Monitoring of the tourism village of the mount merapi slope area through the global sustainable tourism council (gstc) snapshot assessment system

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Abstract. The Indonesian government through the Ministry of Tourism has a big agenda related to the development of sustainable tourism destinations, namely Indonesia must be a benchmarking of sustainable tourism in Southeast Asia. The program began in 2015 with the signing of a memorandum of understanding with 20 Districts / Cities as a form of local government commitment to encourage sustainable tourism development. This study is to find out how the monitoring system is carried out in tourism ecosystems, consists of: destinations, local governments and local universities running and in accordance with predetermined Ed standards. The monitoring system in this study focused more on the standards determined by the Global Sustainable Tourism Council (GSTC), namely on the management standards of tourism destinations and environmental management. A monitoring system focused on how tourism destinations attempt to reduce disaster risk. The study location took samples in the southern slopes of Merapi, namely in the Turi sub-district, which is the area that has the most tourist villages among the other sub-districts in Sleman Regency. This study method was carried out through snapshot assessment and observation through sustainable tourism development indicators consisting of 4 standards, 42 criteria and 102 indicators. Assessment is based on the results of self-assessment. Assessment is given for each element in each standard, where each standard will be given a Likert scale value from 1-7. The criteria used are standard environmental management criteria that are in accordance with the provisions of the determined GSTC, which includes further monitoring with standard D, namely maximizing the benefits for the environment and minimizing negative impacts which consist of: D1 Environmental Risk, D2 Sensitive Environmental Protection, D4 Greenhouse Gas Emission, D11 Light and Sound Pollution, D12 Environmentally Friendly Transportation. Research results indicate that tourism destinations already have standards in destination management and environmental management, but have not carried out overall practices within the framework of sustainable tourism development, especially in standard D.

1. Introduction
Sustainable tourism development is a process and scheme to meet the needs of tourists and surrounding communities in the present, without compromising the fulfillment of future generations' needs. This concept is based on the principle of continuing to pay attention to the ecosystem in accordance with
carrying capacity, realizing the interests of the local community, improving the quality of human life in the physical, spiritual, social and cultural aspects in the long term, and encouraging effective and efficient use of natural resources. Economic, social and aesthetic needs can be fulfilled without neglecting the preservation of cultural integrity, important ecological processes, biodiversity and various life support systems that are the strength of Indonesia’s tourism capital, which are competitive and sustainable.

The strategy for developing sustainable tourism destinations in line with what is mandated in Law No. 10 of 2009 concerning Tourism. The Ministry of Tourism has a major agenda regarding the development of sustainable tourism destinations, namely Indonesia must be a benchmarking of sustainable tourism in Southeast Asia. The program began in 2015 with the signing of a memorandum of understanding with 20 Districts / Cities as a form of local government commitment to encourage sustainable tourism development. In addition, the Ministry of Tourism has also formed a National Working Group tasked with damaging the steps and strategies for developing sustainable tourism destinations. Implementation, the development of tourism in Indonesia must also be able to improve the quality of life of the community, especially the local community in the destination, create added value and strengthen local culture as well as social values and local wisdom [1].

Sleman Regency has various types of tourist destinations that are interesting for tourists to visit. These types of tourist destinations include tourist villages, nature tourism, temple tours, cultural tourism, museums, and artificial tours. This condition is an attraction for tourists, so the number of tourist visits in Sleman Regency increases every year (Table 1). These various alternative choices make Sleman Regency one of the destinations that must be visited when in Yogyakarta [2].

Table 1. Number of Tourist Visits in Sleman Regency 2013-2017

| Tourist type    | 2013  | 2014  | 2015  | 2016  | 2017  |
|-----------------|-------|-------|-------|-------|-------|
| Foreign tourists| 337,974 | 340,599 | 255,194 | 246,136 | 262,071 |
| Domestic tourists| 3,274,980 | 3,882,432 | 4,695,740 | 5,439,165 | 6,552,487 |
| Total number    | 3,612,954 | 4,223,031 | 4,950,934 | 5,685,301 | 6,814,558 |

Source: 2017 Yogyakarta Tourism Statistics Book

The large number of tourist villages in Sleman Regency contributes to tourist visits (Table 1). The contribution of tourist village tourism types is a benchmark in the effect of community empowerment in the village in utilizing the potential in the village. In (Table 2) it is known that contributions from 2013 - 2016 increased, while in 2017 it declined. This gives an interpretation that the tourist village in Sleman Regency occupies the highest position or peak period in 2016. In relation to the number of tourist villages in that year, there are many new tourism village choices that offer various choices of tourism products [2].

Developments in 2013 - 2017 tourism villages that contributed to the number of tourist visits in Sleman Regency. However, in 2017 there was a decrease in the contribution to the number of tourist visits. Various causes of this decline can be interpreted from the conditions that occur. These conditions include the decline in the number of tourist villages due to lack of careful planning in management, trends in tourism products that have similarities, community readiness in managing tourism villages, marketing that is not targeted, saturation of tourists in choosing tourism villages and other reasons [2].

The involvement of this regional government is vital and important as the government organizers in the regions, including universities or research institutions, becoming a Monitoring Center as a strategic choice because these institutions are considered to have research capabilities, objectivity, and integrity, also produce reliable, trustworthy analysis and recommendations (implementable and reliable analysis. The monitoring process at tourism destinations is the main focus of the location of monitoring the implementation of sustainable tourism carried out by the Monitoring Center of Gadjah
Mada University MCSTO Yogyakarta to monitor and evaluate economic, environmental and socio-cultural impacts through the use of systematic applications in the form of sustainable tourism development indicators.

Sleman Regency as one of the 20 destinations as a pilot project and being the 3 main destinations trusted by the Ministry of Tourism is the first phase of the STD, STO and STC programs. Sleman Regency has a Tourism Village which is designated as one of the tourism industries which is considered to be in line with sustainable tourism principles. Based on the results of the Snapshot Assessment conducted by the Global Sustainable Tourism Council, stated that there are still red report cards for several STD indicators, namely: Sustainability Standards, Solid Waste Management, Greenhouse Gas Effects and Environmentally Friendly Transportation.

Sustainable tourism development indicators have 9 issues and indicators including: 1) tourism season, 2) employment and employment, 3) building tourism destinations, 4) tourism governance and ecosystems, 5) local satisfaction in tourism, 6) energy management, 7) water management, liquid waste management, 9) solid waste management. All these major issues are the core areas of the problem, in sustainable tourism, they are then categorized into several important components, as in the table below [3-5].

Table 2: Indicators with several baseline issues in sustainable tourism in Indonesia

| No | Criteria and Standard | Explanation of Criteria |
|----|-----------------------|------------------------|
| 1  | Destination Management | This criterion assesses governance aspects from planning, management, monitoring and evaluation which includes indicators including: sustainable destination strategies, planning arrangements, sustainability standards, destination management organizations, seasonal tourism management, access to all, property acquisition, safety and security, crisis management and emergency, promotion, monitoring, asset inventory, tourism attractions, climate change adaptation, and visitor satisfaction. |
| 4  | Environmental Conservation | Criteria that assess aspects of environmental preservation and include indicators including: the availability of systems addressing environmental risks, sensitive environmental protection, protection of wildlife (flora and fauna), systems for measuring greenhouse gas emissions, energy conservation, water management, water security systems, water quality, sewage treatment systems, reduction of solid waste, guidance on light and sound pollution, and environmentally friendly transportation systems |

Source: Ministry of tourism modified, 2019

Effective management of sustainable tourism destinations according to the assessment based on sustainable tourism destination indicators in accordance with Minister of Tourism Regulation Number 14 of 2016 Concerning Sustainable Tourism Guidelines including the following criteria and indicators as well as supporting evidence as follows [3-5]:

a) Sustainable Destination Strategy There is a multi-year tourism strategy (short, medium and long term) that includes the development of accessibility to destinations, tourism amenities in and around destinations, tourism activities in and around the destination while taking into account the capacity and carrying capacity of the environment, economic growth, social issues, cultural heritage, quality, health, safety, and aesthetics. The preparation of the strategy is carried out with community participation and political commitment from relevant stakeholders.
b) Effective, coordinated management organization with clear funding and division of tasks. In addition, it also involves the private and public sectors which are under the existing legal foundation.

c) Monitoring and evaluation systems that are carried out and reported regularly. The system covers environmental, economic, social, cultural, tourism and human rights issues, as well as tourism impact mitigation procedures that function well and are clearly funding.

d) Adaptation to Climate Change: systems, regulations, better policies, and climate change adaptation programs, risk reduction and awareness raising for the community, and tourism businesses.

e) Planning guidelines: regulations, planning policies that include environmental, economic, social, zoning, land use, design, construction and demolition assessments, which are prepared in conjunction with local communities in order to protect natural and cultural resources. Guidelines, regulations, policies are communicated openly and law enforcement is applied.

f) Visitor Satisfaction There is a system to monitor and report on satisfaction, such as interviews / surveys with exit surveys or handling complaints. The results obtained are used to develop an action plan in order to increase the level of visitor satisfaction.

The weakness of sustainable tourism practices can be seen from the World Economic Forum (WEF) tourism and travel competitiveness index in 2010, which assesses Indonesia as the weakest in (i) policies and regulations, (ii) tourism sustainable, (iii) safety and security, (iv) health, and (v) information and communication technology [6, 7].

2. Methods

The method developed in the study was to assess sustainable tourism development using a mixed methods approach. These mixed methods are approaches that combine qualitative and quantitative forms. This method covers the limitations and disadvantages of each method so that the strength of research becomes greater [8]. This method makes it possible to expand the findings from one method to another because a data collection strategy also builds another data collection strategy [9].

The method of selecting sustainable tourism destination indicators in accordance with the Minister of Tourism Regulation Number 14 of 2016 concerning the Guidelines for Sustainable Tourism includes a description of the criteria and indicators and supporting evidence adapted to local conditions. Whereas for standard D Environmental Conservation includes: a) environmental risk, b) Sensitive Environmental Protection, b) Energy Conservation, c) Water Management, d) Water Quality, e) Liquid Waste, d) Reducing Solid Waste [5].

Several steps in the implementation of snapshot assessment (direct assessment) using a Likert scale with a scale of 0 to 5 which is a measuring device that has been set by the GSTC (Global Sustainable Tourism Council) through direct assessment on site. Snapshot assessment is conducted in Turi District, located in the West, Sleman Regency, D.I Province. Yogyakarta [10]. The location of the study was randomly selected from several tourist villages that were considered to have uniqueness and attractions that still maintained the socio-cultural life of the community. In addition, based on the determination chosen by the local government and approved by the Ministry of Tourism. Tourism villages are expected to be a model (rule model) for developing tourism villages in Indonesia that are able to implement sustainable tourism development.

Assessments that have been carried out by direct assessment methods in the field to obtain facts, use supporting theories, look for previous research related to objects and variables, interview with managers and document facts in the field. In the results of a previous study in 2017 conducted by the Sleman regency government, in a holistic manner, STD assessment standards and the criteria therein were basically fulfilled through programs / activities carried out by several Regional Work Units in Sleman Regency such as the Tourism Office, Culture Service, Office of Environment and other agencies.

The results of the analysis there are still several indicators of sustainable tourism that have not been assessed or received little attention by the GSTC team. Almost all Tourism Villages and tourism objects
have not done so, including: a). Environmentally friendly transportation, b). Access for all, c). Sustainable tourism strategy / plan / master plan.

These indicators have not been implemented in the Tourism Village in Turi Subdistrict due to several reasons including [11, 12]: a. The lack of planner HR in the tourist tourism Village, b. The tourist market in the Tourism Village is generally students and students, c. Road conditions at the Village location Tourism that is in need requires transportation of machinery, d). Minimum coordination between SKPD in Sleman Regency, e). Decision of information in coordination meetings is due to the representatives / PICs (PIC) present when the coordination meetings between SKPD are always changing, f) . Target programs that are not directed at industries or tourism destinations in Sleman Regency.

3. Results and Discussion

Based on the results of a 2017 study, conducted by the MCSTO UGM team there are several recommendations given to support sustainable tourism development in the Sleman Regency for the coming years. The recommendations given are formulated program plans agreed upon by tourism stakeholders especially the government, academics and managers of tourist villages [13]. These recommendations and action plans are classified as short-term, namely two years (2018 - 2019). The two-year period was adjusted to the STD program (Sustainable Tourism Development), STO (Sustainable Tourism Observatories) and STC (Sustainable Tourism Certification) which have been proclaimed by the Ministry of Tourism on an ongoing basis. The following are the results of the assessment of the two indicators which still have low values as in the table below:

| Monitoring by MCSTO UGM | Year | 2017 | 2018 | 2019 | 2020 | Comment |
|-------------------------|------|------|------|------|------|---------|
| Standard D Environmental Conservation includes: a) environmental risk, b) Sensitive Environmental Protection, c) Energy Conservation, d) Water Management, e) Water Quality, f) Liquid Waste, g) Reducing Solid Waste. | | D1, D4, D10, D12 | D1, D4, D10, D12 | D1, D4, D10, D12 | D1, D4, D10, D12 | In Planning (not yet realized) |
| Source: Author Analysis, 2019 |

The results of the assessment of standard D indicators of the values that need attention are obtained criteria 46.5% score already implemented, namely: a) environmental risk, b) Sensitive Environmental Protection, b) Energy Conservation, c) Water Management, d) Water Quality, e) Liquid Waste, f) Reducing Solid Waste. Assessment results at the 0% stage of implementation improvement in the next 12 months, 3.5% implementation over the next 12 months, 21.5% in the planning stage, 25% not, 0% unsure, and 3.5% not answering . From the results of this assessment it was found that tourism villages in Turi sub-district had made efforts to minimize the impact and maximize environmental benefits.

It needs a process to meet all criteria to reach 100%. From the data it can be obtained that the actual conditions are greater in the stages that have not been implemented. Tourism villages in Turi sub-district have understood the benefits of the environment while maintaining local wisdom for sustainable environmental sustainability. This condition is indicated by having made plans at each village level and will be implemented in accordance with environmental conservation criteria.

The results of the assessment are supported by the preservation of local traditions and culture in sustainable environmental conservation efforts. Forms of tradition and culture such as continuing to hold...
annual rituals such as mountain charity, praying around villages, and other activities which are derivatives of ancestors. The community has understood the natural law because the result is that if they do well in nature then nature will be good for humans who live on it. Table 3.1. Below is the result of an evaluation based on the criteria set by GSTC.

Table 4. Results of assessment criteria and assessment score criteria

| No | Assessment Score Criteria                                      | Total | Value  |
|----|----------------------------------------------------------------|-------|--------|
| 1  | Yes (Implemented)                                              | 13    | 46.5%  |
| 2  | Development Process (implementation in the next 12 months)      | 0     | 0      |
| 3  | Development Process (implementation of more than 12 months to front) | 1     | 3.5%   |
| 4  | In the Planning Stage                                          | 6     | 21.5%  |
| 5  | No                                                              | 7     | 25%    |
| 6  | Not sure                                                        | 0     | 0      |
| 7  | No answer                                                       | 1     | 3.5%   |

Source: Author's processed results, 2019

Some of the results of the criteria and the results of the above analysis discuss the focus on environmental conservation that has been implemented based on 1 semester monitoring that addresses aspects of environmental conservation. The measurement of the destination indicator that has been implemented is energy conservation (D5) even though it scores 3-5 (yellow mark). It is a measurement of the amount of mass bio-energy produced from livestock cattle groups. The results of monitoring the energy produced can meet the community's needs as energy alternative: The alternative energy produced is 12 kWh which can be used for lighting 6 houses @ 200 W for 10 hours, this concept is the basis that alternative energy from conventional fuels has been implemented.

Alternative energy as an alternative that refers to all energy that can be used which aims to replace conventional fuels. This discussion is used to reduce the use of hydrocarbon fuels which cause environmental damage due to high carbon dioxide emissions, which contribute greatly to global warming based on the Intergovernment Panel on Climate Change. For several years, what actually meant as alternative energy has changed due to the many choices of energy that can be chosen for different purposes in its use. The term "alternative" refers to a technology other than technology used in fossil fuels to produce energy. Alternative technology that is used to produce energy by overcoming problems and does not produce problems such as the use of fossil fuels, namely with appropriate technology (TTG).

This alternative energy answers the problem of the scarcity of oil fuels, one of which is caused by a significant increase in world oil prices, which has prompted the government to invite the public to tackle energy problems together. The higher prices of fuel, especially gas and fuel for household needs, are increasingly troubling the public. Apart from being expensive, the fuel is also increasingly rare in the market. Efforts to overcome these things encourage the idea of the need to find alternative energy sources so that fuel needs can be met without damaging the environment.

Energy conservation is primarily so that tourism actors and tourist villages have awareness and take the initiative to use renewable energy. The following are some components of the issue of energy management: in the tourist village of Pulesari and its surroundings. This conservation analysis is used to measure energy use, which is energy consumption per capita from all sources (overall and use in the tourism sector - people per day) in tourism villages. The samples used were communal cages of farmer groups as a source of excrement which were then collected into the inlet: a place to mix cow manure and water before it was put into a biogas (methane) producing reactor, biogas flow distributed by residents through a special biogas stove for cooking.
Utilization of Cattle Manure as an Alternative Energy Source because Indonesia as an agricultural
country with a tropical climate has considerable agricultural and livestock resources. These resources,
besides being used for food needs, can also have the potential as an energy source by utilizing manure
into biogas. Utilization of livestock waste (manure) is one of the most appropriate alternatives to
overcome the rising fertilizer prices and scarcity of fuel oil. Moreover, the use of dirty livestock as a
source of materials in the form of biogas. The technology and products are new to farmers and breeders.
Utilization of livestock manure as an energy source, does not reduce the amount of organic fertilizer
sourced from livestock manure. This is because the biogas production of processed manure is returned
to its original condition which is taken only methane gas (CH4) which is used as fuel. Livestock manure
that has been processed in biogas production is moved to a drier place, and if it is dry it can be stored in
sacks for further use.

Related to this, the Pulesari Village Government and its surroundings together with STO UGM,
namely tourism study master students are conducting a study with a group of farmers to utilize their cow
manure to produce biogas as an alternative energy source. For this reason, it is necessary to know the
amount of energy produced from biogas produced from cow dung. By knowing the amount of energy
produced, it will be known how many families can use biogas produced from cow dung. In addition,
from the sociocultural aspects the application of new technology to the community is a challenge due to
the low educational background, knowledge and insight they have. Likewise with the implementation
of biogas technology. Never imagined by Pulesari tourism village community that cow dung can
produce fire. In addition, feeling disgusted with food cooked using food cooked using biogas. For this
reason, this is done to find out the amount of energy conversion produced from the biogas produced by
cow dung and how to socialize the biogas product to the community so that it can be used as a new
entrepreneur pilot in addition to other tourist attractions.

Table 5. Nutrient content in manure originating from several livestock

| No | Type of livestock | N     | P     | K     |
|----|------------------|-------|-------|-------|
| 1  | Dairy cows       | 22.0  | 2.6   | 13.7  |
| 2  | Beef cattle      | 26.2  | 4.5   | 13.0  |
| 3  | Sheep            | 50.6  | 6.7   | 39.7  |
| 4  | Poultry          | 65.8  | 13.7  | 12.8  |

Source: Results of analysis of nutrient content of manure, 2016

Biogas in a tourist village in Turi Subdistrict and its surroundings provides a solution to the problem
of providing energy cheaply and not polluting the environment. The study in the tourism village in Turi
Subdistrict and its surroundings identified an average of 1-2 cows in each house because raising cows
was the second job after farming and zalacca gardening. Every day, on average, a cow produces 30 kg
of dirt. If there are 2,000 bulls, 60 tons of dirt will be collected every day. In real terms, the calculation
of Pulesari tourism village and its surroundings. Monitoring system to measure, monitor, reduce and report energy consumption with the analysis obtained as follows.

- 1 adult cow → 25 kg of dirt / day → 1 m³ biogas
- 6 houses → 20 cows → 20 m³ of biogas per energy worth 12 kWh
- Energy 12 kWh → can be used for lighting 6 houses @ 200 W for 10 hours Energy saving: Turn on the 1200 W generator set for 10 hours → 3.1 gasoline
- Costs incurred = 3 x Rp. 8,000 = Rp. 24,000 / day
  = Rp 720,000/month
  = Rp 8,640,000/month

The existing analysis of saving the energy produced can turn on the equivalent of a 20 watt generator with a time of 10 hours. The biggest advantage of this tourist village is avoiding the problems of dirt that will be carried by water into the soil or river which then pollutes the ground water and river water. Cow manure contains toxins and colly bacteria which endanger human health and the environment. Burning fossil fuels produces carbon dioxide (CO2) which contributes to the greenhouse effect that leads to global warming [14].

Biogas provides resistance to the greenhouse effect through 3 ways. First, Biogas provides a substitute or substitute for fossil fuels for lighting, electricity, cooking and heating. Secondly, methane (CH4) produced naturally by accumulating impurities is the biggest contributor to the greenhouse effect, even greater than CO2. Methane combustion in Biogas converts it to CO2, thereby reducing the amount of methane in the air. Third, with the sustainability of the forest, the CO2 in the air will be absorbed by the forest that produces oxygen against the greenhouse effect. Biogas produces environmentally friendly fuels because it is made from natural ingredients, such as human and animal manure, and other organic wastes. In addition to being useful as a substitute for fuel, several advantages that can be obtained from the use of biogas for the environment include:

a) Reduction in the number of trees cut down for firewood.

b) The cooking process becomes cleaner, and healthier because it does not emit smoke.

c) Animal cages are getting cleaner because the manure waste can be processed directly.

d) The remaining waste released from biodigester can be used as fertilizer so that it does not pollute the environment.

e) Contribute to reducing greenhouse gas emissions through reducing the use of fossil fuels

4. Conclusion

Based on the assessment of the process of energy conservation on environmental indicators (indicator D) of tourism villages in Turi sub-district the implementation carried out in the utilization of livestock manure as an alternative fuel source and its socio-cultural aspects in the field shows that tourism villages in Turi Subdistrict continuously from 2017-2019. Energy conservation carried out by the community in the tourist village knows what prospects can be developed in relation to the application of appropriate biogas technology in the tourist village of Pulesari and its surroundings in the framework of community base tourism to implement sustainable tourism development. Criteria for assessment scores conducted by MCSTO UGM and the Sleman district government establish a joint commitment in realizing sustainable tourism development. Results of analysis and from the data can be obtained that the conditions are in a stage that has not been implemented. Tourism villages that are in the district of Turi have understood the benefits of the environment while maintaining local wisdom to respect the environment. This condition is indicated by having made a plan and will be implemented criteria regarding the environment. Tourism destinations in Turi Subdistrict, Sleman Regency already have standards in destination management and environmental management but have not carried out overall practices within the framework of sustainable tourism development especially in standard D.
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