

An Empirical Validation of Eco-Service Quality (ECOPERF) Scale Measure: A Short Form ECOPERF

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ABSTRACT: This study examined validity two key dimensions of eco-service quality (ECOPERF) scale measure in predicting ecotourism customer satisfaction. Data collected from 269 ecotourists in Australia suggest that the short form ECOPERF instrument (i.e., Eco-service dimension alone) can serve as a useful tool for assessing ecotourism service quality in predicting customer satisfaction. Further, our findings show that the environmentally-friendly practice is a prominent service quality attribute in the assessment of ecotourism service quality. The results provide useful implications for academics and practitioners.

KEYWORDS: ecotourism, service quality, eco-service, customer satisfaction, ECOPERF short-form scale

1. Introduction

Ecotourism has become increasingly popular and one of the fastest growing segments of the world's tourism (Mafi, Pratt and Trupp 2020, 305). Ecotourism provides opportunities for relaxation, experiencing nature and culture, and it also allows tourists to learn about responsible traveling; This is important not only for economic benefits but also to support conservation of natural ecosystems (Beall et al. 2021, 1216). Ecotourism plays a vital role in not only generating revenue but also contributes to the wellbeing of the natural areas and local communities where they visit (Lopez Gutierrez et al. 2020, 197; Mendoza-Ramos and Prideaux 2018, 278).

With the growing attention to ecotourism, ecolodges nowadays have a focus on nature-dependent tourism in order to meet the needs and desires of environmentally conscious consumers. Ecotourists are concerned about negative impacts on the environment and long-term sustainability, and they also expect ecotourism businesses to be environmentally friendly and trustworthy (Beall et al. 2021, 1216-1217). Ecolodges serve as an important element of the ecotourism sector as ecotourists' satisfaction is significantly influenced by ecolodges' service experience (Kwan, Eagles and Gebhardt 2008, 698-699). Thus, an accurate assessment and understanding of the service quality attributes of importance to ecolodge guests might be the first step in improving customer satisfaction in ecotourism industry (Mafi, Pratt and Trupp 2020, 305).

Although extant literature proposes a several ways to measure service quality of ecotourism experience (e.g., ECOSERV scale by Khan 2003; ECOPERF scale by Ban and Ramsaran 2017), there is still a need to devise an effective measure of service quality focusing on ecotourism service aspects that address the shortcomings of the existing measures. The present research addresses this gap by proposing and validating a short form measure of ECOPERF scale developed by Ban and Ramsaran (2017). This study is the first study to investigate the two different dimensions of ECOPERF measure: General-service dimension vs. Eco-service dimension and proposing a short form measure of ecotourism service quality. Our findings suggest that the short-form

ECOPERF instrument (i.e., Eco-service dimension alone) can serve as a useful tool for ecolodge operators in assessing the quality of services they provide.

2. Literature Review

2.1 Service Quality Measure

Literature often defines service quality as the degree of discrepancy between customers' perceptions and expectations (Bebko 2000, 11). Similarly, Parasuraman et al. (1985, 46) suggested that service quality is the assessment of the degree and direction of discrepancy between customers' expectations and perceptions of actual performance levels. Thus, the overall service quality perception involves a comparative evaluation process (Gronroos 1984, 37). Literature suggests that the overall service quality perception includes two components: 1) technical quality (what is delivered) and functional quality (how it is delivered). This means that the customer perception of service quality is influenced by both service outcome and service process.

In an attempt to measure service quality, Parasuraman et al. (1985, 47) developed the SERVQUAL model, which includes 22 service quality attributes within five dimensions: tangibles (appearance of physical facilities and personnel), reliability (ability to perform the expected service dependably and accurately), responsiveness (helpfulness and promptness), assurance (courtesy, trust, and competence), and empathy (caring and customer understanding). The SERVQUAL model has been adopted to many services literature and industry practitioners as a basic model in assessing service quality. However, despite the wide adoption of SERVQUAL model, some limitations have been identified around its conceptual foundation and methodological applicability. For example, Carman (1990, 33) argued that it is difficult to capture expectation and perception measures at the same time. He also suggested that there is a need to add on certain service quality aspects across different services (Carman 1990, 34-35).

With respect to ecotourism sector, Khan (2003, 117) developed the ECOSERV measure, an adapted version of the SERVQUAL to capture service quality in the ecotourism industry. The ECOSERV measure contains 29 items constructed on six dimensions, including assurance (knowledge and courtesy of the employees), reliability (ability to perform the promised service accurately), responsiveness (willingness to help customers), empathy (caring and individualized attention to customers), tangibles (physical facilities and appearance of the personnel that reflects local influence), and ecotangibles (environmentally friendly services dimensions).

Although the ECOSERV scale developed by Khan (2003) was suggested to be a useful instrument for measuring service quality in ecotourism, there were some methodological concerns in terms of the quality measurement and the service quality dimensions. The first limitation of ECOSERV is that it lacks in capturing tourists' service quality perception. The other limitation is that the key service quality variables of ecotourism—such as education and learning aspects—were not included in the service quality dimension, and they are factors that can influence the service quality expectations of ecotourists (Ban and Ramsaran 2017, 142-143).

To address the shortcomings of ECOSERV scale, Ban and Ramsaran (2017, 142-143) proposed a performance-based measure of service quality (SEVPERF) for ecolodge industry as a new service quality parameter that can better explain the variation in service quality measures in the ecotourism industry by using the SERVPERF perception-only attributes. They redefined the SERVQUAL measures by excluding any predetermined expectation items and focusing instead on the performance-only attributes of service and include three service aspects of eco-tourism sector. Some researchers found that a performance-based measures are more suitable in

the marketing research field (Jain and Gupta 2004, 25). The validity of the ECO-SERVPERF scale developed by Ban and Ramsaran (2017, 142-143) was confirmed by a recent work in eco-tourism service literature (Ban et al. 2021, 7).

However, given the environmentally conscious nature of ecotourists segment (Beall et al., 2021, 1216), we argue that there is a need to devise a short form measure of ECOPERF scale focusing on eco-service dimensions only. In this paper, we examine the validity and predictive capacity of the eco-service dimension of ECOPERF as a tool to assess ecotourism service quality and predict ecotourism customer satisfaction.

3. Method

3.1 Eco-tourism Service Quality

Using the ECOPERF proposed by Ban and Ramsaran (2017, 142-143), this article examines how eco-service focused dimension and general service dimensions reflect service quality measure for ecolodge industry. This investigation will help identify whether eco-service dimensions alone are viable alternative to measure service quality measure for ecolodge industry: a short form service quality measure.

More specifically, this paper examines whether eco-service dimension alone is a viable measure for service quality in ecolodge industry. To investigate this, tourists who stayed at ecolodges located in different parts of Australia were invited to complete an online survey questionnaire. These ecolodges are Eco-certified accommodation providers providing nature-based tourism experience and sustainable tourism activities. Five ecolodges agreed to participate in this research project.

3.2 Measurement (survey instrument)

We adopted a 6-dimension ECOPERF measure from Ban et al, (2021, 7). Customer satisfaction measures were adopted from William and Soutar (2009, 418-419). We conducted a pilot study to confirm the question comprehensibility. The questionnaire was then revised and modified to fit ecotourism context.

3.3 Participants and Survey administration

Survey questionnaire was designed in Survey Monkey, an invitation e-mail was sent to 4,571 Australian ecotourists via each of the five different ecolodges' management, serving as intermediaries to reach participants. Participants accessed the online survey through a link embedded in the email sent by the ecolodge where they had previously stayed, as well as through the ecolodge's Facebook webpages. After removing incomplete responses, a total of 269 responses were collected and used for data analysis. The data were analysed using IBM SPSS version 27.

4. Results

4.1 Sample Description

There were 158 (58.7%) female respondents and 111 (41.3%) male respondents in the study. The highest response rate was from the eldest group (60 years and older) with a value of 35.3%. The percentage who reported annual household incomes between \$50,001 and \$100,000 was 34.9% while a smaller-sized group (24.9%) reported incomes under \$150,000. For the education level, a majority indicated themselves as bachelor's degree graduates (34.2%) while a nearly similar-size group (32.0 %) were holders of certificate or diploma degrees.

4.2 Ecotourism service quality measure: *ECOPERF*

Following Ban et al (2021, 7), we used the identified the following six factors to measure service quality: Reliability and Responsiveness (RR), Assurance and Empathy (AE), Tangibles (TA), Eco-activities (EA), Eco-learning (EL) and Eco-friendly practices (EF). Among those six, we divided them into two dimensions to differentiate eco-service performance dimension from general-service performance dimension. General-service performance dimension includes Reliability and Responsiveness (RR), Assurance and Empathy (AE), and Tangibles (TA). Eco-service performance dimension includes Eco-activities (EA), Eco-learning (EL) and Eco-friendly practices (EF).

Confirming convergent validity (Fornell and Larcker 1981, 47), factor loadings of all items upon their respective constructs were significant (see Table 1). Confirming internal consistency, the Cronbach's Alpha values were well above the threshold level suggested by Fornell and Larcker (1981, 47) (see Table 1). The overall results suggest that measures possess a good level of discriminant and convergent validity. Additional tests confirmed that there was no multicollinearity or common method bias within the data. All variance inflation factor (VIF) values were below 5.

Table 1. Service quality reliability test results

Service quality factors / variables	Factor Loading	Cronbach's Alpha	Mean	Std. Deviation
Factor 1. Reliability and Responsiveness (RR)		.89	5.26	
1. Employees are well trained and knowledgeable	.84		5.17	.83
2. Employees provide adequate information	.78		5.18	.84
3. Employees provide the service at promised time	.67		5.25	.76
4. Employees provide the service reliably and consistently	.64		5.16	.73
5. My bill is recorded correctly	.61		5.28	.73
6. Employees are always available to help	.59		5.31	.79
7. Employees are always willing to help	.57		5.36	.73
8. Employees are approachable and easy to contact	.51		5.38	.72
Factor 2. Assurance and Empathy (AE)		.88	5.32	
9. Employees listen carefully to me	.84		5.38	.80
10. Employees are consistently courteous and polite	.77		5.37	.79
11. Employees understand my needs and requirements	.75		5.31	.77
12. Employees are trustworthy and honest	.54		5.23	.72
13. Employees make me feel safe in transactions	.52		5.35	.70
14. Employees instil confidence	.51		5.32	.70
Factor 3. Tangibles (TA)		.78	5.36	
15. Facilities are visually appealing	.67		5.42	.83
16. Facilities reflect local influence such as decoration, colour, texture, ambiance etc.	.65		5.33	.91
17. Rooms are comfortable and clean	.64		5.16	1.004
18. Employees wear local attire and look neat	.58		5.54	.794
Factor 4. Eco-activities (EA)		.82	5.34	
19. The ecolodge is a good place to do eco-activities such as hiking, bushwalking etc.	.86		5.39	.86

20. The ecolodge is a good place to do recreational and leisure activities	.86	5.38	.89
21. The ecolodge is a good place to view natural habitat and wildlife	.62	5.38	.91
22. The ecolodge is a good place to do adventure activities	.56	5.23	.85
Factor 5. Eco-learning (EL)	.86	5.44	
23. The ecolodge is a good place to learn about the environment	.88	5.44	.78
24. The ecolodge is a good place to learn about nature and wildlife	.86	5.47	.76
25. The ecolodge is a good place to learn about the local culture and livelihood	.84	5.42	.80
Factor 6. Eco-friendly practices (EF)	.88	5.26	
26. The ecolodge engages in energy/water conservation efforts	.83	5.26	.81
27. The ecolodge facilities are environmentally safe	.80	5.26	.78
Bartlett's test of sphericity	$\chi^2 = 4704.58$ df = 351, $p < .001$		
Kaiser-Meyer-Olkin measure of sampling adequacy	.90		
Total variance explained (%)	69.91		

4.3 Testing the two dimensions of ECOPERF: general-service dimension vs. eco-service dimension on ecolodge customer satisfaction

First, a Pearson correlation test shows that the customer satisfaction is correlated with all factors of the ECOPERF dimensions (see Table 2). Eco-friendly practice had a substantially stronger correlation with customer satisfaction compared to other factors.

Table 2. Correlation Table: ecotourism service quality factors and customer satisfaction

	1	2	3	4	5	6	7
CS	—						
RR	.295**	—					
AE	.251**	.830**	—				
EA	.275**	.846**	.822**	—			
EL	.274**	.762**	.762**	.727**	—		
TA	.255**	.760**	.787**	.737**	.781**	—	
EF	.329**	.780**	.716**	.719**	.648**	.712**	—

Where CS = Customer Satisfaction, RR = Reliability and Responsiveness, AE = Assurance and Empathy, EA = Eco-activities, EL = Eco-learning, TA = Tangibles, and EF = Eco-friendly practices; * $p < .05$. ** $p < .01$. *** $p < .001$.

Next, we ran a hierarchical multiple regression to examine the predictive capacity of eco-service dimension of ECOPERF measure in explaining the variance in ecotourism customer satisfaction. A hierarchical multiple regression was performed which used two models – 1) model 1 included general-service performance factors as predictors and 2) model 2 included

eco-service performance factors as predictor variables. The dependent variable was customer satisfaction. The model 1 accounted for a significant variance in customer satisfaction, $F(3, 265) = 8.679, p < .001$. The addition of model 2, eco-service dimension, significantly increase the variance accounted for in customer satisfaction, $F(6, 262) = 5.823, p < .001$.

The final model including both general and eco-service dimensions accounted for approximately 12% of the variance in ecolodge customer satisfaction. To test the independency of the eco-service performance dimension as a short form of ecolodge service quality measure, we reran the same hierarchical regression model with reverse order: 1) Eco-service dimension was entered first as model 1 and then General-service dimension was entered as model 2. The results show no significant increment variance in customer satisfaction after adding general-service dimension after eco-service dimension, thus suggesting that the eco-service dimension is the dominant service quality measure which can be used alone as a short form of ecotourism service quality measure (see Table 4).

Table 3. Summary of hierarchical regression model on customer satisfaction

Variable	Model 1	Model 2
<i>Main effects:</i>		
<i>General-service performance</i>		
RR	.250*	.062
AE	-.020	-.086
TA	.081	-.034
<i>Main effects:</i>		
<i>Eco-service performance</i>		
EA		.051
EL		.117
EF		.254**
Model R ²	.089	.118
df	(3, 265)	(3, 262)
R ² Change	.089***	.028*
F Change	8.679***	2.791*

Note. N = 269. Standardized regression coefficients are reported. Where CS = Customer Satisfaction, RR = Reliability and Responsiveness, AE = Assurance and Empathy, EA = Eco-activities, EL = Eco-learning, TA = Tangibles, and EF = Eco-friendly practices, * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Summary of hierarchical regression model on customer satisfaction
(Reverse order)

Variable	Model 1	Model 2
<i>Main effects:</i>		
<i>Eco-service performance</i>		
EA	.031	.051
EL	.090	.117
EP	.248**	.254**

<i>Main effects:</i>		
<i>General-service performance</i>		
RR		.062
AE		-.086
TA		-.034
Model R ²	.115	.118
df	(3, 265)	(3, 262)
R ² Change	.115***	.003
F Change	11.476***	.266

Note. N = 269. Standardized regression coefficients are reported. Where CS = Customer Satisfaction, RR = Reliability and Responsiveness, AE = Assurance and Empathy, EA = Eco-activities, EL = Eco-learning, TA = Tangibles, and EF = Eco-friendly practices,
* $p < .05$. ** $p < .01$. *** $p < .001$.

5. Discussion and Conclusions

The primary aim of this research was to devise a short form of the ECOPERF scale, which we accomplished. The present study investigated the two key dimensions of ECOPERF (ecotourism service quality measure). Our results suggest that the eco-service dimension of ECOPERF alone is a valid and reliable measure to captures the variance accounted for in ecotourism customer satisfaction. Additionally, including general-service dimension does not significantly improve the predictive capacity of the service quality measure. We encourage future research to consider using the short form ECOPERF to assess ecotourism service quality. The findings provide valuable insight into service quality assessment in ecotourism industry.

In addition, our findings provide an important insight into a better understanding the trends of tourist behaviours. We found that the Eco-friendly practice aspect has scored the highest compared to other factors. This indicates that there is a high consideration and expectation from ecotourists on environmentally friendly practices. The results well-representation current trend of environmentally conscious tourist behaviours. The findings inform ecotourism business practitioners of a key marketing attributes direction to attract more ecotourists. Ecolodge management should be fully aware of the consequences of service quality perceptions in increasing customer satisfaction and business success. Understanding what drives visitor satisfaction is not only for management improvements but also for devising an effective marketing strategy. As shown in our data, to manufacture a satisfactory stay, particular emphasis on promoting and executing environmentally friendly practice of the ecotourism experience is a must. For example, ecolodge operators could aim to: a) provide guests with information about what environmentally friendly practices that an ecotourism destination is engaging (e.g., history, traditions, heritage, ecology, attractions, nature reserves, etc.); b) explain what the ecolodge embraces and how it reflects the characteristics of its surroundings in terms of its architectural design and décor, including art, woodwork and textiles; c) feature an environmentally sensitive design; and e) offer locally grown produce such as wine, honey, olive oil, and unique artworks and crafts by local artisans.

5.1 Limitation and Future Research

The current study has a few limitations. First, the respondents, characterised by those who have stayed at the ecolodges, do not necessarily represent the perspectives of the entire

Australian population. Second, the study was conducted in only five ecolodges located in three regions of Australia: Queensland, Western Australia, and South Australia. In this sense, the findings of the study may not be generalised to other geographical areas and beyond this population. Although our study contributes to theory development by demonstrating how the latent constructs can be modelled and incorporated in a structural model, a cautionary note is in order when the results are evaluated. The findings of the current study are thus confined to specific accommodations due to the limitation of distribution and cannot readily be generalised across destinations in Australia. Larger and broader samples may enhance the generalisability of these findings in future research. Further, future research can extend this research through replicating the results in other context of ecotourism.

5.2 Conclusion

Our findings guide researchers in the effective administration and assessment of the ECOPERF in predicting ecotourism customer satisfaction. We propose general considerations around the adoption of this measure in different ecotourism contexts or with different country settings. It is our hope that the brevity of the ECOPERF will encourage uptake of more ecotourism research and service quality evaluation by practitioners and that this paper sheds light on the importance of considering an environmentally friendly practice service attribute.

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