CHAPTER – III
CHAPTER III
RESEARCH METHODOLOGY

3.1 INTRODUCTION

Research methodology form an integral part of any research study. The successful completion of any research work is dependent on the right selection of research methods and techniques to collect all necessary facts, figures and data. For this, researcher has to rely on the field survey technique as well as on published reports, records, journals, periodicals, newspapers and magazines.

The importance and need of the present study has been discussed in the previous chapters. This chapter aims to explain the research design and methodology on which the present study is based, to achieve the research objectives. The present study is concerned with image of green hotels and its effect on customer patronage in Indian hospitality. In the present study, every possible effort has been made to obtain data from primary and secondary sources. This chapter examines in detail the nature, scope and need of the study, particularly in the form of hypotheses and objectives formulated within the framework of research gap which emerged out of the existing literature reviewed. Moreover, determination of sample size, generation of scale items, pre testing and the statistical techniques used in the study have also been summarized along with organizational profile of the study.

3.2 JUSTIFICATION OF THE STUDY

In this era of environmentalism when everybody is talking about sustainability & green management, there is a growing pressure on the different business organisations to reduce their negative impact on society and environment. And hospitality industry is not different from the same. According to a study by the International Hotels Environment Initiative and Accor, 90% of hotel guests would prefer to stay in a hotel that cares about the environment (Mensah, 2004). With the rise of environmentalism, not only the consumers have become more willing to purchase products that generate minimum impact, but also society has become more concerned with the environment. Additionally,
international environmental regulations have increased dramatically and become stricter in recent years. Although, the sensitization among people is much more popular in countries which are already developed as compared to developing nations like India and since different stage of economic development is an important factor affecting environmental practices. It is not wise to generalize conditions in developed nations to developing nations. In hospitality business, guests are becoming increasingly apprehensive about environmental attributes (Millar & Baloglu, 2008), which is the main reason to adopt environmental tools such as eco label and environment management system (Ayuso, 2007). However, one of the major challenge is customer’s reluctance to pay extra even with their consciousness about environment and preference to stay in environmental friendly hotels.

In this context, this study proposed to investigate the effect of green image of eco hotels on customer patronage & intention to revisit. Several studies have been conducted to study the effect of green image on guests behavioral intentions (Lee, J.S., Hsu, L.T., Han, H. & Kim, Y, 2010). Majority of the empirical studies regarding the Green image & its effect on guest’s behavioral intentions has been made in Western and /or affluent countries like USA, Canada etc but not much of the research is been conducted to investigate the green image relationship between customer’s patronage intentions in the eco hotels in India. The proposed study can contribute to the existing literature on the selected variables by providing a theoretical foundation for future research on Green Image of Eco friendly hotels, Guest Satisfaction, Guest Loyalty and patronage intentions in the hotel industry. Therefore, this study proposes the rare and novel constructs respectively and provides a research framework to explore the relationships among green image of ecotels and customer patronage intentions in Indian perspective.

3.3 OBJECTIVES OF THE STUDY

1) To study the guest’s opinion regarding Green Image of the hotels under study.

2) To explore the relationship between Green Image, Guest satisfaction & Guest loyalty in the select hotels.
3) To find out the impact of Guest satisfaction & Guest Loyalty on Patronage intentions in the Eco Hotels.

4) To evaluate the effect of Green image on Guest Patronage intentions.

5) To suggest different strategies about Green image of Eco hotels and their impact on guest revisit intentions.

3.4 HYPOTHESES OF THE STUDY

The branding studies, there is a common assumption that positive image has an impact on the level of customer satisfaction. However, throughout the literature, there is a general agreement that image and satisfaction are closely related. In the past, studies have cited image as an antecedent of customer satisfaction (Andreassen and Lindestad, 1998; Bloemer and Ruyter, 1998; Clemes et al., 2009). Many scholars, such as Su (2005), Lin (2005), Yang (2006), and Zhang (2007), also confirmed the positive relations between brand image and customer satisfaction. In hospitality industry, results of studies done earlier in the area revealed that image has a strong relationship with customer satisfaction. Jamal and Goode (2001) argued that brand image affect customer satisfaction, whereas customer satisfaction affects customer preference. The same has been validated in a study by Nazari et al (2015) and Lahap et al. (2015) concluding that a hotel property can enhance its overall customer satisfaction by working upon its image. The evidences from hospitality industry show that satisfaction alone does not ensure that the customer will avail its services again but is actually guest delightedness that significantly influences the success of any business. Various studies in service industry have confirmed that customer satisfaction strengthen the formation of loyalty (e.g., Kandampully & Hu, 2007; Chiou & Droge, 2006; Kandampully, Juwaheer & Hu, 2011; Chi & Qu, 2008) and the organisation’s image is also recognized as a factor impacting customer loyalty and customer satisfaction (Kandampully, et al., 2011; Chi & Qu, 2008).

Since very few empirical studies have been conducted studying the association of Green image, guest satisfaction and guest loyalty in eco hotels in India, therefore, this study proposes the following hypotheses:
H1: Green image is positively associated with guest satisfaction.

H2: Green image is positively related to guest loyalty.

Customer satisfaction is an important determinant of behavioural intention, which indicates customers’ selective behaviour and how they make purchase decisions. According to study by Zeithaml et al. (1996) behavioural intentions is measured through factors such as word of mouth, repurchase intentions, loyalty and willingness to pay premium. The contented customers will have an intention of visiting a hotel on a long-term basis (Abbasi, Khalid, Azam and Riaz, 2010), thus influencing customers’ intention to patronage a hotel (Edwin and Sheryl, 2013). Therefore, effective customer satisfaction policies must be implemented to retain the existing customers (Ali and Amin, 2014). Previous literature in the area (Fornell, 1992; Rust and Zahorik, 1993; Taylor and Baker, 1994; Patterson and Spreng, 1997) have validated the relationship of customer satisfaction on behavioural intentions. A Study by Bearden and Teel (1983) argued that satisfaction is an important determinant of positive word of mouth and customer loyalty. The effect of customer satisfaction on customer repeat purchase intention is also found positive by Ranaweera and Prabhu (2003). Specifically, the levels of customer satisfaction will influence the level of repurchase intentions and this is supported by past research in a wide variety of studies (Rust and Zahorik, 1993; Taylor and Baker, 1994; Patterson and Spreng, 1997; Hellier et al., 2003). On the basis of the above, it is hypothesized that:

H3: Guest satisfaction is positively related to the Patronage intention.

Bennett (2002) defined loyalty as the association between an individual’s attitudinal inclination towards a product and its patronage. Patronage Intentions corresponds to the word of mouth (WOM), willingness to pay a premium price (WPP) and the repurchase intention (Zeithaml, Berry and Parasuraman ,1996). Customer loyalty as a result of organisational strategy has been found to consists of attitudinal, emotional and behavioural dimensions (Barroso and Picón, 2012). Dick and Basu (1994) and Hagel and Armstrong (1997) stated that loyal customers are more likely to engage in positive word of mouth. The positive and direct relationship between customer loyalty and
customer’s willingness to recommend further finds support in Reichheld (2003, 2006). Zeithaml (2000) argued that good service quality results into customer loyalty which further leads to better retention and willingness to pay premium prices. The same is supported by Srinivasan, Anderson and Ponnavolu (2002) and Zeithaml et al. (1996), which indicated that service quality contributes to willingness to pay premium and word-of-mouth promotion. Auka (2012) defined loyalty as the extent to which a customer demonstrate repeat purchase behaviour from a service provider and deem using the same service provider when a need for service arises. This belief is acknowledged in Oliver’s (1999) definition of loyalty as “a deeply held commitment to rebuy or repatronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts have the potential to cause switching behavior.” Thus based on this, the following hypothesis can be framed:

**H4: Guest Loyalty is positively related to the Patronage intention.**

Green practices are principally essential in the hotel industry, where building strong brand is a key to survive in the prevailing competitive market conditions. Practicing green have been proved to impact brand image and improve the bottom-line of the hotel (Schubert et al., 2010). Ryu et al. (2008) added that hoteliers have acknowledged the significance of practicing green as a component contributing towards the hotel image and have observed that image can be enhanced through green practices, which in turn contributes towards loyalty and behavioral intentions. According to Zeithaml, Berry and Parasuraman (1996), behavioural intentions correspond to spreading positive/negative word of mouth, willingness to pay extra and intention to repurchase the product or service. Particularly in service industry, customer word of mouth is proved to have strong impact on behavioural intentions (Buttler, 1998). Besides providing information to customer, it also affects their purchase and patronizing decisions. Jeong and Jang (2010) added that customers’ pro environmental image and behavioural intentions is influenced by customer perception of green practices. The results of the study by Namkung and Jang (2013) examined that customers opinion about green practices have a positive impact on restaurants’ green image and green behavioural intentions. Previous studies on the concept of image relating to behavioural intentions has been conducted in the airline,
Figure 3.1: Research Model to Be Tested
education, manufacturing, retailing, tourism and restaurant sectors (Ryu et al., 2008; Castro et al., 2007; Chang, 2005; Park et al., 2004; Nguyen & LeBlanc, 2001). Limited studies have studied the effect of image on behavioural intentions; therefore, this study proposes the following hypotheses:

**H5: Green image of Eco Hotels affects the guest’s patronage intention.**

**H5(a):** Eco hotel’s image positively affects word of mouth (WOM).

**H5(b):** The image of Eco Hotel has a positive influence on the willingness to pay a premium (WPP).

**H5(c):** Eco hotel’s green image positively affects guest’s revisit intention (RVI).

### 3.5 SCOPE OF THE STUDY

This study is based on the customer patronage intention towards green practices followed in eco hotels, as green hotels now a days after following these practices lead to positive effect on the environment due to the energy and water conservation. This concept of energy and water conservation via three Rs (Reduce, Reuse & Recycle) and 3 Es (Energy, Education and Efficiency) has made many non eco hoteliers inquisitive in following these practices because due to these practices there is a dual effect on the hoteliers: One, it protects the environment and on the other side, it prevents hoteliers from excessive expenditure. In India also, this concept has taken an edge as there are many hotels in India which have adopted this concept like The Uppal’s (New Delhi), Cabbana hotel (Phagwara), Rodas (Mumbai), The Fern (Jaipur), Meluha The Fern (Mumbai), The Fern Residency (Gurgaon) etc. Although the number of these hotels is very less as compared to other countries like USA & Canada, yet there is a dire need to understand the concept and also to study if these types of hotel image have an effect on customers’ patronage intentions. This study has a relevance because not many empirical researches have been conducted in this particular area which can endorse upon the fact that how green image and customers’ patronage intentions are related.
This study would be relevant for hoteliers to better understand the concept of ecotels. At governmental level, it would be beneficial for policy makers for drafting guidelines for eco friendly hotels. And most importantly the study works in tandem with the concept of “Sustainability”, which is a much talked about topic on the global forums.

There are a number of eco friendly hotels in India and due to financial and time constraints, this study would cover the eco friendly hotels in Northern India which includes The Uppal’s (New Delhi), Cabana Hotel (Phagwara), The Fern Residency (Gurgaon), The Fern Residency, (Chandigarh), Mantra Amaltas (New Delhi) & Ashok Country Resort (New Delhi).

### 3.6 SOURCES OF DATA COLLECTION

The data for the study has been collected through both primary as well as secondary sources.

#### PRIMARY DATA

The primary data which is based on first hand information has been generated by means of specifically developed questionnaires from the customers and employees who have been surveyed from the select hotels under study.

#### SECONDARY DATA

Secondary data has been obtained from the sources such as books, journals and periodicals etc. Articles also played a major part in this investigation, either for illustration or as a point of reference for the study. The information has also been obtained from various websites related to the study.

### 3.7 STUDY AREA

To study the green image of eco friendly hotels and its impact on the customer’s patronage intention is relatively a new development in academic investigations especially
in hospitality and tourism sector in India. The geographical area for the data collection shall be restricted to North India i.e. Delhi NCR, Punjab & Chandigarh. The study area is selected according to the convenience of the researcher as it is not possible for the researcher to cover the whole North India due to little time frame and financial constraints. The information will be collected from the customers of the selected hotels.

Table 3.1: Hotels under study

<table>
<thead>
<tr>
<th>S.NO</th>
<th>HOTELS</th>
<th>APPROX. NUMBER OF GUESTS (2012)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Uppal, New Delhi</td>
<td>7665</td>
</tr>
<tr>
<td>2</td>
<td>Hotel Cabbana, Phagwara</td>
<td>7008</td>
</tr>
<tr>
<td>3</td>
<td>The Fern Residency, Chandigarh</td>
<td>6862</td>
</tr>
<tr>
<td>4</td>
<td>The Fern Residency, Gurgaon</td>
<td>4727</td>
</tr>
<tr>
<td>5</td>
<td>Mantra Amaltas, New Delhi</td>
<td>4344</td>
</tr>
<tr>
<td>6</td>
<td>Ashok Country Resort, New Delhi</td>
<td>3833</td>
</tr>
</tbody>
</table>

3.8 RESEARCH APPROACH

Saunders et al. (2007) illustrated the difference between deductive approach in which we begin to develop the hypothesis and then design a research strategy to verify the validity of developed hypothesis and the inductive approach in which the collection of data comes first and then we analyse the data to develop the hypothesis.

In the present research, we tried to test the hypotheses related to various variables. The data was then collected and analysed to test these hypotheses. Therefore, the present research is deductive in nature. Deductive approach works from the more general to the more specific, where it is sometimes called top-down approach. Deductive approach begins with theory, hypothesis, observation and ends at confirmation.
3.9 SAMPLE SIZE

After a thorough review of literature, the questionnaire was prepared. The data is collected from the eco friendly hotels in Delhi NCR, Punjab & Chandigarh using a structured questionnaire titled “Investigating the effect of Green Image on Guests’ Patronage Intention: A case of Eco Hotels”. The sample size is calculated by using the following formula by (Krejcie & Morgan, 1970).

Population Size Known

\[ s = \frac{X^2 NP (1 - P)}{d^2 (N - 1) + X^2 P (1 - P)} \]

\( s \) = Required sample size.

\( X^2 \) = The table value of chi-square for 1 degree of freedom at the desired confidence Level (3.841).

\( N \) = The population size = 34439

\( P \) = The population proportion (assumed to be .50 since this would provide the maximum sample size).

\( d \) = The degree of accuracy expressed as a proportion (.05).

Thus the calculated sample size is 380 out of which 335 responses are found to be useful.
Table 3.2: Hotel Wise Sample Size

<table>
<thead>
<tr>
<th>S.NO</th>
<th>HOTELS</th>
<th>AVERAGE NUMBER OF GUESTS*</th>
<th>%AGE OF SELECTED SAMPLE SIZE (Average No. of Guests/Total Average Guest X 100)</th>
<th>SELECTED SAMPLE SIZE (%Age X Total Selected Sample)</th>
<th>USABLE SAMPLE COLLECTED</th>
<th>% OF RESPONSE RATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Uppal, New Delhi</td>
<td>7665</td>
<td>22.26 %</td>
<td>84</td>
<td>72</td>
<td>86%</td>
</tr>
<tr>
<td>2</td>
<td>Hotel Cabbana, Phagwara</td>
<td>7008</td>
<td>20.35%</td>
<td>76</td>
<td>66</td>
<td>87%</td>
</tr>
<tr>
<td>3</td>
<td>The Fern Residency, Chandigarh</td>
<td>6862</td>
<td>19.93%</td>
<td>76</td>
<td>66</td>
<td>87%</td>
</tr>
<tr>
<td>4</td>
<td>The Fern Residency, Gurgaon</td>
<td>4727</td>
<td>13.73%</td>
<td>53</td>
<td>46</td>
<td>87%</td>
</tr>
<tr>
<td>5</td>
<td>Mantra Amaltas, New Delhi</td>
<td>4344</td>
<td>12.61%</td>
<td>49</td>
<td>43</td>
<td>88%</td>
</tr>
<tr>
<td>6</td>
<td>Ashok Country Resort, New Delhi</td>
<td>3833</td>
<td>11.13%</td>
<td>42</td>
<td>36</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>34439</strong></td>
<td><strong>100%</strong></td>
<td><strong>380</strong></td>
<td><strong>329</strong></td>
<td><strong>86%</strong></td>
</tr>
</tbody>
</table>

* Average Number of Guests In The Year 2012
3.10  RESEARCH INSTRUMENT USED

To achieve the objectives laid down for the study and considering the peculiarities of the present study, structured instrument was utilized for the study. The present study is descriptive research using questionnaire as a method for collecting data. A comprehensive literature review is done to ensure the validity of the questionnaire. The questionnaire consists of six sections and include questions on the following categories:

**Section A: Demographic Profile**

This section deals with the respondents’ demographic detail which is developed in order to gain information on significant variables such as age, gender, educational qualification, marital status etc. The questionnaire is phrased in a manner which is easily understood by all the participants.

**Section B: Green Image**

Russel and Snodgrass (1987), Baloglu and McCleary (1999), Beerli & Martin (2004), Golden et al. (1987) & Lin et al. (2007) defined the various aspects of image. This section was designed to measure green image with 15 item scale. This scale was been adopted by Lee, J.S., Hsu, L.T., Han, H. & Kim, Y. (2010). For each item, the respondents are given a 7 point likert scale to respond from 1 being strongly disagree to 7 being strongly agree.

**Section C: Guest Loyalty**

Reid and Reid (1993) & Oliver (1997) defined green customer loyalty as the customer wanted to maintain a relation with an institute which was involved environmental or green concerns, and committed to re-buy or patronize a preferred product consistently in the future. This section was designed to measure Guest loyalty with 03 item scale used by Chang and Fong (2010). For each item, the respondents are given a 7 point likert scale to respond from 1 being strongly disagree to 7 being strongly agree.
Section D: Guest Satisfaction

Oliver (1997) (2006), Bansal (2005), and Barnet (2007) defined green customer satisfaction as the customer fulfillment of some need, goal, desire about environmental or green concerns and that this fulfillment was pleasurable. This section was designed to measure Guest satisfaction with 04 item scale as adopted by Chang and Fong (2010). For each item, the respondents are given a 7 point likert scale to respond from 1 being strongly disagree to 7 being strongly agree.

Part E: Patronage Intentions

The fifth section was designed to measure Guest Patronage Intentions with 09 item scale adapted by Lee, J.S., Hsu, L.T., Han, H. & Kim, Y(2010). For each item, the respondents are given a 7 point likert scale to respond from 1 being strongly disagree to 7 being strongly agree.

Part F: Suggestion/ Conclusions

The sixth section will be open ended for the respondents to make suggestions.

Table 3.3: Research Instrument Used

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>No. of Items</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guest Loyalty</td>
<td>3</td>
<td>Reid &amp; Reid (1993), Oliver (1997), Chang and Fong (2010).</td>
</tr>
<tr>
<td>Patronage Intention</td>
<td>9</td>
<td>Lee, J.S., Hsu, L.T., Han, H. &amp; Kim, Y (2010).</td>
</tr>
</tbody>
</table>
The scale items are finalized after reviewing the above mentioned literature, detailed discussion with the subject experts and academicians. Schedule is thereafter used for collecting the requisite information from the guests of green hotels under study. Schedule consists of five sections as discussed above. The data are collected on seven point Likert scale (7<----1>) where 7 denotes strongly disagree and 1 denotes strongly agree. Suggestions are kept in open ended form.

3.11 PILOT STUDY

Pilot study implies testing of questionnaire on a small sample of respondents for the purpose of improving the questionnaire by identifying and eliminating potential problems. Prior to the main study, a pilot study was performed to refine the instrument. A pilot study is necessary when designing a questionnaire because it provides a chance to check the clarity of questionnaire wording and to find out whether or not what the researcher planned is what actually happened.

The initial questionnaire was tested with a convenience sample of 50 guests from The Fern Residency, Chandigarh, Punjab, India. The questionnaire was tested to identify whether the questionnaire is able to capture the required data as expected by the researcher. The test was conducted mainly to find out whether our questionnaire was easily understandable as well as whether there were any vague and confusing questions in the questionnaire.

On the basis of the results of the pilot study, the wording of two items patronage intention construct was found to be confusing. Therefore, the items were adjusted to make it clear and easy to understand. With the exception of these two items, there were no other specific problems with the questionnaire design, the wording of items or the procedure. This research work is published in the form of chapter in a book entitled, “Tourism & Hospitality Industry: Status & Development” released in HOSTOCON-2014 organized by University Institute of Hotel Management and Tourism, Panjab University, Chandigarh, India during Feb 8-9, 2014.
3.12 STATISTICAL TOOLS & TECHNIQUES USED IN THE STUDY

The data so collected through the questionnaire from respondents have been processed and analysed in order to bring out precise results with the help of appropriate statistical tools such as descriptives, correlation, regression analysis, confirmatory factor analysis and structure equation modeling.

3.12.1 Measure of Central Tendency

This measure is mainly used for summarizing the essential features of a series and for enabling data to be compared. It is amenable to algebraic treatment and is used in further statistical calculations.

3.12.2 Measures of Dispersion (Standard deviation)

An average can represent a series only to some extent and can not reveal the entire story of any phenomenon under study. It fails to give any idea about the scatter of the values of items of a variable in the series around the true value of average. In order to measure this scatter, statistical dispersion is calculated.

3.12.3 Percentage Analysis

This technique has been applied to examine the percentages of the demographic profile of the respondents. These demographic variables included were gender, age, qualification etc.

3.12.4 Correlation

Correlation is a statistical technique which helps the researcher to understand the proximity among the variables in order to comprehend the relationship between them. In other words, correlation is directed towards measuring the degree of association between the variables and it refers to any broad class of statistical relationships involving dependence among the variables. The higher the value of correlation between the variables more is the probability of one variable explaining the change in the other variables. The correlation between two variables is said to be linear if the change of one unit in one variable result in the corresponding change in the other variable over the
entire range of values. The relationship between two variables is said to be non linear if corresponding to a unit change in one variable, the other variable does not change at a constant rate but changes at a fluctuating rate. There are several correlation coefficients often denoted by r or p (rho) measuring the degree of correlation. The most common of these is the Pearson coefficient of correlation. Pearson correlation coefficient is a measure of the linear correlation or dependence between two variables X & Y, giving a value between +1 & -1 inclusive. It is widely used in sciences as a measure of strength of linear dependence between two variables. It was developed by Karl Pearson from a related idea introduced by Francis Galton in the 1880s (Rodgers & Nicewander, 1988; Stigler & Stephen, 1989). Pearson’s correlation coefficient between two variables is defined as the covariance of the two variables divided by the product of their standard deviations. Pearson correlation coefficient is sensitive only to a linear relationship between the variables. Other correlation coefficients have been developed to be more robust than the Pearson coefficient of correlation. The coefficient of correlation takes (r) values from +1 to -1. If two sets or data have r = +1, they are said to be perfectly correlated positively if r = -1 they are said to be perfectly correlated negatively: and if r = 0 they are uncorrelated. The coefficient of correlation ‘r’ is given by the formula

\[ R = \frac{n \cdot \sum dx \cdot dy - \sum dx \cdot \sum dy}{n \cdot \sum dx^2 - (\sum dx)^2 \cdot n \cdot \sum dy^2 - (\sum dy)^2} \]

Where

- \( r \) = correlation of coefficient
- \( dx \) = deviation of x series from an assumed mean
- \( dy \) = deviation of y series from an assumed mean
- \( \sum dx \cdot dy \) = sum of the product of deviations of x & y series from their assumed mean
- \( \sum dx^2 \) = sum of squares of x series from an assumed mean
- \( \sum dy^2 \) = sum of squares of y series from an assumed mean
3.12.5 Regression Analysis

Regression analysis is a statistical tool for the investigation of relationships between variables. Usually, this technique seeks to ascertain the casual effect of one variable upon another. More specifically, regression analysis examines the relation of a dependent variable (response variable) to specified independent variables (explanatory variables). The objective of regression analysis is to predict the changes in the dependent variable in response to changes in the independent variables (Hair et al., 2008). The mathematical model of their relationship is the regression equation. A regression equation contains estimates of one or more hypothesised regression parameters. These estimates are constructed using data for the variables from a sample. These estimates measure the relationship between the dependent variable and each of the independent variable. These also allow estimating the value of the dependent variable for a given value of each respective independent variable. Both simple and multiple regression have been used in the study.

There are certain terms that need to be clarified to understand the results of this statistical technique. Beta (Standardised regression coefficients) value is a measure of how strongly each predictor variable influences the criterion variable. Beta regression coefficient is computed to make comparisons and assess the strength of the relationship between each predictor variable to the criterion variable. Higher the beta value the greater the impact of the predictor variable on the criterion variable. R is a measure of the correlation between the observed value and the predicted value of the criterion variable. R Square ($R^2$) is the square of this measure of correlation and indicates the proportion of the variance in the criterion variable which is accounted for by the model. In essence, this is a measure of how good a prediction of the criterion variable can be made by knowing the predictor variables. However, R square tends to overestimate the success of the model when applied to the real world, so an adjusted R square value is calculated which takes into account the number of variables in the model and the number of observations (participants) model is based on. This adjusted R square value gives the most useful measure of the success of model.
3.12.6 Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) is a statistical tool that enables researchers to either confirm or reject preconceived theory. It is a deductive approach and multivariate statistical technique that is used to test how well the measured variables represent the construct and the model building. To perform CFA, it is essential to specify both the number of factors that fall within a set of variables and which factor of each variable will load highly on before results can be computed. CFA is of great use in improving quantitative measurement in social sciences.

CFA is conducted with the objective of verifying the fitness of each latent construct. In the present study, it is performed to assess the fitness, reliability and validity of four measured constructs that is Green Image, Guest loyalty, Guest Satisfaction and Patronage Intention. CFA is a way of testing how well measured variables represent a smaller number of constructs. As such, the objective of confirmatory factor analysis is to test whether the data fit a hypothesized measurement model. This hypothesized model is based on theory and previous analytic research (Pathak, V., Chakraborty, T., & Mukhopadhyay, S., 2013). CFA was first developed by Joreskog and has built upon and replaced older methods of analyzing construct validity (Joreskog, 1969). CFA is used to provide confirmatory test of measurement theory, which requires a construct first be defined and specified in terms of measurement model. It is a way of testing how well measured variables represent a smaller number of constructs. One of the biggest advantages of CFA is its ability to assess the construct validity of the measurement theory by calculating factor loadings, average variance extracted (AVE) and construct reliability (CR).

3.12.7 Structure Equation Modeling

Structural Equation Modeling is a very general, very powerful multivariate analysis technique that includes specialized versions of a number of other analysis methods as special cases. Structural equation modeling (SEM) is a very general statistical modeling technique, which is widely used in behavioral sciences. It can be viewed as a combination of factor analysis and regression or path analysis. The interest in SEM is
often on theatrical constructs, which are represented by the latent factors. The relationships between the theoretical constructs, which are represented by the regression or path coefficient between the factors. The structural equation model implies a structure for the covariance between the observed variable, which provides the alternative name covariance structure modeling. However, the model can be extended to include means of observed variables or factors in the model, which makes covariance structure modeling a less accurate name.

Structural equation modeling provides a very general and convenient framework for statistical analysis that includes several traditional multivariate procedures, for example factor analysis, regression analysis, discriminant analysis and canonical correlation, as special cases. Structural equation models are often visualized by graphical path diagram. The statistical model is usually represented in a set of matrix equations.

Major Applications of SEM are:

A) Path analysis or casual modelling, which hypothesizes casual relationships among variables and tests the casual models with a linear equation system. Casual models can involve either manifest variables, latent variables or both;

B) Confirmatory factor analysis, an extension of factor analysis in which specific hypotheses about the structure of the factor loadings and inter correlations are tested.

C) Second order factor analysis, a variation of factor analysis in which the correlation matrix of the common factors is itself factor analysed to provide second order factors.

D) Regression models, an extension of linear regression analysis in which the regression weights may be constrained to be equal to each other, or to specified numerical values;

E) Covariance structure models, which hypothesize that a covariance matrix has a particular form. For example, you can test the hypothesis that a set of variables all have equal variance with this procedure.
F) Correlation structure models, which hypothesized that a correlation matrix has a particular form. A classic example is the hypothesis that the correlation matrix has the structure of a circumplex.

Structure equation modeling has its roots in path analysis and most structural equation models can be expressed as path diagrams.

3.12.7.1 Path Diagram

A Path diagram consists of boxes and circles, which are connected by arrows. The observed (or measured) variables are represented by a rectangle or square box, and latent (or unmeasured) factors by circles or ellipse. Single headed arrow or paths are used to define causal relationship in the model, with the variable at the tail of the arrow causing the variable at the point. Double headed arrows indicate co-variance or correlations, without a casual interpretation. Statistically, the single headed arrows represent regression coefficients, and double headed arrows co variances. The path diagram represents a clear hypothesis about the factor structure. In structural equation modeling, the confirmatory factor analysis is imposed on the data.

The structural equation modeling process centers around two steps: validating the measurement model and fitting the structural model. The former is accomplished primarily through confirmatory factor analysis, while the latter is accomplished primarily through path analysis with latent variables.

3.12.7.2 Indicators

Indicators are observed variables, sometimes called manifest variables or reference variables, such as items in a survey instrument. Four or more is recommended and three is acceptable and common practice. However, two indicators or even a single indicator may be acceptable if the researcher is confident in the measure’s validity and reliability. In fact, the prime consideration in selecting indicators is whether they are theoretically sound and reliably measured. By convention, indicators should have pattern coefficients (factor loadings) of .7 or higher on their latent factor.
While SEM packages are used primarily to implement models with latent variables, it is possible to run regression models or path models also. In regression and path models, only observed variables are modeled, and only the dependent variable in regression or the endogenous variables in path models have error terms. Independent in regression and exogenous in path models are assumed to measured without error. Path models are like regression models in having only observed variables with respect to latents. Path models are like SEM models in having circle and arrow casual diagrams, not just the star design of regression models. Using SEM packages for path models instead of doing path analysis using traditional regression procedures has the benefit that measures of model fit, modification indexes, and other aspects of SEM output.

3.13 RELIABILITY AND VALIDITY

3.13.1 Reliability

Reliability is defined as the extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials. In short, it is the stability or consistency of scores over time or across raters. Reliability is the extent to which an experiment, test or any measuring procedure yields the same result on repeated trials. Without the agreement of independent observers able to replicate research procedures, or the ability to use research tools and procedures that yield consistent measurements, researchers would be unable to satisfactory draw conclusions, formulate theories, or make claims about the generalisability of their research. In addition to its important role in research, reliability is critical for many parts of our lives, including manufacturing, medicine and sports. Joppe (2000) defined reliability as, ‘the extent to which results are consistent over time and an accurate representation of the total population under study is referred to as reliability and if the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable’. It is measured in following ways:

Cronbach’s Alpha

It refers to the extent to which items inter-correlate with one another. Internal consistency implies that multiple items measure the same construct and inter-correlate
with one another. In contrast, low inter-item correlation indicates that some items are not drawn from the appropriate domain and are unreliable (Churchill, 1979). The commonly accepted measure of internal consistency is cronbach’s alpha. The value of an alpha is .70 is the minimum acceptable standard for demonstrating internal consistency (Kennedy et al., 2002).

**Construct/Composite Reliability**

It is the measurement of reliability and internal consistency of the measured variables representing latent construct. It is easily computed from the squared sum of factor loadings for constructs and the sum of the error terms for a construct (Hair et al., 2001).

\[
CR = \frac{(\text{Sum of standardised loading})^2}{(\text{Sum of standardised loading})^2 + \text{Sum of error terms}}
\]

The rule of thumb for CR is 0.70 or higher (Fornell & Larcker, 1981).

**3.13.2 Validity**

Validity refers to the degree to which a study accurately reflects or assesses the specific concept that the researcher is attempting to measure. While reliability is concerned with the accuracy of the actual measuring instrument or procedure, validity is concerned with the study’s success in measuring, what the researchers set out to measure. Validity determines whether the research truly measures, which it was intended to measure or how truthful the research results are? In other words, does the research instrument allow you to hit ‘the bull’s eyes’ of your research object? Researchers generally determine validity by asking a series of questions and will often look for the answers in the research of others. It is the extent to which the instrument measures what it purports to measure. For example, a test that is used to screen applicants for a job is valid if its scores are directly related to future job performance. There are different types of validity criteria including: content, construct and divergent validity.
Content validity

It is the extent to which the content of the items is consistent with the construct definition (Hinkin, 1995). It can be established through existing literature on the subject or discussions with subject experts.

Construct validity

It is the extent to which a set of measured items actually reflects the theoretical latent construct. It deals with the accuracy of measurement (Joppe, 2000). It can be established in following ways:

- **Convergent validity**

  Convergent validity tests the extent to which the covariance between the two measures is uniquely explained by the trait factor. Thus, items that are indicators of a specific construct should converge or share a high proportion of variance in common. It involves the extent to which a measure correlates highly with other measures designed to measure the same construct.

  It can be established in following ways:

  a) **Factor loading:** High factor loading i.e., above 0.50 or ideally 0.70 or higher indicate level of convergence.

  b) **Average variance extracted:** In CFA, the average percentage of various extracted (VE) is a summary indicator of convergence. AVE is calculated by using standardised loadings, which as under:

      \[
      \text{AVE} = \frac{\text{Sum of squared standardised factor loadings}}{\text{Number of items}}
      \]

      If AVE is above 0.50, convergent validity gets established.

- **Discriminant validity**

  Discriminant validity refers to the extent to which the measure differs from other measures designed to measure different concepts. It can be examined through the
evaluation of the average variance extracted (AVE). Fornell & Larcker (1981) highlighted the importance of evaluating the discriminant validity of the construct used in the research. They suggested that average extracted for each construct should be greater than the squared correlation between constructs.

- **Nomological validity**

  It is a type of validity that assesses the relationship between theoretical constructs. It seeks to confirm significant correlations between the constructs as predicted by theory. It is a form of construct validity. A nomological net is built in which several construct are systematically interrelated (Hair et al., 2007). It gets established by proving the already existing theoretical relations.

3.14 **CHAPTER SCHEME**

The present study undertook to explore and investigate the “Effect of Green Image on Customer Patronage Intention: A Case of Eco Hotels”. The entire study has been divided into seven chapters and also includes appendices and Bibliography in the end.

**Chapter 1: Introduction**

This Chapter gives an overview of the concept of sustainability and how pro-environmentalism has prompted the development of eco hotels. The chapter briefly touches the concept of green marketing, green image, guest satisfaction, guest loyalty, guest patronage intention and their relevance in the context of green hotels.

**Chapter 2: Review of Literature**

The chapter portrays the past research work done in the field of green image, guest satisfaction, guest loyalty and patronage intention with reference to Indian and global hospitality sector and finally identifies the research gap for the study. The purpose of this chapter is to build theoretical framework for the research by reviewing the existing literature.
Chapter 3: Research Methodology

This chapter deals with the discussion regarding nature and scope of the study, formation of research hypotheses and objectives, generation of scale items, selection of respondents, data collection, data purification, reliability and validity and limitation of the study along with future agenda.

Chapter 4: Green Image in Eco hotels under study

This chapter talks about the green practices followed by hotels at the global level and various green practices followed by the hotels under the study. The chapter also discusses the benefits of following green practices with the help of suitable examples.

Chapter 5: Green Image of Eco hotels and its relationship with Guest Loyalty, Guest Satisfaction & Patronage Intentions

This chapter discusses the relationship of various variables i.e. green image with guest loyalty, guest satisfaction and patronage intention with the help of previous researches in the area.

Chapter 6: Effect of Guest Image of Eco hotels on Patronage Intentions- Data Analysis & Interpretation

This chapter depicts the results of the data collected and analyses in the light of the theoretical framework. For analyzing the data and testing the hypotheses, various statistical tools have been used. On the basis of results, a strategic framework has been developed for enhancing customer experience in Indian hospitality industry.

Chapter 7: Conclusion, Suggestion & future research

Conclusion and suggestions have been drawn on the basis of findings of the research study carried among the customers of the select hotel properties. The chapter also discusses strategic implications, research contributions, suggestions and future recommendations.

Appendices

Bibliography
REFERENCES


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