International Journal of Environment, Agriculture and Biotechnology
Vol-11, Issue-6; Nov-Dec, 2026
Peer-Reviewed International Journal
Journal Home Page Available: https://ijeab.com/
Journal DOI: 10.22161/ijeab

Sustainable Green Tourism Practices in Nainital: An Analytical Assessment of Existing Initiatives from Tourist and Stakeholder Perspectives

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Received: 30 Sep 2026; Received in revised form: 20 Oct 2026; Accepted: 28 Oct 2026; Available online: 05 Nov 2026
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Abstract— *Nainital, an oasis of lakes and hills, is a popular tourist destination in the Kumaon region of Uttarakhand and the demand for tourists regularly puts a strain on its carrying capacity, especially during weekends and summer season. The present study examines the existing sustainable green tourism practices in Nainital from the perspective of its stakeholders. A 12-item Likert scale structured questionnaire was used and had 500 respondents which were selected using stratified sampling (250 tourists and 250 tourism stakeholders). Reliability analysis, exploratory factor analysis, descriptive statistics, one-sample t-test, independent-samples t-test, one-way ANOVA, Pearson correlation, and multiple regression were used to analyze the data in SPSS. It was found to have good internal consistency (Cronbach's α = 0.873) and the instrument was found to have four factors. Existing practices were rated significantly higher than the neutral neutral score with environmental practices rated the highest and institutional and industry support rated the lowest (M = 3.55, SD = 0.61). The variance in overall effectiveness was accounted for by 41.6% through environmental practices, community and cultural initiatives and institutional support. Stakeholders were the most positive rating the practices and the older generation of 56 years and over were the most critical of the practices. The results suggest that the green efforts of Nainital are well received in general, but there is a lack of uniformity in their implementation; awareness and enforcement of green initiatives and participation of communities in the green movement are also in need of improvement.*

Keywords— ***sustainable tourism, green tourism practices, Nainital, Uttarakhand, hill destination, stakeholder perception, SPSS analysis***

I. INTRODUCTION

Nainital, situated at an altitude of approximately 6358 meters above sea level, is a popular tourist place in the Kumaon region of Uttarakhand. It is approximately 276 km from the state capital Dehradun and 314 km from New Delhi while Kathgodam railway station is 35 km and Pantnagar airport is 71 km away. The town is famous for its eye-shaped Naini lake surrounded by hills like Ayarpata, Devpata, Handibandi, Chini, Alma, Lariya Kanta, Sher ka Danda etc and oak, pine, chestnut, walnut and deodar forests. It has a total area of approximately 11.3 square kilometres and is dotted with tourist sites such as Naina Devi temple, Hanuman Garhi, St. John's Church, Mall Road, Himalaya viewpoint and the Eco-Cave Garden. Other resorts like Bhimtal, Ramgarh and Mukteshwar at the nearby hills are also popular among tourists (Veena World blog).

The development of better highways, trains, coaches and taxis now make Nainital accessible to visitors from Delhi and the National Capital Region within a day, making

short weekend styles the most common mode of travel. Tourism provides jobs, infrastructure and revenue to the host community, but also affects the carrying capacity of the destination. Overcrowding leads to higher living expenses, water shortages, housing shortages, more litter and can impact the behaviour of the host community as well as the culture of the community. In an exploratory study, Jacob et al. (2024) describe unregulated tourism influx, unplanned development of infrastructure, and dumping of huge waste as severe disturbances to the environment in the context of the tourism industry in Uttarakhand.

Such pressures have led to green tourism practices being placed at the heart of the future of the destination. Green practices involve systematic waste collection, protection of the lake, vehicle control, using resources efficiently by hotels and transport companies, community involvement and awareness campaigns for tourists. While the subject of sustainability has been discussed in Nainital by several authors (Lad, 2020; Pande, 2011; Beg et al., 2018; Ahmed, 2013), little has been done to measure the entire spectrum of existing green practices as viewed by both tourists and those who earn their livelihood from tourism. The present research has been approved and this is found to be a gap that green tourism has been a topic of scholarly discussion but there is no in-depth study which gives focus to green tourism practice in Nainital.

The objective of that research is to study existing sustainable green tourism practices and initiatives in Nainital and this article covers the work on that objective. It does so analytically, by analysing the respondents' ratings for these practices, testing the ratings, inferring which groups of practices contribute to the overall perceived effectiveness of green tourism and whether there are differences between the ratings of tourists and policy makers/stakeholders and between different age groups. The rest of the paper presents a review of the literature and the formulation of the hypotheses (Section 2), methodology (Section 3), SPSS analysis (Section 4), discussion (Section 5) and conclusion (Section 6).

II. REVIEW OF LITERATURE

2.1 Tourism pressure, carrying capacity and over-tourism

The concept of "limited destinations" is an old one but is debated. In the article " Tourism Carrying Capacity: Tempting Fantasy or Useful Reality?," McCool (2001) discusses the usefulness of carrying capacity as a planning tool. According to Cooper (2016) in his textbook Essentials of Tourism, as the popularity of a destination grows, the number of tourists also increases and the environment and host community are placed under pressure to accommodate the tourists. In his article, The impact of perceived crowding on customer satisfaction (2016), Zehrer has stated that crowding relates to the experiences that visitors have while visiting the destination, thus it is relevant to a destination that becomes full over the weekends.

Several settings have been studied in regards to over-tourism. In his paper (Taiminen, 2018) on the negative impacts of over-tourism from environmental and socio-cultural perspectives, higher prices and rents, increased water use, decreased groundwater, and increased litter are all examples of negative impacts. In Europe, over-tourism is seen as a threat to cultural heritage, with Adie (2019) stating that the perceptions of the threat are different among rural and urban residents, so the testing for group differences in perception make sense. However, for hill areas in India, Gupta et al. (2022) indicate in their paper, Controlling the uncontrolled: Over tourism in hill station of northern India that tourists are not the fault, as lack of infrastructure for tourists and residents is also to blame, and that the policy should reduce the gap between the social and cultural factors. Over-tourism in Indian cities is discussed by Barbhuiya (2020), who has conducted a case study of Nainital, the town has been recognized as an over-tourism context.

2.2 Weekend tourism and uneven development

Many short stay tourists visit Nainital from Delhi and NCR. Pintilli and Draghici (2010), Weekend Tourism as an Instrument for Local Development, see weekend tourism as a tool for local development; Dissart et al. (2009), An Estimation of Tourism Dependence in French Rural Areas, analyze the degree of dependence in the rural economy on tourism. In total, these studies demonstrate that, even when short-stay visitors do not utilise many of the destination's facilities, they can still be a useful contributor to the local economy. Development is not a smooth process, however. In the study of the problems and prospects of tourism in the Kumaun region, Melkani and Kumar (2021) noticed that the destinations near Nainital are not evenly distributed as some are over developed while others are under developed, which leads to unplanned development. Badar (2020) in the context of Shimla, an analysis of tourism sustainability in the hill towns, found unbalanced development between the town centre and the outskirts, and proposed that the balanced development can aid sustainability.

2.3 Sustainability practices in Nainital and Uttarakhand

There are several studies that record practices that this article aims to measure. In “Identifying the need and

potential of ecotourism in Nainital, India" Lad (2020) notes, that the local authorities are keen on sustainability, with the Jheel Vikas Parishad, Nagar Palika and the forest department having lake wardens who keep the lake clean, while a fine is imposed for any plastic waste in the lake, and waste is collected door to door. In Sustainable tourism – A case study of Nainital (Uttarakhand) written by Pande (2011), the Uttarakhand High Court has banned heavy vehicles near the lake; there was also an "Mission Butterfly" integrated solid waste management programme launched by the community which involved setting up large bins at strategic points and recycling waste. According to Negi (2019) in JETIR, the forest department of Uttarakhand have introduced very strong regulations to safeguard nature from unwanted encroachment. Beg et al. (2018) and Ahmed (2013) have studied sustainable tourism development in Nainital-Uttarakhand and Uttarakhand region respectively.

At the community level, Kumar et al., (2023) in their study 'Tourism and its evaluation – A Case study of district Nainital', state that the visitors to Nainital encourage socio-cultural incorporation; which is the reason why one can find various cultures, fairs and festivals in Nainital. According to Masarrat (2012) study on the satisfaction of the tourists regarding the tourism products of Uttaranchal, tourists' satisfaction with accommodation, hygiene conditions, religious sites and culture and heritage are satisfied. In "Barriers to local community participation in tourism development: Evidence from mountainous state Uttarakhand, India", Kala and Bagri (2018) concentrate on the hindrances in adopting local community involvement in tourism development. In the article "Sustainable Development of Tourism in Uttarakhand (India)" Singh (2018) describes four pillars of sustainable development: economic, ecological, cultural and local sustainability which should be taken into consideration while building a sustainable destination. The four pillars inspire the following dimensions in the present instrument: environmental, community and cultural and institutional.

2.4 Green tourism beyond Nainital

An analysis of studies conducted at other destinations illustrates how the concept of green tourism is being presented. Andari and Setiyorini (2016) discuss the role of green tourism in creating sustainable urban tourism, while Markose et al. (2022) highlight sustainability initiatives in green tourism development in Wayanad, India, Tan (2021) investigates factors influencing the implementation of green tourism in Da Nang City, Dewi et al. (2023) discuss green tourism in Bali based on local wisdom, and Matharu and Xalxo (2017) study sustainable tourism practices in Bhutan, and Vijaya Lakshmi et al. (2024) examine eco-tourism perspectives for Telangana. Habimana et al. (2023) provided a critique on Sustainable Tourism Development, while Al-Romeedy (2024) covered sustainable innovations in tourism from a green entrepreneurship point of view and Daneshwar and Revaty (2024) outlined a paradigm shift towards environmental responsibility in sustainable green tourism and hospitality. In sum, the literature deals with green tourism as a mix of environmental policy, community engagement, tourism institutional support, and innovation by tourism businesses, as reflected in this literature.

2.5 Research gap, conceptual framework and hypotheses

The analyzed studies report results for individual practices in Nainital, satisfaction or perceptions in certain areas but none of them integrates the environmental, community and institutional practices into one measurement model, tests it with tourists and stakeholders, and connects the practices to the perceived overall effectiveness. The conceptual framework for this study is shown in Figure 1. Environmental practices (EP), community and cultural initiatives (CC) and institutional and industry support (IS) are hypothesized to affect the perceived overall effectiveness of green practices (OE), and the ratings of the composite Green Practice Index (GPI) are analyzed for favourability and differences between the responses of the various categories of respondents and age groups.

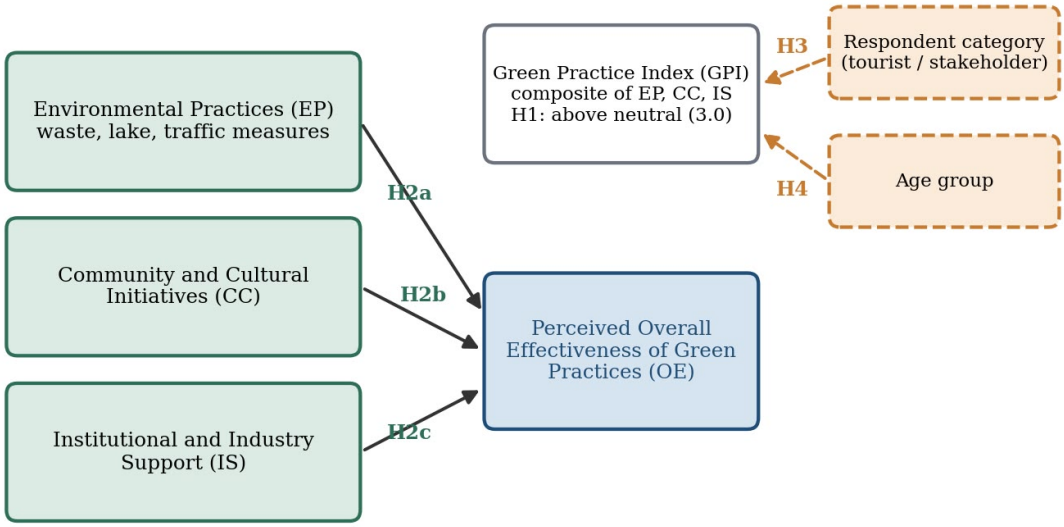


Fig.1. Conceptual framework of the study.

The following hypotheses are tested (alternate form; where each null hypothesis indicates that there is no effect or difference):

- **H1:** Respondents' perceived implementation of existing sustainable green tourism practices in Nainital is significantly above the neutral midpoint of 3.0.
- **H2:** Environmental practices (H2a), community and cultural initiatives (H2b) and institutional and industry support (H2c) each significantly and positively influence the perceived overall effectiveness of green practices for the environment and local community.
- **H3:** Perceptions of green tourism practices differ significantly between tourists and tourism stakeholders.
- **H4:** Perceptions of green tourism practices differ significantly across age groups.

III. RESEARCH METHODOLOGY

3.1 Research design and population

The study adopted descriptive and analytical cross sectional study design using a structured questionnaire, the other part of the study is the secondary data and interview. The universe is Uttarakhand, sampling frame is tourists visiting the tourist destination of Nainital city, sampling unit includes tourists, stakeholders of tourism (accommodation providers, transport providers, hotel & restaurant owners & staff, art & craft sellers, boatmen, tourist guides, tourist police, government officials, healthcare professionals, parking contractors).

3.2 Sample size and sampling technique

Stratified sampling was used to split the sample size of 500 into two groups; 250 tourists and 250 tourism stakeholders. The stakeholders were divided into four strata (Table 1) and the respondents of each stratum were approached on a convenient basis. This is a relatively large sample size of 10+ respondents per item, which is sufficient for factor analysis, and is sufficient for the regression with 3 predictors.

3.3 Instrument

There were two parts of the questionnaire. Part A collected demographic characteristics including gender, age group, education, respondent category and stakeholder group. Part B consisted of 12 statements which were rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) and organized into four constructs containing three items each: Environmental Practices (EP1–EP3), Community and Cultural Initiatives (CC1–CC3), Institutional and Industry Support (IS1–IS3), and Perceived Overall Effectiveness (OE1–OE3). The statements (Table 2) were identified from the practices reported in the literature including: Door to Door waste collection; Lake wardens and plastic fines; Vehicle restrictions near the lake; Community participation and institutional enforcement; (Lad, 2020; Pande, 2011; Negi, 2019; Singh, 2018). The Green Practice Index (GPI) is the mean of the 9 practice items (EP, CC and IS) and OE is the outcome measure.

3.4 Statistical tools

IBM SPSS Statistics was used to code and analyse data. The sequence of analysis followed was: (i) frequencies for

the demographic profile; (ii) means, standard deviations, skewness and kurtosis; (iii) Cronbach's alpha, Kaiser–Meyer–Olkin (KMO) measure, Bartlett's test of sphericity and exploratory factor analysis (principal component extraction with varimax rotation); (iv) one-sample t-tests against the neutral value of 3 (H1); (v) Pearson correlation; (vi) multiple linear regression (H2); (vii) independent-samples t-test (H3); and (viii) one-way ANOVA with Tukey post hoc comparisons (H4). The level of significance used for all tests was 5%.

IV. DATA ANALYSIS AND RESULTS

4.1 Demographic profile of respondents

Table 1. *Demographic profile of respondents (N = 500)*

Variable / category	Frequency	Percentage
Gender		
Male	301	60.2
Female	199	39.8
Age group (years)		
18-25	81	16.2
26-35	138	27.6
36-45	129	25.8
46-55	97	19.4
56 and above	55	11.0
Educational qualification		
Up to higher secondary	71	14.2
Graduate	214	42.8
Postgraduate and above	215	43.0
Respondent category		
Tourist	250	50.0
Stakeholder	250	50.0
Stakeholder group		
Accommodation, restaurant and hotel staff/owners	80	16.0
Transport providers and boatmen	60	12.0
Art and craft sellers and tourist guides	55	11.0
Government officials, tourist police, healthcare and parking staff	55	11.0

Note. Stakeholder groups are percentages of the total sample (N = 500).

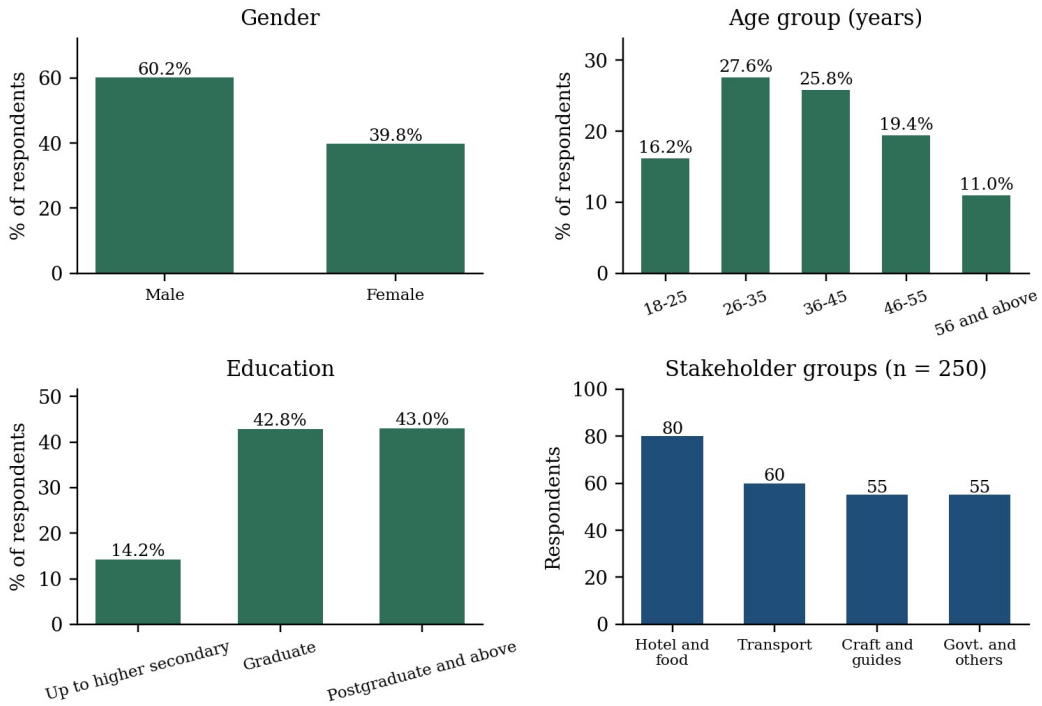


Fig. 2. Demographic profile of the respondents.

Table 1 and Figure 2 indicate that the sample is evenly distributed between the two groups of tourists and stakeholders (250 in each group). Sixty percent (60.2%) of the respondents are males. The biggest groups are those aged 26 to 35 years (27.6%) and 36 to 45 years (25.8%) while those aged 56 years and over make up the smallest group (11.0%). The sample educated is well, with 85.8% of them having a graduate or higher level qualification. The largest stakeholder stratum (80 respondents) is stakeholders in accommodation and food-service.

4.2 Descriptive analysis of the Likert items

Table 2. Item-wise descriptive statistics (N = 500)

Code	Statement	Mean	SD	Skewness	Kurtosis
EP1	Solid waste is collected and disposed of systematically (door-to-door collection and designated bins).	3.76	0.89	-0.30	-0.49
EP2	Lake conservation measures (lake wardens, cleanliness drives, fines for plastic) are effectively enforced.	3.67	0.97	-0.42	-0.40
EP3	Restrictions on heavy vehicles near the lake help reduce pollution and congestion.	3.79	0.90	-0.47	-0.16
CC1	Tourism gives local residents employment and income opportunities.	3.61	0.94	-0.37	-0.29
CC2	Local community members actively take part in tourism planning and green initiatives.	3.38	0.97	-0.14	-0.48
CC3	Local culture, crafts, fairs and festivals are promoted and preserved through tourism.	3.55	0.96	-0.26	-0.41
IS1	Government and local bodies enforce environmental regulations on tourism activities.	3.44	0.94	-0.09	-0.43
IS2	Tourists and service providers are made aware of green practices through signage and campaigns.	3.31	0.96	-0.17	-0.20
IS3	Hotels, restaurants and transport operators follow eco-friendly	3.44	0.90	-0.12	-0.30

	practices (waste segregation, water and energy saving).				
OE1	Existing green practices have improved the environmental condition of Nainital.	3.56	0.97	-0.23	-0.62
OE2	Existing green practices have improved the welfare of the local community.	3.56	0.96	-0.24	-0.51
OE3	Overall, the green initiatives are contributing to sustainable tourism in Nainital.	3.61	0.92	-0.26	-0.34

Note. Scale: 1 = strongly disagree to 5 = strongly agree.

All 12 item means are above the score of 3 which represents the neutral point (Table 2, Figure 3). The second highest rating is for EP3 (restriction of heavy vehicles near the lake) with M = 3.79 and the next is for systematic waste collection (EP1, M = 3.76). Awareness of green practices among tourists and service providers and community participation in planning (CC2) are also comparatively low at IS2 (M = 3.31) and CC2 (M = 3.38), respectively. Skew values are close to normal range (between -0.47 and -0.09) and Kurtosis values are close to normal range (between -0.62 and -0.16), so the items are close to normality and parametric testing should be used.

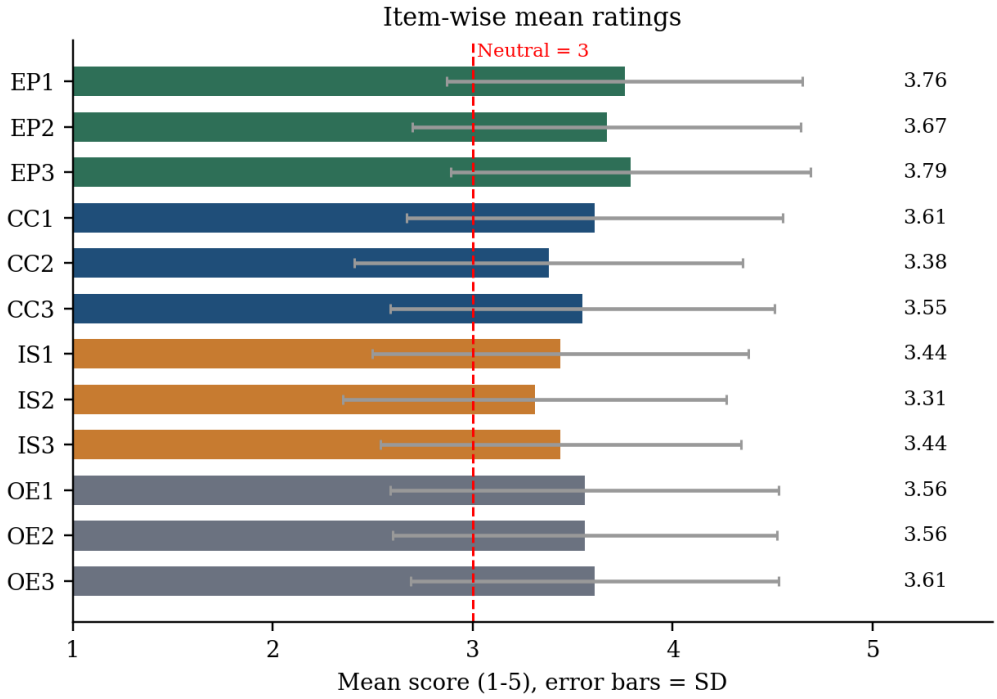


Fig.3. Item-wise mean ratings (green = EP, blue = CC, orange = IS, grey = OE).

4.3 Construct-level descriptive analysis

Table 3. Descriptive statistics of the constructs (N = 500)

Construct	Min	Max	Mean	SD	Skewness	Kurtosis
Environmental Practices (EP)	1.00	5.00	3.74	0.77	-0.35	-0.26
Community and Cultural Initiatives (CC)	1.33	5.00	3.51	0.80	-0.24	-0.42
Institutional and Industry Support (IS)	1.00	5.00	3.40	0.76	0.00	-0.31
Perceived Overall Effectiveness (OE)	1.33	5.00	3.58	0.82	-0.21	-0.51
Green Practice Index (GPI)	1.56	5.00	3.55	0.61	-0.23	-0.11

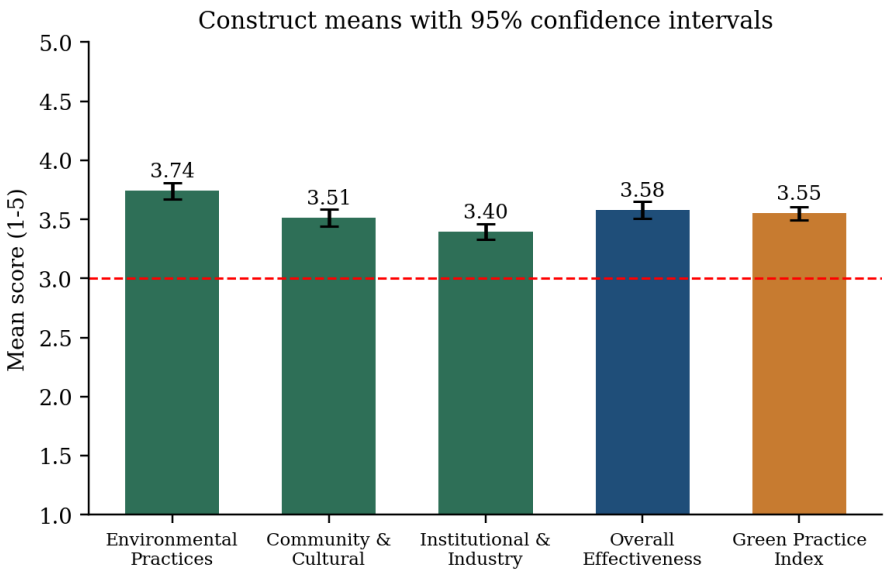


Fig.4. Construct means with 95% confidence intervals (dashed line = neutral midpoint of 3).

The highest mean rating (M = 3.74, SD = 0.77) is given to environmental practices, followed by community and cultural initiatives (M = 3.51) and institutional and industry support (M = 3.40). The overall effectiveness of the green practices is evaluated at 3.58 and the composite GPI is found at 3.55 (Table 3, Figure 4). The visible, tangible actions taken to manage waste and traffic are thus stronger than the softer institutional actions on the part of enforcement and awareness.

4.4 Descriptive comparison of tourists and stakeholders

Table 4. Mean (SD) of constructs by respondent category

Construct	Tourists (n = 250)	Stakeholders (n = 250)	Difference
Environmental Practices	3.68 (0.81)	3.80 (0.72)	+0.12
Community and Cultural	3.40 (0.79)	3.63 (0.80)	+0.22
Institutional and Industry	3.31 (0.73)	3.48 (0.79)	+0.18
Overall Effectiveness	3.50 (0.84)	3.65 (0.79)	+0.16
Green Practice Index	3.46 (0.61)	3.64 (0.59)	+0.17

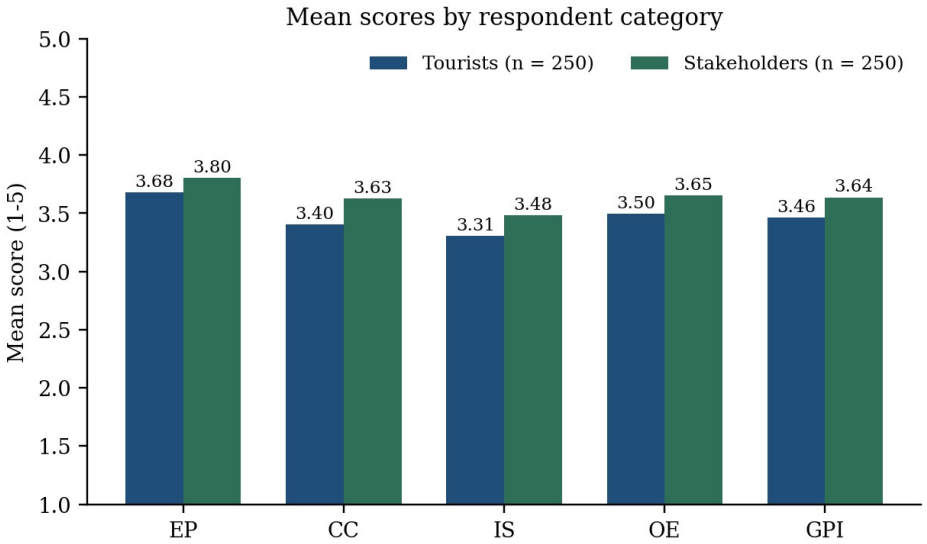


Fig.5. Mean scores of tourists and stakeholders.

The mean scores are higher for the stakeholders on every construct than the tourists (Table 4, Figure 5). But the gap is greatest for community and cultural initiatives, which makes sense as these are activities that are more likely to be available to residents and tourism workers than to short-stay visitors. In section 4.7 the significance of the difference between the two composite indexes is tested.

4.5 Reliability and exploratory factor analysis

Table 5. Reliability and rotated component matrix

Item	F1: EP	F2: CC	F3: IS	F4: OE	h² / overall
EP1	.807	(.12)	(.13)	(.20)	0.72
EP2	.715	(.18)	(.25)	(.25)	0.67
EP3	.800	(.12)	(.14)	(.21)	0.72
CC1	(.07)	.795	(.08)	(.24)	0.70
CC2	(.16)	.830	(.13)	(.13)	0.75
CC3	(.15)	.761	(.19)	(.19)	0.67
IS1	(.11)	(.10)	.754	(.27)	0.66
IS2	(.16)	(.18)	.767	(.18)	0.68
IS3	(.20)	(.13)	.788	(.09)	0.69
OE1	(.24)	(.20)	(.18)	.789	0.75
OE2	(.18)	(.18)	(.20)	.779	0.71
OE3	(.22)	(.20)	(.13)	.810	0.76
Cronbach's α	**0.783**	**0.788**	**0.754**	**0.826**	**0.873**
Eigenvalue (initial)	**5.02**	**1.33**	**1.16**	**0.97**	
% variance (rotated)	**17.3**	**17.8**	**16.8**	**18.8**	**70.6**

Note. Principal component extraction, varimax rotation, four components specified from the questionnaire design; cross-loadings below .40 shown in brackets. KMO = 0.882; Bartlett's $\chi^2(66) = 2{,}300.9$, $p < .001$. Overall α for the 12 items is shown in the last column of the α row. Initial eigenvalues are in the order of extraction, so the F1–F4 labels follow the items they load on.

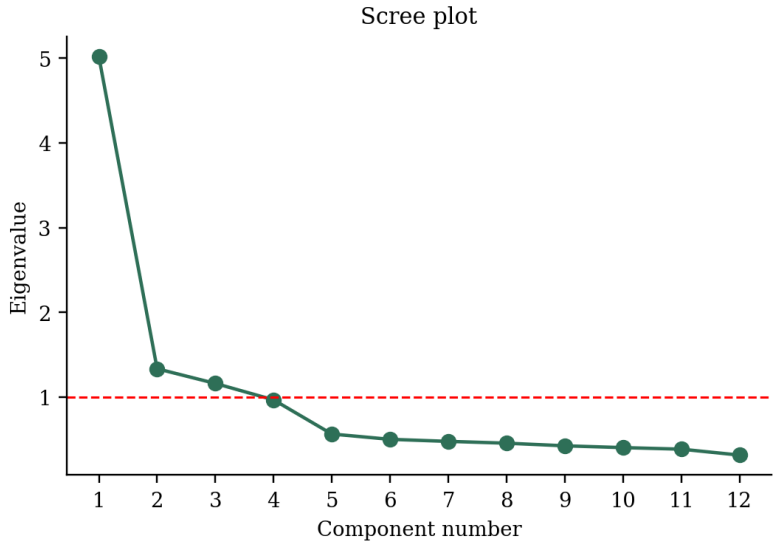


Fig.6. Scree plot of the twelve questionnaire items.

Cronbach's alpha is 0.783 for EP, 0.788 for CC, 0.754 for IS and 0.826 for OE, and 0.873 for all twelve items, all above the conventional .70 threshold (Table 5). The Bartlett's test ($\chi^2 = 2{,}300.9$, df = 66, $p < .001$) and the

KMO measure (0.882) indicate that the data are appropriate for factor analysis. Figure 6 depicts the scree plot with three initial eigenvalues above the Kaiser's criterion of 1 (5.02, 1.33 and 1.16) and the fourth eigenvalue is barely under the Kaiser's criterion of 1 (0.97). The instrument was designed to have 4 constructs and 4 component solution was specified. It accounts for 70.6% of the variance, loadings are at least .70 on the component(s) they were supposed to load on, and communalities range between 0.66 and 0.76. This means that the scale has construct validity.

4.6 Correlation analysis

Table 6. Pearson correlation matrix of the constructs (N = 500)

Construct	EP	CC	IS	OE
EP	–			
CC	.391	–		
IS	.458	.386	–	
OE	.543	.485	.472	–

Note. Correlation is significant at the 0.01 level (two-tailed).

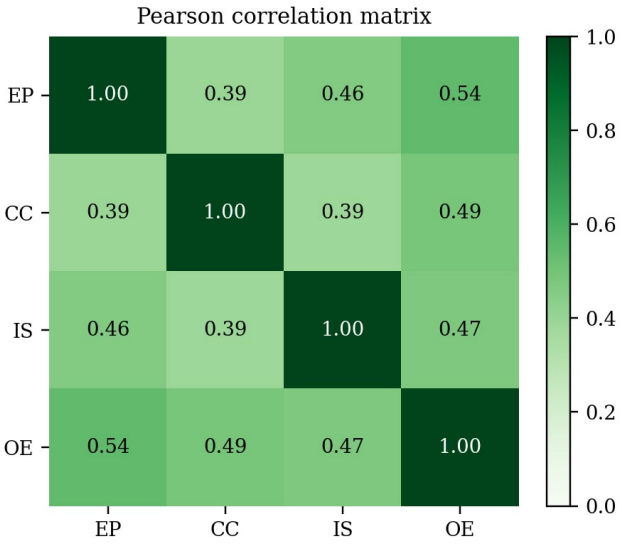


Fig.7. Heat map of correlations among the constructs.

Table 6 shows that all constructs are significantly and positively correlated with each other, as seen in Figure 7. The environmental practices have the highest correlation of r = 0.543 with overall effectiveness, followed by community and cultural r = 0.485 and institutional support r = 0.472. The correlations between the predictors are between 0.386 and 0.458, indicating moderate correlation and not suggesting multicollinearity.

4.7 Hypothesis testing

H1 (one-sample t-test). The constructs and the composite index were compared with the neutral value of 3.

Table 7. Results of hypothesis tests H1, H3 and H4

Test / group	Mean	SD	t / F	df	p	Effect size	95% CI / note
Environmental Practices	3.74	0.77	21.58	499	< .001	0.96	[3.67, 3.81]
Community and Cultural	3.51	0.80	14.31	499	< .001	0.64	[3.44, 3.58]
Institutional and Industry	3.40	0.76	11.58	499	< .001	0.52	[3.33, 3.46]

Overall Effectiveness	3.58	0.82	15.73	499	< .001	0.70	[3.50, 3.65]
Green Practice Index	3.55	0.61	20.28	499	< .001	0.91	[3.50, 3.60]
H3: Independent-samples t-test (Stakeholders vs Tourists), GPI							
Stakeholders (n = 250) vs Tourists (n = 250)	3.64 vs 3.46	0.59 vs 0.61	3.23	498	.001	0.29	Levene p = .674
H4: One-way ANOVA by age group, GPI							
Between groups			F = 4.09	4, 495	.003	η^2 = 0.032	Levene p = .496
18-25 years (n = 81)	3.64	0.55					
26-35 years (n = 138)	3.62	0.62					
36-45 years (n = 129)	3.55	0.56					
46-55 years (n = 97)	3.54	0.65					
56 and above years (n = 55)	3.26	0.61					

Note. H1 tests against μ = 3 (Cohen's d as effect size). Tukey HSD post hoc: the 56 and above group differs significantly from the 18–25 (p = .003), 26–35 (p = .002) and 36–45 (p = .028) groups; the difference from the 46–55 group is marginal (p = .056).

H1 is supported. All constructs are well above the neutral value (Table 7). The composite index averages 3.55 (95% CI 3.50–3.60), t(499) = 20.28, p < .001, d = 0.91, a large effect. Environmental practices have the greatest effect (d = 0.96), and institutional and industry support have the least effect (d = 0.52).

H3 is supported. Levene's test shows equal variances (p = 0.674), and stakeholders (M = 3.64, SD = 0.59) rate green practices significantly higher than tourists (M = 3.46, SD = 0.61), t(498) = 3.23, p = .001. Small to moderate effect (d = 0.29).

H4 is supported. The age groups differ significantly, F(4, 495) = 4.09, p = .003, η^2 = 0.032, a small effect. The mean ratings drop from 3.64 for the age group 18-25 years to 3.26 for age groups over 56 years. The two oldest groups are significantly more critical than the three younger groups, as indicated by Tukey comparisons (Figure 8).

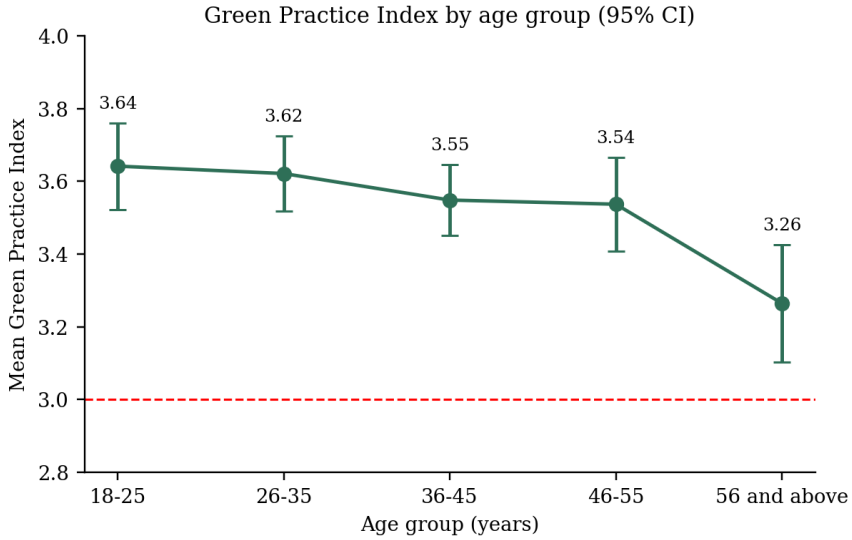


Fig.8. Green Practice Index by age group, with 95% confidence intervals.

4.8 Regression analysis

Table 8. Multiple regression predicting perceived overall effectiveness (OE)

Predictor	B	SE	β	t	p	VIF
(Constant)	0.477	0.167		2.85	.005	
Environmental Practices (EP)	0.363	0.043	0.340	8.51	< .001	1.36
Community and Cultural (CC)	0.276	0.039	0.271	7.02	< .001	1.26
Institutional and Industry (IS)	0.227	0.043	0.211	5.30	< .001	1.35

Note. $R = 0.645$, $R^2 = 0.416$, adjusted $R^2 = 0.412$, $F(3, 496) = 117.75$, $p < .001$; Durbin–Watson = 2.08.

H2 has been supported (H2a, H2b and H2c). The regression model is significant, $F(3, 496) = 117.75$, $p < .001$, with an adjusted R^2 of 0.412 (41.6%) of the variance in perceived overall effectiveness explained. All three predictors are significant and positive: environmental practices ($\beta = 0.340$, $p < .001$), community and cultural initiatives ($\beta = 0.271$, $p < .001$) and institutional and industry support ($\beta = 0.211$, $p < .001$) (Table 8, Figure 9). VIF values less than 1.36, and a Durbin–Watson statistic of 2.08, suggest no issues with multicollinearity or autocorrelation. For every 1-point increase in the rating of environmental practices, the perceived effectiveness increases by 0.36-point, while controlling for the other predictors.

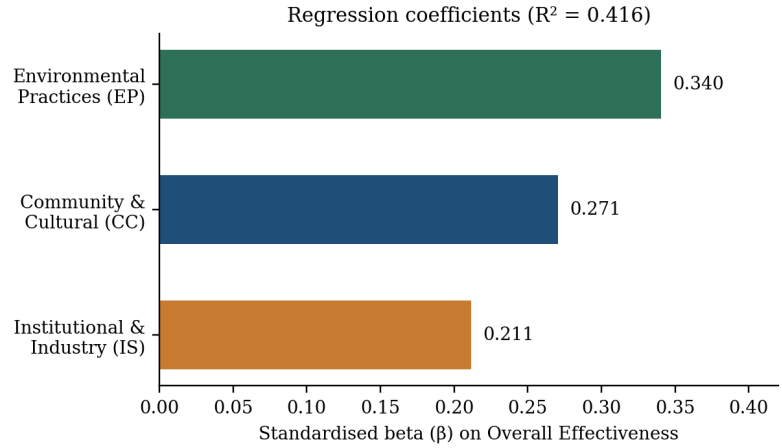


Fig.9. Standardised regression coefficients for perceived overall effectiveness.

V. DISCUSSION"

The outcome of the results is clear. The existing green tourism practices in Nainital are rated favourably by the respondents (GPI = 3.55), environmental practices are rated highest. This corresponds with the visible measures reported in previous descriptive studies: lake wardens, plastic fines and door-to-door waste collection (Lad, 2020), the heavy-vehicle ban near the lake and the Mission Butterfly waste programme (Pande, 2011) and the forest department's regulation (Negi, 2019). Restriction of heavy vehicles ranks as the top measure in this study and is the same measure listed in Pande (2011), indicating that the measures that are easy to see and easy to enforce are the ones people believe are most effective.

The mean for institutional and industry support is the lowest (M = 3.40) and the single weakest is awareness of green practices. This disparity between tangible measures and less tangible institutional work reinforces the idea of Gupta et al. (2022) that the issue of over-tourism is not a problem of the tourists alone, and that infrastructure and policy needs to keep up with demand, too. It also supports the observation of Melkani and Kumar (2021) that Nainital has an unplanned and uneven development. Community participation (CC2) comes in 2nd lowest position. The results of the present research are consistent with that of the barriers faced by community participation in Uttarakhand by Kala and Bagri (2018) as community participation in planning and green initiatives is less developed than the employment and cultural benefits of tourism (CC1 and CC3) which reflects the socio-cultural incorporation described by Kumar et al. (2023).

The regression indicates all three sets of practices have a significant impact on perceived effectiveness and also that

the environmental practices are the most significant (β = 0.34). The three predictors account for 42% of the variance, which is why the multi-dimensional view of sustainability developed by Singh (2018) and his economic, ecological, cultural and local pillars are useful to assess a destination; effectiveness is determined by all four pillars and not one of them alone. Other aspects of the visits and residency that have not yet been addressed, such as crowding (Zehrer, 2016) and experiences of congestion at peak times, could also influence judgments of the effectiveness of green measures.

While stakeholders were more positive than tourists, this could be a reflection of their greater knowledge of developments in the destination and the fact that they have a vested interest in the reputation of the destination, and the tourists form their impressions from short stays. This finding of group differences is consistent with Adie (2019) who found that the perceptions of over-tourism vary among rural and urban residents, and thus, the tourist–stakeholder difference is included. The lower ratings for those aged 56 and older may reflect the longer memory of the destination among these respondents and the increased expectations they may have had, but this has to be confirmed in interviews, which the broader research will involve.

VI. CONCLUSION

The present study was conducted through analysis of the existing sustainable green tourism practices of Nainital from the perspective of 500 tourists and stakeholders through an instrument consisting of 12 items on five point Likert Scale which is reliable and tested using the SPSS-based tests. The practices are rated well above the neutral level with environmental measures leading and institutional support and awareness lagging. Variance in perceived overall effectiveness is accounted for by environmental, community and institutional practices (41.6%) and ratings differ significantly between respondent categories and age. Each of the four hypotheses is supported.The results have four practical implications. Firstly authorities should maintain and expand the visible environmental measures that achieve the highest ratings, including the collecting of waste, protecting the lakes and regulating vehicles. Second, awareness raising campaigns with tourists and service providers should be prioritised along with strict and more visible enforcement as it is rated as the lowest. Thirdly, there should be more active involvement of the community in the planning process and their involvement in green initiatives, something that the residents have already acknowledged as providing them with employment and cultural benefits. Fourth, there should be an improvement in communication with the tourists, as they are less able to benefit from the communication than stakeholders, and older residents/visitors should be targeted.The study has some limitations. The data are self-reports of perceptions at a specific time and place, convenience sampling of strata limits generalisation and the number of principal components chosen by design was four. Further studies could incorporate objective parameters like waste volume and lake quality parameters and conduct a comparative study with other hill destinations of Uttarakhand and simultaneously test the relationship through structural equation modelling.

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