Ecotourism in Seafront Resorts for Future TOD Development in Small Island (Case Study: Gili Air, NTB)

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Abstract. Transit-Oriented Development (TOD) has been thought to encourage tourism development in targeted areas. There are small islands that have many potentials as a tourism destination; however, they do not have TOD on their transportation system. In the future, TOD development may focus on tourism development that required eco-resorts to prevent environmental issues. This study was conducted to compare two seafront resorts based on tourists’ perceptions to encourage the architects to design more eco-resorts in Gili Air. Data on ecological contexts of cottages unit (CU), building position and circulation (PC), landscape elements (LE), and waste management (WM) were collected in situ through measurements and observations. Data on tourist perceptions were collected using a questionnaire with a Likert scale (N1=53; N2=62). The results showed that the two resorts have a different quality in three indicators, i.e., Local character on building style, night lighting on the terrace, and attractiveness in building positioning. Besides, six crucial points should be considered for seafront resorts to achieve ecotourism goals at Gili Air. The seafront-resorts are expected to have an essential role in TOD and ecotourism development to what extent their significant presence can reduce their impacts on people and the environment.

1. Introduction
Transit-Oriented Development (TOD) is generally defined as a mixed community that was encouraged to decrease the dependence of driving by living near the transit service area [1]. In Indonesia, the small island usually categorized as tourism destination magnets that will bring a significant economic deficit for the community. In Makassar, the three locations of TOD development in Main Island are needed to ensure the social and public facilities of small islands [2]. In Lombok, there is no TOD development in main and small islands. Meanwhile, Gili Matra (Meno, Air, and Trawangan) has the longest staying visitors of other Gilis in Lombok and has impacts on tourism deficit. Among the three islands, Gili Air has some potential for TOD development because it is the nearest Gili from Lombok and has higher tourism satisfaction as Gili Meno (72%) than Gili Trawangan (53%) [3]. That study showed that rapid tourist development at Gili Trawangan had negative impacts on tourist perceptions. Therefore, Gili Air is the most suitable small island to be set as an ecotourism destination from others.

Ecotourism is a responsible journey to a specific area that has programs to protect nature by conservation, to increase welfare by local society participation (Fandeli, 2002) [4], and to support sustainable tourism [5]. Ecotourism criteria for tourist destinations are almost the same in many countries; there have to be landscape, tourism attraction, wild animals, and local society participation [6] [7] [8]. The Government had determined some regulations related to the ecotourism program, but several are not implemented well, especially in Gili Indah Villages, North Lombok District [3].
Tourism components, according to Spillane (2002), consist of supporting facilities and hospitality, which are so important such as attraction, infrastructure, and transportation [9]. Those two components can be found in accommodation facilities, serve tourist’s needs [10], and give some attractions [11], particularly in East and West seashore at Gili Air. Accommodation facilities, known as resorts, are one of the most essential supporting facilities besides traveling agency, money changer, et cetera, which increased in quantity from 777 rooms in 2007 to 2581 rooms in 2012 [3]. Otherwise, the presence of accommodation facilities are often associated with environmental issues, one of them is increasing in the number of algae in Gili Matra from less than 5% in 1993 to 40-70% of the water surface in 2012 [13]. Another issue is a garbage accumulation in the middle island of Gili Trawangan [3]. Unfortunately, the Government took different actions by demolishing restaurant constructions in the seashore of Gili Trawangan [14]. This program will be executed at Gili Meno and also Gili Air.

A study on accommodation building quality is, therefore, urgently needed to reduce some adverse impacts on the environment [5] [15], especially for those in the ecotourism area [16]. Resort with good quality can improve tourist perceptions [17] and expectation based on quality product approach [16]. Tourist perception is shaped by comfortableness in pedestrian circulation, climate changes, building shape, and also landscape elements that consisted of lighting, pavement, and plants [18]. Quality improvement in cottage units can be achieved by applying local building facades and materials [5] [17] [18] [19]. Moreover, resorts in ecotourism area have to reduce the chances of building collapsing from natural disaster by using local building structure in platform shape [20], applying sustainable infrastructure or building arrangement [20] [21] [22], choosing eco-friendly material for landscape [23] [24] [25], and using sustainable wastewater and garbage management system [5] [19] [26].

The quality of resort building depends on how a building responds to natural disasters and climate changes [20] [27]. Orientation, opening, and sun shading in a building can determine its response to climate changes. Furthermore, selection in building construction, structure, and materials is necessary to reduce the chances of building collapsing and preserve land in the resort area. The pattern in building arrangement and pedestrian circulation, as infrastructure resort, can be seen as resort attraction for tourists [20] [28] [29]. Landscape elements, included hardscape and softscape, should be an essential requirement for resort ecology. Hardscape elements are required to be sustainable in placement, treatment, and general standard [20] [30] [31], while softscape elements quality are determined by their function and distribution in the resort [20] [27].

Furthermore, wastewater from cottage units should not contaminate freshwater areas [20] [26] [32]. Most of the small beach resorts are not paying more attention to their environment [19] [33] [34]. That wastewater, which contains nitrate and phosphate, can be reused for sprinkling landscape or recycling it into freshwater [35]. This method can be found only in certain resorts at Gili Air. Ecological aspects of the building can be seen in Lombok traditional building at Sade Village [27] [36], Middle Lombok District. There are many indicators to determine resorts and environmental impact from energy saving to waste management system. All those indicators need to be tested in resorts for better quality and to preserve its surrounding environment.

There are many studies about the environmental impact of resorts near the seashore, but this kind of study is barely done before. Other studies were searching for to what extent the resort can bring environmental impact [19]. Some studies were searching for design criteria without concerning tourist perceptions on tourism destinations [23] [24] [25] [21]. This study cannot be compared to other studies. The indicators were determined by collecting some potential indicators and criteria from previous studies, most of them from theories. Many studies did not recognize the small island as necessary, so this study hopefully can be a trigger for other researchers to conduct other new studies.

Therefore, this comparative study is conducted to examine tourists’ perception of ecotourism architectural variables of two seafront small-size resort (15-20 units) at Gili Air for future TOD development. A comparison of the two resorts may help us to design more cost-effective and favorable resorts at Gili Air. Some indicators that are recognized as important should be implemented in new eco-resort development for small island sustainability in future TOD and ecotourism program.

2. Materials and method
This study uses quantitative methods for determining resort-quality by collecting tourist perception on a five-Likert-scale questionnaire. Data collection was carried out by observation, interview, and
questionnaire. Tourist perception on resort architecture was defined by four variable groups, i.e., resort cottage units (CU), building position and circulation (PC), landscape elements (LE), and waste management (WM) (Table 1). The data on tourist perception were collected using a one-page questionnaire. The questionnaire consisted of 20 questions related to the chosen indicators of the four variable groups. There were five questions for CU, six questions of PC, six questions for ML, and three questions for WM. One indicator, such as ‘building façade’, was considered unique because the respondents were expected to know the local traditional façade. Some respondents were only guessing which characteristics determine the local façade, and others know them better because they had traveled in Lombok Island before.

| Indicators                          | Indicators                          |
|-------------------------------------|-------------------------------------|
| Resort Cottage Units (CU)           | Landscape Elements (LE)             |
| CU1 Sun glare does not pass into resort buildings | LE1 Adequate number of outdoor elements |
| CU2 Wind and breeze can move into the buildings | LE2 Outdoor elements are comfortable to use |
| CU3 The temperature in the buildings is comfortable | LE3 The resort area is cool and shady |
| CU4 Building character is in keeping with traditional Lombok architecture | LE4 Plants in the resort shade most of the area |
| CU5 Night lighting on the terrace is effective | LE5 Plant positioning is nice and tidy |
|                                    | LE6 Plants in the resort are considerably diverse |
| Building Position and Circulation (PC) | Waste Management (WM)               |
| PC1 Building positioning and clustering allows adequate access for guests | WM1 Sanitation facilities are good |
| PC2 Building positioning is visually attractive | WM2 No disturbing smells in the resort area |
| PC3 There are sufficient inter-buildings spaces | WM3 Quality and management of wastewater and rubbish are adequate |
| PC4 Connecting trails between buildings are recognizable in the night | |
| PC5 Connecting trails are comfortable for walking | |
| PC6 Connecting trails are safe (e.g., no extreme slope, no sharp material) | |

Respondents were staying tourists of the tow resorts, TBH and SC. Respondents had to answer the questionnaire by rating their perception on a five-scale, from strongly disagree (1) to strongly agree (5) with positive statements on architectural indicators. During the study, the number of staying tourist at TBH were 104 people, while at SC were 217 people. Random sampling did not apply to this study, as resort management only permitted interviews or gave questionnaires to tourists who were willingly participating in the study. The sample was therefore chosen haphazardly with some criteria but distributed almost evenly among weeks during the study. The tourists chosen are above 18 years old and have stayed in that resort at least one day. This effort was carried out to maximize the representativeness of the sample to the population. The number of samples at TBH was 53 people with sex ratio 1:1; at SC were 62 people with sex ratio 1:1. Most of the TBH and SC respondents were
Europeans, and the rest were Americans. Respondents have a variety of occupations and ages in both resorts.

The data collected from the questionnaire were analyzed using mean score analysis and the Mann Whitney U test. Mean score analysis was used to determine resort quality in 3 categories interpretation based on intervals from Sturges formula. Those are bad (3.13-3.61), average (3.61-4.09), and good (4.09-4.57). Mann Whitney test was used to determine differences of indicators that related to resort quality [37] by using the null hypothesis (Ho): ‘there is no difference in quality at both resort.’ These methods will lead to one conclusion for this study to improve those resorts for sustainability in the future TOD area. TOD has not implemented yet, but the Gili has chances to be a transited tourism area from Bali and to be the main tourism destination in Lombok. Improvement in some indicators to achieve the standard ecotourism resort is very important for business operators and Government.

3. Result and discussion

3.1. Turtle Beach Hotel (TBH)
Turtle Beach Hotel (TBH) has many separated units with local building character (Figure 1). This cottage position has the seaward orientation to face a swimming pool as a primary view in the resort. Since the building has an east-west orientation, it gets most of the sun glare in the morning and evening. Building structure used is not in platform shape, so the building is not well adapted to big earthquakes. Building style in cottage units imitates local Lombok architecture character of lumbung shape and using local materials i.e., woods and tassels. The terrace is equipped with a general lighting type with one lamp placed in the middle of the cottage façade.

All buildings of TBH are arranged in a U line linear pattern for tourist’s accessibility in the resort area. Buildings are orientated slightly oblique to pedestrian circulation. Pavement materials in circulation are made of cement and rocks, so the circulation cannot absorb the rainwater. This trail is narrow, only 70-80cm width, for two walking people, while architecture standard for two trails circulation is at least 120 cm width [29].

There is a sufficient quantity of hardscape elements in TBH. Hardscape elements in the resort have consisted of sunbathing chairs, wooden tables, chairs, and garden lamps. They are arranged around the swimming pool area, while garden lamps are arranged along with circulation in the resort. This resort has many varieties in plants i.e., including ground cover, shading, decoration, fruit-producing, and visual barrier types placed separately in resort based on their functions. Plants can shade most of the resort area, while the front garden in the resort is not appropriately shaded. The swimming pool is located in the middle of the resort yard to accommodate tourist’s needs to spend their leisure time.

TBH uses Gili care service to manage organic and inorganic waste in the resort, so there is no area for composting organic waste. This management is recommended for seafront resorts to reduce the potential of environmental impacts. Wastewater from all cottage units is collected in septic tanks, located under the space between buildings, and then the water is channeled into the infiltration wells. This water management should be replaced by a water treatment plant system that can recycle wastewater into freshwater for sprinkling in a landscape.

Some of the architectural indicators tested can be used for ecotourism development program. TBH should pay more attention to wastewater management because the present waste disposal can harm the source of clean water area. Several indicators might also be improved, i.e., sun shading, width and materials of pedestrian circulation, and space between units.
Figure 1. Turtle Beach Hotel (TBH) layout: cottages area (yellow), restaurant (orange), and swimming pool.

Figure 2. Salim Cottages (SC) layout: cluster 1 (orange-resort facilities), cluster 2 (yellow-cottages area), and cluster 3 (yellow-cottages area)

3.2. Salim Cottages (SC)
Salim Cottages (SC) has many separated small cottage units with a traditional facade and terrace area on the front (Figure 2). Building materials are composed of natural and human-made materials to adapt to climate change and natural disasters. Cottage unit style does less represent local facade, as TBH does. Terrace lighting is a general lighting type, but it is not sufficient to illumine the whole area at night.

Buildings in this resort are organized based on their functions, so the spatial pattern of buildings is divided into some clusters. Resort facilities are placed on the front site (cluster 1), while standard and deluxe room units are placed in the middle site (cluster 2), and other standard units are placed afterward (cluster 3). Pedestrian circulation in the resort is about 120 cm width providing comfort for two walking people, and it uses a linear line pattern. Materials for circulation are made of cement and rocks for walking in cluster 1, and the other is made of sand beach in clusters 2 and 3. Circulation is lighted up by well-designed garden lanterns.

Both hardscape and softscape elements of SC are well arranged. Hardscape elements, such as sunbathing chairs arranged into one in barbeque area near cottage units while garden lamps are placed alongside pedestrian circulation. The plant variety is considerably diverse in type, i.e., shading, decoration, and ground cover types. They are unevenly distributed, particularly in cluster 3.

Inorganic waste is managed by Gili Care service, while organic waste, such as foliage, is naturally decomposed on land. Building material remains are stacked to make a decomposing area near the employee’s building. Wastewater from cottage units is managed by collecting water into big septic tanks placed between buildings. If the tanks were full, the wastewater would need other new tanks for disposition, so this system is not efficient and needs a wide area for excavation.

Many architectural indicators for seafront resorts are well achieved in SC. Several indicators need to be improved for a better resort quality. They are sun shading, local building style, terrace lighting at night, pedestrian circulation materials, plant distribution in resort, and also waste management. Those aspects are very important to be improved for better quality in that resort.

3.3. Architectural quality assessment
Turtle Beach Resort (TBH) and Salim Cottages (SC) show many indicators in eco-resort that considered good, average, and bad quality. Architectural indicators in average quality should be improved to promote ecotourism programs, although they are still acceptable. Resorts are expected to play an important role in preserving the environment. All indicators were skewed in the normality test because most of the tourist choices are about 4 to 5 to most indicators (Table 2). TBH and SC have to consider for the lowest mean score is wind and breeze can enter the building (CU2) indicator because tourists only give 3.13 for TBH and 3.15 for SC. This indicator cannot be used on the test because it is not reliable. On the other hand, tourists give high appreciation for TBH on the attractiveness of buildings arrangement (PC2, with mean score 4.57) while SC is appreciated for comfortable walking on pedestrian circulation (PC5, mean score 4.39). Those indicators have to be kept in good quality.
Tourists have the same perception of resort-quality only for several architecture indicators at both resorts (with a difference of mean rank in both resort is less than 0.1), such as ‘wind and breeze can enter the building’ (CU2), ‘hardscape elements are adequate and comfortable to use’ (LE1 and LE2) and also ‘plants make most of the shaded area in the resort’ (LE4) indicators. Both resorts do not have any wind ventilation because the room is set to cool by the air conditioner, so both tourists feel the wind cannot enter the cottage units (CU2). The number of landscape elements at both resorts is different, while TBH has more elements than SC. Besides, tourists show that TBH and SC have the quantity of the same element (LE1). TBH uses natural material for landscape elements and SC uses woven plastic, but tourists show both materials are barely comfortable to use (LE2). The last, tourists show that both resorts are not quite good at the shaded area on the landscape because the arrangement of tall trees is not evenly distributed on the front garden at TBH and cluster 3 at SC.

Tourists in both resorts, however, they gave lower scores on cottage units (CU) indicator, such as ‘wind and breeze into the building’ (CU2), which TBH has 3.13 while SC has 3.13; and gave average score on sun glare pass through the room (CU1), which TBH and SC both share 3.64 and 3.78 (Table 2). These results show that those architecture indicators are not good enough in both resorts when TBH has 100 cm and SC has 50 cm of building shading. TBH is more appreciated by tourists than SC, as TBH is using local facade on cottage units. TBH also uses local materials and **lumbung** shapes for building character. Furthermore, the night lighting on the terrace in TBH is better than SC.

**Table 2. Mean Score and Mann-Whitney Test Results**

| No   | Indicators                                      | Resorts | Mean Score | Mann Whitney Test | Remarks |
|------|-------------------------------------------------|---------|------------|-------------------|---------|
|      |                                                 |         | Mean       | Remarks           | P-Value | Remarks |
|      |                                                 |         | Remarks    |                   |         |         |
| CU1  | Sun glare does not pass into resort buildings   | TBH     | 3.64       | Average           | 57.40   | 0.627   | Ho      |
|      |                                                 | SC      | 3.78       | Average           | 60.23   | accepted|         |
| CU2  | Wind and breeze can move into the buildings     | TBH     | 3.13       | Bad               | 58.45   | 0.871   | Ho      |
|      |                                                 | SC      | 3.17       | Bad               | 59.45   | accepted|         |
| CU3  | The temperature in the buildings is comfortable| TBH     | 4.28       | Good             | 61.46   | 0.435   | Ho      |
|      |                                                 | SC      | 4.17       | Good             | 56.96   | accepted|         |
| CU4  | Building character is in keeping with traditional Lombok architecture | TBH | 4.36 | Good | 70.04 | 0.001 | Ho | rejected |
|      |                                                 | SC      | 3.81       | Average           | 49.86   | accepted|         |
| CU5  | Night lighting on the terrace is effective      | TBH     | 4.32       | Good             | 65.12   | 0.054   | Ho      |
|      |                                                 | SC      | 3.94       | Average           | 53.93   | rejected|         |
| PC1  | Building positioning and clustering allows adequate access for guests | TBH | 4.40 | Good | 60.27 | 0.68 | Ho | accepted |
|      |                                                 | SC      | 4.30       | Good             | 57.95   | accepted|         |
| PC 2 | Building positioning is visually attractive     | TBH     | 4.57       | Good             | 67.54   | 0.006   | Ho      |
|      |                                                 | SC      | 4.16       | Good             | 51.93   | rejected|         |
| PC 3 | There are sufficient inter-buildings spaces      | TBH     | 4.15       | Good             | 63.10   | 0.203   | Ho      |
|      |                                                 | SC      | 3.97       | Average           | 55.50   | accepted|         |
| PC4  | Connecting trails between buildings are recognizable in the night | TBH | 4.19 | Good | 61.00 | 0.531 | Ho | accepted |
|      |                                                 | SC      | 4.00       | Average           | 57.34   | accepted|         |
| PC5  | Connecting trails are comfortable for walking   | TBH     | 4.25       | Good             | 56.32   | 0.389   | Ho      |
|      |                                                 | SC      | 4.39       | Good             | 61.22   | accepted|         |
| PC6  | Connecting trails are safe (e.g., no extreme slope, no sharp material) | TBH | 4.21 | Good | 55.59 | 0.276 | Ho | accepted |
|      |                                                 | SC      | 4.39       | Good             | 61.82   | accepted|         |
| LE1  | Adequate number of outdoor elements             | TBH     | 3.94       | Average           | 58.61   | 0.903   | Ho      |
|      |                                                 | SC      | 3.89       | Average           | 59.32   | accepted|         |
| LE2  | Outdoor elements are comfortable to use         | TBH     | 3.94       | Average           | 58.89   | 0.972   | Ho      |
|      |                                                 | SC      | 3.94       | Average           | 59.09   | accepted|         |
| LE3  | The resort area is cool and shady               | TBH     | 4.02       | Average           | 57.25   | 0.583   | Ho      |
|      |                                                 | SC      | 4.14       | Good             | 60.45   | accepted|         |
The assessment of building position and circulation (PC) is almost the same at both resorts (Table 2). Only two indicators marked the average category. Inter buildings distance in TBH (PC3) is more highly appreciated (mean score 4.15) than in SC (mean score 3.97), although SC has wider space than TBH in measurement (space in SC is 300 cm, while TBH is 150 cm). An indicator of night lighting on circulation (PC4) is also obtained a higher score in TBH (mean score 4.19) than in SC (mean score 4.00). It is likely due to TBH has defined spatial distances among garden lanterns while SC does not have any. On the other hand, tourists mark high score for SC on comfortability and safety on the pedestrian way (4.25 for PC5 and 4.21 for PC6).

Landscape elements (LE) assessment showed only one indicator in good category at both resorts, which is plant position indicator (Table 2). Tourists of SC gave average category for 3.89 and 3.94 on quantity and quality of landscape material indicators (LE1 and LE2) respectively, while TBH gained almost the same category for 3.89 and 3.94 on that two indicators. Indicator for shading area in the resort has an average category at both resorts too (TBH 3.92 and SC 3.97). This result shows that tourists have the same perception of resort assessment on the shading area. Plants variety (LE6) at TBH also had a higher score (mean score 4.28) than SC (mean score 4.02). TBH can improve on cool and shady in resort (LE3) indicator on the front garden while SC improves on plant varieties (LE6) on cluster 3 of the resort.

Waste management that involves wastewater and garbage management is about the same quality in both resorts. Both resorts do not have disturbing smells in areas (WM2) (TBH has 4.32 and SC has 4.19); while sanitation facility (WM1) and waste management (WM3) in both resorts have to be improved (TBH has 4.00 and 4.08 while SC has 3.89 and 3.86 respectively) (Table 2). Those kinds of water management should be replaced to the better one to avoid environmental impacts in years.

Tourists of the two resorts gave the same opinions at some indicators, but they also had diverted perceptions on other indicators. They perceived that both TBH and SC need to improve on sun shading (CU1), quantity and quality of landscape elements (LE1 and LE2), resort shaded area (LE4), sanitation facility (WM1) and also waste management (WM3) indicators. Tourist at SC also perceived that SC also needs some improvements on the Local character in building style (CU4), night lighting on the terrace (CU5), space between buildings (PC3) and plant varieties in resort (LM6) indicators; while tourist at TBH only needs addition improvement on the cool and shady area in resort (LE3).

Many indicators need to be improved and concerned at both resorts. This improvement will bring resorts to be better in quality in Small Island. Other resorts near seashore may be better or worse in quality because all resorts are different and cannot be generalized into one or two resorts groups. However, TBH and SC are three-star resorts that boost eco-resort development in Gili Air.

| No | Indicators | Resorts | Mean Score | Mann Whitney Test |
|----|------------|---------|------------|------------------|
|    |            |         | Mean       | Remarks | Mean | P-Value | Remarks |
| LE4 | Plants in the resort shade most of the area | TBH | 3.92 | Average | 59.04 | 0.991 | Ho accepted |
|     |            | SC     | 3.97 | Average | 58.97 |          |         |
| LE5 | Plant positioning is nice and tidy | TBH | 4.36 | Good | 62.24 | 0.302 | Ho accepted |
|     |            | SC     | 4.20 | Good | 56.32 |          |         |
| LE6 | Plants in the resort are considerably diverse | TBH | 4.28 | Good | 64.51 | 0.087 | Ho accepted |
|     |            | SC     | 4.02 | Average | 54.44 |          |         |
| WM1 | Sanitation facilities are good | TBH | 4.00 | Average | 60.28 | 0.688 | Ho accepted |
|     |            | SC     | 3.89 | Average | 57.94 |          |         |
| WM2 | No disturbing smells in the resort area | TBH | 4.32 | Good | 61.87 | 0.359 | Ho accepted |
|     |            | SC     | 4.19 | Good | 56.63 |          |         |
| WM3 | Quality and management of wastewater and rubbish are adequate | TBH | 4.08 | Average | 63.76 | 0.139 | Ho accepted |
|     |            | SC     | 3.86 | Average | 55.05 |          |         |

3.4. Architectural quality comparison

Quality comparison is determined by mean differences of tourist perceptions at both resorts. The result shows that differences were only found on 3 out of 20 indicators (Ho rejected) (Table 1), i.e., the local character on building style (CU4), night lighting on the terrace (CU5), and attractiveness on building.

No disturbing smells in the resort area

Quality and management of wastewater and rubbish are adequate

Tourists of SC gave average category for 3.89 and 3.94 on shading area in the resort. They perceived that both TBH and SC need to improve on sun shading (CU1), quantity and quality of landscape elements (LE1 and LE2), resort shaded area (LE4), sanitation facility (WM1) and also waste management (WM3) indicators. Tourist at SC also perceived that SC also needs some improvements on the Local character in building style (CU4), night lighting on the terrace (CU5), space between buildings (PC3) and plant varieties in resort (LM6) indicators; while tourist at TBH only needs addition improvement on the cool and shady area in resort (LE3).

Many indicators need to be improved and concerned at both resorts. This improvement will bring resorts to be better in quality in Small Island. Other resorts near seashore may be better or worse in quality because all resorts are different and cannot be generalized into one or two resorts groups. However, TBH and SC are three-star resorts that boost eco-resort development in Gili Air.
arrangement (PC2). The other indicators do not have any significant differences to be considered as tourist intentions.

The building style of cottage units (CU4) in both resorts is different in the façade and materials (Table 1). Tourists in TBH gave good responses as cottages style shows the unique local building of Lombok (mean rank is 70.04), while tourists in SC considered that its cottages style has less similarity to local architecture (mean rank 49.86). This indicator has the smallest P-value of others, so this leads both resorts to always concern about building style to create a good impression. Night lighting on the terrace (CU5) indicator is considered to have a different quality at both resorts (Table 1). TBH tourists considered that the terrace lightings on cottages are adequate to give illumination to their surroundings (mean rank 65.12), while SC tourists considered that the lightings are quite not good at night (mean rank 53.93). Both resorts use the same lighting, general lighting, but the position of lamps is different.

Attractiveness in building arrangement (PC2) in both resorts is different from tourist perceptions (Table 1). Most of TBH tourists considered the building arrangement on cottage units are attractive (mean rank 67.54), while some of SC tourists considered the arrangement is average (mean rank 51.93). TBH arranged the buildings effectively so they expectedly can share the sea panoramic from the terraces, while SC arranged them in linear line so they all can face the resort garden for an attractive view. The mean rank difference is quite extensive 15.61 for this indicator, which shows a significant difference in both resorts’ quality.

These results show that three indicators are perceived as different in quality. Unfortunately, there are no other similar researches that try to find differences in quality and this result cannot be compared to other studies. Applying local building character and using local materials can improve resort-quality [5] [17] [18] [19]. Therefore, night lighting on the terrace can improve the tourist’s prospect at night and improve the resort’s landscape design quality for tourism [29]. The arrangement of building level on the landscape can provide open space in resort design, cluster the landscape for built and non-built area, provide circulation area for comfortably walking [20], and attract tourists.

Tourists at both resorts had more concern about those indicators that need to be improved. Improvement in quality can bring positive perception from tourists and also can reduce environmental impact for future development. One indicator, such as building style of cottage units (CU4) that was perceived as unique or beautiful was the building style that shows local character. For TOD, Gili Air will be one of the transited areas from Bali to Lombok. Using local style on cottages will attract tourists and use local materials for eco-resort criteria and reduce human-made materials for sustainability. These implications will also be the same for those two indicators.

3.5. Resort criteria based on tourist interview

This study also collected the tourist expectations on seafront resort. The questions consisted of four-choice questions are given to several tourists at both resorts (TBH were 20 tourists and SC were 19 tourists). Many cottages style expected from tourist perceptions is small buildings that show local or traditional character rather than the modern one. Only did a few tourists not consider building style and choose a modern style. Some tourists did not know Lombok’s traditional building style, but they can tell whether cottages style is imitating to local style or not. Meanwhile, they also expected the resorts have many separated small building units as in TBH and SC rather than the big one composed many units for building type because it is not suitable to holiday theme for a small island. These kinds of expected future eco-resort designs are found in TBH and SC.

Most of the tourists in both resorts chose more space for plants than the swimming pool for resort area (16 of 39 visitors). Meanwhile, tourists also considered the swimming pool area is important for beach resorts; then, the swimming pool should be larger (14 of 39 visitors). The swimming pool area should share the same area in the landscape. Other tourists said both plants and swimming pool areas are important (have the same space areas) for beach resort (9 of 39 visitors). Unfortunately, the beach in front of resorts cannot be accessed freely because of restaurant areas for the resort business. They have to walk a bit far to access the east beach of Gili Air. Therefore, tourist expectations for this
aspect are the same. They need the swimming pool area, although there is the beach next to their resort.

All tourists in both resorts said that wastewater management at Gili Air is so important to be noted for all resorts. One of the tourists felt uneasy about plastic waste that floating on the seawater when she was in a boat. She wanted to participate by paying fees for better waste management at Gili Air because Gili Air has a beautiful beach.

The tourists in both resorts show the same point of expectation for beach resort quality. They highly appreciate cottages units with local building character, space between cottage units in the resort, plants and swimming pool area in resort garden, and wastewater management. This finding was associated with eco-resort design criteria [20] that encourage minimizing environmental impact from buildings along a seashore. All of these aspects should be prioritized in developing eco-resorts at Gili Air for sustainable development. Both resorts need to preserve the environment to pursue tourist expectations.

4. Conclusion
Gili Air is expected to be one of the ecotourism development areas, so resorts have to adjust to some eco-resort indicators to improve their quality. Unfortunately, the Government program does not consider the important role of resorts to create a better environment when resorts are slightly responsible for environmental impacts [27]. The Tourists assessed some indicators needed to improve the quality of resorts in ecotourism and future TOD area based on two selected resorts. Those resorts do not necessarily represent all resorts at Gili Air, and there are no resorts with the same characters. The result shows that cottage units, lighting on the terrace, building arrangement, materials usage, and waste management in resort also have important roles in identifying ecotourism indicators correlated to previous researches [20] [21] [24] [31] [32]. This study shows that both resorts in Gili Air are instead not paying any concerns about selecting and arranging landscape elements that have not been found in the previous studies.

Ecotourism programs applied in resort can reduce environmental impacts and motivate tourists to stay longer. However, future TOD in a small area will impact on tourism facilities directly or indirectly. The small island is very resistant to environmental change, so it has to be resilient to overcome environmental impact in future TOD development, whereas the development will intake on the main island. One or two eco-resort development may have a slight impact on environment resilient, but the high number resorts along seashore will overwhelm sea contamination in future development. These eco-resort criteria will make a better living for humans and the environment.

This study has many limitations and needs to be improved in the future. The study of TOD development in the small island has not conducted yet, so future studies need to elaborate on the previous findings. Some indicators of cottage units, building position, landscape elements, and waste management may not suitable for other research, so the indicators have to be relevant to the existing resort study. Some improvements in eco-resort indicators are needed to develop the research.

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