Structural model to evaluate the effect of participation and satisfaction on ecotourism sustainability

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Abstract. This paper is directed to study the effect of local community participation and visitors' satisfaction on ecotourism sustainability at Badung regency of Bali province, Indonesia. Two important aspects regarding ecotourism sustainability had been studied, i.e. (a) economic benefits for local people and (b) tourists’ satisfaction. Applying variance-based structural equation modeling, data were collected in July 2015 from local community leaders of Kiadan Village at Badung regency and tourists who visited this village, were analysed. Four latent variables, namely (a) community participation, (b) economic benefits, (c) tourists’ satisfaction, and (d) ecotourism sustainability, were used to build structural model. The results showed sustainability of Kiadan’s ecotourism was significantly affected by local community participation and visitors’ satisfaction although community participation’s effect slightly greater than tourists’ satisfaction with path values for participation and satisfaction as much as 0.651 and 0.627, respectively.

1. Introduction

Many scholars argue sustainability of tourist destinations depends on the involvement and participation of local community on the tourism system in their villages [1][2][3]. By taking participation in tourists activities, local people have chances to initiate and manage their small businesses that take focus on servicing and supplying visitors needs. Furthermore, for people with lack of abilities to start their own business, they might be employed by tourist industries located around their village. In general, tourism give many economic benefits for local people whom participated in tourism activities at their village by direct or indirect participation [1].

Despite of the economies beneficiaries, undoubtedly Bali’s tourism also causes some negative potentials especially on socio-cultural and environmental aspects. Recently, Balinese people experienced water scarcity that is never happened before tourism so intensive in this small island. Another example is the disruption of the traffic’s flow as consequences of the concentration of tourism industries and people’s activities. These conditions lead to the inquiry of ‘the friendly-formed of tourism’ that is argued has less negative impacts. Ecotourism is proposed to be an alternative.

This research is motivated to elaborate and to study the relationship between local community participation and sustainability of ecotourism, especially in highland region of Bali. We focused our study on three main issues, namely (a) the effect of community participation on economies’
benefit gained by local people, (b) the effect of community participation and tourists satisfaction on ecotourism sustainability, and (c) the effect of ecotourism sustainability on economies’ benefit for local people. Variance-based structural equation modeling (PLS-SEM) is applied to study these issues. This technique is chosen with following considerations:

(i) Classified to soft modeling technique, PLS-SEM is not too strict regarding the fulfillment of normality assumption as found on covariance-based SEM techniques such as AMOS and LISREL [4];
(ii) PLS-SEM can be used without loss of power test for small sample. This technique has been proven its power even for sample only sized 6 [5].

In brief, SEM is a statistical method that is grouped to multivariate statistical analysis as well as factor analysis, and is commonly used by social researcher to study the relationship among latent variables [5][6]. According to Bollen [6] and Tenenhaus et al. [4], SEM is a powerful technique to study latent variable or construct, a variable that can not be measured directly. Latent variable is usually measured by its indicators or manifests.

2. Research Method

The data in this research is obtained from local people and community leaders who participate in the management of Kiadan Village Ecotourism, and from tourists whom visiting Kiadan Village ecotourism on May—July 2015. Kiadan is located at northern part of Badung regency, Province of Bali. Self-administered questionnaires were distributed for 120 respondents, 60 samples were taken from the local people and their leaders, and another 60 were taken from the tourists whom visited Kiadan village. Prior to use for collecting data, the questionnaire were tested to evaluate its validity and reliability.

We developed our SEM’s model that consists of six first-order latent variables, namely (a) direct participation, (b) indirect participation, (c) economies’ benefit, (d) tourists’ attraction, (e) accessibility, and (f) amenities; and three second-order latent variables, i.e. (a) ecotourism sustainability, (b) local participation, and (c) visitors satisfaction. The conceptual model of this research is depicted in Fig. 1.

![Conceptual Research Model](image)

**Figure 1.** Conceptual Research Model
3. Results and Discussion

3.1. The Assessment of Questionnaire

Prior to data collection, we tested the validity and reliability of the questionnaire. For reflective construct, an item is declared invalid, if its correlation with total items score on the same construct is $< 0.30$ [8]. Furthermore, a reflective construct is called reliable if the value of its Cronbach’s alpha ($\alpha$) $\geq 0.60$ [9]. The assessment results is listed in Table 1.

| Construct               | Total item | Valid item | $\alpha$ value |
|-------------------------|------------|------------|----------------|
| Direct Participation    | 4          | 4          | 0.727          |
| Indirect Participation  | 3          | 3          | 0.652          |
| Tourists’ Attraction    | 11         | 9          | 0.771          |
| Accessibilities         | 2          | 2          | 0.612          |
| Amenities               | 2          | 2          | 0.636          |
| Economic Benefit        | 3          | 2          | 0.602          |

Based on the assessment results, three items that are proved insignificant to represent their constructs (tourists’ attraction and economic benefit) were eliminated on subsequent analysis. We used SmartPLS 3.2.3 from [10] to analyse the model.

3.2. Outer Model Analysis

As described previously, a latent variable $\xi$ is measured through its manifests $x_h$. For reflective measurement – a latent variable is reflected into $p$ manifest (observable) variables – the causal relationship can be expressed in equation (1) as follow:

$$x_h = \pi_{h0} + \pi_h \xi + \epsilon_h$$  (1)

In (1), $\xi$ has mean $m$ and standard of deviation equals to 1. According to H. Wold (cited in [4, p.163]), the predictor specification must satisfy

$$E(x_h|\xi) = \pi_{h0} + \pi_h \xi$$  (2)

Outer model analysis is aimed to elaborate the relationship between construct and its items. This assessment is conducted by observing the individual loading factor of the manifests, evaluating constructs’ internal consistency by observing the composite reliability (CR) and checking constructs’ convergent validity through its average variance extracted (AVE) [7]. A construct is argued has internal consistency if its CR’s $\geq 0.708$ [10] and achieved convergent validity if its AVE’s $\geq 0.50$ [10][11]. In addition, the outer loading has to be greater than 0.60 [9] and significant [11]. The AVE for one contruct that is reflected into $p$ manifest variables can be counted using formula (3) that is introduced in [4] and [16]:

$$AVE = \frac{1}{p} \sum_{h=1}^{p} Cor^2(x_h, \xi)$$  (3)

By examining the AVE’s values for all of first-order reflective constructs in our model, suggested all of constructs achieved convergent validity. The smallest and the largest AVE’s were found for tourists’ attraction and for tourists’ amenities as much as 0.508 and 0.683,
respectively. In addition, the examination of CR’s values showed all constructs also achieved internal consistency and accessibilities and tourists’ attraction constructs with the smallest and the largest CR’s values as much as 0.741 and 0.849, respectively. Refers to this outer assessment, we concluded that the inner model analysis is worth to be conducted.

3.3. Inner Model Analysis
Inner or structural model analysis relates to causal relationships among constructs [9]. The assessment of inner model is conducted by examining the path coefficients that relate one or more exogenous constructs to an endogenous construct. The path coefficients for inner relationship is depicted in Fig. 2. We got eight out of nine paths are significant at 10 percent significance level, while one path coefficient is insignificant.

![Path Coefficients for Inner Relationships](image)

Furthermore, the coefficient of determination $R^2$ that represents the amount of endogenous’ variance is explained by its respective exogenous constructs has to be noted. According to [13], an endogenous construct is claimed has a weak, moderate, or substantial predictive accuracy whenever its $R^2$ greater than the threshold values as much as 0.19, 0.33, and 0.67, respectively. In addition to examine the $R^2$, one should check the predictive relevance of endogenous constructs by noting the Stone-Geisser’s $Q^2$ value. The $Q^2$ value $> 0.0$ suggests the construct is relevantly predicted by its respective exogenous constructs [11]. The $R^2$s and $Q^2$s for endogenous constructs in our model is listed in Table 2. Refers to Table 2, except for economies’ benefit construct that is moderately predicted by its exogenous constructs, the rest are substantially predicted by their respective constructs.

3.4. Discussion
Despite the community participation has been acknowledged and promoted since 1950s as an important agent to assure the successful of development process, its implementation and mechanism are still debated among economic development scholars [14]. Community involvement is argued has a central position in the development process as well as an indispensable tool to educate people [1]. Our work showed people of Kiadan village significantly affect ecotourism sustainability at this area through their participation. The more local
Table 2. The Assessment of the Inner Model

| Construct               | R²   | Accuracy? | Q²   | Relevance? |
|-------------------------|------|-----------|------|------------|
| Direct Participation    | 0.871| Yes       | 0.484| Yes        |
| Indirect Participation  | 0.729| Yes       | 0.306| Yes        |
| Tourists’ Satisfaction  | 0.919| Yes       | 0.298| Yes        |
| Economic Benefit        | 0.492| Yes       | 0.184| Yes        |
| Sustainable Ecotourism  | 0.995| Yes       | 0.171| Yes        |

people get involved on ecotourism at Kiadan, the more its sustainability could be expected. Furthermore, their participation on ecotourism also positively affect the economic benefit for the host. This finding is inline with the similar research is done by [15].

From demand perspective, the sustainability of ecotourism at Kiadan is significantly affected by its visitors’ satisfaction, although this effect is slightly less than the effect arise from local participation. Visitors felt satisfied with attraction, accessibilities, and amenities in this destination. Observing the path values of these constructs, it is clear that natural attraction outperformed accessibilities and amenities factors in forming tourists’ satisfaction whom visited this ecotourism destination.

4. Conclusion
The results of this work gave several explanations regarding the causal relationships between community participation, ecotourism sustainability, visitors’ satisfaction, and the economic benefit for local people. The sustainability of ecotourism at Kiadan village, Badung regency of Bali, is significantly affected by local community participation and tourists whom visited the destination. The more local people get involved in ecotourism activities at this village, the more economic benefit they will get. In addition, we concluded tourists’ attraction is the ultimate factor to keep ecotourism at this village sustain. From this finding, we suggest the tourism stakeholders at Badung regency to maintain natural landscape and to expand local activities that support ecotourism at Kiadan Village.

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