

Analysis of cleanliness, health, safety, and environmental sustainability in Merapi disaster-prone tourist villages

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ABSTRACT

Background: Covid-19 pandemic has brought enormous effect on tourism sector. Covid-19 transmission can be prevented by the implementation of cleanliness, health, safety, and environmental sustainability (CHSE) aspects. This study aims to analysis the implementation of CHSE based on the Indonesian National Standard No. 9042 of 2021 (Standar Nasional Indonesia No.9042 Tahun 2021).

Method: This was a quantitative study with survey design executed using CHSE guidelines of the Indonesian National Standard No. 9042 of 2021. The research sample consisted of 68 tourist cottages which were selected using total sampling technique. The research instrument was CHSE checklist to measure the implementation of CHSE in the tourist cottages.

Results: Results of the study showed that the implementation of CHSE in tourist cottages in three tourist villages of Nganggring, Tunggul Arum, and Penting Sari were categorized as low with the scores of 22.90% for management, 37.02% for human resources, and 27.46% for guest participation.

Conclusion: CHSE implementation in three tourist villages of Nganggring, Tunggul Arum, and Penting Sari has not be done in maximum manner so that the scores for each of the indicators of management, human resources, and guest participation were categorized as low.



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1. Introduction

Corona Virus Disease (Covid-19) is a transmissible virus which may cause disease ranging from the light one such as common cold to the severe one such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) (Livana et al, 2020). The cause of Covid-19 is the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), where SARS-CoV-2 is a new variant of coronavirus which is unidentified in humans. On 31 December 2019, the World Health Organization (WHO) China Country Office reported that in the city of Wuhan, Hubei Province,

China there was a pneumonic disease whose etiology was unknown. Further, China reported on 7 January 2020 that the case was a new case of coronavirus. On 30 January 2020 the WHO confirmed the case as Public Health Emergency of International Concern (PHEIC) and on 11 March 2020 the WHO confirmed Covid-19 as pandemic (Kemenkes, 2020).

Yogyakarta Special Region is one of the main tourist destinations in Indonesia. (Yuniati, 2018). The emergence of Covid-19 pandemic has changed tourism interest from mass tourism to alternative tourism such as tourist villages since they are considered unique and based on community participation. Covid-19 transmission can be prevented with implementation of health protocols during the visit such as washing hands using soap, body temperature checking, using masks, and distancing as well as implementation of policies in cleanliness, health, safety, and environmental sustainability (Wahyuni, 2019).

Due to the Covid-19 pandemic, efforts are required so that tourist villages can welcome visitors or guests again in a safe manner. Therefore, efforts are required for the implementation of policies in cleanliness, health, safety, and environmental sustainability (Mitasari et al, 2022). Cleanliness, health, safety, and environmental sustainability need to be put in practice in tourist cottages since during the Covid-19 pandemic this could make the visitors or tourists feel assured that they would get safety and comfort during their visit (Rosalina et al., 2022). Visitors' or tourists' preference in selecting tourist cottages are influenced by such factors as information on the destinations, availability of suitable tourist products, and implementation of cleanliness, health, safety, and environmental sustainability in the tourist destinations (Karomi, 2022). There are two factors that affect the preparedness for the implementation of cleanliness, health, safety, and environmental sustainability, i.e internal factor in the form of the availability of supporting facilities for the implementation of health protocols, and external factor in the form of the presence of public policies, visitors' awareness for participation, and coordination and cooperation among concerned parties (Utami & Kafabih, 2021).

Based on the results of the preliminary study, there were six tourist cottages located in three tourist villages. With regard to the management aspect, every tourist cottage had not equipped itself with guidance in cleanliness, health, safety, and environmental sustainability which should be placed in it. With regard to the human resources aspect, many of the tourist cottage personnel had not been provided with trainings on cleanliness, health, safety, and environmental sustainability. Next, in terms of visitor participation, many of the visitors did not comply with the implemented health protocols. With this background, the researchers are interested in conducting a study entitled "Analysis of Cleanliness, Health, Safety, and Environmental Sustainability in Tourist Villages Prone to Mount Merapi Disaster which was then adjusted to the Indonesian National Standard No. 9042 of 2021 to be analyzed and evaluated for their preparedness in cleanliness, health, safety, and environmental sustainability.

2. Method

This was a quantitative study with survey design. The study was conducted in three Merapi Disaster-Prone Areas (DPA), i.e. Nganggring, Tunggul Arum, and Penteng Sari Tourist Villages. The evaluation was made using the Indonesian National Standard for cleanliness, health, safety, and environmental sustainability at tourist cottages in the Merapi DPA tourist villages. The evaluation was made to analyze and evaluate the levels of preparedness in the implementation of cleanliness, health, safety, and environmental sustainability. The population consisted of 68 tourist cottages in three tourist villages in Merapi Disaster-Prone Area (DPA) with 38 cottages in Penteng Sari, 7 cottages in Nganggring, and 23 cottages in Tunggul Arum. The sample of this study consisted of 68 tourist cottages in three tourist villages in Merapi Disaster-Prone Area. The instrument used in the study was the checklist for cleanliness, health, safety, and environmental sustainability which was developed based on the Indonesian National Standard (Standard Nasional Indonesia or SNI) issued by the National Standard Agency (Badan Standard Nasional or BSN).

Data was analyzed by calculating the index of preparedness for the implementation of CHSE at tourist cottages. A checklist item was given a score of 0 if it did not work, a score of 0.5 for working partially, and 1.0 for working in full. Index of preparedness was evaluated using the following formula:

$$\frac{((\text{The number of items not functional} \times 0) + (\text{The number of items functional} \times 0,5) + (\text{The number of items fully functional} \times 1))}{\text{The total number of checklist items}}$$

Preparedness for the implementation of CHSE were categorized into three levels.

Table 1. Preparedness Levels for Implementation of CHSE

Index	Description
Score \geq 80%	High Level of Preparedness
Score 50 – 79%	Medium Level of Preparedness
Score < 50%	Not Prepared

3. Results and Discussion

3.1. Results

3.1.1. Management

The management of Cleanliness, Health, Safety, and Environmental Sustainability deals with policy implementation, provision of information, provision of facilities, coordination with tourist cottage groups, monitoring, and evaluation of the policy implementation. Some of the tourist cottages had not implemented Indonesian National Standard (SNI) for Cleanliness, Health, Safety, and Environmental Sustainability. Further, the levels of variable fulfillment for cleanliness, health, safety, and environmental sustainability for each of the indicators in three villages in Merapi Disaster-Prone Area are presented in [Table 2](#).

Table 2. Management of cleanliness, health, safety, and environmental sustainability

No	Indicator	Fulfillment Level
1.	Implementation of policy and information on cleanliness of tourist cottages	1%
2.	Availability of cleanliness facilities	54%
3.	Monitoring and evaluation of cleanliness	1%
4.	Guidelines for the implementation of health protocols	11%
5.	Refund for not-permitted visitors	72%
6.	Visitor recordings	23%
7.	Provision of information on pandemic prevention	0%
8.	Easily readable written information on health practices	1%
9.	Delivery of information to the owner in the occurrence of health problem	0%
10.	Health facilities and tourist cottage	26%
11.	Provision of information regarding on-line reservation and only receiving visitors from a community, family, or organization at one occasion	81%
12.	Coordination, monitoring, and evaluation of the implementation of health practices at tourist cottages	37%
13.	Policies and procedures for self-rescue in case of earthquake and fire	1%
14.	Insufficient information and advisory regarding safety, evacuation route, map of assembly area, important telephone contacts	1%
15.	Safety facilities	21%
16.	Coordination, monitoring, and evaluation of tourist cottage safety	38%
17.	Policies or guidelines regarding environmental sustainability	3%
18.	Separation between organic and non-organic waste	16%
19.	Environmentally-friendly processing of liquid waste	19%
20.	Monitoring and evaluation of environmental sustainability practices	3%

Based on [Table 2](#), it is known that the indicator with lowest fulfillment rate was “delivery of information to the owner in the occurrence of health problems” (fulfillment rate of 0%). Whereas, the indicator with highest fulfillment rate was “Provision of information regarding on-line reservation and only receiving visitors from a community, family, or organization at one occasion” (fulfillment rate of 81%).

The average scores for the fulfillment rates of the variables of management of cleanliness, health, safety, and environmental sustainability are presented in [Table 3](#).

Table 3. Management of cleanliness, health, safety, and environmental sustainability

No	Variable	Maximum Score	Average
Management			
1.	Cleanliness	58%	28,79%
2.	Health	40%	23,53%
3.	Safety	42%	29,01%
4.	Environmental Sustainability	60%	10,88%
Management on CHSE			22,80%

It is known from [Table 3](#) that the management variables had four aspects whose rates were low, i.e. cleanliness (fulfillment rate of 29.01%), health (fulfillment rate of 28.79%), safety (fulfillment rate of 23.53%), and environmental sustainability (fulfillment rate of 10.88%).

3.1.2. Human Resources

Human resource dimension of Cleanliness, Health, Safety, and Environmental Sustainability deals with the efforts by the owner/operator in helping with the management of cleanliness and orders (regulations) at tourist cottages, helping in implementation of advisories regarding health protocols, helping in managing tourist cottages in the implementation of safety management, and in complying with the prevailing regulations of environmental sustainability. The fulfillment rates of the human resources variable in each of the indicators of cleanliness, health, safety, and environmental sustainability in three tourist villages in Merapi disaster-prone area are presented in [Table 4](#).

Table 4. Human resources variable with regards to cleanliness, health, safety, and environmental sustainability

No	Indicator	Fulfillment Rate
1.	Operator gives advisories regarding cleanliness protocols	60%
2.	Operator keeps cleanliness of tourist cottage	29%
3.	Operator gets training on cleanliness	51%
4.	Operator maintain his/her health and gets vaccinated	59%
5.	Operator gives advisories regarding health protocols	56%
6.	Operator implements orders (regulations) regarding safety and security	1%
7.	Employees comply with regulations regarding environmental sustainability	42%

It is known from [Table 4](#) that the indicator with the lowest fulfillment rate was “Operator implements orders (regulations) regarding safety and security” (fulfillment rate of 1%). Whereas, the indicator with medium fulfillment rate was “Operator gives advisories regarding cleanliness protocols” (fulfillment rate of 60%).

Average scores of the fulfillment rate for the human resources variable on cleanliness, health, safety, and environmental sustainability are presented in [Table 5](#).

It is seen from [Table 5](#) that the human resources variables had three aspects whose fulfillment rates were low, i.e cleanliness (fulfillment rate of 47.00%), safety (fulfillment rate of 0.74%), and environmental sustainability (fulfillment rate 43.02%), whereas the health aspect was in the medium category (fulfillment rate of 56.96%).

Table 5. Human resources variable with regards to cleanliness, health, safety, and environmental sustainability

No	Variable	Maximum Score	Average
Human Resources			
1.	Cleanliness	88%	47,00%
2.	Health	93%	56,96%
3.	Safety	50%	0,74%
4.	Environmental Sustainability	50%	43,38%
Human Resources on CHSE			37,02%

3.1.3. Visitor Participation

Visitor participation variables for cleanliness, health, safety, and environmental sustainability deal with the concern of whether the visitors follow the advisories of cleanliness and protocols, health, get vaccinated, get informed easily on the assembly area or evacuation route, and get informed on efforts to save water and energy. The fulfillment rates for the visitor participation variables on cleanliness, health, safety, and environmental sustainability for every indicator in three tourist villages in Merapi Disaster-Prone Area are presented in [Table 6](#).

Table 6. Visitor participation on cleanliness, health, safety, and environmental sustainability

No	Indicator	Fulfillment Rate
1.	Visitors wash hands, keep cleanliness of tourist cottage, and dispose of rubbish in its place properly	66%
2.	Visitors follow advisories of health protocols	26%
3.	Visitors get information of assembly area and evacuation route	15%
4.	Visitors get information on efforts to save water and energy	0%

It can be seen from [Table 6](#) that the indicator with the lowest fulfillment rate was “Visitors get information on efforts to save water and energy” (fulfillment rate of 0%), whereas the indicator with medium fulfillment rate was “visitors follow health protocols and keep cleanliness” (fulfillment rate of 66%).

The average scores for the visitor participation aspects of cleanliness, health, safety, and environmental sustainability in three tourist villages are presented in [Table 7](#).

Table 7. Visitor participation on cleanliness, health, safety, and environmental sustainability

No	Variable	Maximum Score	Average
Visitor Participation			
1.	Cleanliness	100%	69,06%
2.	Health	57%	26,10%
3.	Safety	50%	14,71%
4.	Environmental Sustainability	0%	0%
Visitor Participation on CHSE			27,46%

It is known from [Table 7](#) that visitor participation had three aspects with low rates, i.e. health (fulfillment rate of 26.10%), safety (fulfillment rate of 14.71%), and environmental sustainability (fulfillment rate of 0%). Meanwhile, the cleanliness aspect was in the medium category (fulfillment rate 69.06%).

3.2. Discussions

3.2.1. Management

All regulations and policies related to cleanliness, health, safety, and environmental sustainability are essential aspects which should be complied with so that they become the reference for the maximum implementation of protocols. In line with the Regulation of the Minister of Tourism and Creative Economy No. 13 of 2020 ([Kemenparekraf RI, 2020](#)), is mentioned that to restore the trust of domestic and international communities to go on tour in safe, comfortable, and healthy

manners due to the effects from the corona virus disease 2019, assurance (guarantee) is required with regard to cleanliness, health, safety, and environmental sustainability. One of the assurances which should be possessed by every tourist destination is certification which is according to BSN ([Badan Standardisasi Nasional, 2021](#)). This standard is the requirement for cleanliness, health, safety, and environmental sustainability for the running and support of tourism activities.

On the management side, the cleanliness aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penting Sari) was categorized as low with a score of 28.79%. Compliance with policies and procedures to maintain the orders regarding cleanliness and information or advisories related to cleanliness at tourist cottages as well as monitoring and evaluation of cleanliness policy implementation are one of tourist attracting factors in the new normal situation to make tourists feel safe and comfortable. Based on the observation, document analysis, and interviews, it was found that the implementation of policies and procedures to maintain orders in cleanliness and information or advisories related to cleanliness at tourist cottages as well as monitoring and evaluation on the implementation of cleanliness policy at tourist cottages were categorized as low (1%).

The study by ([Ani et al., 2021](#)) mentioned that implementation of directions and information on cleanliness in three star hotel in Depok City were in good level. From the study by ([Arianto et al, 2022](#)) it was found that restroom facilities in Baron beach were sufficiently available according to the book of standard guidelines of public restrooms in Indonesia published by the Restroom Association (Asosiasi Toilet) in 2016. Insufficient display of policies, directions, and information on cleanliness at tourist cottages had caused unawareness of the existing regulations among the tourists. This might lead to violation of the cleanliness policy by the tourists. Therefore, the display of directions and information on cleanliness is deemed important so that tourists are aware of the prevailing regulations and information in the visited tourist places.

On the management side, the health aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penting Sari) was categorized as low with a score of 23.53%. There were two indicators of health whose ratings were low, i.e. insufficient fulfillment of information provision regarding pandemic prevention (1%) and delivery of information in the occurrence of health problems (0%).

Tourism health may affect tourism industry. Healthy tourism may serve as one of the ways to promote a tourist destination ([Wirawan, 2022](#)). In a study ([Rori et al., 2022](#)) with the restaurant of Paradise Hotel Golf & Resort, it was shown that implementation of health protocol in the services of the restaurant had increased the sense of trust and safety among the visitors. Insufficient information on the prevention of disease transmission may result in the visitors' negligence in the effort to prevent disease transmission. Therefore, it is necessary to give advisories for visitors with symptoms of transmissible disease to inform the operator for isolation measure. If such information is not delivered, then disease transmission may occur in a tourist village.

On the management side, the safety aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penting Sari) was categorized as low with an implementation score of 29.01%. There were two indicators with low ratings, i.e. insufficient fulfillment in the implementation of self rescue procedures during earthquake and fire (1%) and insufficient information and advisories regarding safety, evacuation route, map of assembly area, and important telephone contacts (1%).

A study by ([Afitasari, 2021](#)) in the tourist object of Taman Bambu Air Waduk Sermo Yogyakarta, it was revealed that the tourist object had implemented policies of risk preparedness by implementing risk control measures of elimination, administration, and provision of personal protective equipment. Another study by ([Tandilino et al., 2020](#)) showed that tourist destinations in Kupang had implemented safety regulations with good criteria.

The absence of self-rescue procedures for possible earthquake and fire at tourist cottages has prevented tourists from knowing the steps to rescue themselves in the occurrence of fire or earthquake. Furthermore, insufficient information of evacuation route and map of assembly area may result in confusion among tourists during evacuation to the assembly area. Absence of important telephone contacts information for emergency situations such as fire rescue department, BPBD

(Regional Disaster Mitigation Agency), PMI (Indonesian Red Cross), and Basarnas (National Search and Rescue Agency) may result in tourists' failure in contacting the numbers in times of need.

On the management side, the environmental sustainability aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as low with a score of 10.88%. There were four indicators of environmental sustainability with low ratings. Those were insufficient implementation of policies or guidelines with regard to environmental sustainability (3%), separation between organic and non-organic wastes (16%), environmentally friendly processing of liquid waste (19%), and monitoring and evaluation of policies in environmental sustainability (3%). Hence, it showed that the implementation was categorized as low.

Results of a study by (Suparmini et al., 2015) in Banten showed that the implementation of environmental sustainability practices met the criteria for good practices. Being responsible for environmental sustainability, socio-cultural aspects, and sustainable business operations are included in the principles of keeping environmental sustainability (Aminuddin et al., 2016). Insufficient practice of separation between organic and non-organic wastes may cause confusion among visitors in disposing of the wastes properly according to the types of the wastes. This may result in environmental pollution around the tourist cottages. Therefore, the operators should implement policies with regard to environmental sustainability so that the sustainability of the environment around the tourist cottages is maintained.

3.2.2. Human Resources

With the dimension of human resources, the cleanliness aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as low with a score of 46.00%. There was insufficient management of the tourist cottages in maintaining the cleanliness of living houses. It was categorized as low with a score of 29.00%.

According to the Regulation of the Minister of Tourism and Creative Economy No. 13 of 2020 (Kemenparekraf, 2020) regarding cleanliness, health, safety, and environmental sustainability in tourism sector, one of the criteria for human resources in attracting tourists is the cleaning of public spaces and objects with disinfectants. Insufficient practice of cleanliness in the area of tourist cottages would lower tourists' intention to visit. Insufficient practice of cleanliness would make the area less attractive to see and stay. Therefore, the operators need to implement management policies regarding cleanliness in the area of tourist cottages so that the tourist cottages become clean and this would make tourists feel comfortable in the tourist cottage area.

With the dimension of human resources, the health aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as medium with a score of 56.96%. There were two health indicators with medium scores, those were the operators keeping healthy and getting vaccinated (59%) and health protocol advisories at tourist cottages (56%).

According to CHSE Guidelines (Kemenparekraf RI, 2020), health protocols regulations should be implemented properly and that equipment related to health protocols should be confirmed to work well. Maximum implementation of health protocols can increase awareness among various parties. Good practices of health keeping among the operators, being vaccinated, and giving advisories regarding health protocols can lead to the surrounding area being free from diseases so that visitors are less worried about disease transmission. Therefore, implementation of health protocols is important for tourist places to avoid disease transmission.

On human resources side, the safety aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as low with a score of 0.74%. The indicator with low rating was the implementation of safety and security regulations by the operator (1%).

According to the Regulation of the Minister of Tourism and Creative Economy No. 13 of 2020 (Kemenparekraf, 2020), human resources, i.e. the operators or local communities should develop safety regulations and implement them in the tourist area. Insufficient implementation of safety regulations in tourist cottages would prevent tourists from knowing safety procedures in the

occurrence of natural disasters or fire. Therefore, it is important that tourist cottages implement safety procedures and regulation in the tourist cottages area so that tourists would know the actions to be taken in the occurrence of disaster or other accidents.

With the dimension of human resources, the environmental sustainability aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as medium with a score of 43.38%. The indicator of employees' compliance with regulations related to environmental sustainability in the tourist cottage area was categorized as low with a score of 42%.

According to (Sujali, 2008), creation of a green and cool open space environment and waste processing practice according to environmental procedures could increase the attractiveness of a tourist cottage. Insufficient awareness among employees to comply with regulations related to environmental sustainability would result in environmental damage around tourist cottages due to pollution. Therefore, human resources counseling and training are necessary for the business runners to improve the quality of human resources in such a way that environmentally-concerned tourist places would come into existence.

3.2.3. Visitor Participation

With the dimension of visitor participation, the cleanliness aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as medium with a score of 69.06%. The indicator of visitors washing hands, keeping cleanliness of tourist cottages, and disposing of wastes properly was in the medium category with a score of 66%.

This is in line with a study by (Wicaksono & Suradi, 2021) in a tourist object in Dlingo, Mangunan, Bantul Regency. It was found in the study that, with regard to visitor participation, the visitors had implemented the protocols. If visitors participate in the implementation of maintaining cleanliness of tourist cottages or tourist objects and disposing of waste properly, then a clean environment would be realized.

With the dimension of visitor participation, the health aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as low with a score of 26.10%. The indicator of visitors implement advisories on health protocols was in the low category with a score of 26%.

This is different from a study by (Batubara & Suci, 2022) in Devoyage tourist object, Bogor. It was found in their study that the visitors had participated in implementing health protocols properly by getting their body temperature checked and by keeping the distance in the tourist area. Low participation among visitors in implementing health protocols could result in disease transmission. Therefore, cooperation is required between visitors and operators of tourist cottages in order that the visitors comply with the advisories of health protocols in tourist areas. With implementation of health protocols as determined by tourist cottage management, disease transmission can be avoided.

With the dimension of visitor participation, the safety aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as low with a score of 14.71%. The indicator of visitors getting information on the assembly area and evacuation route was categorized as low with a score of 15%.

This is different from a study by (Rifai et al., 2022) in the tourist village of Ploso Kuning, Turi, Sleman where visitors got information on assembly area and evacuation route from the tourist location maps placed in the tourist area. Insufficient information of the assembly area and evacuation route may lead to visitors' confusion in taking actions if natural disasters or fire occur at any time. This would decrease the sense of safe feeling at tourist cottages. Therefore, the availability of safety information is important so that visitors know the actions to take in the occurrence of disasters.

With the dimension of visitor participation, the environmental sustainability aspect in three tourist villages in Merapi Disaster-Prone Area in Sleman, Yogyakarta (Tunggul Arum, Nganggring, and Penteng Sari) was categorized as low with a score of 0%. The indicator of visitors getting information on water and energy saving was categorized as low with a score of 0%.

This is different from a study by (Rifai et al., 2022) in the tourist village of Ploso Kuning, Turi, Sleman where the visitors had implemented environmental sustainability programs in the tourist area and got information on water and energy saving. Visitors' failure in getting information on water and energy saving would lead to visitors' lack of knowledge to save water and energy in a tourist cottage area. When energy and water are used continuously without saving, then wasting of energy would happen. Therefore, it is important for the operators to provide information on environmental sustainability and for the visitors to implement the informed advisories to save water and energy resources among others.

4. Conclusion

Implementation of CHSE at tourist cottages in three tourist villages of Nganggring, Tunggul Arum, dan Penting Sari was still categorized as low with management aspect score of 22.90%, human resources aspect score of 37.02%, and visitor participation score of 27.46%. It is suggested that the Tourism Office of Sleman Regency conduct socialization regarding regulations on cleanliness, health, safety, and environmental sustainability for the operators of tourist cottages in Merapi DPA; conduct monitoring on the implementation of cleanliness, health, safety, and environmental sustainability in Merapi DPA and organize training and mentoring on cleanliness, health, safety, and environmental sustainability in the tourist cottage areas. In addition, the owners of tourist cottages are suggested to give advisories to the visitors to implement practices of cleanliness, health, safety, and environmental sustainability at tourist cottages. Meanwhile, visitors or tourists are expected to implement practices of cleanliness, health, safety, and environmental sustainability at tourist cottage areas.

Declaration

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Conflict of Interest: The researchers declare that no conflict of interests exists in this study.

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