RESIDENT SUPPORT FOR TOURISM AMIDST COVID-19 PANDEMIC IN BROMO TENGGER SEMERU NATIONAL PARK, INDONESIA: A CLUSTER ANALYSIS APPROACH

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ABSTRACT

National parks (NPs) have become a rapidly growing segment of nature-based tourist destinations. However, the COVID-19 pandemic has impacted tourism activities across Indonesian NPs. While existing studies have scrutinized the impact of COVID-19 on tourism, studies that focused on clustering residents adjacent of NPs to support tourism amidst the COVID-19 pandemic remain underexplored. To unveil how residents are clustered, we assess residents in Ngadisari and Wonokitri villages based on their distinctive opinions of perceived benefits (PB), perceived costs (PC), perceived health risks (PHR), and support for tourism (ST). Totally, 354 respondents were obtained. We found that residents are clustered into two clusters named tourism supporters and cautious supporters. Tourism supporters are identified by their high agreement on PB and ST, and low agreement with PC. In contrast, Cautious supporters hold lower agreement in PB and ST, and higher agreement on PC and PHR. Our findings revealed that residents are heterogeneous and constitute a distinctive group of opinions and interests. Therefore, the design of policies and interventions should be adjusted based on those clusters.

INTRODUCTION

In Indonesia, National parks (NPs) have become a rapidly growing segment of the nature-based tourist destination. In 2016, at least 5 million people visited 54 Indonesian NPs (KLHK, 2017). This coincides with the paradigm shift of NPs management, which plays a vital role in biodiversity conservation and providing environmental services (i.e., nature-based tourism). Nature-based tourism (NBT) considers playing a pivotal role in serving simultaneous economic, social, and ecological benefits toward its neighbouring communities (Nugroho & Numata, 2020; Sharpley, 2014, 2020). At this point, encouraging active involvement of adjacent communities of NPs in NBT management is among the top Indonesian government concerns (Wiratno, 2018). Nevertheless, earlier studies indicated that tourism is vulnerable to sensitive global issues, such as climate change (Scott et al., 2019), politics (Akadiri et al., 2020), and health (Kuo et al., 2008; Mckercher & Chon, 2004) , including the COVID-19 pandemic (Sigala, 2020).

Indeed, COVID-19 is a global health issue that significantly impacts society's political, economic, environmental, and sociocultural conditions (Chakraborty & Maity, 2020; Djalante et al., 2020; Nicola et al., 2020). It affects human activity patterns, which directly decreases destinations' global visitation patter (Brouder, 2020; Gössling et al., 2020). However, while the status of the COVID-19 pandemic in Indonesia remains fluctuating, the government has gradually made efforts to loosen community activities through a new-normal scheme. Since June 22, 2020, the Indonesian government has progressively relaxed strategic sectors, including tourism activities in NPs (PPID menlhk, 2020).

Earlier studies indicated that the relaxation period had increased visitation destinations, particularly for local destinations (e.g., Brouder et al., 2020; Hara & Yamaguchi, 2021; Jiricka-Pürrer et al., 2020). While increasing visitation would escalate local economic activities, it is simultaneously vulnerable to COVID-19 spreading in the tourist destination and surrounding communities. Given this scenario, while residents are keen on the benefits of tourism activities, they may have concerns about contracting the COVID-19 virus (Brouder et al., 2020; Joo et al., 2021; Qiu et al., 2020). Subsequently, these may determine their level of support of tourism activities in their area. Ultimately, understanding residents' opinions on how they consider benefits and costs of tourism, perceived health risks, and their level of support for tourism would be an essential basis in evaluating mitigation of inherent risks related to tourism amidst the COVID-19 pandemic.

However, local communities reflect diverse groups of individuals that may hold different opinions and interests on specific issues. Considering social exchange theory (SET), residents' willingness to coexist with tourism is contingent upon how they perceive tourism impacts (benefits and costs) (Gursoy et al., 2019; Nugroho & Numata, 2021). In the context of the COVID-19 pandemic, Joo et al. (2021) demonstrated that locals' perceived health risks significantly determine locals' support for tourism activities in their area. More

importantly, whilst studies on local behaviour are ubiquitous, research focusing on the heterogeneity opinions of community residents adjacent to NPs toward tourism amidst the COVID-19 pandemic remains understudied.

Given those circumstances, the current study attempts to cluster residents in two adjacent villages of Bromo Tengger Semeru National Park (BTSNP) (i.e., Ngadisari and Wonokitri) based on tourism's perceived benefits and costs, perceived health risks, and level of support toward tourism amidst the COVID-19 pandemic. We hypothesized that residents are clustered based on their perceived benefits (PC), perceived costs (PC), perceived health risks (PHR), and support for tourism amidst the COVID-19 pandemic (STD). The current study results will indicate a community's structure in responding to the tourism operationalization amidst pandemic, which eventually offers an essential basis in managing tourism in NPs and their neighbouring communities. To clarify that, we use an extended social exchange theory (SET) as the theoretical framework. SET postulates that resident's decision to support tourism is determined by their level of perceived benefits and costs. Once perceived benefits outweigh the costs, eventually, residents will support tourism development. SET has long been employed in tourism studies that focus on behavioral studies (Nunkoo, 2016; Sharpley, 2014).

RESEARCH METHOD

Bromo Tengger Semeru National Park (BTSNP), situated in East Java province-Indonesia, offers stunning landscapes and authentic traditional culture. Eventually, BTSNP is among the most visited national park in Indonesia. BTSNP encourage residents of neighbouring communities to be involved in managing tourism. At this point, Ngadisari and Wonokitri are well known as the entrance of the most visited tourist attraction in BTSNP, which eventually, their economic activities were sorely impacted by the COVID-19 pandemic. Ngadisari and Wonokitri village are administratively located in Probolinggo and Pasuruan regency, respectively. Figure 1 demonstrates the location of the research study. Ngadisari is inhabited by 3,078people, while Wonokitri has 1,510 residents. Most of the residents are farmers, while a small part of them employs as entrepreneurs, staff, and government officers.

A structured questionnaire was constructed to investigate determinants of resident support tourism amidst the COVID pandemic based on the SET framework and perceived health risks variable. The questionnaire consisted of latent variables and measured items. The first section of the questionnaire consisted of four latent variables. Perceived benefits, perceived costs, perceived health risks, and support for tourism development was adopted from previous research. Totally, 45 measured items or questions were generated. Question responses were on a five-point Likert scale, with 1 representing "strongly disagree" and 5 representing "strongly agree". The second part of the questionnaire consisted of residents' demographic characteristics, including gender, age, formal education attainment, and personal monthly income.
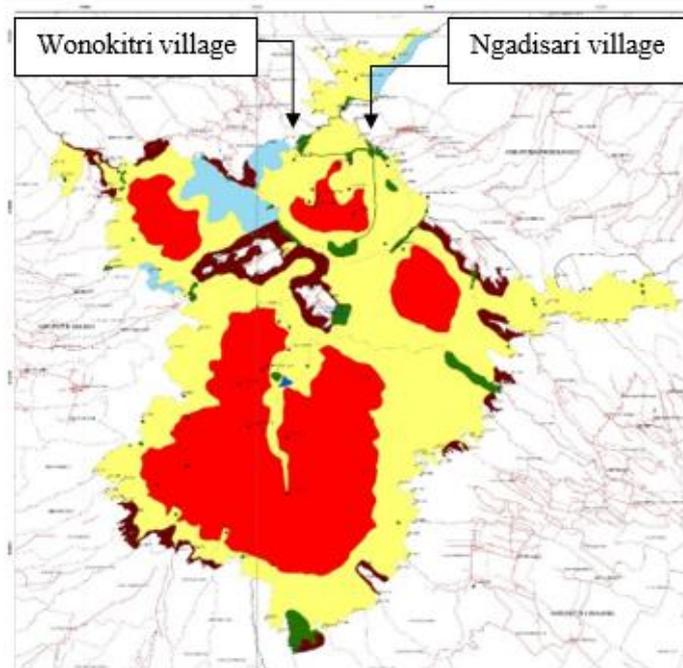

Figure 1. Research site

A direct face-to-face interview was employed to administer the questionnaire. Heerwegh & Loosveldt (2008) concurred that it allows the researcher to locate and convince intercepted respondents to engage and complete the questionnaire items on-site, eventually obtaining a high response rate. Moreover, a convenience sampling manner was used to assign intercepted respondents predicated on their accessibility, availability, and willingness to participate in the survey. In the current study, only residents of the targeted villages aged 18 or more were assigned to engage in the survey.

First, data screening was run to ascertain data conformity and applicability before the cluster analysis. Only completed questionnaires were utilized for subsequent series of analyses. *Second*, the reliability of the latent variable was measured by using Cronbach alpha's coefficient (alpha). It demonstrates how closely related a set of questions are as a group within the assigned latent variable. Taber (2018) indicated that α coefficient > 0.5 demonstrates a high level of reliability. At this point, the mean value of the questions of the latent variable was utilized in cluster analysis. *Third*, the k-means clustering method was employed to acquire clusters. k-means allow the researcher to assign the optimum number of clusters (k) based on the cluster centre. In the current study, the silhouette method was used to specify the optimum number of k. Subsequently, k-means analysis was run. Fourth, generated clusters were then evaluated using an independent sample t-test to compare the statistical difference of generated clusters. Next, generated clusters were named by considering their characteristics. Finally, descriptive statistics by using cross-tabulation were run to outline the demographic characteristics of cluster members. K-means clustering analysis and descriptive statistics were performed by utilizing the stats and ggplot2 packages in R Studio ver 1.1.463 (RStudio Team, 2015).

RESULT AND DISCUSSION

1. *Respondent characteristics*

In total, 354 respondents were obtained. Table 1 shows respondents' demographic characteristics. Most of the respondents were male (70.34%) and between 25 – 45 years old (75.99%). Of the respondents, 8% were illiterate, 53.11% had graduated from high school, and 6.78% had enrolled in university. Moreover, 55.37% of the respondents earn personal monthly income of IDR 1,000,000 – 2,500,000 and only 6,78% of them earn > 4,000,000 (1 US$ = 14,191.2 IDR as of November 14, 2021).

Table 2 demonstrates the overall value of the designated latent variables. The mean value of perceived benefits (PB), perceived costs (PC), perceived health risks (PHR), support for tourism amidst pandemic (ST) were 4.14, 1.95, 2.46, and 4.05, respectively. Moreover, the standard deviation of PB, PC, PHR, and ST were 0.77, 0.95, 0.86, and 0.69, respectively. Likewise, Cronbach's alpha value for PB, PC, PHR, and ST were 0.81, 0.82, 0.44, and 0.64, respectively. These generated values demonstrated a high level of reliability (Taber, 2018). Hence, the mean values of question items under designated latent variables were utilized in the cluster analysis.

Table 1. Respondents' demographic characteristics.

Characteristics		Frequency	Percentage (%)
Gender			
	Male	249	70.34%
	Female	105	29.66%
Age (years)			
	17 - 25	40	11.30%
	>25 - 35	139	39.27%
	>35 - 45	130	36.72%
	> 45 - 55	41	11.58%
	>55	4	1.13%
Formal education attainment			
	No formal education	8	2.26%
	Elementary school	47	13.28%
	Junior high school	87	24.58%
	High school	188	53.11%
	University	24	6.78%
Personal monthly income (IDR)			
	< 1,000,000	42	11.86%
	≥1,000,000 – 2,500,000	196	55.37%
	≥2,500,000 – 4,000,000	92	25.99%
	>4,000,000	24	6.78%

A non-hierarchical analysis employing the k-means method was used to generate clusters using a priori optimum number of clusters acquired from the silhouette manner. The optimum number of clusters was two, and it is outlined in Figure 2. Subsequently, we generated two clusters by using k-means from 354 respondent responses. Figure 3. illustrates the cluster plot for resident support tourism amidst pandemics based on SET tenets and perceived health risks. Interestingly, we found that resident opinion of health risks was not significantly different between Cluster 1 and Cluster 2.

Interestingly, we found that residents considered tourism activities would not influence their health risks and daily activities in booth clusters. These may be caused by most residents of the villages having received the COVID-19 vaccine. Moreover, nature-based tourism is an outdoor activity that has a low potential for transmitting the COVID-19 virus. Our finding was contrary to Joo et al. (2021), who demonstrated that residents believed that tourism could harm their daily activities, which directly, negatively, and significantly influenced their decision to support tourism in their area.

Cluster 2 (*n=207*), being the largest members in the study, represented 58.5% of the respondents. Likewise, Cluster 1 (*n=147*) represented 41.5% of the respondents. Table 2 demonstrates that all latent variables, except perceived health risk, were statistically significant. This confirmed that the two generated clusters were different. The generated clusters were labelled corresponding to their distinct characteristic features.

Demographic characteristics (i.e., gender, age, personal monthly income, and level of formal education) of the cluster's members were identified by cross-tabulation analysis. Table 3 shows respondents' demographic characteristics. We found that Cluster 1 was dominated by females between 25 – 35 years old, graduated from high school, and had monthly income between IDR 2,500,000 – 4,000,000. However, most of the members of the Cluster 2 was male, between 35 – 45 years old, had attained high school, and earned IDR 1,000,000 – 2,500,000 per month.

Table 2. Mean, standard deviation, and Cronbach alpha of the latent variables

Latent variable	Overall value		
	Mean	SD	Cronbach's alpha
Perceived benefits (*n=20*)	4.14	0.77	0.81
Perceived costs (*n=9*)	1.95	0.95	0.82
Perceived health risks (*n=4*)	2.46	0.86	0.44
Support for tourism (*n=6*)	4.05	0.69	0.64

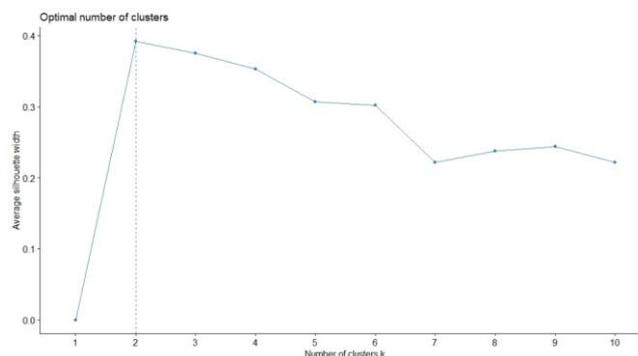*SD= standard deviation, n = number of questions*

Figure 2. The optimum number of clusters generated by Silhouette method
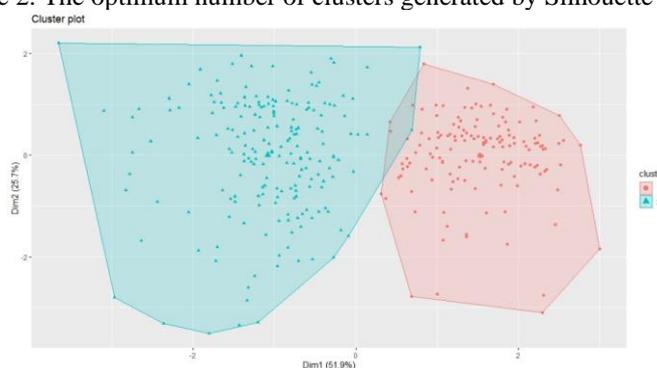

Figure 1 Cluster plot for resident support for tourism amidst the COVID-19 pandemic based on SET and perceived health risks.

Table 4. describes the cluster variables of the study. The current study revealed that Cluster 1 is primarily characterized by the high agreement that tourism provides economic, social, and environmental benefits. In contrast, they firmly believed that tourism would not generate negative impacts (i.e., economic, social, environmental), including health risks. This may lead cluster 2 to hold high agreement in supporting tourism amidst the COVID-19 pandemic. Our findings generally confirm the robustness of SET tenets, which emphasize that should residents perceive benefits outweigh the costs, they will eventually support tourism in their area.

Given those scenarios, cluster 2 was labelled as "tourism supporters."
Compared to Cluster 1, Cluster 2 identified by their higher agreement that tourism negatively impacts their community and health risks. Notwithstanding, they lesser believed that tourism brings benefits to their community. Consequently, their level of support for tourism amidst the COVID-19 pandemic was lower than Cluster 1. These are corroborated by Joo et al. (2021), who argued that perceiving health risks will decrease residents' willingness to support tourism in their community. Accordingly, the cluster was labeled as "*cautious supporters*".

Table 3. Demographic characteristics of the respondents (*n=354*)

Demographic characteristics	Cluster 1		Cluster 2	
	Freq	Percentage (%)	Freq	Percentage (%)
Gender				
Males	48	24.0%	150	75.0%
Females	99	49.5%	57	28.5%
Age (years old)				
17 - 25	16	8.0%	24	12.0%
>25 - 35	82	41.0%	57	28.5%
>35 - 45	46	23.0%	84	42.0%
> 45 - 55	3	1.5%	38	19.0%
>55		0.0%	4	2.0%
Formal education				
Illiterate		0.0%	8	4.0%
Elementary school		0.0%	47	23.5%
Junior high school	32	16.0%	55	27.5%
High school	98	49.0%	90	45.0%
University	17	8.5%	7	3.5%
Personal monthly income (IDR)				
< 1,000,000	3	1.5%	39	19.5%
≥1,000,000 – 2,500,000	49	24.5%	147	73.5%
≥2,500,000 – 4,000,000	76	38.0%	16	8.0%
>4,000,000	19	9.5%	5	2.5%

Table 4. The significance of Cluster variables of the study

Latent variable	Cluster center		SD		t-value	p-value	sig
	C-1	C-2	C-1	C-2			
Perceived benefits	4.49	3.89	0.15	0.23	-26.599	0.000	***
Perceived costs	1.39	2.35	0.26	0.37	27.078	0.000	***
Perceived health risks	2.43	2.49	0.41	0.55	-1.1481	0.252	
Support for tourism amidst pandemic	4.32	3.86	0.26	0.38	12.752	0.000	***

*C-1 = Cluster 1, C-2= Cluster 2, ***p<0.001*

CONCLUSION

The current study concludes that residents adjacent to Bromo Tengger Semeru National Park, i.e., Ngadisari and Wonokitri villages, were clustered into two clusters, namely *tourism supporters* and *cautious supporters*. We provide empirical findings that communities are heterogenous in opinion and interests based on perceived benefits, perceived costs, perceived health risks, and support for tourism amidst the COVID-19 pandemic. However, while the current study is empirically proven, it has implications for national park and nature-based tourism site managers. While residents generally support tourism amidst pandemics, the study reveals low awareness of health risks. Accordingly, enhancing residents of neighboring TNBTS awareness of health risks and preventing COVID-19 are required. These could be materialized through community empowerment programs to maintain a supportive attitude toward tourism development amidst pandemics.

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