



Sustainability Ecotourism Complexity in Batu-Indonesia: CBE Implementation based on Tourists' Evaluation

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Abstract

This study aimed to analyze the implementation of CBE principles in the ecotourism management. This quantitative study investigates the relationship between independent variables and the implementation of CBE principles. This research was conducted in three ecotourism areas: Coban Rondo, Coban Talun, and Paralayang. Visitors of those three ecotourism were used as the samples of this study (± 375 visitors). The data would be analyzed using multiple regression to determine the relationship between several variables to the implementation of CBE principles. A Two-Way ANOVA had been used to see whether variables had a significant influence on CBE. According to the results of multiple regression analysis, only Coban Rondo shows a significant relationship. The findings of analysis show a significant influence, which is only shown by the varied motives for traveling to Coban Talun and Paralayang. The distinction in BNT notation arises exclusively in Paralayang, whereas no notational difference appears in Coban Talun.

Keywords: sustainability ecotourism; community-based ecotourism; tourist; complexity

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Introduction

Tourism should be oriented towards sustainability (Taena et al., 2022) in order to align with the Sustainable Development Goals or SDGs (Mallick et al., 2020). Community-Based Ecotourism (CBE) is one form of sustainable development or SDGs Implementation that is responding to these demands (Marlina et al., 2020). Ideally, the CBE should be implemented to ensure the long-term viability of ecotourism (Phelan et al., 2020).

Several terms are used to describe the positive sides of CBE, including creative and regenerative tourism (Duxbury et al., 2021), green tourism (Anand et al., 2012), responsible tourism (Chettiparamb & Kokkranikal, 2012), pro-poor tourism (Purbasari & Manaf, 2018), and even it is considered as a magic bullet (Ghosh & Ghosh, 2019) and "a Core" of sustainable tourism through three pillars - environmental, social, and economic (Machnik, 2021). CBE bolsters the use of sustainable resources/conservation and allows for local community involvement (Singgalen, 2020) or rural (Ammirato

et al., 2020) and even Various studies reveal a positive contribution of CBE in indigenous communities. preventing environmental degradation and reducing overexploitation (also known as eco-friendly ecotourism) (Ammirato et al., 2020). CBE has a strategic tourism marketing framework that incorporates multiple perspectives (Lin et al., 2020), involving local governments, visitors, and local communities in presenting cultural products and various natural attributes (Ruiz et al., 2019). CBE has the potential to realize local community participation and empowerment (Stone, 2015), and even become a transformative socio-economic form for local communities (Kim et al., 2019).

Nevertheless, issues arise in ecotourism practices (Kc, 2020), such as those encountered by local communities whose incomes are low due to a lack of education, skills, and capacity to develop (Kim et al., 2019). Local community involvement is frequently neglected, even marginalized (Carvache-Franco et al., 2021; Khalid et al., 2019). Ecotourism activities are also often trapped in the orientation to reap the highest profit so that sometimes they ignore the conservation aspect (Butler et al., 2020; Stringer et al., 2020). Consequently, the local community must improve its capacity. Stakeholders engagement or multiple stakeholders is very needed to realize that matter (Atanga, 2018), apart from the implications of anticipatory and solution policies (Kc, 2020). Consistent implementation of a proper management framework and alignment with CBE principles is required (de Grosbois & Fennell, 2021). Conceptually, the CBE emphasizes the integrated basic principles that should be observed to ensure the success of ecotourism (Husamah & Hudha, 2018; Rahardjanto et al., 2019), allowing ecotourism practices to remain sustainable even under stressful or unstable conditions (Mudzeni et al., 2021). Implementing CBE principles in ecotourism practices is difficult, despite the increasing number of evidence indicating that only such an approach will ensure ecotourism success (Machnik, 2021). Various portraits of the implementation of CBE principles in the field are required to uncover "well-intended efforts and good practices" (Fabricius & Pereira, 2015) or implementation success stories (Puri et al., 2019), and even to map various problems (Hoogendoorn, 2017); thus, it can make it easier to find the right solution (whiz-bang solutions) (Montgomery et al., 2020). The study's findings will assist related parties in developing relevant management policies; thus, the policies will be able to improve environmental knowledge that is oriented toward sustainable development, motivate and maximize the involvement of local communities, and increase economic, social, and cultural benefits for the larger community (Masud et al., 2017).

Indonesia is a country with many ecotourism destinations that have the potential to improve the community's quality of life/welfare while also ensuring the sustainability of environmental fungi (Harianto et al., 2020; Wibowo et al., 2021). Generally, there are several researches regarding the sustainability of ecotourism in Indonesia (Wibowo et al., 2021). Therefore, previous researchers have partially completed several policies about CBE and its principles in Indonesia, specifically about the theme of coastal biodiversity conservation and environmental awareness (Abidin et al., 2021), site suitability evaluation for ecotourism development (Yuwono et al., 2021), comparative and competitive advantages (Wardana et al., 2021), sustainable management (Sjaifuddin, 2020), and status and ecotourism potential (Djunaidi et al., 2020). Meanwhile, reviews about the implementation of CBE principles have been conducted in Clungup Mangrove Conservation (Husamah & Hudha, 2018), Gili Labak (Rahardjanto et al., 2019), mangrove ecotourism at Muara Kubu Mangrove Areas (Nugroho et al., 2019), and mangrove ecosystem of southern (Abidin et al., 2021). A special study, however, has not been conducted in Batu City. Despite the fact that Batu City has declared itself as a "City of Batu Tourism," with ecotourism as its mainstay. This means that the sustainability of life in Batu City is heavily reliant on the sustainability of ecotourism. Batu City is one of favorite areas for vacation (Insani et al., 2019). Additionally, evaluation of CBE principles from the "side" of visitors (tourists/visitors) is still rarely done, despite the fact that they have a strategic position in supporting the sustainability of CBE (Wagner et al., 2021). The core of CBE is visitor attendance (Walker & Moscardo, 2014). Therefore, this study aims to analyze the implementation of Community-based Ecotourism (CBE) principles in managing the ecotourism of Batu City. Visitors' evaluation of the implementation of CBE principles will be a fundamental ecotourism development policy of Batu City in the future, with a focus on innovation to maximize CBE's potential for community welfare and environmental sustainability. This study is expected to be an alternative for solution to the problems of CBE principles in Batu City, specifically in the context of sustainability and it can be a starting point for related science in the development of other aspects of ecotourism studies and environmental conservation, both in terms of breadth and depth.

Research Method

Study Design

This study was a quantitative study by examining the relation between independent variables, which covered age, education, occupation, income, and travel motive to the implementation of CBE principles. The results of the relationship investigation would be used as the basis for the discussion to provide a recommendation for solution toward the problems of implementing CBE, particularly for

the ecotourism in Batu City in the context of sustainability, based on the perspectives of ecotourism experts.

Study site and sample selection

Three eco-tourism areas were selected to conduct this study, precisely in Batu City, East Java Province. These areas were Coban Rondo, Coban Talun, and Bukit Paralayang. This study was carried out for three months, in March to April 2021. Visitors of those three ecotourism areas in Batu City were used as the samples of study (\pm 125 visitors per location; hence, the total samples are 375). The samples were categorized based on (1) Gender; (2) Age; (3) Education; (4) Occupation; (5) Income; (6) Regional origin; and (7) travel motives.

Data Collection and Instrument

Several methods were used to collect data for this study, including those were recommended by previous ecotourism researchers (Husamah & Hudha, 2018; Rahardjanto et al., 2019); one of them was by distributing questionnaire that would be filled up by respondents (visitors or tourists). The statements in the questionnaire referred to the 5 CBE Principles that had been modified (Rahardjanto et al., 2019), including (1) Conservation Principles (Natural Conservation Principles consisted of 6 criteria and Cultural Conservation Principles (there were 4 criteria); (2) Principles of Community Participation (there were 7 criteria); (3) Economic Principles (there were 5 criteria); (4) Principles of Education (consisting of 5 criteria); and (5) Tourism Principles (there were 6 criteria). In connection with the pandemic conditions when the research was conducted, the questionnaire was transformed into an online questionnaire using the Google Form platform. Furthermore, the questionnaire links were distributed to the respondents in this study. Respondents filled out the questionnaire using a Likert scale with an option scale of Strongly Disagree (SD = 1); Disagree (D = 2); Agree (A = 3); and Strongly Agree (SA = 4). The first distributed questionnaires were tested for validity and reliability. Based on the test results, all items were declared valid if the items had a sig value of <0.05 . Cronbach's Alpha was 0.968, indicating that the instrument was reliable.

Data Analysis

Data on the results of filling out the questionnaire were downloaded in the form of .csv; the researchers would later check the entire data set before conducting an analysis. Microsoft Excel and SPSS software were used in the analysis. The frequency of information source profile data was calculated and then presented in the form of a graph. Profile data was converted into score data. Furthermore, profile data was presented via crosstab. Quantitative research data were analyzed using multiple regression analysis to find out the relationship between all variables (age, education, occupation, income, and travel motives) on the implementation of CBE principles. Significance level (α) used in this study was 0.05. Two-Way ANOVA was conducted to discover whether there was a significant effect of the variable on the CBE.

Results and Discussion

Demographics of Respondents

Gender

Information on gender aspect data is as presented in Figure 1.

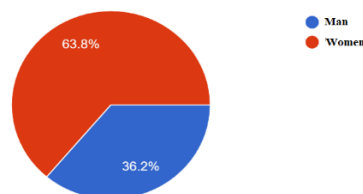


Figure 1. Gender diagram

Based on Figure 1, most of the respondents are women (53.8%). Male respondents only 36.2%.

Age

Information on age aspect data is as presented in Figure 2.

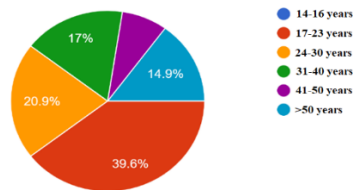


Figure 2. Age Diagram

Based on Figure 2, most of the respondents are 17 to 23 years old (39.6%) or known as millennial generation, and the lowest is 41 to 50 years old (0.4%).

Education

Information on education aspect data is as presented in Figure 3.

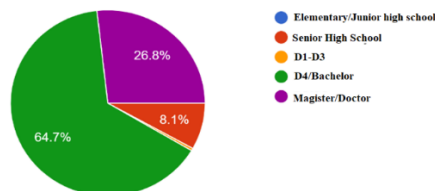


Figure 3. Education diagram

According to Figure 3, most of respondents have Bachelor Degree (D4/S1) for 64.7% and the lowest is Diploma Program (D1-D4) for 0.4%.

Occupation

Information on occupation aspect data is as presented in Figure 4.

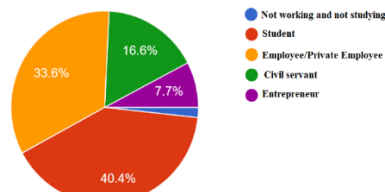


Figure 4. Occupation diagram

Based on Figure 4, most of respondents are students (40.4%) and 1.7% are not working or not studying.

Income

Information on income aspect data is as presented in Figure 5.

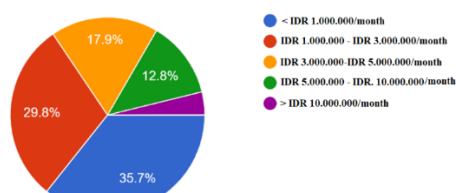


Figure 5. Income diagram

Based on Figure 5, most of the respondents are earning less than IDR. 1.000.000/month (35.7%) and the lowest is for those who have incomes more than IDR. 10.000.000/month (3.8%).

Respondent's Origin

Information on respondent's origin aspect data is as presented in Figure 6.

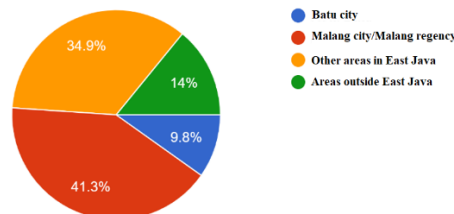


Figure 6. Respondent's Origin diagram

According to Figure 6, most of the respondents come from both Malang City and Malang Regency (41.3%) and the lowest comes from Batu City (9.8%).

Travel Motives

Information on travel motives aspect data is as presented in Figure 7.

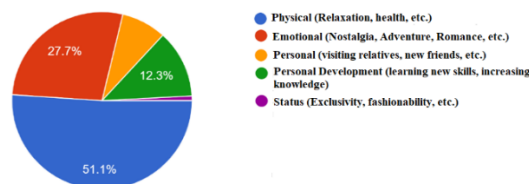


Figure 7. Travel motive diagram

Based on Figure 7, most of respondents argue that their travel motive is Physical (Relaxation, exercise, health, to experience a new culture), in which it is about 51.1% and there is only 0.9% who have status motive (Exclusivity, Fashionably, to get attractive offers, and show off shopping opportunities).

Regression Analysis Results

Ecotourism of Coban Rondo

The results of the Kolmogorov-Smirnov test inform that the residual data are normally distributed [$D(191) = 0.064$, $p = 0.055$]. The regression analysis results are provided in Table 1. Multiple linear regression is performed to predict the CBE based on gender, age, Education, occupation, income, origin, and travel motive of the visitors. A significant regression equation is obtained [$F(7,183) = 3.054$, $p = 0.005$], with R^2 of 0.105.

Table 1
Regression Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	107.138	8.803		12.171	0.000
Gender	2.436	2.491	0.072	0.978	0.329
Age	1.318	1.333	0.115	0.989	0.324
Education	-4.154	1.667	-0.202	-2,492	0.014
Occupation	-1.355	1.740	-0.082	-0.779	0.437
Income	-0.868	1.549	-0.061	-0.561	0.576
Origin	2.541	1.440	0.132	1.764	0.079
Motives	2.864	1.100	0.185	2.604	0.010

Based on Table 1, regression equation is $y = 107.138 + 2.436X_1 + 1.318X_2 - 4.154X_3 - 1.355X_4 - 0.868X_5 + 2.541X_6 + 2.864X_7$.

Ecotourism of Coban Talun

The results of the Kolmogorov-Smirnov test inform that the residual data are normally distributed [D (128) = 0.060. $p = 0.200$]. Multiple linear regression is performed to predict CBE based on gender, age, education, occupation, income, origin, and tourist motives. Significant regression equation is not obtained [$F(7.120) = 1.325$ $p = 0.244$], with R^2 of 0.072.

Ecotourism of Bukit Paralayang

The results of the Kolmogorov-Smirnov test inform that the residual data are normally distributed [D (128) = 0.060. $p = 0.200$]. Multiple linear regression was performed to predict CBE based on gender, age, education, occupation, income, origin, and tourist motives. Significant regression equation is not obtained [$F(7.132) = 1.769$ $p = 0.099$], with R^2 of 0.086.

Analysis Result of Two-Way ANOVA

Ecotourism of Coban Rondo

The results of the Kolmogorov-Smirnov test inform that the residual data are normally distributed [D (191) = 0.054, $p = 0.200$]. Levene test results inform that the variance of the CBE data is homogeneous [$F(12.178) = 0.839$, $p = 0.610$]. Table 2 presents the results of the Two-way ANOVA test.

Table 2
Two-way ANOVA Test Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	5132.733 ^b	12	427.728	1.685	0.073	0.102
Intercept	218471.238	1	218471.238	860.756	0.000	0.829
Education	1645.479	3	548.493	2.161	0.094	0.035
Motives	1605.840	4	401.460	1.582	0.181	0.034
Education * Motives	335.715	5	67.143	0.265	0.932	0.007
Error	45178.764	178	253.813			
Total	2130127.000	191				
Corrected Total	50311.497	190				

According to Table 2, several findings can be concluded, namely (1) Differences in education level do not have a significant effect on CBE [$F(3.178) = 2.161$, $p = 0.094$, $\eta^2 = 0.035$]; (2) Differences in travel motives do not have a significant effect on CBE [$F(4,178) = 1.582$, $p = 0.181$, $\eta^2 = 0.034$]; and (3) There is no significant interaction between education level and travel motive towards CBE [$F(5.178) = 0.265$, $p = 0.932$, $\eta^2 = 0.007$].

Ecotourism of Coban Talun

The results of the Kolmogorov-Smirnov test inform that the residual data are normally distributed [D(128) = 0.064, $p = 0.200$]. Levene test results inform that the variance of the CBE data is homogeneous [$F(10.117) = 0.957$ $p = 0.485$]. Table 3 presents the results of the Two-way ANOVA test.

Table 3
Two-way ANOVA Test Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	4255.709 ^b	10	425.571	1.542	0.133	0.116
Intercept	311268.097	1	311268.097	1127.756	0.000	0.906
Education	648.745	2	324.373	1.175	0.312	0.020
Motives	3081.457	4	770.364	2.791	0.029	0.087
Education * Motives	1482.430	4	370.607	1.343	0.258	0.044
Error	32292.760	117	276.006			
Total	1437268.000	128				
Corrected Total	36548.469	127				

According to Table 3, several findings can be concluded, namely (1) Differences in education level do not have a significant effect on CBE [$F(2,117) = 1,175$, $p = 0.312$, $\eta^2 = 0.020$]; (2) Differences in travel motives have a significant effect on CBE [$F(4,117) = 2,791$, $p = 0.029$, $\eta^2 = 0.087$]. Yet, the results of the BNT test are not shown since the follow-up test states that all groups do not have a significant difference; and (3) There is no significant interaction between education level and travel motive towards CBE [$F(4,117) = 1,343$, $p = 0.258$, $\eta^2 = 0.044$].

Ecotourism of Bukit Paralayang

The results of the Kolmogorov-Smirnov test inform that the residual data are normally distributed [$D(140) = 0.066$, $p = 0.200$]. Levene test results inform that the variance of the CBE data is homogeneous [$F(10,129) = 1.381$, $p = 0.196$]. Table 4 presents the results of the Two-way ANOVA test and Table 20 presents the results of the BNT test for the effect of travel motives on CBE.

Table 4
Two-way ANOVA Test Results

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	6019.283 ^b	10	601.928	2.450	0.010	0.160
Intercept	463675.291	1	463675.291	1887.599	0.000	0.936
Education	1284.945	2	642.472	2.615	0.077	0.039
Motives	3631.809	4	907.952	3.696	0.007	0.103
Education * Motives	2024.919	4	506.230	2.061	0.090	0.060
Error	31687.938	129	245.643			
Total	1576381.000	140				
Corrected Total	37707.221	139				

According to Table 4, several conclusion can be drawn, namely (1) Differences in education level do not have a significant effect on CBE [$F(2,129) = 2,615$, $p = 0.077$, $\eta^2 = 0.039$]; (2) Differences in travel motives have a significant effect on CBE [$F(4,129) = 3,696$, $p = 0.007$, $\eta^2 = 0.103$]. The results of the BNT test are presented in Table 5; and (3) There is no significant interaction between education level and travel motive towards CBE [$F(4,129) = 2,061$, $p = 0.090$, $\eta^2 = 0.060$].

Table 5
BNT test results on the influence of travel motives to CBE

Motives	Mean	Notation
Emotional	100.4634	a
Physical	104.7391	ab
Personal	111.2857	ab
Personal Development	111.7143	b

Based on Table 5, it can be seen that the CBE in the "emotional" motif group is significantly lower than the "personal development" motif group. On the other hand, the "physical and personal" motives do not have a significant difference in CBE, both with the "emotional" and "personal development" motives. Departing from the respondent demographics, it can be concluded that female visitors predominate in the three ecotourism destinations of Batu City. This is in line with various previous studies indicating that women travel more frequently than men. Women frequently travel alone as well (Tilley & Houston, 2016). The majority them are students or college students (millennial generation). According to various studies, millennials prefer to travel to nature or visit ecotourism. Especially with the availability of social media, which is very appealing to millennials (Pramono et al., 2020; Sharmin et al., 2020).

Their income is still low since they are students or they are pursuing a bachelor's degree. Hence, the primary reason for traveling is physical (Relaxation, exercise, health, and to experience a new culture). This is in line with previous research findings that the primary reason for traveling is relaxation or efforts to improve physical aspect (Vujičić et al., 2020).

According to the results of multiple regression analysis, only Coban Rondo Ecotourism has a significant relationship. Coban rondo is the most well-known prima donna ecotourism destination.

Coban Rondo is one of the East Java tourist areas that combines natural beauty with a variety of tourist attractions such as landscape viewing, trekking, Gajah Tunggang, and so on. According to the findings of the study, Coban Rondo has a high tourism potential as a leading natural tourism destination in Malang Raya, East Java. The development efforts that have been carried out are maximal. Generally, it can be concluded that Coban Rondo tourist object has great potential to be developed into a variety of alternative tourist attractions to support the Waterfall tourist object, which is the most popular (Reindrawati, 2008).

A Coban Rondo waterfall in Malang is a popular domestic and international tourist destination. The waterfall, which can reach 84 meters in height and is located at an altitude of 1.135 meters above sea level, is fed by the Cemoro Dudo fountain, which is located on the slopes of Mount Kawi and has a discharge of 150 liters per second during the rainy season and 90 liters per second during the dry season. Tourists are drawn to the panorama of the waterfall that blows the water droplets wrapped in natural beauty and enhanced by the cool mountain air that is still very natural. On weekends or national holidays, Coban Rondo attracts a large number of tourists, both domestic and foreign. The Coban Rondo tourist attraction includes more than just waterfalls. In the morning, visitors can see a panoramic view of the beauty of Batu City from the top of the hill, as well as various family medicinal plants, pine forests, various animals, and hostelry places (Guesthouse). Outbound is one of popular facilities for visitors from agencies, schools, and the nature-loving community. Aside from waterfalls, one of the most popular destinations is the labyrinth in the Coban Rondo area (Mutia, 2018).

The Two-Way ANOVA results indicate a significant effect, which is only shown by the various reasons for traveling in Coban Talun and Bukit Paralayang. The difference in BNT notation is only visible in Bukit Paralayang, whereas it has no effect Coban Talun. CBE is significantly lower in the "emotional" motive group than the "personal development" motive group. On the other hand, the "physical and personal" motives do not differ significantly in CBE, both from the "emotional" and "personal development" motives. Therefore, it can be declared that travel motives are relatively diverse and it tends to be no difference between motives. Each individual or tourist has their own motives, which are related to each person's experience (Lewis et al., 2021).

Conclusions

According to the results of multiple analysis regression indicate that only in Coban Rondo has a significant relationship. The results of Two-Way ANOVA show significant effect which is only shown by the difference in the motives for traveling in Coban Talun and Bukit Paralayang. The distinction in BNT notation only appears in Bukit Paralayang, whereas it has no effect in Coban Talun. This shows that basically every individual or tourist has their own motives, which are related to each person's experience. Therefore, this aspect needs to be considered in implementing the CBE principles in the future to create sustainable ecotourism.

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