Research Methodology
3. Research Methodology

3.1 Universe and sample
The study involved exposing the respondents to experimental prompt and getting them to answer a very descriptive questionnaire including various questions to measure different components of CBBE. The respondents typically had to spend around 20 minutes for the survey. The researcher therefore recruited 6 summer trainees excluding the researcher himself.

Respondents are typical users of Agro chemical products or the opinion leaders who suggest using the agrochemical products in the key markets of Maharashtra & Odisha.

The respondents of the study were randomly chosen from the key markets of Maharashtra & Odisha. In Maharashtra major markets selected for the study are Pune, Amravati, Akola & Yawatmal and Odisha major markets are Baragarh & Sambalpur and randomly assigned to various experimental conditions. The subjects of research were randomly selected and randomly assigned to each sales promotional prompt in the experimental research. The questionnaire designed to measure the dependent variable had two broad parts. The first part was administered prior to providing the experimental prompt and then after the exposure of subjects to the experimental prompt relating to Price Promotion (immediate effect) and Premium Promotion (with purchase premium), the second part was administered with respect individual sales promotional prompt.

3.2 Sample Profile
Reponses are obtained from 650 respondents who all are user or purchase influencers for the agrochemical products.

<table>
<thead>
<tr>
<th>Sr No.</th>
<th>State</th>
<th>Key Markets</th>
<th>No. of respondents (Frequency)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Maharashtra</td>
<td>Pune</td>
<td>100</td>
</tr>
<tr>
<td>2</td>
<td>Maharashtra</td>
<td>Amravati</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>Maharashtra</td>
<td>Yawatmal</td>
<td>150</td>
</tr>
<tr>
<td>4</td>
<td>Odisha</td>
<td>Bargarh</td>
<td>150</td>
</tr>
<tr>
<td>5</td>
<td>Odisha</td>
<td>Sambalpur</td>
<td>150</td>
</tr>
</tbody>
</table>
The study conducted in two states of India 1. Maharashtra & 2. Odisha. Total no. of respondents is 650. Out of the total 650 respondents from Maharashtra was 350 and 300 respondents were selected from Odisha. Being a huge geographical area in both the states the researcher selected the most potential area as far as brand usage is concerned.

Three districts in Maharashtra selected for the survey are Pune, Amravati & Yawatmal. 100 respondents selected from Pune, 100 respondents are selected from Amravati & 150 respondents are selected from Yawatmal. The objective of selection of the three districts is majorly concentrated to the focus of agrochemical companies in these areas. Major crops in this location are Cotton, Soybean and Vegetables.

Fig 4 depicts the two districts selected in the state of Odisha i.e. Bargarh & Sambalpur... 150 respondents selected from Bargarh & 150 respondents selected from Sambalpur. In
these two districts respondents are much aware of brands in agro chemical sector in comparison to other part of the state.

![Map of Odisha showing survey locations](image)

Figure 2: Survey Location in the state of Odisha

Major respondents are farmers and they are either user of the products or are aware of all the brands considered for study. The researcher used a questionnaire with close ended questions depicting several components of customer based brand equity (CBBE). Each questionnaire has five sections first section was related to profile of respondent, second was related to Insecticides third one is Fungicides fourth one is Herbicides and fifth section was plant nutrition products. Insecticide, Fungicide, Herbicide & Plant Nutrition product had three major segments one is capture responses without sales promotion second with price promotion (immediate effect) and third with premium promotion (with purchase premiums). Again each segment has nine questions first four questions are related to Awareness & association of a brand, next two questions are associated with Perceived quality & last three questions are related to Brand loyalty. All the responses
judged with Likert scale with seven options one being strongly disagrees and seven is strongly agree. All the respondents were prompted with images of pack shots of different brands.

3.3 Sector of Research

Importance of Agro Chemical Business in Indian Economy

With 18 crore hectares of land India stands second largest agricultural coverage in the world arena. If we consider the India's workforce it is almost a 47% is employed in agricultural occupation; however its contribution to the GDP is a mere 14%. (FICCI 2014b). Nearly 81 million hectares of India's land is desertified, threatening the food security at this point in time. The overgrazing of land and changing climatic patterns are exacerbating the situation. Indian farmers with lack of proper skill, awareness & technology end up into low production of outputs.

FICCI (2013a) emphasized the study of the food security of 125 countries, carried out by one of the agrochemical giant the E.I. DuPont, a well-known diversified chemicals and agrochemicals company, placed India somewhere in the middle at a discomforting 65th rank. According to the report if crop losses due to pests – estimated at anywhere between 20-40% of total output and for as much as 3% of GDP – are to be reduced, chemical pest control and management strategies will have to play a crucial role. In spite of its relevance, the industry continues to have a negative perception, amongst the public and, sadly, even among policy makers in India. In spite of having a robust regulatory process – that industry sees as exceedingly slow in efficiency – there is a commonly held notion that ‘old world’ pesticides are being used indiscriminately and rampantly, with awful consequences for human & animal health and the environment what it has been perceived. It has been realized and subsequently raised that the sale of illegal, adulterated, misbranded and spurious products increased substantially, farmers and industry agreement, has assumed sizeable proportions, although the exact magnitude is hard to pin down emphasized by FICCI (2013b). The estimate made by the Indian Council of Agricultural Research (ICAR), pegs it at around 40% of all pesticides used in the country – a frightening scenario even allowing for a possibility of overestimation! Some idea of the extent to which import of illegal imports of registered and unregistered active ingredients takes place came when in Jan.-Feb 2014 this year the Supreme Court gave notices to two large importers after seizures of illegal pesticides at Customs in
different part of the country. Shockingly the seizure of 25-tonnes of active ingredients, valued at Rs. 32-mn, is seen by the industry only as the tip of an iceberg: in the last financial year, over 18 such seizures took place ultimately. It is clear that the adverse impacts of these dubious quality products are wide-ranging: on human health, the environment, crop safety, brand value and revenues. Ultimately the most affected lot are farmers who land up using them FICCI (2013b).

Many crops are purchased centrally at government set prices; in 2011, an election year, these prices were held, slowing the growth of the farm economy. Transport is another problem, often resulting in crops having to be sold locally at unfavourable market prices. As a result farmer income is generally low and while several governments have initiated rural investment programmes, crop production fails to meet the considerable potential that exists.

**Challenges of Agrochemical marketing & Brand Building in India**

In the current time stringent environment regulations across the world are increasing the cost of developing new products and simultaneously delaying the introduction of new products in the market. Case in point, in the European Union any agrochemical product if found to be mutagenic, carcinogenic or endocrine disruptor would not achieve registration or re-registration irrespective of the level of exposure generated. As per the govt norms it takes almost nine to ten years to bring a new product. Immense low focus on R&D by domestic manufacturers due to high costs: The industry is facing a serious challenge owing to the rising R&D costs. For introduction of new molecule it takes almost USD 250 million in research and development. This prevents the companies to invest in R&D activities and focus more on the generic products which require low investments in research and development.

Farmers being uneducated it has been found that they are not aware of the appropriate kind of pesticide, its dosage and quantity and application frequency are not obeyed. Practically it is not easy to reach the farmers owing to infrastructure issues, regional languages and dialects. A connecting link between the farmers and the manufacturers are the retailers who don't have much of a technical experience and are unable to provide a proper product understanding to the farmers. In the same it is also very difficult for the farmers to convey their needs effectively to the manufacturers.
At this point in time there is a dire need of a system that can regulate distribution outlet. The market being predominantly generic in nature makes a strong and efficient distribution network essential for the crop protection market. Anyhow the industry is facing problems due to supply chain inefficiencies and inadequate infrastructure which results in post-harvest losses estimated at INR 45,000 crore (FICCI, 2014c) every year, thereby impacting the farmers. Actually lack of efficient distribution system also makes it difficult for the agrochemical companies to reach the farmers to promote their products and educate them about their usage and benefits of the product.

Due to lack of brand awareness there is a significant share of non-genuine pesticides which can be counterfeit, spurious, adulterated or sub-standard. As per the industry Estimates the non-genuine pesticides could account for up to 40% of the pesticides Sold in India in FY13 (FICCI, 2014c). These products are inferior formulations which are unable to kill the pests or kill them efficiently. Some such products do perform but leave bye products which may significantly harm the soil and environment. The damage through such products is manifold. Other than the crop loss and damage to soil fertility use of non-genuine products leads to loss of revenue to farmers, agrochemical companies and government. Few of the key reasons for use of non-genuine products are lack of awareness amongst the farmers, difficulty in differentiating between genuine and non-genuine products, supply chain inefficiencies, law enforcement challenges and influencing power of distributors/retailers. The long gestation period for new products is a major concern: It takes almost 10 years to bring a new molecule into the market. For the generic products even it can take up to 5 years to get the product registered. In India the regulatory bodies do not have adequate resources and infrastructure to execute timely registration of products. Many times the rules are not clearly defined creating interpretation challenges for the regulatory bodies. Leading to confusions thereby adding to the complexities for the crop protection chemical Companies.

**Agrochemical Companies, Govt. And Regulatory bodies**

Agrochemicals can play a crucial role in overcoming the challenges faced by Indian agriculture sector, thereby ensuring food and nutritional security for the nation. The only
solution by which this can be achieved is by developing innovative products; expand the product/service offering and promoting the use of agrochemicals amongst the end users, i.e. the farmers. In fact the low consumption levels provide a significant opportunity for agrochemical companies to increase their market penetration up to a significant level. Some of the key imperatives are product innovation (Product innovation needs to capture emerging market trends and match international standards) & farming solution End to end (Companies should look for opportunities to provide a comprehensive agri offering to the farmer, or a one stop solution for the farmer ranging from agriculture and farm inputs to procurement, storage and distribution services on the output side would help companies develop sustainable business models).

3.4 Variables in the Study and Measurement
The study is on the impact of various Sales Promotional measures on Brand Equity of agrochemical products which is operationally measured as the construct ‘CBBE’ as per the conception given by Yoo and Donthu (2001).

The dependant variable in this research is components of CBBE. Aaker (1991) defined Equity of a Brand is the group of assets namely, Awareness & Associations of Brand, the Perceived Quality, Loyalty of Brand

3.5 Tools used for the research
While administering the questionnaire the respondents were shown images of selected Brands with or without sales promotional scheme in print media (colour printouts) or electronic media (mobile phones or laptops) as the experimental prompt. But these prompts are used if the respondents unable to recollect the brand or the respondents are asking whether we have any image of the brand we are talking about.

3.6 Statistical methods and Analyses
The responses of few of the respondents were edited and some of the responses were omitted as they were either not filled or filled incompletely or not done properly. The valid responses were typed in the spreadsheet of SPSS software. Most of the data analysis was done using SPSS 16.

The statistical tool ‘t’ test was used to calculate the influence or effect of SP on CBBE and the differential effect between before the Sales Promotion and after the Sales
Promotion and between Sales Promotion, viz., Price Promotion (immediate effect) and Premium Promotion (with purchase promotion).

ANOVA tests were used to find out the most favourite brand (in the order of preference) among the brands by the population. Various statistical tools like Correlations, Reliability analysis and Factor analysis were also performed.

3.7 Development of questionnaire
To capture the different components of CBBE nine responses were framed for three category of sales promotion viz without sales promotion, with price promotion and with purchase premium.

Without sales promotion
Nine responses were put to the respondents to capture the three components of brand equity without sales promotion are mentioned here below.

R1 - I can always identify my favourite Brand

R2- I got a high brand knowledge about my favourite Brand

R3 - Few feature of my favourite Brand appears in my memory in no time.

R4- In no time I can recollect logo of my favourite Brand

R5- The likely qualities of my favourite brand is extremely high

R6 - The consistence quality offering by my favourite brand would be very high

R7 –My loyalty towards my favourite brand is certainly very high

R8 - My favourite brand will always be the 1st preference

R9 –I won’t prefer to purchase any other brands, in case my favourite brand existing in the store
**Price promotion (with immediate effect) – B**

Nine responses were put to the respondents to capture the three components of CBBE with price promotion are mentioned here below.

R1 - I can always identify my favourite Brand than others

R 2- I got a high brand knowledge about my favourite Brand than others

R 3 - Few feature of my favourite Brand appears in my memory in no time than others

R 4 - In no time I can recollect logo of my favourite Brand than others

R 5 - The likely qualities of my favourite brand is extremely higher than others

R 6 - The consistence quality offering by my favourite brand would be very high than others

R 7 - My loyalty towards my favourite brand is certainly very high than others

R 8 - My favourite brand will be my 1st choice than others

R 9 - I won’t prefer to purchase any other brands, in case my favourite brand existing in the store than others

**Premium Promotion (with purchase premiums) - C**

Nine responses were put to the respondents to capture the three components of CBBE with purchase premiums are mentioned here below.

R1 - I can always identify my favourite Brand than others

R 2- I got a high brand knowledge about my favourite Brand than others

R 3 - Few feature of my favourite Brand appears in my memory in no time than others
R 4 - In no time I can recollect logo of my favourite Brand than others

R 5 - The likely qualities of my favourite brand is extremely higher than others

R 6 - The consistence quality offering by my favourite brand would be very high than others

R 7 - My loyalty towards my favourite brand is certainly very high than others

R 8 - My favourite brand will be my 1st choice than others

R 9 - I won’t prefer to purchase any other brands, in case my favourite brand existing in the store than others