Tourist Behavior of Plastic Waste Reduction in the Coastal Area of Trang Province, Thailand

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***Abstract*—The objective of this study is to estimate the tourist behavior of plastic waste reduction in the coastal area of Trang Province, Thailand. 316 tourists (153 male, 163 female) traveling in the five districts along with the coastal area were included as the participants in this study. The results showed that 57 % of the tourists were found to be good behavior. Amongst 14 variables in statistic analysis, knowledge was found as significant predictor after adjusting in full model of multiple logistic regression. The knowledge compain of plastic waste reduction ought to be promoted to increase of awareness among tourists for reducing plastic waste problem in the coastal area at early age. A greater emphasis must be placed on formulation and implementation of policies aimed at addressing the emerging problems of plastic waste in the costal area of Thailand.**

***Index Terms*—Tourist behavior, plastic waste reduction, coastal area, Thailand.**

I. Introduction

Over the past decades, plastic consumption has increased exponentially and leaded to parallel growth in mismanaged plastic waste [1], [2]. It is almost completely non-degradable and fragmented into microplastics in the marine environment [3], and as evidence of its hazards increases [4], greater attention is required to address this problem [5]. Trotter *et al*. [6] mentioned that plastic waste has direct negative effects on animals such as reduced growth rate, fecundity or life span. However, the indirect effects of plastic waste, which has the ability to sorb chemicals from the surrounding media, on chemical communication have yet to be investigated. Its impact is of global significance, and the threats posed by marine litter to humans and the environment have been recognized for around 58 years [7]. However, despite its importance, it has only gained real recognition during the past few years.

Presently, the plastic waste issue is a problem that has grown out of hand. Its costs to society and marine environments are immeasurable and irreversible. Its impact encompasses local, regional, national, and global scales and includes adverse effects on human health, aesthetics, the economy, public perception and and biologic interactions [8]. It can have land-based (e.g., direct from rivers and beaches, which is where the bulk comes from) as well as sea-based sources (e.g., waste disposal from shipping, oil rigs) [9]. Lebreton *et al*. [10] compiled the International Coastal Cleanup results as 'Shoreline and recreational activities' comprised 57%, 'Ocean and waterway activities' 6%, and the other 3 sources like 'Smoking activities' 37%. Based on the assessment that marine debris is rapidly accumulating in the center of the oceans, it is important to reduce solid waste inputs into the sea.

Trang Province locates in the Southern part of Thailand with approximately 119 kilometers of 5 districts for costal area. According to the data on tourist profile by the end of 2016, the tourist number and revenue are the third and fourth orders of Southern part of Thaliand, respectively [11]. From the report of Trang Provincial Administrative Organization [12] reported that more than 240,621 tons of total solid waste was generated in 2017. The low efficiency of solid waste management including separation, collection, transportation processes was presented in Trang province. Hence, there are the high chance of being able to enter the beach and the sea.

The transformation of a region into a tourist destination causes changes in socio-spatial relationships, leading in many situations to the disfigurement of natural landscapes and environmental degradation. Silva *et al*. [13] indentified that the lack of education of the tourists and beaches users, who throw away the garbage produced by them on the sands of the beaches. The educational efforts such as signs at the entrance of the beaches, educational campaigns on a local or national scale, beach-cleaning activities to reduce the waste; increase the cleaning frequency on beaches; strengthen law enforcement in coast areas; reduce the use of disposable items on the coastal area should be recommenced [14], [15].

This study was to evaluate the tourist behavior of plastic waste reduction in the coastal area of Trang Province, which is the one of the many tourist coastal area of Thailand. Firstly, the plastic waste reduction of tourist behavior in five district of coastal area in Trang province was to explore. The association and best predictor of tourist behavior for plastic waste reduction were investigated by logistic regression and multiple logistic analyses, respectively.

II. Material and Methods

A. The Study Area

Data for this research was collected by developed questionnaire focusing on plastic use reduction among Thai

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tourists in the coastal area of Trang Province, Thailand. Five districts in the coastal area of Trang Province including Sikao, Kantrang, Yan Ta Khao, Hatsam ran and Palian were included as the study area. Fig 1 shows a map of the coastal area of Trang Province, Thailand. The data based on the developed questionnaire was collected during March –May 2019 after approving by Committee for Research Ethics, Mahidol University (COA. No. 2019/122.2105). A total of 316 respondents were included in this study. The target population in this study was the tourist in five districts of the coastal area of Trang Province. Tourists completed a questionnaire through face to face interview. Likewise, simple random sampling was used to select 316 tourists from each district.

Fig. 1. A map of the coastal area of Trang province, Thailand.

B. Questionnaire

Structured questionnaire based on the literature review was used in the study. This questionnaire was divided in four parts; demographic characteristics; knowledge of plastic waste reduction; altitude of plastic waste reduction; and behavior of plastic waste reduction. Tourist behavior of plastic waste reduction and predictor factor were determined. Reliability tests for the attitude part gave a value of 0.65 for Conbach's Coefficient-Alpha.

C. Data Management and Statistical Analysis

The results are described by means of central tendency for each variable. In addition, the associations between behaviors of plastic waste reduction with independent variables were analyzed by chi-square tests. In addition, the independent variables with a p-value < 0.25 in bivariate analysis were included in the full model of multiple logistic regressions along with their 95% confidence interval. All the analysis was performed by using IBM SPSS V 20.

III. Result and Disscussion

A. Characteristic of Tourist

Acorrding to the data from the questionaires (Table I), more than 51 % of tourists in this area were female. The majority of tourtists (46.8 %) were bachelor degree and above for education background. Most of them (60.1%) were in the married status. More than 27.5 % of tourists have the own business with more than 15,000 Baht (27.8 %) for monthly income. Concerning the residency profile, over 60 % of tourists were stayed in this province with third time visit (28.5 %). The main propose (58.9 %) of visit from tourist were leisure with one day trip (66.1 %). Most tourist involvement and motivation in this province on the plastic reduction were reduce plaster used (41.1%) and community commend (44.9 %), respectively

TABLE I: Demographic Information of Participants (*N*=316)

Items	Number	Percent
Sex		
Male	153	48.4
Female	163	51.6
Education		
No school	1	0.3
Primary school	57	18.0
Secondary school	110	34.8
Bachelor and above	148	46.8
Status		
Single	106	33.5
Married	190	60.1
Divorce	18	5.7
Widow	2	0.6
Items	**Number**	**Percent**
Occupation		
Own business	87	27.5
Employee	75	23.7
Farmer	49	15.5
Government officer	38	12.0
Private office	43	13.6
Housewife	10	3.2
Student	14	4.4
Income (Baht)		
Less than 5000	25	7.9
5000-7000	55	17.4
7000-10000	81	25.6
10000-15000	67	21.2
More than 15000	88	27.8
Residency		
In Trang	193	61.1
Outside Trang	123	38.9
Number of Visit		
Several time	82	25.9
First time	58	18.4
Second time	85	26.9
Third time	90	28.5
Fourth time	1	0.3
Trip purpose		
Natural tour	68	21.5
Leisure	186	58.9
Eating	22	7.0
Diving	26	8.2
Duration		
One day trip	209	66.1
Stay overnight	56	17.7
Two nights	47	14.9
More than 2 night	4	1.3
Involvement		
Reduce plaster used	130	41.1
Proper dispose	64	20.3
Purpose the suggestion	21	6.6
Reduce plaster used and proper dispose	37	11.7
Proper dispose and purpose	51	16.1

the suggestion		
Reduce plaster used and purpose the suggestion	13	4.1

Items	Number	Percent
Motivation		
Commend	40	12.7
People commend	17	5.4
Community commend	142	44.9
Reward	10	3.2
Punishment	174	55.1

B. Knowledge, Attitude and Behavior of Plastic Waste Reduction

Table II indicated the level of knowledge, attitude and behavior for plastic use reduction of tourist. Most of tourist (60.1 %) has the poor knowledge of plastic waste reduction. The good attitude for plastic waste reduction was found in the more than 76 % of tourist in this province. For plastic waste reduction behavior, 57.0 % of tourist was good behavior. For statistical analysis (Table III), tourists who were high knowledge had a good behavior for plastic waste reduction. Multiple logistic regression analysis revealed that high knowledge tourist was 5.6 times more likely to good behavior for plastic use reduction (Adj. OR 5.676; 95% CI: 3.36-9.58). Among the reasons for the lack of behavior change are, influencing knowledge of environmental issues, but also enhancing visitor experiences and thus their satisfaction [16]. It has only been in recent years that the power wildlife tourism has to affect change and the assumption of attitudes leading to behavior change in this sector have been recognized, in particular that a general attitude about a thing has been proven in numerous studies to not lead to specific behaviors. Further, it is now recognized that interpretive and educational experiences provided to tourists will not change behaviors "unless a specific behavior is explicitly targeted and communication is designed to address attitudes relevant to that behavior" [17].

TABLE II: LEVEL OF KNOWLEDGE, ALLTITUDE AND BEHVIOR OF PLASTIC WASTE REDUCTION

Items	Number	Percent
Knowledge		
Poor	190	60.1
Good	126	39.9
Attitude		
Poor	74	23.4
Good	242	76.6
Behavior		
Poor	136	43.0
Good	180	57.0

TABLE III: ASSOCIATION AND PREDICTION WITH PLASTIC WASTE REDUCTION

Items	Behavior level				COR	95% CI		P value
	Poor		Good			Lower	Upper	
	n	%	n	%				
Age								
Below 34	60	40.8	87	59.2	1			
Over 34	76	45.0	93	55.0	0.844	0.540	1.320	0.457
Sex								
Male	65	42.5	88	57.5	1			
Female	71	43.6	92	56.4	0.957	0.613	1.495	0.847
Education								
Lower than bachelor	86	43.0	114	57.0	1			
Bachelor and higher	50	43.1	66	56.9	0.996	0.627	1.580	0.986
Status								
Single	62	49.2	64	50.8	1			
Couple	74	38.9	116	61.1	1.519	0.963	2.394	0.072
Occupation								
Regular income	76	48.7	80	51.3	1			
Irregular income	60	38.2	97	61.8	1.536	0.980	2.408	0.061
Level of Income								
10000 or less	69	42.9	92	57.1	1			
More than 10000	67	43.2	88	56.8	0.985	0.631	1.538	0.947
Resident								
In Trang	86	44.6	107	55.4	0.852	0.539	1.348	0.494
Outside Trang	50	40.7	73	59.3	1			
Number of visit								
Several time	28	48.3	30	51.7	1			
Few times	69	39.2	107	60.8	1.281	0.773	2.124	0.337
Trip purpose								
Leisure	76	40.9	110	59.1	1.241	0.789	1.950	0.350
Other	51	54.3	43	45.7	1			
Duration								
One day trip	90	43.1	119	56.9	0.997	0.632	1.596	0.990
More than one day	46	43.0	61	57.0	1			
Involvement								

Yes	118	43.2	155	56.8	0.946	0.493	1.814	0.867
No	18	41.9	25	58.1	1			
Participation								
Positive strategies	57	40.1	85	59.9	1.24	0.798	1.943	0.348
Punishment	79	45.4	95	54.6	1			
Knowledge								
Poor	111	58.4	79	41.6	1			
Good	25	19.8	101	80.2	5.676	3.360	9.589	<0.001
Attitude								
Poor	32	43.2	42	56.8	1			
Good	104	43.0	138	57.0	1.011	0.598	1.710	0.967

It can be conclused that this study provides the foundation for high level of behavior for plastic waste reduction of tourist in Thailand. Hence, it confirms the strong perdictors of knowledge of plastic waste reduction with the behavior of plastic waste reduction among Thai tourists in the costal area of Trang provice, Thailand. The knowledge of plastic waste reduction ought to be promoted to increase of awareness among tourists for reducing plastic waste problem in the coastal area at early age. A greater emphasis must be placed on formulation and implementation of policies aimed at addressing the emerging problems of plastic waste in the costal area of Thailand.

IV. Conclusion

The purpose of this study was to determine the level and predictor of behavior among Thai tourist for plastic waste reduction in the costal area of Trang province, Thailand. Five districts in the coastal area of Trang Province were included as the study area. The logistic regression and multiple logistic regressions were used to determine the association and the best predictor for plastic waste reduction among Thai tourists. The results performed that knowledge of plastic waste reduction were found to be the most significant predictors of good behavior.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Conceptualization, and methodology, C.R., ;data collection, P.S, T.T.S; data analysis, O.L.; writing, W.O.; funding acquisition, C.R.

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