opportunities are better when tourism development, 35.0% were in agree, 41.5% were in neutral, 4.8% were in disagree and strongly disagree. 16.5% of respondents were strongly agree that tourism development will not decrease recreation opportunities of local resident, 57.5% were in agree, 21.0% were in neutral, 5.1% were in disagree and strongly agree.

3.1.   The anxieties

The anxieties of the host resident toward impacts of tourism development was measured by two items (The spatial distributive resident's attitude in this section was presented in figure 9 and figure 10). The analysis of data survey showed that 9.5% of respondents felt anxious about negative environmental impacts from tourism, 40.3% were in neutral,

Figure 7: The expectance of shopping opportunities

Figure 8: The expectance of shopping opportunities

50.3% have not felt anxious. The familiar results were given in statement of "Tourism Development will NOT to increase Crime in your Area" 21.0% were in strongly agree, 31.5% were in agree, 40.5% were in neutral and only 7.0% were in disagree and strongly disagree.
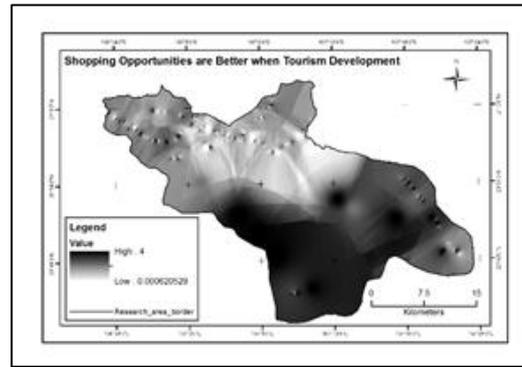

Figure 5: The expectations tourism development
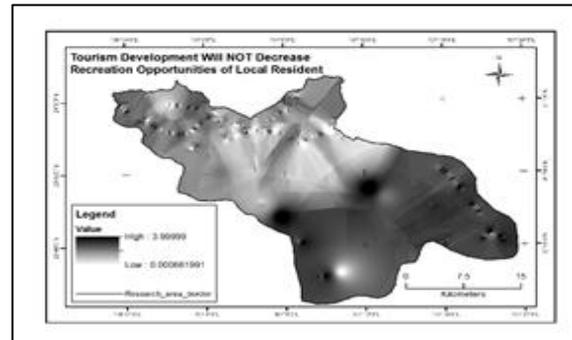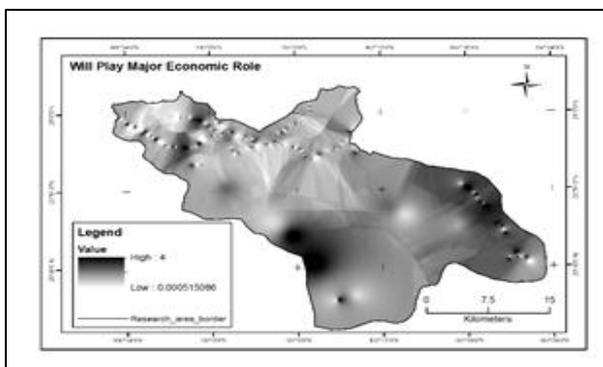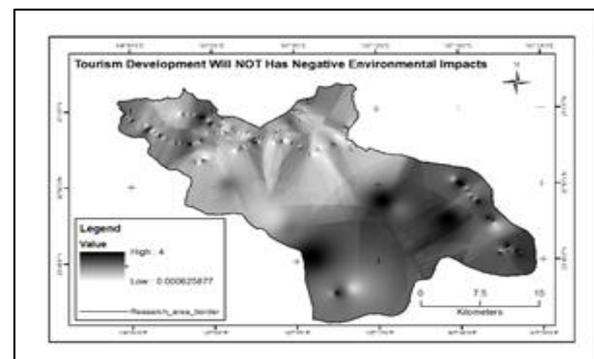

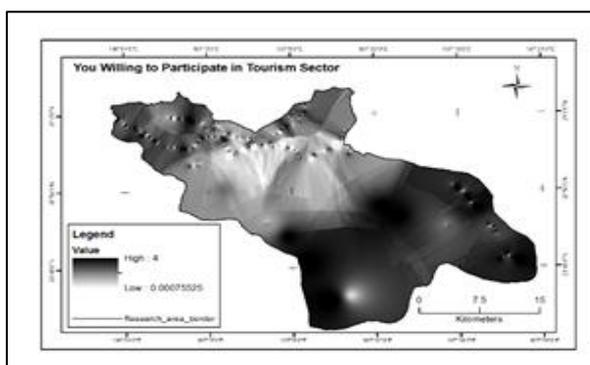**Figure 9:** The anxieties toward environment impacts

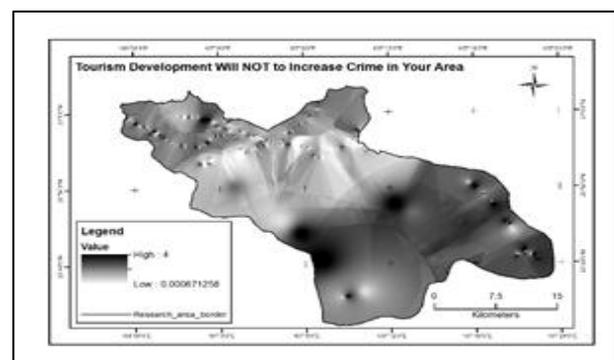

Figure 6: The willing to participate

Figure 10: The anxieties toward crime

3.2. The Level of Opposition

The level of opposition of the host residents toward tourism development was measured by two items (The spatial distributive resident's atttude in this section was presented in figure 11 and figure 12). The analysis of data survey showed that 21.3% of respondents agreed that building infrastructure to service local community is more important than for tourism development. 53.8% have contrary views on this statement and 25% were in neutral. However, with the statement of "You will NOT agaisnt to buid new tourism facilities" over half of respondents (53.3%) have neutral attitude while only (6%) of the studied sample have negative attitude, and those who have positive attitude represent 40.6% of the sample.

3.1. The resident's attitude toward tourism development

The mean scores of 12 items of the respondent's attitudes toward tourits and tourism development were examined. The highest mean scores were identified in section 1, including: III) Tourism development Will Increase employment opportunities in your community (M =2.91); IV) Employment from tourism are suitable for pepole in your community (2.90); While the lowest mean scores were found in section 3 (V- WiIl play major economic role (M = 2.50)) and section 6 (X-You will NOT agaisnt to buid new tourism facilities (M = 2.55)). Althought the result of resident's attitude assessment presented that almost local people have a positive attitude of toward tourism development, there are 53.3% of studied samples were in neutral when asked for the ability agaisnt to buid new tourism facilities. This reflected their doubts as well as the degree of uncertainty about the benefits or damages from tourism development.
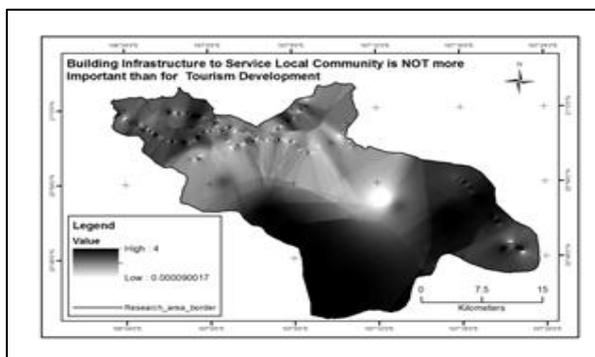
The spatial distributive resident's atittude toward tourism development in study area was calculated by formula (1) which was supported by Raster Calculator tool in Arcmap:

$$(Float("item1") * 0.0296 + Float("item2") * 0.0806 + Float("item3") * 0.0296 + Float("item4") * 0.0806 + Float("item5") * 0.0285 + Float("item6") * 0.1379 + Float("item7") * 0.0285 + Float("item8") * 0.0285 + Float("item9") * 0.1051 + Float("item10") * 0.2684 + Float("item11") * 0.0877 + Float("item12") * 0.0951)$$

The spatial analysis result (figure 13) found that rural communities who live far from the core of tourism activity had more positive attitudes. Conversely, urban communities who live close to the core of tourism activity had more negative attitudes toward tourism development. In terms of administrative territory, local people living in island communes (Ngoc Vung, Thang Loi), floating villages and Dai Yen ward have the most positive attitude toward tourism development. The remaining communities inculude people living in center wards (Bai Chay, Hong Gai, Hong Ha…) had more negative attitudes toward tourism development.

4. Conclude

These results suggest that GIS is an effective support tool for spatial analysis of the resident's attitude towards tourism development in particular and socio-economic issues in general; Urban communities had more negative attitudes toward tourism development than rural communites; The tourism development plans in future need to take the spatial distributive resident's attitude as an important basis for organizing tourism territory.
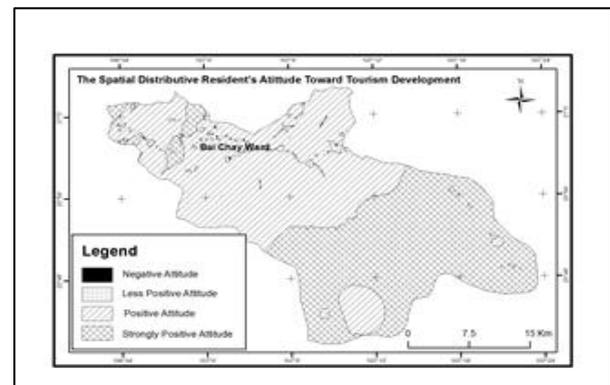

Figure 11: The level of opposition toward building tourism infrastructure

Figure 13: The level of resident's attitude toward tourism development

In addition, from these results we can assumption that resident's attitudes towards tourism may dependent on the socio-economic geographic characteristics of the regions. Therefore, we can building a forecasting model of degree of attitudes towards tourism by using macro-economic statistics indicators.

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Figure 12: The level of against toward building tourism infrastructure

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