CHAPTER 3 - RESEARCH METHODOLOGY

This chapter on methodology adopted for the research describes the methodology of the research work being taken up currently and commences with the Problem definition. This is followed by Objectives of the research, the Hypothesis, Scope of the study, Research Framework, Research design, Population, sampling method, Sources of Data, Research tools, Data collection methods and Analytical methods.

3.1 Problem Definition

To study the existing status of marketing strategies for Cymbidium Orchids with a view to identify marketing gaps and challenges to meet a well-designed realistic vision.

3.2 Scope of Study

The study is limited to:

i. Cymbidium orchid growers from Sikkim and Darjeeling Hills
ii. Cymbidium buyers / Potential buyers from Sikkim and Darjeeling Hills
iii. Cymbidium buyers / Potential buyers from India
iv. Cymbidium buyers / Potential buyers outside India

After an exploratory study, it was decided to survey the growers of Cymbidium Orchids in Sikkim and Darjeeling Hills. After the growers were surveyed through questionnaire, customers and potential customers of Cymbidium Orchids were surveyed and segmented into three different categories

i. Local
ii. National
iii. International
3.3 **Hypotheses:** Following 14 hypotheses have been formulated based on literature and existing theories:

- H₀₁: Growers of Cymbidium do not have significant support
- H₀₂: Growers do not possess significant marketing capability
- H₀₃: Growers significantly are not aware of alternate uses of their product
- H₀₄: Growers are not having significant return to their investments
- H₀₅: Growers do not find their endeavour significantly economically viable
- H₀₆: Cymbidium orchids do not evoke distinct values significantly in the minds of local customers
- H₀₇: Local customers do not find cymbidium to be highly priced
- H₀₈: Customers do not find cymbidium to be adequately available
- H₀₉: Local customers have no specific purchase motivation for cymbidium
- H₀₁₀: Specific factors do not make cymbidium a preferred flower
- H₀₁₁: Purchase of cymbidium is not affected by Activity, Interest and Opinions (AIO) profile of customers
- H₀₁₂: Cymbidium as gift items is not perceived better than other gifts
- H₀₁₃: Online promotion does not help in marketing cymbidium
- H₀₁₄: There are no perceptual differences between the beliefs held by local, national and International consumers of Sikkim Cymbidium

3.4 **Nature of research**

The nature of research is empirical and conclusive research as it is a data-based research followed by conclusions that are capable of being verified. The formulation of hypotheses is another reason for the choice of empirical research. Conclusive research tests the hypotheses of the research problem and draws definite conclusions for implementation. Our research conforms to these requirements and thus, is conclusive in nature.
3.5 Research Design

The present research is based on exploratory research design as explorations are needed to develop a holistic understanding of a problem that needs to be comprehended. This is true in case of this study. It is an exploratory study which helped us to determine the best research design, data collection method and selection of subjects. The study is descriptive also as the work required describing certain trends, and beliefs. This research design has helped the researcher in understanding and fathoming the problem under investigation and to clarify concepts. The study is Analytical as it involves critical thinking skills and the evaluation of relevant facts and information.

The basic methods of exploratory research are Literature Survey, Experience Survey, Analysis of Case Studies, Interview schedule. All these methods, have, therefore, been employed in the research design of this study.

3.6 Exploratory Study

An exploratory study was conducted to identify the issues concerning the topic. Unstructured interviews with professionals of three identified disciplines were conducted. Findings of this exploratory study provided better insights into the problem and thus facilitated the development of hypotheses.

3.7 Sample

i. Sample – Growers

The sample respondents of this research consist of Cymbidium growers who have been engaged in growing Cymbidium Orchids for at least 5 years. The respondents were from the Sikkim and Darjeeling Hills.

- **Place:** 115 from Sikkim and 30 from Darjeeling
- **Gender:** 77 Male and 68 Female
- **Age group:** 21 (20-35), 52 (36-50), 72 (More than 50)
- **Income:** 54 (Below 1,00,000) and 91 (above 1,00,000)
ii. **Sample – Local Buyers:** The sample respondents of this research consist of people from the Sikkim Himalayan region who are expected to have knowledge about Cymbidium. They are buyers/potential buyers of Cymbidium Orchids.

iii. **Sample – National Buyers:** The sample respondents of this research consist of people from across India who has knowledge about Cymbidium Orchids. They are buyers/potential buyers of Cymbidium Orchids.

iv. **Sample – International Buyers:** The sample respondents of this research consist of people from outside India who are expected to have knowledge about Cymbidium Orchids. They are buyers/potential buyers of Cymbidium Orchids.

### 3.8 Sample Size

i. **Sample size – Growers:** 145 valid responses were collected. The number of respondents approached was 160.

ii. **Sample size – Local Customers:** 212 valid responses were collected. The number of respondents approached was 250. Male (99) Female (113). Age-group 18-25 (6); 26-35 (86); 36-45 (110) and above 45 (10)

iii. **Sample size – National Customers:** 250 valid responses were collected. The number of respondents approached was 250. (Male (142) Female (108). Age-group 18-25 (28); 26-35 (88); 36-45 (102) and above 45 (32)

iv. **Sample size – International Customers:** 109 valid responses were collected. The number of respondents approached was 200. (Male (62) Female (47). Age-group 18-25 (8); 26-35 (21); 36-45 (49) and above 45 (31)

### 3.9 Sampling Method

Two sets of samples were drawn – one for growers and other for customers. Growers were selected randomly. For the purpose, a list of 1250 family was collected from the government department and 175 growers were chosen randomly, i.e. by drawing out a number between 0 and 9 and then selecting every 16th number thereafter. Of these 19 had to be rejected for non-availability or refusal to respond. Sample customers were chosen online and hence the method may best be described as through convenience. Despite its criticism, most researchers in humanities rely upon convenience sampling method (Fabrigar, L. R et al ,1999).
There are reasons to rely upon online facility for collecting data. Online data collection has gained popularity in recent times because of several practical advantages. These include Flexibility (Schonlau et al., 2001), Speed and timeliness (Kannan et al. 1998), Multimedia content (Dommeyer and Moriarty, 1999/2000; Mullarkey, 2004), (Hogg A, 2003), Ease of data entry and analysis. (Wilson and Laskey 2003) and Low Administration cost - (Jackson, 2003). Representativeness of online data has been questioned by researchers, but it has been pointed out that with the greater diffusion of online technology will cease to be an issue. In our case flowers are purchased by people who generally are better educated, relatively affluent and of higher status. Such people also have access to internet-based technologies and hence it is believed that sample drawn online will be representative.

### 3.10 Research Tools

In all, four research tools based on *Likert Scale* were designed and administered. These are as follows:

i. **Research Tools - Growers**: The tool is developed using Likert Scale in a range of 1 to 5 with 1, 2, 3, 4 and 5 corresponding to Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree respectively. The tool contains 39 statements. Therefore, each of the 145 respondents answered 43 questions which equal a total of 6708 responses for analysis in the survey.

ii. **Research Tools – Local Customers**: The tool is developed using Likert scale in a range of 1 to 5 with 1, 2, 3, 4 and 5 corresponding to Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree respectively. The tool contains 58 statements. Therefore, each of the 212 respondents answered 66 questions which equal a total of 13596 responses for analysis in the survey.

iii. **Research Tools – National Customers**: The tool is developed using Likert scale in a range of 1 to 5 with 1, 2, 3, 4 and 5 corresponding to Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree respectively. The tool contains 58 statements. Therefore, each of the 250 respondents
answered 66 questions which equal a total of 13992 responses for analysis in the survey.

iv. **Research Tools – International Customers:** The tool is developed using Likert scale in a range of 1 to 5 with 1, 2, 3, 4 and 5 corresponding to Strongly Disagree, Disagree, Neither Agree nor Disagree, Agree and Strongly Agree respectively. The tool contains 58 statements. Therefore, each of the 109 respondents answered 66 questions which equal a total of 7194 responses for analysis in the survey.

The scale has been designed by the researcher. The process followed for this purpose has been to develop statements in correspondence with the objectives. These statements were submitted for peer reviewing the statements for their appropriateness and relevance. Experts rated the statements on the identified factors on a scale of 1 to 5 with 5 representing high value for relevance and appropriateness. Statement scoring below 4 was either rejected or further modified and submitted again for the rating to follow the process again. Ones the first draft of statements became ready, a pilot survey was conducted with 11 growers and 48 consumers to ensure that they understand what is intended by the researcher. If a gap in understanding was visible the researcher modified the statements appropriately. In this process, some statements were deleted.

Questionnaire for growers was administered by the researcher himself collected data from the growers often speaking in the native language (Nepalese) and which is also the first language of the researcher. For online questionnaire a google form was developed and a link created which was mailed to the likely respondents. For surveying the customers, the researcher has used rotary club network and emailed members across the country. For surveying the US and Australian respondents, the Facebook group - Australian Cymbidium Scene and Orchids Always members were approached. The sampling technique, therefore, may be considered judgmental also to some extent. There were no outliers because perhaps we relied on the Likert scale.

The confidentiality of the information obtained from the respondents was promised. The filled in questionnaires were collected the same day and on a few
occasions after a few days. For National and International customers, an online questionnaire was designed using Google form.

v. **Research Tool DEMATEL:** The DEMATEL method is being employed widely to explore interrelations between factors. It has been successfully applied in many areas, to understand the macro environment of cymbidium in Sikkim it was decided to use it. Tool was developed after consulting the experts. 14 factors were identified, and their dependence measured using paired comparison.

vi. **Research Tool AHP:** For this purpose, a tool was designed with five major criteria developed for the first tool (Colour, Aroma, Size, Longevity and Upkeep). Initially, the relative importance of these criteria is determined and thereafter, five more matrices were designed to compare how the four popular flowers used for improving the home/office ambience relatively measure on these criteria. The data was collected from the same 40 respondents of which five questionnaires were found to be invalid. The final sample size, therefore, is 35. In all cases, consistency ratio is found to be well below 10 and hence results are acceptable.

### 3.11 Reliability Analysis

Reliability of the data was vital for measurement as this study is based on the beliefs of people. Cronbach's Alpha has been used to measure the reliability of the data collected for this study. In statistics, Cronbach's Alpha (Cronbach LJ (1951) is a coefficient of internal consistency. It is commonly used as an estimate of the reliability of a psychometric test for a sample of examinees. The measure can be regarded as an extension of the Kuder–Richardson Formula 20 (KR-20), which is an equivalent measure for dichotomous items. Alpha is not robust against missing data. Several other Greek letters have been used by later researchers to designate other measures used in a similar context. Somewhat related is the Average Variance Extracted (AVE).

The theoretic value of alpha varies from 0 to 1 since it is the ratio of two variances. Higher values of alpha are more desirable. Some professionals, (Nunnally, 1978) as a rule of thumb, require a reliability of 0.70 or higher (obtained on a substantial sample) before they use an instrument. Obviously, this rule should be applied with
caution when alpha has been computed from items that systematically violate its assumptions. Furthermore, the appropriate degree of reliability depends upon the use of the instrument. For example, an instrument designed to be used as part of a battery of tests may be intentionally designed to be as short as possible, and therefore somewhat less reliable. Other situations may require extremely precise measures with very high reliabilities.

i. **Reliability Analysis – Growers:** Cronbach's Alpha was found to be above 0.9. The reliability of the data therefore is excellent.

<table>
<thead>
<tr>
<th>Table 3.1: Reliability statistics (growers)</th>
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<tbody>
<tr>
<td>Cronbach's Alpha</td>
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<tr>
<td>0.955</td>
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ii. **Reliability Analysis – Local Customers:** Cronbach's Alpha was found to be above 0.8. The reliability of the data therefore is good.

<table>
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<th>Table 3.2: Reliability statistics (local customers)</th>
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<tr>
<td>Cronbach's Alpha</td>
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<td>0.950</td>
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iii. **Reliability Analysis – National Customers:** Cronbach's Alpha was found to be above 0.8. The reliability of the data therefore is good.

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<th>Table 3.3: Reliability statistics (national customers)</th>
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<td>Cronbach's Alpha</td>
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<tr>
<td>0.892</td>
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iv. **Reliability Analysis – International Customers:** Cronbach's Alpha was found to be above 0.8. The reliability of the data therefore is excellent.

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<th>Table 3.4: Reliability statistics (International Customers)</th>
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<tr>
<td>Cronbach's Alpha</td>
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<td>0.896</td>
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3.12 Common Method Bias Analysis

This is based on Harman’s one-factor test with an explorative (EFA) factor analysis. The EFA-solution of the un-rotated principal factor analysis of Growers Survey revealed the presence of 7 factors with an eigenvalue greater than 1.0. The largest factor having an Eigen value of 18.4 did not account for most of the variance in the variables (43%). Therefore, in accordance with Podsakoff and Organ (1986, p. 536) no general factor is apparent.

Similarly, in the customers survey the first factor corresponded to an Eigen value of 21.115 and explains 24.7 percent of variance and. As for both sets of data, the first-factor contribution is below 50% it is interpreted that method bias is unlikely to have significantly affected the study results. Harman’s one-factor test though widely used is not the best of the methods to determine common method bias. Confirmatory factor analysis provides deeper and detailed analysis. Because of the unavailability of required software, we could not use the same.

KMO value for these analyses is 0.856 (Growers) and 0.814 (Customers). A value above 0.8 is concerned very good in the context of sampling adequacy. Similarly, Bartlett’s test of sphericity is also found to be exceptionally high with corresponding p-vale almost zero in each case. This supplements our earlier conclusions.

3.13 Data Analysis

All analyses were conducted using Statistical Software (SPSS) 16.0 version. The test statistics was checked and found to follow a normal distribution. For the hypothesis testing the confidence, the limit is set at 95%. A t-test was used to determine the significance of beliefs. The mean selected for one sample test was taken as 3 being the mid value of the Likert scale. At 95%, confidence limit for the t-test is considered significant if its Z value is beyond ± 1.96 and Significance (Sign.) less than 0.05. Decision-Making Trial and Evaluation Laboratory (DEMATEL) technique was introduced developed about 4 decades back. It found wide acceptance as a robust tool to determine the cause and effect relationship while evaluating multi-dimensional decision situation (Chiu et al., 2006, Liou et al., 2007, Tzeng et al., 2007, Wu and Lee, 2007, Lin and Tzeng, 2009). It is a useful method to examine and develop cause and effect association while exploring a complex and a less known

### 3.14 Hypotheses Testing

The Hypotheses testing has been done using one-sample t-test. Higher mean value and smaller standard deviation shows that the belief is significant. The Alternate Hypothesis is accepted if:

i. For a positive statement: if mean value is above 3 and t-test Z value is beyond ±1.96 and Significance value is less than 0.05.

ii. For a negative statement: if mean value is below 3 and t-test Z value is beyond ±1.96 and Significance value is less than 0.05.

iii. ANOVA has been used to test the hypothesis. For the hypothesis testing the confidence limit is set at 95%. Null Hypothesis is accepted if calculated F-value is below the tabulated value and the corresponding significance is over 0.05.

As the study is exploratory, the use of hypothesis should not be taken as conclusive. It merely provides a direction for future studies and a more structured study should be undertaken to test the hypothesis by future researchers.

This chapter provides us the methodological basis for carrying out the study. The result and discussion are the theme for next chapter. We provide the details as per our research objectives and attempt to integrate the results in a larger framework of literature. We also provide the implications of our findings in the next chapter.