

# Annexure

- Questionnaire
- Coded Questionnaire with Hypothesis
- Cronbach Calculation
- Green Cosmetic products- images

# "An Empirical Study on Consumer Behavior towards Green Cosmetics in Selected Cities of Gujarat"

Respected Sir/Ma'am,

I am pursuing doctoral research for the above mentioned subject, I would request you to take out **4-5 minutes** and fill the below questionnaire assuring you that the same information will be used for academic purpose only and it would be confidential. I take this opportunity to express my sincere thanks to your valuable time to fill the below questionnaire.

Thank you,  
Prutha Shah

*\*"Green Cosmetics" are sustainable cosmetics made with biodegradable formulations and utilizing ingredients from renewable plant and bacteria sources, having lower toxicity, and transparent production practices.*

*\*You may consider Green Cosmetics as Organic/ Natural Cosmetics*

*\* Indicates required question*

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1. Name \*

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2. Gender \*

*Mark only one oval.*

Male

Female

Other: 

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## 3. City \*

*Mark only one oval.*

- Ahmedabad
- Vadodara
- Surat
- Other: \_\_\_\_\_

## 4. Educational Qualification \*

*Mark only one oval.*

- Upto-12th Standard
- Graduate
- Post Graduate
- Other: \_\_\_\_\_

## 5. Occupation \*

*Mark only one oval.*

- Student
- Home-Maker
- Business
- Working Professional
- Government Service
- Other: \_\_\_\_\_

## 6. Monthly Income \*

Mark only one oval.

- Upto Rs.20,000
- 21,000 to 40,000
- 41,000 to 60,000
- 61,000 to 80,000
- 81,000 and above

## 7. How many members are there in your family? \*

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## 8. How many female members are there in your family (including if, you are female)? \*

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**EBM Model** called as Engel, Blackwell and Miniard Model- well-known **consumer decision-making model** used to explain and predict the decision-making process. The model outlines the factors that influence each stage of the decision-making process, such as the consumer's need recognition, information search, evaluation of alternatives, purchase and post-purchase evaluation. The model also considers the influence of external factors, such as advertising and word of mouth, on the consumer decision-making process.

## 9. Do you use Cosmetic Products? \*

**(Cosmetic Products include Skin care, Hair care, Body care, Make-up and Fragrances)**

Mark only one oval.

- Yes     Skip to question 10
- No     Skip to question 54

Do you use Cosmetic Products?- If Yes

10. What is the monthly expenditure you spend on cosmetic products? \*

*Mark only one oval.*

- Upto Rs.500
- 501- 2,000
- 2,000-3,500
- More than 3,500

11. What type of cosmetic products you purchase? \*

*Check all that apply.*

- Skin-Care
- Hair-Care
- Body-Care
- Make-Up
- Fragrances

12. Have you heard about the term "**Green Cosmetics**" \*  
(**Green cosmetics also means organic/natural products**)

*Mark only one oval.*

- Yes      *Skip to question 13*
- No      *Skip to question 55*

About the term "Green Cosmetics"

13. If Yes, how did you get to know about the term "Green Cosmetics" \*

*Check all that apply.*

- Friends/Family
- Social Media
- Advertisement
- Newspaper
- Other: \_\_\_\_\_

14. According to you, what are green cosmetic products? \*

*Check all that apply.*

- Sustainable
- Chemical Free
- Renewable Plant ingredients
- No animal testing
- Other: \_\_\_\_\_

15. Have you ever purchased Green Cosmetic products? \*

*Mark only one oval.*

- Yes     *Skip to question 16*
- No     *Skip to question 55*

Have you ever purchased Green Cosmetic products?-If Yes,

16. How much do you spent monthly on Green cosmetic Products? \*

*Mark only one oval.*

- Upto- Rs.500
- 500-2,000
- 2,000 to 3,500
- More than 3,500

17. What type of green cosmetic products you prefer to purchase? \*

*Check all that apply.*

- Skin-Care
- Hair-Care
- Body-Care
- Make-Up
- Fragrances

18. From where do you purchase Green cosmetic products? \*

*Check all that apply.*

- Social Media-(Instagram, WhatsApp, Facebook Etc)
- Departmental Stores
- Company Website
- Other

19. What motivates you to purchase Green Cosmetic Products? \*

*Check all that apply.*

- Do not harm the environment
- Health Benefits
- Ethical Values
- Social Pressure
- No side effects

20. Which factors helps you to decide which Green Cosmetic products to purchase? \*

*Check all that apply.*

- Price of the product
- Quality of the product
- Brand Reputation
- Environment sustainability
- Easy Availability

21. How do you evaluate the quality of the Green cosmetic products? \*

*Check all that apply.*

- Ingredients
- Packaging
- Certification
- Brand Name
- Place of Manufacturing

22. What kind of research you do before purchasing Green cosmetic products? \*

*Check all that apply.*

- Online Reviews
- Social Media
- Word-Of-Mouth
- Other: \_\_\_\_\_

23. Do you get influenced by reviews, ratings or Word-of mouth while purchasing Green cosmetic products? \*

*Mark only one oval.*

- Yes
- No

24. Do you consider the environmental impact before purchasing the Green cosmetic products? \*

*Mark only one oval.*

- Yes
- No

25. How often do you purchase Green cosmetic Products? \*

*Mark only one oval.*

- Weekly
- Monthly
- Ocassionally

26. What kind of emotions affects the consumer's decision while purchasing Green cosmetic products? \*

*Mark only one oval.*

- Positive Emotions- Hope of Improvement, Performance Optimism
- Negative Emotions- Fear of side effects, Harmful chemicals, Body Allergic

27. What kind of mood affects the consumer's decision while purchasing Green cosmetic products? \*

*Mark only one oval.*

- Positive Mood- Excitement, Anticipation and Satisfaction
- Negative Mood- Anxiety, Frustration and Sadness

28. What influences your buying behavior for purchasing Green Cosmetic products? \*

*Check all that apply.*

- Recommendation from friends and family
- Trust and Loyalty
- Importance of Sustainability
- Highlight the unique features of Green cosmetic products

29. Which Social media influences you the most for the purchase of Green cosmetic products? (Example- If you are using a social media, you see the sponsored advertisement or a video, reel etc.) \*

*Check all that apply.*

- Instagram
- Facebook
- LinkedIn
- Twitter
- You Tube
- Other

30. According to you, how does Advertising influences consumers buying decision while purchasing Green Cosmetic products? \*

*Check all that apply.*

- By raising the Green products awareness and promoting the benefits of the same.
- By shaping the consumer's attitudes and perception by focusing on the environment and social benefits
- By creating a positive image and encourage consumers in buying more sustainable products
- By focusing on the unique features of green cosmetic products including Quality and Value

Gender Influence buying behavior of Green cosmetic products

31. Gender can influence the buying behavior of Green cosmetics by consumers preference and attitude \*

*Mark only one oval.*

- Yes
- No

32. Women are more likely to purchase premium products than men \*

*Mark only one oval.*

- Yes
- No

33. Gender also affect the way consumers evaluate and perceive the quality and safety \*

*Mark only one oval.*

- Yes
- No

34. Men and Women may have a different expectation and preferences regarding Packaging \*

*Mark only one oval.*

Yes

No

35. Men and Women may have a different expectation and preferences regarding Sustainability \*

*Mark only one oval.*

Yes

No

Criteria for Evaluating the Alternatives in green cosmetic products

36. Price and affordability \*

*Mark only one oval.*

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

37. Quality and Performance \*

*Mark only one oval.*

Strongly Disagree

Disagree

Neutral

Agree

Strongly Agree

## 38. Environmental Impact and comparison \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

## 39. Sustainability \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

## 40. Brand reputation \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Answer the following statements:

41. Green cosmetic products are made with natural, sustainable and are chemically free. \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

42. Green cosmetic products are better for environment and can help in the reduction of the carbon footprint \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

43. Green cosmetic products have higher quality ingredients and may offer better performance than traditional cosmetic products \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

44. Consumers should be made more educated about the benefits of using green products especially environment and health benefits \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

45. Promotional activities can be used to increase the awareness of the green cosmetic products \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

46. Products can be made available in the online and offline stores to increase the accessibility \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

47. Green cosmetic products should be tested to meet the quality standard \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

48. Good customer service should be provided after the purchase of green cosmetic products \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

49. Consumers should be provided with accurate and proper information regarding the green cosmetic products \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

50. Offers, Discounts and rewards should be given to the consumers purchasing green cosmetic products \*

*Mark only one oval.*

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

51. According to you, are you loyal towards towards the brand you purchase? \*

*Mark only one oval.*

- Yes
- No

52. Are you willing to pay more for better green cosmetic products? \*

*Mark only one oval.*

- Yes
- No
- Maybe

53. Are you willing to recommend the purchase of green cosmetic products to others? \*

*Mark only one oval.*

- Yes
- No

Do you use Cosmetic Products?- If No

## 54. Why don't you use cosmetic products? \*

*Check all that apply.*

- I feel that Cosmetic products are expensive
- I have allergic reactions
- I feel that cosmetic products are harmful for the environment (chemical ingredients, animal testing, plastic pollution, air pollution)
- Other: \_\_\_\_\_

Have you ever purchased Green Cosmetic products?- If No,

## 55. I have not purchased Green cosmetic products: \*

*Check all that apply.*

- I feel that Green cosmetic products are highly expensive
- Marketers need to clearly communicate the product's benefits and sustainable position
- Practices require consumers to change their habits and adopt new ones
- I am willing to try green cosmetic products if the prices are reduced
- I do not trust in the concept of green/organic cosmetics

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Google Forms

## Prutha Shah- (Research Scholar)

### M.S.University- Thesis Final Questionnaire and Hypothesis Coding:

Google Form-No.	Code	Questions
1	B1	Name
2	B2	Gender
3	B3	City
4	B4	Educational Qualification
5	B5	Occupation
6	B6	Monthly Income
7	B7	No. of Family members
8	B8	Female members in the family
9	Q1	Do you use Cosmetic products?
10	Q2	What is the monthly expenditure you spend on cosmetic products?
11	Q3	What type of cosmetic product you use?
12	Q4	Have you heard the term "Green Cosmetics"
13	Q5	If yes, where did you get to know about the term "Green Cosmetics"
14	Q6	According to you, what are green cosmetic products?
15	Q7	Have you ever purchased green cosmetic products?
16	Q8	How much do you monthly spend on green cosmetic products?
17	Q9	What type of Green cosmetic products you prefer to purchase?
18	Q10	From where you purchase green cosmetic products?
19	Q11	What motivates you to purchase green cosmetic products?
20	Q12	Which factors help you to decide which green cosmetic products to purchase?
21	Q13	How do you evaluate the quality of green cosmetic products?
22	Q14	What kind of research you do before purchasing green cosmetic products?
23	Q15	Do you get influenced by reviews, ratings or WOM while purchasing green cosmetic products?
24	Q16	Do you consider the environmental impact before purchasing the green cosmetic products?
25	Q17	How often do you purchase green cosmetic products?
26	Q18	What kind of Emotions- while purchasing GCP?
27	Q19	What kind of mood effects- while purchasing GCP?
28	Q20	What influences your buying behavior for purchasing GCP?
29	Q21	Which social media influences you the most while purchasing GCP?
30	Q22	According to you, how does advertising influence consumers buying decision while purchasing GCP?
	<b>Section</b>	<b>Gender Influence Buying behavior of Green cosmetic products</b>
31	Q23	Gender can influence the buying behavior of GC by the consumers preferences and attitudes
32	Q24	Women are more likely to purchase premium products than men
33	Q25	Gender also affects the way consumers evaluate and perceive the quality and safety
34	Q26	Men and Women may have a different expectation and preferences regarding packaging?
35	Q27	Men and Women may have a different expectation and preferences regarding sustainability

	<b>Section</b>	<b>Criteria for evaluating the Alternatives in Green cosmetic products</b>
36	Q28	Price and Affordability
37	Q29	Quality and Performance
38	Q30	Environmental Impact and Comparison
39	Q31	Sustainability
40	Q32	Brand Reputation
	<b>Section</b>	<b>Answer the following statements</b>
41	Q33	Green cosmetic products are made with natural, sustainable, and chemically free ingredients
42	Q34	Green cosmetic products are better for environment and can help in reducing carbon footprint
43	Q35	Green cosmetic products have higher quality ingredients and may offer better performance than traditional cosmetic products
44	Q36	Consumers should be made more educated about the benefits of using green products especially environment and health benefits
45	Q37	Promotional activities can be used to increase the awareness of green cosmetic products
46	Q38	Products can be made available in online and offline stores to increase the accessibility
47	Q39	Green cosmetic products should be tested to meet the quality standards
48	Q40	Good consumers service should be provided after the purchase of green cosmetic products
49	Q40.5	Consumers should be provided with accurate and proper information regarding green cosmetic products
50	Q41	Offers, discounts and rewards should be given to the consumers purchasing green cosmetic products
51	Q42	According to you, are you loyal towards the brand you purchase?
52	Q43	Are you willing to pay more for better green cosmetic products?
53	Q44	Are you willing to recommend the purchase of green cosmetic products to others?
54	Q45	Why don't you use cosmetic products?
55	Q46	I have not purchased green cosmetic products

<b>H0<sub>1</sub></b>	Gender has no direct relation with usage of Cosmetic Products <b>(B2, Q1)</b>
<b>H0<sub>2</sub></b>	Purchase of green cosmetic products does not have a direct relation with the income of the consumers. <b>(Q7,B6)</b>
<b>H0<sub>3</sub></b>	Impact of the promotional method of green cosmetics has no relationship on switching of the brands by the consumers. <b>(Q37,Q42)</b>
<b>H0<sub>4</sub></b>	Female don't believe gender impact purchase Behavior of Green Cosmetic Products <b>(Q23, B2)</b>
<b>H0<sub>5</sub></b>	The female consumers are not loyal as compared to male consumers while purchasing the green cosmetic products <b>(B2, Q42)</b>
<b>H0<sub>6</sub></b>	Increase in Number of Female Family members has no relation of Male using Cosmetic Products <b>(B7,B2,Q1)</b>
<b>H0<sub>7</sub></b>	The consumers of Vadodara city do not intend to pay more towards the purchase of green cosmetic products than the consumers of Ahmedabad city. <b>(B3,Q43)</b>
<b>H0<sub>8</sub></b>	Quality of product has no Impact on the consumers of Ahmedabad city during purchase of Green Cosmetic Products <b>(B3, Q29)</b>
<b>H0<sub>9</sub></b>	Environmental awareness of the consumer has no relation on the purchase of green cosmetic products <b>(Q16,Q30)</b>
<b>H0<sub>10</sub></b>	Increase in Education level for person using Cosmetic Product has no impact on his awareness on Green Cosmetic Product <b>(B4,Q4)</b>

<b>H0<sub>11</sub></b>	Person who hear about Green cosmetics from only Friends/Family has no relation to his likeliness to purchase Green Cosmetic product from departmental store <b>(Q5,Q10, Q20)</b>
<b>H0<sub>12</sub></b>	Person who hear about Green cosmetics from Social Media and has purchased Green Cosmetic product has no relation to increase spending on Cosmetic Products <b>(Q5, Q2)</b>
<b>H0<sub>13</sub></b>	Gender Subjective norm has no relation on the purchase of premium products <b>(Q24, Q2, B2)</b>
<b>H0<sub>14</sub></b>	Person who used CP for Skin has no favoring likeliness to have purchased Green Cosmetic Product <b>(Q7, Q3)</b>
<b>H0<sub>15</sub></b>	An Individual who has used Cosmetic Product for certain body part (Skin, hair, etc.) has no relation with the usage of Green cosmetic for same body part <b>(Q3, Q9)</b>
<b>H0<sub>16</sub></b>	Individual who gets motivated by Green Cosmetic product not causing harm to environmental has no relation on checking environmental impact while purchasing green cosmetic product <b>(Q11, Q16)</b>

<b>H017</b>	Consumer who considers packaging as important factor to evaluate quality is not willing to pay more for Green Cosmetic Product <b>(Q13, Q43)</b>
<b>H018</b>	Allergic Reaction don't impact the willingness of consumers to use Green Cosmetic Products <b>(Q46,Q45)</b>
<b>H019</b>	Consumers of Vadodara city when compared to Surat do not have direct relation with sustainable and environmental impact of Green Cosmetic Product <b>(Q30, Q31, B3)</b>
<b>H020</b>	Brand Name has no relation on perception of quality of the Green Cosmetic product <b>(Q13)</b>
<b>H021</b>	Consumer aware of Green cosmetic product do not have direct relation of perceiving green cosmetics as chemical free products <b>(Q6, Q4)</b>
<b>H022</b>	Consumers of Ahmedabad city when compared to Surat do not have any influence of social media while purchase of Green Cosmetic Product <b>(Q21, B3)</b>
<b>H023</b>	Consumers of Surat city when compared to Vadodara do not have any influence of Brand Reputation while purchasing Green Cosmetic Product <b>(Q32, B3)</b>
<b>H024</b>	Influence via Word of Mouth has no relation in generating Positive emotions towards Purchase of Green Cosmetic Products <b>(Q18, Q14)</b>

<p>L'ORÉAL</p>				
	<p>Pure Clay FW</p>	<p>Pure Clay Mask</p>	<p>Ever Strong Conditioner</p>	<p>Extraordinary Oil Serum</p>
 <p>ESTÉE LAUDER</p>				
	<p>Skin Care</p>	<p>Green Science Cleanser</p>	<p>Botanical Repair</p>	<p>Botanical Serums</p>
				
	<p>Skin Defense Cream</p>	<p>Face Wash</p>	<p>Lip Balm</p>	<p>Green Tea Deodorant</p>
				
	<p>Satin Care</p>	<p>Razor</p>	<p>Creame</p>	<p>Hair remover</p>
				
	<p>Soap</p>	<p>Hand Wash</p>	<p>Creame</p>	<p>Bath Moisturiser</p>

				
	<p>Matte Moist Clay FW</p>	<p>Matte Moist Moisturizer</p>	<p>Aloe Gel</p>	<p>Lakme Green Eyeliner</p>
				
	<p>Face Wash</p>	<p>Face Serum</p>	<p>Walnut Scrub</p>	<p>Anti-tan</p>
				
	<p>Men's Grooming Set</p>	<p>Hair Cleanser</p>	<p>Age Defying Facial Serum</p>	<p>Almond Oil</p>
				
	<p>Gold Facial</p>	<p>Shagrain</p>	<p>Under Eye Cream</p>	<p>Mask</p>
				
	<p>Lotion</p>	<p>Skin Toner</p>	<p>Hair Serum</p>	<p>Shampoo</p>



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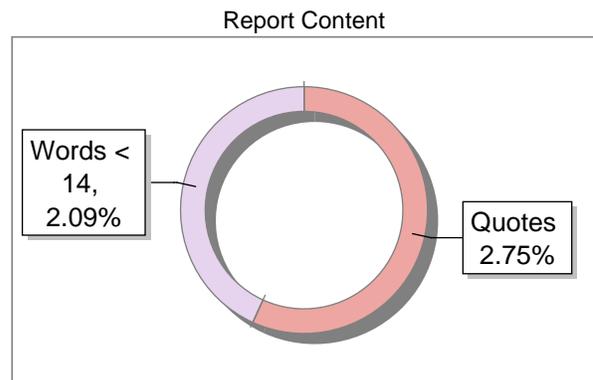
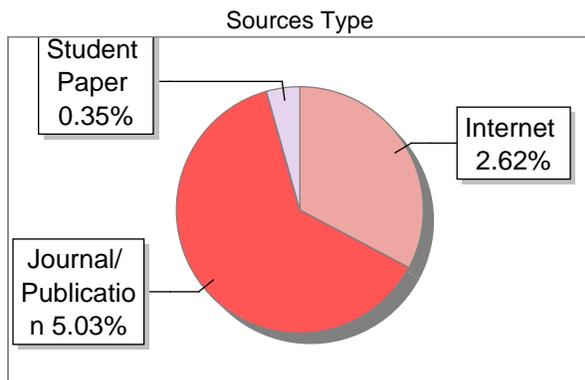
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# **Thesis Submission in Commerce and Business Management**

For Pursuing Ph.D. on

**“AN EMPIRICAL STUDY OF CONSUMER BEHAVIOR TOWARDS  
GREEN COSMETICS IN SELECTED CITIES OF GUJARAT STATE”**

**Submitted to:**

Departmental Research Committee, Department of Commerce & Business Management, Faculty of Commerce, The Maharaja Sayajirao University of Baroda, Vadodara.

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The Maharaja Sayajirao University of Baroda, Vadodara



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CHAPTER 1

# 1. INTRODUCTION

## INTRODUCTION - INDEX

- *Cosmetics*
- *History of cosmetics*
- *Indian History*
- *A brief timeline of cosmetics*
- *Green Cosmetics*
- *Consumer Behavior*
- *Consumer Buying behavior- All factors*
- *Models*
- *Market Overview*
- *Organic Market Classification*

## 1.1. What is COSMETICS?

The origin of the Greek word Cosmetics, “Kosmetikos” means “technique of dress and ornament”- skillful in arrangement or organization; derived from the Greek words kosmos, which signify decorations and order. At its core, they combine chemical molecules from nature or artificially produced. In a limited few nations, cosmetics like lipstick, mascara, eyeshadow, foundation, blush, and highlighter are frequently regarded as cosmetics. [1]

The American Food and Drug Administration defines cosmetics as substances "intended to be applied to the human body for cleansing, beautifying, promoting attractiveness or altering the appearance without affecting the body's structure or functions." [2]



<https://www.vectorstock.com/royalty-free-vector/beauty-means-and-decorative-cosmetics-collection-vector-20813711>

## 1.2. Origin of Cosmetics

Nearly all civilizations have a history of cosmetics that dates back at least 7000 years. There is a claim that cosmetic body art is the origin of human civilization. Egyptian and Greek archaeological finds provide evidence of cosmetic use in ancient times. Their investigation and study revealed that castor oil was utilized in Egypt as a skin lotion and protective balm. Greeks also used cosmetics, whereas some women in Rome invented makeup for whitening their skin and Kohl for their eyes. [3]

### **EGYPT:**

Kohl originated in North Africa. Fresh moringa was used to treat wrinkles, and special ointment was used for scars and burns. Jurors off lotion was used, which contains a mixture of beeswax and Resin. They also use the products on the mummies as they believe there is life after death.



### **MIDDLE EAST:**

Cosmetics were used in Persia. During the Persian rule, kohl, a black powder, was applied to the edges of eyelids to make them darker and give them a better look. Al-Zahrawi practiced the "Medicine of Beauty," employing incense, perfumes, and other fragrant materials. He saw cosmetics as a branch of medicine.



### **CHINA:**

Since 3000 BC, when gelatin beeswax first appeared, Chinese people have used gum to dye their fingernails. Flowers played an essential role in China. The court ladies were so startled that they started drawing a tiny, delicate plum blossom pattern on their foreheads.



## MONGOLIA

Women from the royal families used to paint crimson marks under their eyes and on the central part of their cheeks here, but no one knew why.



## JAPAN

In Japan, a class of women known as geisha performed and danced while wearing lipstick made from rice flour for the face and back and safflower petals for painting the eyebrows.



## EUROPE

In the Roman Empire, prostitutes and opulent women frequently used cosmetics; at the time, pale makeup was fashionable. Italian women wore red lipstick to denote their social standing, while Spanish prostitutes covered up their light skin with pink cosmetics. The use of cosmetics persisted in the following decades, and in the 19th century, Queen Victoria ruled that only performers should use the same.



## THE AMERICANS AUSTRALIA

For occasions or battles, certain Native American tribes and the Australians painted their faces.



## 19<sup>th</sup> CENTURY

The development of color cosmetics, improvements to product safety, and new technologies like mirrors, photography, marketing, and electricity in private and public spaces all contributed to the establishment of the western cosmetics business in the late 1800s. Customers were discouraged from using items like face powder, rouge,



lipstick, and similar ones once they were discovered to contain hazardous substances. Zinc oxide was first used for face powder in 1866 and quickly gained popularity.

## 20<sup>th</sup> CENTURY

Until the 19th century, a few of the cosmetic ingredients were very harmful and could not be bought in the department stores.

In those days, a blotting sheet was used to whiten the cheeks in the summer and the nose in the winter. Blush was regarded

to be captivating and as a woman of the night. As it was used as soap, a hair tonic, and on lips,

Vaseline quickly gained popularity. The early 1900s saw the introduction of aromatic fragrances, followed by roll-on and aerosol deodorants in 1952 and 1965, respectively. Around 1910, makeup

became fashionable in Europe and the United States. The Russian Ballet introduced colored cosmetics to Paris, and Max Factor built the first professional makeup workshop for actors. The

Hollywood film business later in the 1920s significantly impacted cosmetics; lipsticks were the most well-liked product. After the First World War, cosmetic surgery became popular. Up until

the 19th century, cosmetics were only available to women. Silicone implants were first introduced

in 1962. The Second World War saw a shortage of cosmetics. The main cosmetic products of this time were eye shadow, new lip colors, and blush as companies like Revlon, L'Oréal, and Ponds came into the limelight.

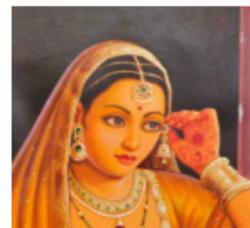
## 21<sup>st</sup> CENTURY

Cosmetic products have become an essential part of most people's lifestyle; like other industries, cosmetic companies have also become an integral part of running the country's economy. Now, the companies have expanded to not only retailers but also online.



### 1.3. Indian History

The history of Indian civilization is more than 5000 years ago in cosmetics terms. Face paint, pots, oval mirrors, and combs were examples of artifacts from the Harappa and Mohenjo-Daro periods that demonstrated the usage of cosmetics at all different socioeconomic levels at the time. The two great epics, Ramayana and Mahabharata, have given much description as much importance has been given to Ramchandra, Sita, Nakul, and Sahadev, also following the Anushasan Parva Mahabharata's advice and executing the Chandrayana vrata for beauty. Additionally, as previously indicated, "cosmetics" originated from the Greek word "kosmetikos," which denotes a person skilled in cosmetics. It is the science of modifying attractiveness and altering appearance. It can be categorized into four categories: plastic surgery, cosmetic surgery, and trichology.



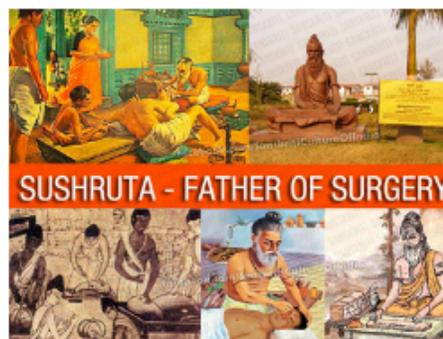
Anatomy, physiology, and skin diseases are the focus of dermatology, a branch of medicine.

The dermatology subspecialty of trichology focuses on the hair and scalp.

Cosmetic surgery's primary objective is to rejuvenate a patient's appearance.

Repairing flaws to restore a normal appearance and function is the primary goal of plastic surgery.

Sushruta Samhita has described the ancient tradition of surgery in India as one of the most brilliant gems in the Indian medical literature; it has given a detailed description of teaching and learning practice. Along with his surgical expertise, Acharya Sushruta significantly impacted many areas of medicine. However, his contribution to cosmetology is particularly noteworthy because he is regarded as the father of modern cosmetology. Many of his



130 guiding principles have provided guidance for Ayurvedic and cosmetology treatments. [4]

Indian women roughed their faces, hands, palms, cheeks, and fingers with clay and henna paste. Using natural paints, they painted their body parts with signs of the sun, moon, and flowers. India had a medical code dating back to 1000 B.C. in the form of Ayurveda, and they used the raw materials in the medicines and cosmetic preparations. [5]



#### **1.4. A Succinct History Of Cosmetics**

Cosmetic deodorant was curated in 1888 by an unidentified Philadelphian named Mumm. In the early 20<sup>th</sup> century, makeup was considered a fashionable term in the U.S.A. and Europe, but the Hollywood business had the most significant influence. Annie Turnbo began selling hair treatments in 1900. Max Factor began offering makeup to movie stars in Los Angeles in 1904. Eugene Schueller, the inventor of L'Oréal, created synthetic hair dye in 1907, and sunscreen was curated in 1936. After the First World War, Williams established Maybelline, and for the first time, dark eyes, red lipstick, nail polish, and the suntan by Coco Chanel were in trend. Cylindrical lipsticks were first developed in 1915. Charles and Joseph Revson founded Revlon in 1932; in 1944, a chemist developed sunscreen; mascara in 1958; and in 1963, Revlon introduced the first powdered blush. <sup>16]</sup>

Regarding product development and marketing, the Indian cosmetics business has been busy. For the Indian market, new tactics are being used. India has a long history of using cosmetics to enhance its appearance. Aesthetic makeup products have been used in India since ancient times, and the country is now one of the top cosmetics consumers. Since 1991, however, the cosmetic industry has gained more attention due to liberalization, and consumers have experienced a significant shift from increased purchasing power to increased fashion consciousness. Indians are becoming more aware of the value of having excellent looks and appearances due to consumers being regularly updated about new cosmetic goods thanks to the growth of satellite television and the internet. Most cosmetics producers in India serve the home market, although they are progressively expanding into other markets, particularly those for herbal cosmetics. <sup>17]</sup>

## 1.5. Green Cosmetics

The term "green" is well-known and widely used in cosmetics. Any green product or green cosmetic is not widely known, but green cosmetics are associated with organic and natural ingredients and environmental friendliness. Regulatory authorities around the world have created different regulations governing cosmetic items. The definition of a product as natural or environmentally friendly has always been ambiguous. According to the Canadian bureau, terms like "green," "environmentally friendly," and "all-natural" "are challenging to successfully substantiate and do not effectively communicate a distinct or specific meaning to customers." "Guides for the use of Environment Marketing Claims" for environmental products have been released by the Federal Trade Commission (FTC) in the United States.

A private industry standard for green cosmetics exists in Europe. A well-known, non-profit certification body is the COSMOS standard, commonly called the cosmetic organic standard made up of several members who categorize and define cosmetics as natural and organic based on predetermined criteria. Additionally, it receives a mark of approval on its label, which covers the product's production process, packaging, environmental management, labeling, communication, and the origin and processing of its ingredients. The principal regulatory body for cosmetics in China is the Chinese Food and Drug Administration (CFDA), which has established requirements for licensing green cosmetics products.

The Drug and Cosmetic Act of 1948 defined a cosmetic in India as "Any component intended to be rubbed, poured, sprinkled, sprayed, or applied to the human body or part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance," includes "any article intended for use as a component of cosmetics."

Cosmetics are further classified into:

- 1- Synthetic cosmetics
- 2- Natural/ Green Cosmetics

Cosmetics created with synthetic ingredients include items made with synthetic colorants, treated pigments, softeners, sunscreens, whiteners, foamers. <sup>[8]</sup>

Organic Natural components or natural active materials are used to make green cosmetics, such as mucilaginous from aloe vera, standard extracts of Pterocarpus Santalum and Curcuma longa, pastes composed of oat meal flour, oils, and plant extractions that are primarily used to preserve the skin. Green and sustainable cosmetics are those created from natural components and renewable resources. Petrochemical components manufactured from petrol, a non-renewable and unstable fuel, are used by numerous industries. The core of green cosmetics comprises bio-based compounds derived from regenerative sources of bacteria and plants. <sup>91</sup>

The desire to avoid using artificially created cosmetics technology has <sup>90 90</sup> led to an increase in the usage of green cosmetic goods, as the use of artificially made cosmetics has too many threatening body ailments such as cancer; thus, cosmetic manufacturers are now moving towards natural or green products.

Green consumers can be defined as those who are aware of his or her responsibility to the environment conservation measures and spend time purchasing environmentally friendly products. Also, <sup>98</sup> due to the increase in adverse climate conditions, global warming, and the use of artificial manufacturing, processing, and use of commodities, <sup>98</sup> people have started believing that green commodities will help to decrease that climate condition and consumers have started to buy green cosmetics products.

Green consumers can be further divided into three groups: Behavioral green consumers are those who always think and act green; they believe in buying all the expensive, environmentally friendly products. Think green consumers are always concerned about environmental products but are not keen on buying them despite their benefits as they feel that it is uneconomical to spend resources. Potential green consumers do not think or act as they care about environmental measures, but they do it silently without being noticed. <sup>101</sup>

## 1.6. Consumer- Behavior

Consumer behavior research examines how people decide what they need, want, or do concerning a product, service, or company. Consumers' emotional, mental, and behavioral responses are included. Marketers' analysis of consumer behavior allows them to learn about the shifting needs of the consumer. It is regarded as one of the primary keys to learning about consumer needs. Consumer behavior is crucial because it aids marketers in understanding consumer purchasing decisions. It also helps to analyze how consumers feel about different companies, how things affect them, how they research products before buying them, and how their surroundings affect them in a big way.<sup>[11] [12]</sup>

### *1.6.1. Consumer Buying Behavior Factors*

Five elements primarily govern consumer purchasing behavior and influence whether the target consumer will purchase a product.

The five elements are:

1. Psychological factors
2. Social factors
3. Cultural factors
4. Personal factors
5. Economic factors

#### 1. Psychological factors-

It is considered one of the most essential parts of consumer behavior, which includes, Motivation- One of the most well-known theories of motivation is Maslow's theory of the hierarchy of needs, which posits that there are five basic human needs: safety, social, esteem, and self-actualization needs. Of the abovementioned needs, the necessities and security needs should be prioritized.

Perception- This term often refers to the knowledge one collects about a product and analyzing an associated image. Every time a consumer sees an advertisement, review, testimonial, or promotion for a product, it shapes their perspective of that product, and the consumer's perception is a critical factor in any purchasing decision. In the modern era, one receives continual information from the internet and television, and consumers gain a particular viewpoint by looking at all the media.

Learning- Through use, <sup>146</sup> consumers learn about new products, and this learning may be cognitive or conditioned. Cognitive learning is when a product satisfies our needs and gives us satisfaction, whereas conditional learning occurs when one is exposed to a situation and reacts to it.

Attitudes and Beliefs- Any consumer has an attitude or a belief towards a product while purchasing the same; thus, it also plays an essential role in purchasing the same.

## **2. Social factors-**

All consumers have a social group, whether it be a family or friends,

Family- Consumers tend to buy the products that/they observed bought in the family since childhood; they form an inclination towards certain products that continue in the future.

Reference groups are generally the groups associated with clubs, schools, professionals, churches, and friends. They have a common pattern of purchasing the product, influencing buying behavior.

Roles and status- As the nature of a person, consumers are indeed affected by their role in society, and their status would affect the purchase decision accordingly.

### **3. Cultural factors-**

Every customer has unique ideals and values within the community to which they belong. The community's culture influences behavior either deliberately or unconsciously.

Culture- The fundamental needs, beliefs, desires, behaviors, and preferences followed by immediate family and neighborhood members make up culture.

Subculture- Subculture: Following civilizations, there are subcultures, which are groups of people that have a similar set of values and beliefs but who may differ in terms of where they live, nationality, religion they follow caste, and politics.

Social Class is usually formed by a person's geography, occupation, education, and family background.

### **4. Personal Factors-**

They vary from person to person-

Age- Age is one of the most significant determinants of preferences; a teenager's choice is unquestionably different from an older person's.

Income- The income of a consumer generally impacts purchasing behavior; the higher the income, the more purchasing power there will be.

Occupation- A consumer will purchase a product suitable to their profession.

Lifestyle- The consumer's lifestyle is dictated and influenced by their purchase decisions.

## 5. Economic factors-

The country's economic conditions influence consumers' purchasing decisions. A prosperous nation's economy helps to improve consumer confidence when making purchases, while a lousy economy reduces purchasing power and raises unemployment.

Personal Income- This criterion determines how much money one will spend on goods and services. Personal income is further broken down into disposable income and discretionary income. Disposable income is the money left over after all payments, like taxes, are made; the more money one has, the more one will spend on different things. Discretionary income is the money that is left over after paying for all basic needs. <sup>[13]</sup>

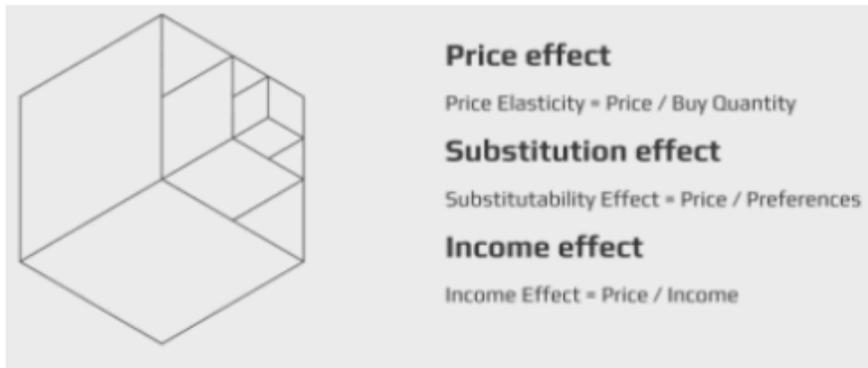
### 1.6.2. Models

There are two main models of consumer behavior:

#### 1) Traditional Model - consumer behavior

##### A. Economic model-

The principle of diminishing marginal utility, where the consumer desires to spend the least while benefiting the greatest, is the foundation for utility maximization in this approach.



Source:

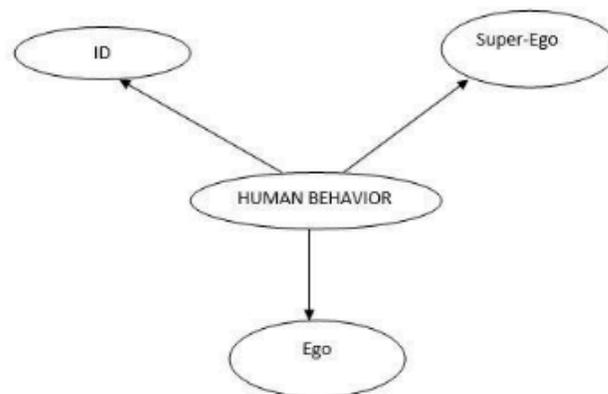
<https://neostrom.in/economic-model-of-consumer-Behavior/>

- One of the factors in the economic model is the pricing effect, which states that when a product's price is lower, more people will purchase it.
- Another economic model component is the substitution effect, which states that if the price of the substitute product is lower, the utility of the original product will also be lower.
- The third variable is the income effect, which indicates that when more money is available, or revenue is produced, more will be purchased.

According to scientists, the model is unsatisfactory since it presupposes market homogeneity. However, consumer behavior only considers goods and price, perception, motivation, learning, attitude, personality, and sociocultural influences. According to the scientists, it is critical to adopt a multidisciplinary approach because customers are impacted by both internal and external influences, meaning that price is not the only element in decision-making.. [14]

##### B. Psychoanalytic Model of Consumer Behavior-

According to Sigmund Freud's theory of personality, the id, ego, and superego, which are the three components of the human mind, interact to produce behavior. According to him, kids are faced with a conflict between natural desires and social expectations at each level, which causes them to conquer each developmental stage and eventually become mature adults. The interactions between the three mental structures that he suggested make up the core of the human mind, and how these three interact and try to achieve a balance in each other's demands influence how one acts and sees the world.



Source: <https://www.projectguru.in/using-psychoanalytic-theory-and-pavlovian-theory-by-online-marketers/>

- The Id- The earliest structure; it only operates subconsciously and is concerned with basic physical demands.
- Super Ego- The superego development occurs when a child discovers what is right and wrong regarding culture. It is typically associated with social conventions and morals related to conscience.
- The Ego – Known as the self and responsible for balancing the needs of the id and superego, the ego is the pragmatic, logical aspect of personality that is both conscious and unconscious. The child's future capacity to cope and operate as an adult depends on their capacity to resolve internal conflicts.<sup>[15]</sup>

### C. Learning Model-

<sup>96</sup> The Russian physiologist Ivan Pavlov, who conducted experiments on dogs and studied how they reacted to bell and meat cues, is remembered by the name given to the model. The amount of saliva the dog secreted as a reaction was used to gauge the response. According to the definition of learning, it is the modification of Behavior brought about by repetition and based on prior knowledge.



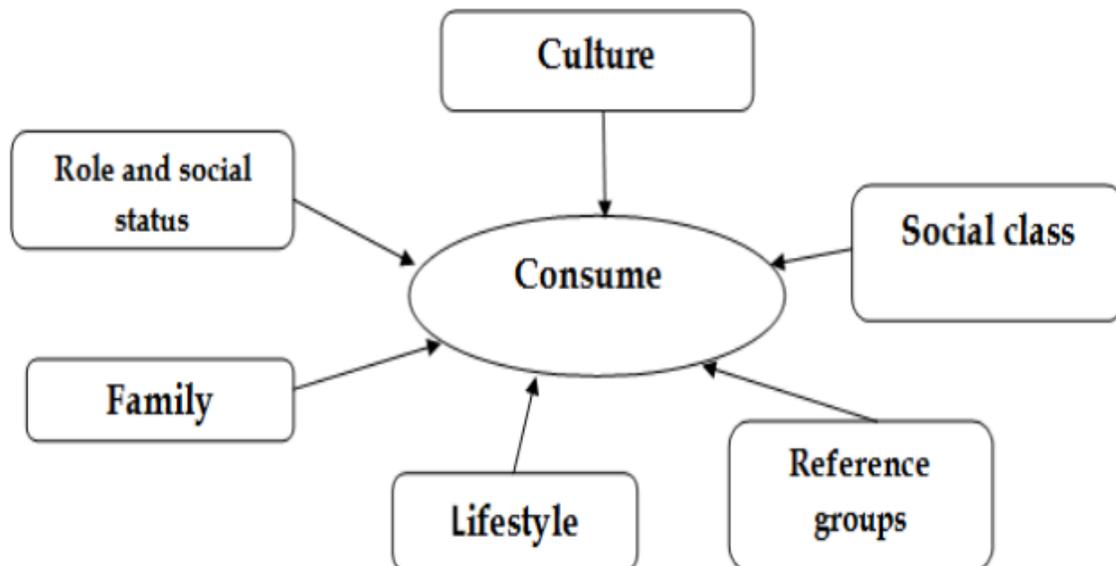
Source: <https://slideplayer.com/slide/9448821/>

- Drive – This powerful internal urge to act is known as drive, which the person or consumer encourages to satiate his impulses.
- Drives can be ingrained due to physiological requirements like thirst, hunger, and discomfort. It fuels a craving for prestige or social acceptance, and one has cues that trigger action during decision-making and purchases.
- Non-Triggering cues: They have an impact on decision-making without really triggering it.

- Product cues are divided into two categories: positive and negative. Positive product signals include package color, weight, style, and pricing.
- Informational cues are outside stimuli that offer details about the product, advertisement, and sales promotion.
- The reaction is what the buyer does, whether they purchase anything or not.
- Reinforcement occurs when a person or consumer buys a product, uses it, and enjoys it. This means that learning is a crucial component of buying behavior, and the marketer tries to instill an **image of the** product in the consumer's head. [16]

#### D. Sociological Model-

It is also one of the consumer behaviors that explains why people behave as they do. They have three main components: psychological component, how the consumers think about the products; structural component, viewpoints on the social role in society; and political economy, which influences the use of financial resources in choosing to buy or not to buy. Further, the social groups can be divided into Primary and Secondary.



Source: [https://www.researchgate.net/figure/Sociologic-determinants-of-consumer-behavior\\_fig1\\_322098671](https://www.researchgate.net/figure/Sociologic-determinants-of-consumer-behavior_fig1_322098671)

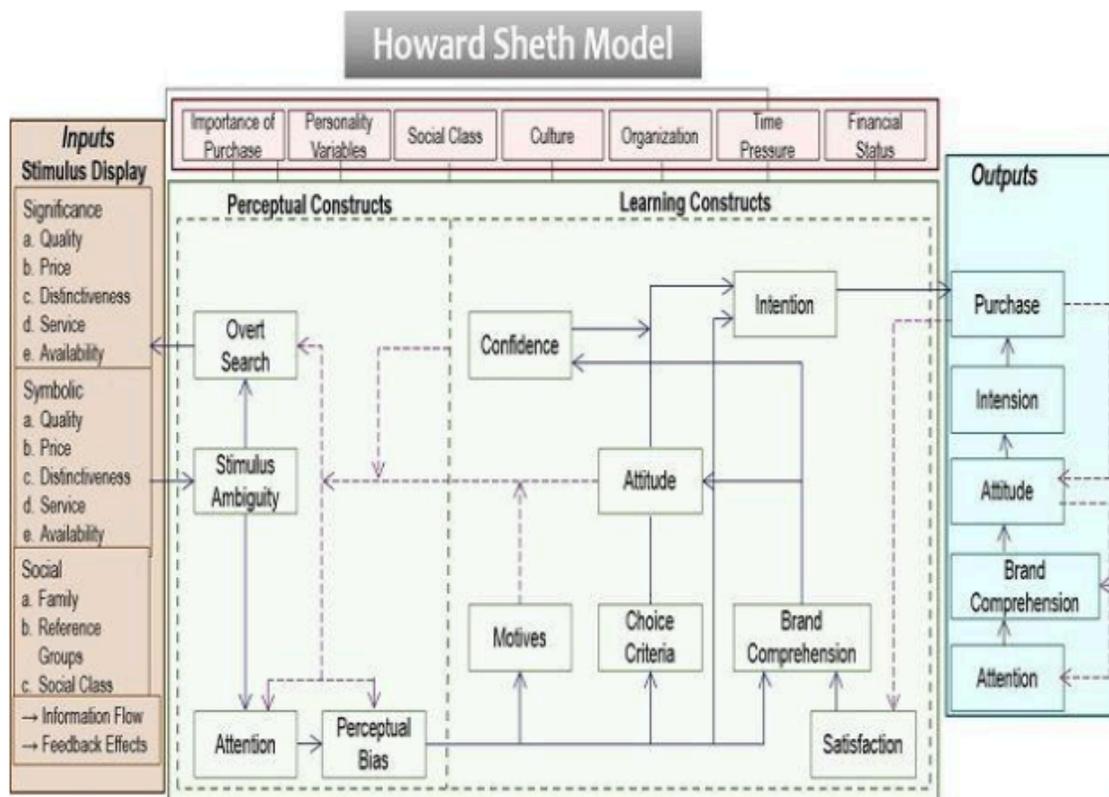
Primary groups include family members, friends, and coworkers, and the secondary group includes any member of society who can directly or indirectly influence the consumers.

According to the sociological model, a consumer is a part of society, and they may have groups; also, the buying behavior is influenced by the group, and the marketers ought to recognize the response factor of the consumer. The base of the sociological model of consumer behavior forms social learning theory; the learning pattern due to social influence will be

- Socialization experiences- It affects the individual's internal environment, whereas the external environment affects the personal, emotional, and social factors.
- Group Processes- These can range from appreciation to rebellion, obedience, and influence of an individual's parents/ family.
- Familiarity creates a need for group membership and relative behavior patterns or self-perception.
- Attitude- It is the result of actions, beliefs, and knowledge, which results in well-being. It can be positive or negative, and the factors influence one's purchase behavior by the level of agreement and attitude consistency.<sup>[17]</sup>

## 2) **Contemporary Model of Consumer Behavior-**

### A. Howard Sheth Model-



Source: <https://theinvestorsbook.com/howard-sheth-model.html>

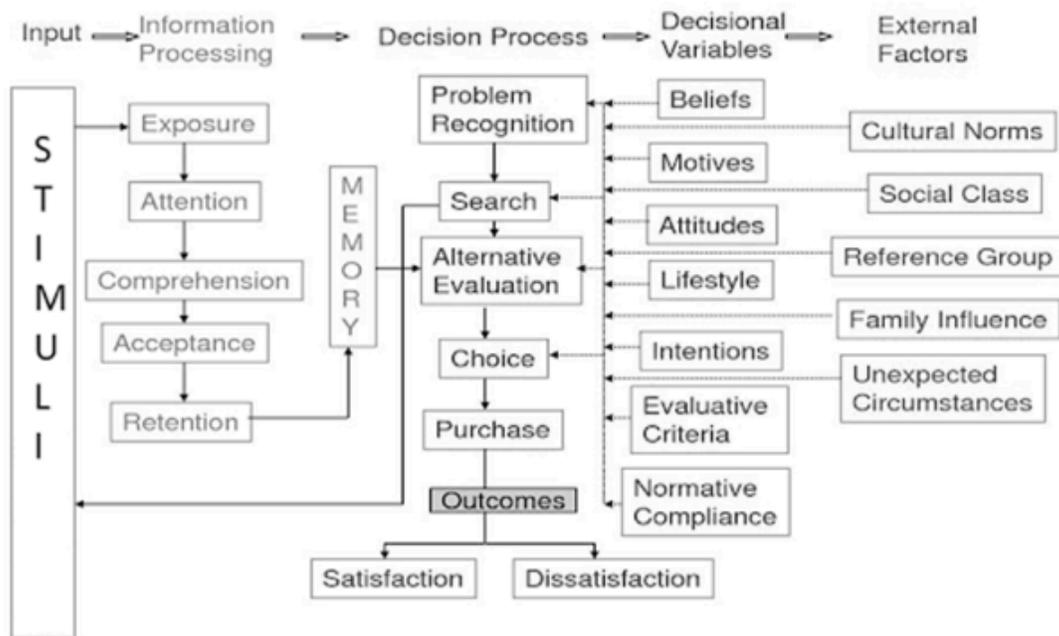
This model, developed by John Howard and Jagdish Sheth in 1969, integrates social, psychological, and marketing influences based on customer preferences. Its core three levels are:

- Extensive problem solving- At this level, the consumer would seek information about all the brands available in the market before purchasing because they do not know the brand or preference for any particular product.
- Limited problem solving- Due to their lack of knowledge about the goods they want to purchase, buyers at this level need comparative brand information to determine their preferred brand.
- Habitual response behavior- The customer knows the brands, can distinguish between the many qualities, and chooses to buy a specific product.
- The main four sets of variables are-

- Inputs- These include three main types of stimuli in the consumer's environment: tangible aspects of the product that serve as a brand, significance stimuli, and verbal or visual products (symbolic stimuli); sales and service employees who can support marketing activities are among the information sources. The social contexts in which consumers interact with brands, products, and each other are additional sources of information. Advertising and mass media are not within the business's sphere of influence.
- Perceptual and Learning constructs- Perceptual bias happens when customers alter the information received and their existing wants or experiences. It deals with psychological factors that come into play when a consumer considers a choice. It creates categories, consumer objectives, brand information, preferences, and intended purchase information.
- Outputs- These results are from elements such as customer response to such elements, attention, brand knowledge, attitudes, intention, and perceptual and learning variables.
- Exogenous (External) Variables- The importance of the purchase, the consumer's personality, religion, and time are further deciding elements. Thus, the model tries to explain the significance of symbolic and social stimuli. [18]

**B. Engel, Blackwell, and Minard Model-**

# EKB MODEL



Source: <https://baxispatel.blogspot.com/2021/03/the-ekb-model-engel-kollat-blackwell.html>

It originated in 1968 and was first used to organize the rapidly expanding corpus of research about consumer behavior. It discusses additional relevant tasks and the four-step decision-making process consumers use.

The EKB model's distinguishing feature between high and low involvement in the purchasing process is its central idea. The model represents a consumer's active information search and assessment activity and is a conscious solving and learning model.

- The involvement in the high-risk purchase is significant, whereas the involvement in the low-risk purchase is minimal.

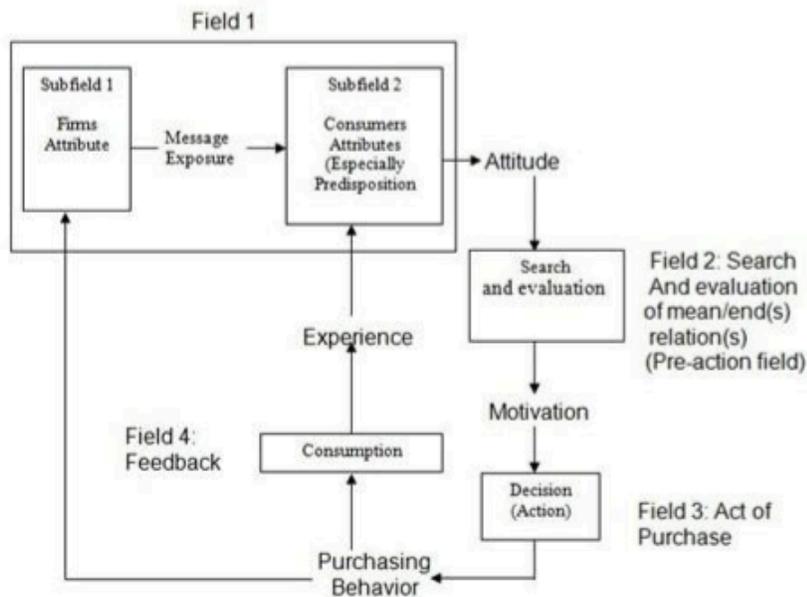
The main components of the model are-

- Information processing involves the consumer's deliberate exposure to, focus on, comprehension of, and retention of stimuli linked to a brand or product that they get from

marketing or non-marketing sources. When a stimulus is presented, attention chooses which will be focused on and understood.

- Central Control Unit- The information and experience regarding the product are stored as a memory for other possibilities as the acquired and retained stimuli are processed further in the central control unit.
- Examine the consumer's criteria for making a decision, the broad and specific attitudes that affect the choice, and the core elements of the customer's personality that shape how they respond to the options provided.
- Decision Process- It includes problem identification. Internal and external research and evaluation- The buying procedure - Decision results.
- External influences: These include things like money, culture, family, social class, and physical circumstances that <sup>75</sup> have an impact on how consumers make purchases. It depends on the specific product, which may positively or negatively impact the decision to buy.

### C. Nicosia Model-



Source:<https://professionalshiksha.blogspot.com/2018/10/nicosia-model-of-consumer-behavior.html>

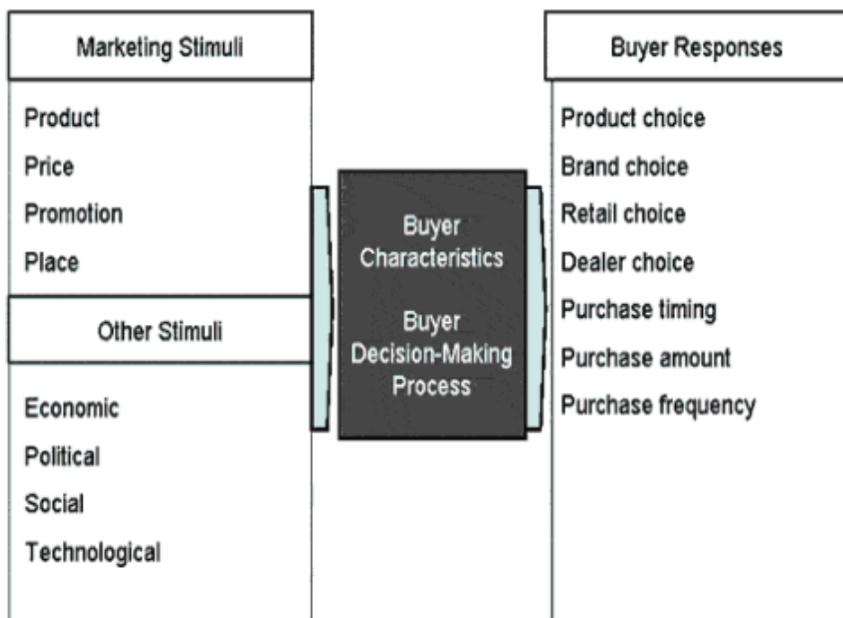
Professor Francesco Nicosia, a specialist in consumer motivation and behavior, created it in 1966. It mainly concentrates on the connection between the business and its clients; the main fields of the model are:

- The firm's attributes and the consumer attributes are further broken down into two subfields; the first one deals with the firm's marketing environment and communication efforts that have an impact on the target market and consumer attitudes, while the second one details the consumer characteristics, experience, personality, and promotional idea towards the product at the stage where the consumer forms an attitude.
- Search and evaluation – In this case, the consumer will start looking for brands from competing companies and then compare and contrast each brand.
- Making a purchase- The outcome will be persuading the customer to buy the company's items from a specific store.

- Feedback on sales performance- After buying the product, the company examines the consumer's and the customer's feedback. <sup>33</sup> Consumers will use their experience with the product to shape their attitudes and predispositions toward the firm's future messaging, and the company <sup>160</sup> will use feedback from its sales data to improve. <sup>[20]</sup>

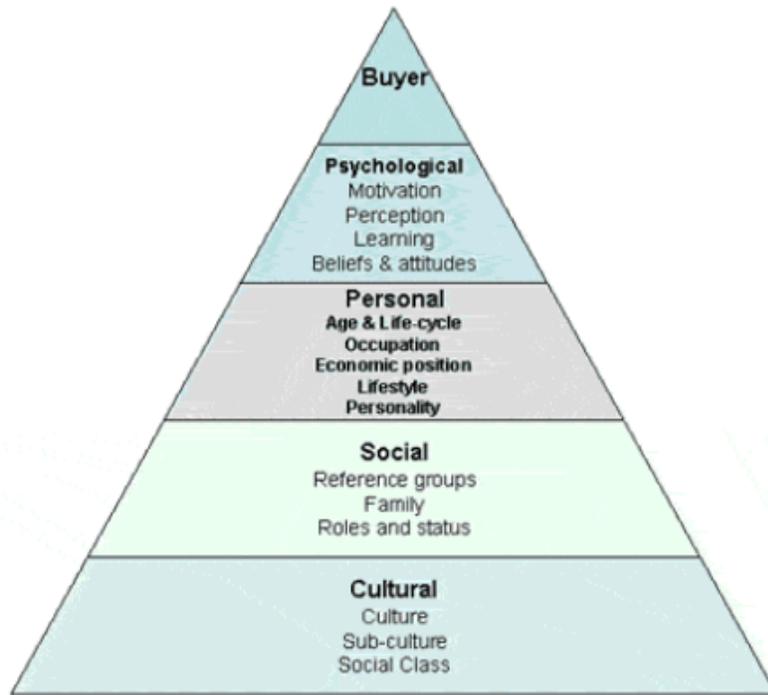
**D. Stimulus-response Consumer behavior-**

Stimulus-Response Model of Buyer Behaviour



Source: <https://www.tutor2u.net/business/reference/buyer-Behavior-stimulus-response-model>

The customer's "black box" is penetrated by marketing and other stimuli in the model, which results in specific reactions. The decision-making process determines what the consumer has purchased based on how the consumer perceives the stimulus. [21]



Source: <https://www.tutor2u.net/business/reference/buyer-Behavior-stimulus-response-model>

## 1.7. Organic Market Classification

The cosmetics sector has rapidly developed and is moving towards using natural or organic components. The younger generation has a considerably larger desire for green items. Additionally, the industry will continue to grow because of environmental concerns and increased attention to sustainability.

### 1. **PRODUCT TYPE**

- a) Skincare- Premium skincare has observed an increasing trend <sup>156</sup> in the last few years. Most importantly, it has gained attention as it implies minimum allergy reactions and maintains overall good health. Also, it has been observed that a kid's skin is delicate and sensitive, so the best option is organic cosmetic products:

Cream & Lotion	Serums	Cleanser	Face packs	Other
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- b) Hair - Care

Shampoo.	Conditioner.	Hair- Oil	Hair- Dye	Others
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- c) Make- Up

Face- care	Eye- Products	Lip- Products	Nail- Products
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- d) Body- Care

Soaps.	Shower- Gel	Creams	Oils
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- e) Fragrance

## 2. END-USER

Men	Women	Unisex	Baby
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## 3. SALES CHANNEL

Hyper/Super Markets	Convenience	Specialty	Direct- Selling
Departmental- Stores	Online- Retailing	Other- Sales channels	

## 4. PRICE- RANGE

Economy- Range	Mid- Range	Premium- Range
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## 5. REGION

- North America
- Latin America
- Europe
- East Asia
- South Asia
- Oceania
- Middle East and Africa

## 1.8. Brief Of The Segments

- When compared to traditional products, manufacturing green ingredient items is said to be more environmentally beneficial. As the demand for eco-friendly cosmetics has grown, businesses have begun substituting organic ingredients for synthetic ones.
- In North America, the market for organic color cosmetics is rising along with awareness of sustainability, and US customers are willing to spend more for these goods.
- The market for specialized goods has become more accessible in the United Kingdom. Skincare items, including sunscreen, concealer, and anti-aging lotions, are in high demand, and the market is growing due to the younger population.
- Convenience packaging, which has risen to tiny and convenient packed items, is driving the cosmetics industry in Germany and is a critical issue for companies in the consumer product category. Product developments such as oils and serums have significant sales.
- <sup>141</sup> Organic cosmetics have become more prevalent in China for skincare and beauty. As a result of their competitive advantage in such a vast market, consumers are turning to natural solutions.
- Given that individuals are more knowledgeable and connected than ever, the contemporary period is also known in India as the digital consumer era. Social media and digitalization have had a favorable impact on consumer behavior in India and the market for green cosmetics. Additionally, social media inspiration and celebrity influence are becoming more prevalent nationwide. Market demand is more robust for a better supply chain, logistics, and marketing plan.
- Natural, vegan, organic, and sustainable skin <sup>139</sup> care are becoming more popular among consumers worldwide. All demographic groups have noticed an upsurge in the desire for organic goods. On the other hand, women worldwide are using makeup more frequently.

- Over the past several years, the male cosmetics <sup>99</sup> sector has seen significant changes in beauty and fashion businesses. By shattering the stereotype and normalizing makeup for boys, items like concealers, foundations, beard oils, facial washes, moisturizers, and social media have had a significant impact on male beauty.
- With innovation in building a brand name and surviving in the market, the key players have been implementing various survival strategies; businesses have started concentrating on innovations in consumer wants and needs. To aid in developing a recognizable brand, vendors have begun providing distinctive package forms and materials. This is an attempt to use the shape, texture, and aesthetic appeal of package components to appeal to consumers' many senses. Manufacturers have coordinated product launches with social media initiatives. Businesses have been actively participating and collaborating to acquire a competitive edge. <sup>[22]</sup>

## 1.9. Market Overview

- According to Statista, Statista Consumer Market Insights, the total revenue of the Cosmetics Market worldwide is expected to be 125,409.14 million US\$ by the year 2027<sup>[23]</sup>

Year	Revenue (in Million US Dollars)
2014	82,245
2015	77,845
2016	79,587
2017	83,769
2018	87,581
2019	89,883
2020	72,366
2021	80,737
2022	93,054
2023	103,817
2024	108,410
2025	113,205
2026	118,547
2027	125,409

[Reference No:23](#)

- The beauty and personal care industry's expected global income for the cosmetics sector to rise by a total of 21.6 billion US dollars (+20.8 percent) from 2023 to 2027. The income is projected to amount to 125,409.14 million US dollars in 2027.
- According to the report by Statista, Statista Consumer Insights, the overall growth rate in the cosmetics market worldwide is estimated to amount to 5.79% by 2027 <sup>[24]</sup>

Year	Revenue
2016	2.24%
2017	5.25%
2018	4.55%
2019	2.63%
2020	-19.49%
2021	11.57%
2022	15.26%
2023	11.57%
2024	4.42%
2025	4.42%
2026	4.72%
2027	5.79%

[Reference No.24](#)

- According to the report published by Statista, Statista Consumer Insights, the below table shows the revenue of the Cosmetics industry worldwide in 2022 Segmentation <sup>[25]</sup>

<b>Segments</b>	<b>Revenue (in Billion US dollars)</b>
Face	27.92
Eyes	24.55
Lips	17.70
Natural Cosmetics	11.75
Nails	11.15

[Reference No.25](#)

- According to the reports by Global Beauty and presented in Statista, the below table shows the top 10 leading Cosmetics manufacturers globally in 2021 <sup>[26]</sup>

<b>Companies</b>	<b>Revenue (billion US\$)</b>
Loreal	40.31
Unilever	25.11
The Estee Lauder Co.	16.4
Procter and Gamble Co.	14.4
Shiseido Co.	8.19
Louis Vuitton	8.13
Beiersdorf	7.24
Chanel	7.05
Nature and Co	7.05
Coty	5.3

[Reference No.26](#)

- It can be concluded from the above graph that Loreal holds the highest share in the beauty industry in 2021, according to the Statista report.

	<b>Companies</b>	<b>Brand Value (in billion US dollars)</b>
<b>1</b>	Loreal	11.22
<b>2</b>	Estee Lauder	7.93
<b>3</b>	Gillete	6.91
<b>4</b>	Nivea	6.81
<b>5</b>	Guerlain	6.13
<b>6</b>	Clinique	6.06
<b>7</b>	Dove	5.1
<b>8</b>	Pantene	4.75
<b>9</b>	Lancome	4.59
<b>10</b>	Garnier	4.13

Reference No.27

- According to the report surveyed by Brand Finance but published in the data of Statista, the below table shows the Brand Value of the top 10 cosmetics brands globally in the year 2022: <sup>1271</sup>

According to another survey,

- <sup>27</sup> The growth in the cosmetics industry has been increasing continuously and has grown by 5% in the past two years.
- The total revenue is predicted to increase by 758 billion US dollars by 2025.

**One of the main reasons are:**

- Increase in the demand for natural, clean, and sustainable cosmetics.
  - Increase in the online channel sales share.
  - In order to close the gap between businesses and customers in the cosmetics sector, social media platforms like Instagram and YouTube have emerged as some of the most critical platforms.
  - Demand increases, including male consumers, minorities, baby boomers, and Generation X.
- Thus, due to all the above reasons stated, the market value has been 500 US dollars, and there has been a 27% increase in the sales of online cosmetics products. <sup>1281</sup>
  - According to sources, the natural cosmetics market generated the following earnings:

<b>Year</b>	<b>Revenue (in billion US dollars )</b>
2014	7.96
2015	7.73
2016	8.08
2017	8.72
2018	9.35
2019	9.85
2020	10.81
2021	11.92
2022	11.75
2023	12.93
2024	13.87
2025	14.87
2026	16
2027	17.26

[Reference No.29](#)

- Consumers at a global level have become cautious due to the toxic ingredients used in cosmetics. Thus, the manufacturers have started using natural ingredients and essential oils. As consumers are switching products from chemical to natural or organic, it is essential to understand the meaning of a few key terms:

<b>Terms</b>	<b>Definition</b>
Natural Cosmetics	Products have at least 95% raw natural ingredients and no animal-derived/based ingredients.
Organic Cosmetics	Products that do not grow with the help of pesticides and have at least 95% of raw materials used should be certified.
Vegan Cosmetics	Products that do not have any animal-derived/based ingredients
E-Commerce	Retailers selling online on various platforms
Mass Merchandiser	Retailers who offer a variety of products, keeping in mind the need of majority consumers
CAGR	Compound Annual Growth Rate
Agro-Chemicals	Chemicals such as fertilizers, hormone, fungicide, insecticide, or soil treatment that improves crop production

[Reference No.30](#)

- The US's most well-known certification agencies for organic cosmetics are NFS, NOP (National Organic Program), and OASIS (Organic and Sustainable Industry Standards). EU Organic and Nature, approved by the European Union, are most often used in Europe.
- BDIH and Bio Cosmetics in Germany
- According to the report of Statista Consumer Market Insights, the table below shows the Annual Growth in the Global Beauty Market and the Annual Growth Rate of Organic and Natural Beauty Market:

Year	Annual Growth in the Global Beauty Market	Annual Growth Rate of Organic and Natural Beauty Market	Year	Percentage
2013	3.8%	7.3%	2020	2.8%
2014	3.6%	6.6%	2021	10.4%
2015	3.9%	6.8%	2022	9.4%
2016	4%	6.6%	2023	8.7%
2017	4.9%	6.9%	2024	9%
2018	5.5%	7.1%	2025	9.2%
2019	5.25%	7.3%		

*Reference No.31*

- According to Statista, Allied Market Research Report, the below table states the value of Between 2020 and 2031, natural and organic cosmetics and personal care products:

Year	Market Value (in billion US dollars)
2020	33.4%
2021	35.2%
2022	37%
2023	39%
2024	41.1%
2025	43.2%
2026	45.5%
2027	47.9%
2028	50.5%
2029	53.2%
2030	56%
2031	58.6%

*Reference No.32*

- The main <sup>153</sup> factors that are responsible for the change in consumer priority can be understood from the below table of the survey conducted among 12,000 respondents 18 years and above across 12 countries by Philips and published in the Statista report:

Factors	Percentage	Countries	Percentage
Vegan	45%	China	90%
Inclusivity	52%	France	83%
Sustainability	60%	Germany	71%
Organic Ingredients	64%	US	64%
Effectivity	82%	UK	56%
		Other	72%

[Reference No.33](#)

[Reference No.34](#)

- Here are a few stats of why consumers are willing to buy more natural cosmetic products- 45% of Gen Z and millennials are keen <sup>110</sup> to know what ingredients are being used in the cosmetic products:
  - 73% of US consumers believe that natural/ organic cosmetic products do not have any harmful ingredients.
  - 72% of skin care consumers believe natural/ organic skincare is much better for health.
  - Due to its effectiveness, 60% of French consumers bought green cosmetic products.
  - 66% of consumers worldwide considered personal care organic/ natural products of high quality <sup>135</sup>
- The US and China are the key market leaders in natural/ organic cosmetics; natural cosmetics have become one of the most profitable segments. US natural and organic cosmetics sales were about 1.3 billion US dollars by the end of 2023.
- Consumers in China are also prioritizing the use of natural or organic cosmetic products. The China market is assumed to cross over \$3 billion by the end of 2023 <sup>136</sup>
- According to Global Data collected among 29,000 respondents, the below table consumers shows the consumers looking towards a healthier enough food ingredient inspired natural or organic cosmetic products along with the percentage and importance of the supplements required in the particular product:

Preferred Ingredients	Percentage	Supplements in the product	Percentage
turmeric	68%	Vitamin C	69%
fruits or vegetable extracts	64%	Vitamin E	68%
coconut oil	58%	Enzymes	42%
natural oils	51%	Probiotics	42%
tea	47%	Collagen	31%
apple cider vinegar	46%	Amino Acids	31%
Food waste- ground, seeds and peels	33%	Retinol	27%
caffeine	29%	CBD	26%

Reference No.37

- Consumers are willing to spend more and more on cosmetic products. In the United States, spending habits and a large-scale switch from traditional to natural products among Millennials and Gen Z have rapidly increased. <sup>88</sup> According to the report, Millennials (70%) and Gen Z (73%) are willing to pay higher prices for natural and sustainable products. <sup>138</sup>
- From the survey of around 4500 respondents aged 18 years and above conducted in China, Germany, France, the UK, and the US, <sup>122</sup> it has been observed that domain videos for the consumers. At the same time, they purchase natural or cosmetic products for 56%, transparency for 31%, and availability for 27%. Thus, consumers are interested in purchasing the product, but higher pricing is one of the main barriers. <sup>139</sup>
- There has been a transition seen from natural to clean cosmetic products. The <sup>86</sup> surveys show that consumers are moving towards more eco-friendly, ethical, cruelty-free, no animal testing, sustainable, and green cosmetic products. Clean beauty allows producers and consumers to drive towards a sustainable industry. Clean cosmetic products involve product modification, changes in the production process, and packaging. It can be said that consumers are seeking cosmetic products overall while keeping their health and personal values ahead. <sup>140</sup>

- Considering the sustainable attributes consumers considered most important while purchasing cosmetic products, it can be observed that from a survey conducted of 2084 respondents aged 16 to 64 years in North America and 1992 respondents in The United Kingdom, 36% of consumers read the precise list of ingredient, 21% considered ethical credentials, 21% of them took sustainability or recyclable packaging seriously, 20% observed how sustainably sourced the materials are and 14% of them considered vegan or organic ingredients. [\[41\]](#)
- Another survey conducted worldwide taking 29,000 respondents claimed that 49% of the consumers considered ammonia-free products while purchasing green cosmetics, 44% cruelty-free, 43% silicone-free, 42% sulfate-free, 40% vegan options, 44% phosphate-free, 37% micro-friendly, and 38% paraben free. Thus, more and more consumers are consciously switching from traditional cosmetic products to green cosmetic products. [\[42\]](#)
- According to the Statista report (Market Insights) 2021, the top ten countries that own the highest contribution in terms of revenue of the Cosmetics market (beauty and personal care) market globally are:

<b>Countries</b>	<b>Revenue in US Dollars</b>
1. United States	80,212
2. China	51,732
3. Japan	37,835
4. India	22,338
5. Brazil	18,110
6. Germany	17,931
7. United Kingdom	15,425
8. France	15,231
9. Russia	14,868
10. South Korea	11,945

*Reference No.43*

- The following table, taken from a Statista publication, displays the market percentage of global cosmetics in the Asia-Pacific region:

Year	Percentage
2015	36.2%
2016	36.9%
2017	37%
2018	39%
2019	41%
2020	43%

[Reference No.44](#)

- It can be observed from the above <sup>72</sup> table that there has been a continuous increase in the share of the cosmetics industry at a global level.
- By 2025, the Motilal Oswal Group estimates that the cosmetics industry's market size will have grown by two trillion Indian Rupees. Dalal Street Investment Journal:

Year	Market Size of Cosmetics Industry
2016	868
2019	1,267
2020	1,120
2025	1,981

[Reference No.45](#)

- According to the Crunch Base report, the below table shows the total funding in the beauty and cosmetics companies in India from the last few years:

Year	Funding (in billion U.S dollars)
2016	0.8
2017	01
2018	1.8
2019	1.2
2020	2.1
2021	1.9

[Reference No.46](#)

- According to the report of Money Control in India, the top 10 companies in Household and Personal care companies in India in March 2022:

Companies	Sales (INR in billion)
HUL	459.96
Dabur India	71.85
Marico	63.37
Godrej	62.54
Colgate	48.41
P & G	35.74
Emami	28.82
Gillette	20.09

[Reference No.47](#)

- By 2025, the market for online personal and beauty services in India is anticipated to reach over six billion US dollars, according to a report by Inc42.

Market size	Year
03	2020
3.5	2021
4.1	2022*
4.5	2023*
4.9	2024*
5.7	2025*

[Reference No.48](#)

- The following table displays the share of India's e-commerce Cosmetics market by brands in 2021, per the JM Financial report:

Companies	Percentage
Nykaa	38%
Amazon & Flipkart	20%
Others	16%
Purplle	10%
Myntra	09%
Good Glam	07%

[Reference No.49](#)

- According to McKinsey & Company, from a survey conducted in India in March 2022 among 1,009 respondents aged 18 years and above, the impact of Social Media while making purchase decisions in India categorically, 70% of the total respondents purchased the personal care products online, and 76% of the total respondents purchased skin and makeup products via online platforms. <sup>80</sup> [\[50\]](#)
- According to the Praxis Global Alliance report, a survey was conducted among 984 respondents regarding their preferred way of shopping while buying Personal care products in India in 2021:

Channel	Percentage
Online Aggregator	53%
Online Cosmetic Platforms	36%
Brand apps/ websites	27%
Physical Stores	18%

*Reference No.51*

- According to a survey conducted by Clootrack, Inc42, in India among 25,996 respondents in February 2022 on a score of 0 to 10:

Categories	Score
Effects on skincare	7.4
Fragrance	5.5
Effects on Hair	4.1
Usage	3.1
Price	2.6

*Reference No.52*

- From the above data, it can be observed that for the consumers of India, when purchasing personal care products online, the effects on skincare and fragrance had the highest impact. In contrast, price was considered as the least important factor. <sup>157</sup>
- According to the Statista Report, Natural Cosmetics segment's revenue was US\$0.90bn in 2023.
  - The market is expected to grow by 3.61% annually (CAGR 2023-2027).
  - Regarding global comparison, China generates the most revenue (\$2,775.00m in 2023). [\[53\]](#)

CHAPTER 2

## **2.COMPANY PROFILE**

## COMPANY PROFILE - INDEX

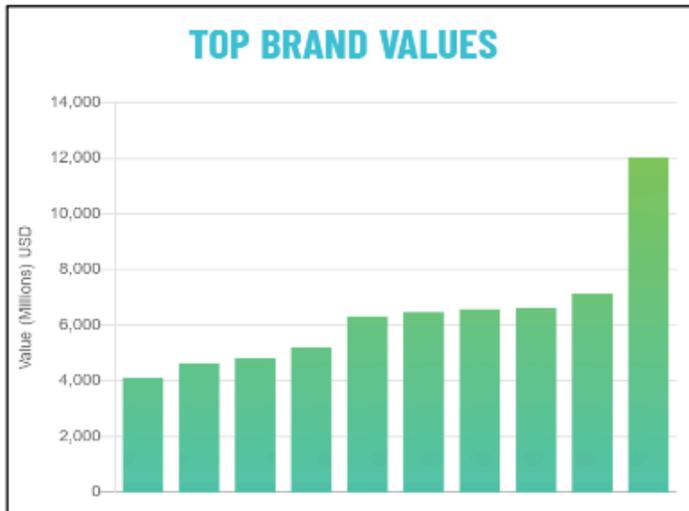
- *Top 10 global companies*
- *Top 20 Indian companies*
- *Top 10 Indian-origin cosmetic companies*
- *Top 10 Indian green cosmetic companies*
- *Leading Cosmetic Companies of Gujarat*
- *Home-grown green cosmetic companies of Gujarat*

## 2.1. The top global cosmetic companies <sup>[1]</sup>

1. L'Oréal
2. Estée Lauder
3. Nivea
4. Gillette
5. Dove
6. Guerlain
7. Lancôme
8. Clinique
9. Pantene
10. Garnier

No.	Name of the company	Origin Country	Brand Value (USD million)
1.	L'Oréal	France	12,027
2.	Estée Lauder	USA	7,151
3.	Nivea	Germany	6,617
4.	Gillette	USA	6,578
5.	Dove	USA	6,470
6.	Guerlain	France	6,313
7.	Lancôme	France	5,199
8.	Clinique	USA	4,828
9.	Pantene	Europe	4,635
10.	Garnier	France	4,102

<https://brandirectory.com/rankings/cosmetics/charts>



<https://brandirectory.com/rankings/cosmetics/charts>

#### *TOP-20 Indian Companies Study Methodology*

- Brief of Company
- Parent company
- Total products
- Total stores
- Market Share

#### **2.2. Top-20 Indian Companies- [2]**

- 1) Lakme
- 2) L'Oreal
- 3) Revlon
- 4) Maybelline New York
- 5) Colorbar
- 6) Sugar Cosmetics
- 7) Nykaa
- 8) The Body Shop India
- 9) Johnson & Johnson Ltd
- 10) VLCC Healthcare Ltd
- 11) Natura & Co

- 12) Patanjali Ayurveda Ltd.
- 13) Himalaya Drug Company
- 14) Forest Essentials
- 15) Zilch Cosmetic
- 16) MamaEarth
- 17) Shahnaz Hussain Group
- 18) Coloressence
- 19) Godrej Consumer Products Ltd

1. **Lakme-** Lakme was Tata’s first Indian cosmetics company, and India’s first Prime Minister, Jawaharlal Nehru, was one of the prominent pioneers behind the launch of India’s premium makeup brand. The word Lakme originated from the French word for Lakshmi. Initially, it collaborated with two reputed brands- Robert Piguet and Renoir; after a few years, it decided to be an Indian-origin brand. The parent company of Lakme was Hindustan Unilever Ltd in 1933. The main revenues of Hindustan Lever come from the Cosmetics, toiletries, soaps, and detergents industry; the maximum revenue comes from Cosmetics, soap, and preparations. [\[4\]](#) [\[5\]](#) Hindustan Unilever ranked 1<sup>st</sup> in cosmetics sales revenue in 2021-22. Lakme brand is famous for cosmetics products, and the various product lines include- [\[3\]](#)



<b>Product Lines</b>	<b>Total products</b>
Body and skin care	267
Makeup	247
Hair Care	166
Eye Care	146
Face Creams	133
Shampoo	72
Face Wash	40
Health and Wellness	18
Health Care	18
Fragrances	09
Hair Conditioner	09
Face Scrub	06

From the above table, <sup>102</sup> it can be concluded that there are more than 1500 products, more than 400 salons, and 125 cities all over India.

According to a report by Financial Express, a few brands dominate the Indian cosmetics industry, and Lakme is one of them, with a market share of 10% in the Indian geography.

According to another database of CMIE Prowess, the company had an operating margin of 25.4% and a net margin of 16.9% <sup>60</sup> at the end of March 2022. [6]

2. **Loreal-** Loreal was founded by a young chemist, Eugene Schueller, with the initiative of formulating hair dyes in 1909. It was considered Research and Innovation in the Service of Beauty. With time, it gradually expanded into various countries. Loreal Indian Pvt Ltd. It is a private Ltd company established in India in 1994, and currently, more than 90% of the production is done locally. The significant revenue of Loreal comes from cosmetics, toiletries, soaps, and detergents, whereas the maximum revenue comes from hair products. Loreal ranked 6<sup>th</sup> in cosmetics in sales revenue in 2021-22.



Loreal pledged to pursue sustainable growth in its road map report. They employ all of the distribution channels and have 15 brands.

**The Loreal has succeeded in mainly Hair, Skin, and Makeup products: [7]**

Market	Brands
Mass marketing	Loreal Paris, Garnier, Maybelline New-York, NYX Professional make-up
Hair and beauty salons	Loreal Professional, Matrix, Kerastase, Cheryl's cosmeceuticals, decor
Selective distribution	Kiehl's, Yves Saint, <sup>133</sup> Laurent, Giorgio Armani, Ralph Lauren, Diesel and Guy Laroche

<sup>138</sup> There are more than 1600 employees across five regional locations in India and two manufacturing plants in Chakan, Pune, and Baddi, Himachal Pradesh. It has 2 Research and Innovation centres. [8]

According to a report in the Economic Times, Loreal had around 8-9% of the market share in India's face care segment and 10% in the E-commerce market.

According to another database of CMIE Prowess, the company had an operating margin of 18% and a net margin of 11.3% <sup>60</sup> at the end of March 2022. [9] [6]

3. **Revlon-** Modi-Mundipharma Beauty Products Pvt Ltd., formerly known as Modi-Revlon and a member of the Umesh Modi Group, introduced Revlon in India in 1995. During that period, India's first foreign cosmetics company was established. In the personal care and color cosmetics markets, it excels as a color authority and a trendsetter in beauty. High-quality product innovation, performance, and elegant sophistication were its primary goals when it was first introduced. To maintain the quality level of the products, Revlon also has technological expertise from Revlon's cutting-edge research centre in the USA.



Below are a few famous brands under Revlon:

Super Lustrous	Top Speed
Colorstay	Colorsilk
Revlon Photoready	Flex and Charlie



More than 2000 goods are in the personal and beauty care categories (makeup, fragrances, skincare, hair care). Revlon has more than 40,000 stores and 100 Exclusive Brand outlets in India. It is thought that Modi-Mundipharma Beauty Goods Pvt Ltd was the first to conceptualize in-store beauty advisers. [10] Along with four other regional offices in India, Revlon has its corporate office in Delhi.

According to a report published in Economic Times in November 2022, Modi shared that the company’s online market share was around 20%, and they are targeting to increase it by 25 to 30%. [11] [12]

- 4. Maybelline New York-** Maybelline New York is a global cosmetic brand. In 1913, a chemist from Chicago named Thomas Williams used petroleum jelly for her sister for the first time on her lashes and brows to enhance them. Her brother helped her create a new product; in 1915, Maybel got her name, and Thomas founded a new global industry, Maybelline, named after the bride and her favorite beauty aid. After that, in 1917, Thomas Williams introduced Cake Mascara, considered the first modern eye makeup product for daily use. It was then available via mail order, followed by red eyebrow pencils with colored eyeshadows and eyeliners. Maybelline was the first cosmetic company to have its advertisement on the radio. In 1932, it introduced cake mascara for retail sale. The tagline of Maybelline is “Maybe it is Maybelline.” Maybelline entered the Indian market in 1998 and has technically advanced products. Today, Maybelline offers more than 200 products, and in India, it has more than 160 products in the Eyes, Face, and Lip care segments.



According to a report by Financial Express, Maybelline's market share in the Indian market was around 7% after Lakme. [\[13\]](#) [\[14\]](#) [\[15\]](#)

- 5. Colorbar-** Colorbar was launched in India in 2004 by Samir Modi and is a part of Modi Enterprises. He launched Colorbar in India, targeting to change the buying experience of women while purchasing cosmetic products, keeping in mind the country's population and equally maintaining the quality of the products. Reena Chhabra, one of the company's CEOs with immense experience in cosmetic products, brought a complete change to Colorbar cosmetics, making it 100 cr in a few years. Today, Color Bar has more than 100+ exclusive stores and 1200+ multi-brand outlets, including Shoppers Stop, Lifestyle, New U, and Pantaloons in India. The products are also available online.

The main motto behind the brand is to be gender-neutral and celebrate the diversity of all who visit us. ColorBar believes in expressing each human being by its uniqueness; they also have a cruelty-free product range, becoming India's third largest brand. ColorBar products are produced and packaged in France, Germany, Italy, Korea, and the USA. The brand is ISO certified in US, EU, UK, and Japan for FDA standardization and quality. Globally, Colorbar is present on e-commerce platforms in Sri Lanka, Malaysia, the USA, the UK, and the UAE.

The product lines of Colorbar include Makeup, Skincare, Haircare, Fragrances, and more than 500 products.

According to Euromonitor's report, Colorbar ranks fourth in market share at 3.6%. [\[16\]](#) [\[17\]](#)

- 6. Sugar Cosmetics-** Sugar Cosmetics was founded by Vineeta Singh and Kaushik Mukherjee in 2012. The parent company of Sugar Cosmetics is Vellvette Lifestyle, Vellvette. It started with just two products: a black matte eyeliner and a black kohl pencil. It started as an online supplier of natural, paraben-free cosmetics. The tagline of Sugar



Cosmetics is “Rule the World, One Look at a Time.” Sugar Cosmetics opened a Shopify store in 2015.

Sugar Cosmetics has a wide range of products in the lip care, skin care, face care, and nail care segments.

According to a report, it sells 200K+ products per month and operates on a hybrid model with its presence in 35,000 multi-brand outlets across 550 cities.

Sugar Cosmetics is present on all the prominent e-commerce platforms like Amazon, Flipkart, Nykaa, and Myntra.

Sugar Cosmetics is globally available in Korea, Germany, Italy, and the USA.

During the pandemic, Sugar Cosmetics' operating income increased by 82% in FY 2020, and its revenue crossed 200 crores in FY 2022.

Thus, the company has achieved new heights along with an omnichannel approach focusing on content marketing and development of its app. [\[18\]](#) [\[19\]](#)

7. **Nykaa-** Nykaa was founded by Falguni Nayar in 2012 to initially take the cosmetic products market at a higher level with just 3 employees and 60 orders. It was launched as an online corporation and later on omnichannel. The origin of Nykaa is “Nayaka,” a Sanskrit word that means actress or the one in the spotlight. It has products from domestic, international, luxury, prestigious, premium, niche, cult brands, expert advice, and videos.



It understands the needs and preferences of the consumers 72 luxe, trending kiosk stores for the same. Nykaa has more than 2400 products with 100% authentic brands in skincare, makeup, haircare, bath and body, fragrances, and personal care.

Nykaa increased its physical stores to 141 by December 2022 across 56 cities.

As of 31<sup>st</sup> March 2022, Nykaa has over 1500 brands and over 4.3 million SKUs.

Nykaa E-Retail ranked 6<sup>th</sup> on the e-commerce platform in terms of sales revenue according to the CMIE Prowess database.

The company had an operating margin of 6.2% and a net margin of 2.6% in March 2022. [\[20\]](#) [\[21\]](#) [\[6\]](#)

8. **The Body Shop India-** Late Dame Anita Roddick founded it in the UK in 1976. It has a history of championing local communities via its bespoke Community Fair Trade (CFT), which sources its ingredients, accessories, and packaging materials worldwide. Globally, The Body Shop has 30 CFTs and 3 in India. They are committed to “Enrich Not Exploit,” which includes enriching people, the planet, and products.



The Body Shop was launched in India in 2006 with the motto of sustainably fair ingredients and 100% vegetarian and cruelty-free products.

The Body shop has over 1000 products in Hair care, Skin care, and Body care worldwide.

The current CEO of India is Shriti Malhotra.

The Body Shop has 3000 stores across 68 countries worldwide. There are 200 stores in India, and it plans to expand 100 more stores by the end of 2025.

Thus, Body Shop reaches customers through e-commerce sites, sub-franchisee businesses and selective wholesale new markets worldwide.

The brand has dropped prices in India by 20-30%, intending to increase its share in an intensely competitive market. [\[22\]](#) [\[23\]](#) [\[24\]](#)

9. **Johnson & Johnson Pvt Ltd.-** Johnson & Johnson Pvt Ltd is an American multinational corporation founded in 1886 in the USA that developed medical devices, pharmaceuticals, and consumer-packed goods. In 1947, Johnson & Johnson started marketing baby powder in India. 1957 it started a separate legal entity in India with 12 employees. Indian company also had a manufacturing unit, and they started with all the above products.



The current CEO of India's Johnson & Johnson is Sandeep Makkar. In India, it has varied segments, but in the cosmetic segment, it has baby care, women's health, and

beauty products, such as skin and hair care products. The company is classified into the wholesale trading industry. The maximum revenue comes from cosmetics, toilet preparations, soap, and washing preparations.

It ranked 55<sup>th</sup> in wholesale trading in terms of sales in 2021-22.

The company had an operating margin of 18% and a net margin of 11.9% during the year ended 31<sup>st</sup> March 2022. [\[25\]](#) [\[26\]](#) [\[6\]](#)

**10. VLCC Health Care Limited-** VLCC was founded by Mrs.Vandana Luthra in 1989. It was the first company to have multi-outlet operations in the wellness and beauty industry. The company's primary services include Slimming services, Beauty and Grooming, Dermatology, Laser, and Hair build. Most products are manufactured at company-owned plants, 2 in India and 1 in Singapore.



VLCC has Wellness and Beauty clinics across 106 cities in India and 25 in 09 other countries.

VLCC has a diversified 118 skin care, hair care, and body care products. It also has nutraceuticals under the labels VLCC Natural Sciences, VLCC Slimmer's, VLCC Shape up, VLCC Wellscience, Bellewave, and Skin MTX brands.

Its products are in over 1,10,000 retail stores, salons, spas, and aesthetic dermatology clinics.

The company's operating revenue increased by 17.92% on 31<sup>st</sup> March 2022 compared to the previous year. [\[27\]](#) [\[28\]](#) [\[29\]](#)

**11. Natura & Co.-** It was founded in 1969 in Sao Paulo and is a Brazilian multinational company in the cosmetics and personal care



segment. It is considered one of Brazil's leading companies in direct sales and protects the Amazonian social biodiversity via its sustainable business model.

All its products are 93% vegan and cruelty-free.

In 2014, Natura and company was the first company to have received Bcorp certification; its third certification was completed in 2020.

Natura's EKOS line has Union of Ethical biotrade (UEBT) certified products.

It operates in over 100 countries, 3200 stores, 32000 employees, and 7.7 million representatives and consultants.

Natura and Co. had a consolidated net revenue of 36.3\$ billion in 2022. The company has over 53% of women leadership at Natura & Co. The main aim of Natura and Co is to conserve the natural ecosystems by creating protected areas and promoting the local actors. [\[30\]](#)

**12. Patanjali Ayurved Ltd.-** Patanjali Ayurved Ltd was founded in 2006 and owned by Balkrishna Ramdev to create a healthy society via Yog and Ayurved for rural and urban development. Farmers are the main assets of this company.

They contact farmers for herbal and organic products and various other initiatives to increase their income.



Patanjali earns its primary revenue from the processed food industry in food products, beverages, and tobacco, whereas Home and personal care ayurvedic products are other major revenue segments.

The main segments in natural personal care include Skin care, Dental care, Hair care, Body care, Eye care, and Shishu (Baby) care products; it has more than 1200 Personal and beauty care products.

Today, Patanjali Ayurved has more than 47,000 retail stores, 3500 distributors, 18 multiple warehouses, and six factories in India.

Patanjali Ayurved has more than 2,00,000 employees.

The company had an operating margin of 8.9% and a net margin of 4% during the year ended March 2022. [\[31\]](#) [\[32\]](#) [\[33\]](#) [\[6\]](#)

13. **Himalaya Drug Company**- The company was founded by Mohammad Mamal in Dehradun in 1930. The company's new name is Himalaya Wellness Company, and it is popular in pharmaceuticals and skin care products. The firm of the company is situated in Bangalore, India.



The healthcare products of the Himalaya company are made with Ayurvedic ingredients of Indian origin and are further sold under the label Himalaya Herbal Healthcare.

The company has many researchers that help utilize the herbs and minerals in Ayurveda.

The primary services are pharmaceuticals, self-care products, baby products, and welfare products.

Himalaya Global Holdings Ltd. It is the primary parent company that works for Himalaya Drug Company globally. The firm functions in the US, Middle East, Asia, Europe, and Oceania, selling its products in more than 106 countries and has over 500 products under the label Himalaya.

According to a Nielson Survey report published in the Economic Times, the Himalaya company has a market of around 19%. Himalaya's Purifying Neem Face wash leads the category by 1,200 crores, growing at 17.5% from the industry's view. [\[34\]](#) [\[35\]](#) [\[36\]](#)

14. **Forest Essentials**- Forest Essentials is an Indian-origin company founded by Mira Kulkarni in 2000. Initially, it was started with an investment of 2 lakh rupees, and the product ranges were only handmade soaps and candles.

Forest Essentials is an authentic, traditional skincare brand with its roots in the science of Ayurveda.



It claims to be pure, ethical, plant-based ingredients, 100% natural, and authentically Ayurveda products.

The segments include Face care, Body care, Hair care, Makeup, Fragrances, and wellness products.

The various certifications and standardizations are cruelty-free, GMP, Make in India, Ayush Premium, and ISO.

Forest Essentials is considered India's premium luxury skincare and beauty brand and has more than 100 stores nationwide.

The main clients of Forest Essentials are Taj Hotels, The Oberoi Group, The Ritz Carlton, and The Four Seasons; it also supplies its products to Rashtrapati Bhavan.

Forest Essentials mainly supplies 190 hotels, online platforms like Amazon, Nykaa, Tata Cliq, and Flipkart, and exports to 120 countries.

According to a report by the Voice of Fashion, Forest Essentials had a market share of 30% in the luxury beauty market segment. [\[37\]](#) [\[38\]](#)

15. **Ziltch Cosmetics**- It was founded by Ananya Ukil and Srishti Bakshi in 2019 in Delhi, India. The main product segments include make-up, skincare, hair care, body care, and wellness products.

It claims to be paraben-free and toxin-free, has no animal testing, and has skin-friendly ingredients.

The products are available on e-commerce platforms such as Amazon, Flipkart, Nykaa, and Ziltch's website.



The company had its ups and downs during the pandemic but aims to continue launching multi-functional products without any quality effect.

Ziltch looks ahead to introducing new products in makeup categories and planning to take them at a global level. [\[39\]](#) [\[40\]](#)

16. **Mamaearth-** Mamaearth was founded by Varun Alagh and Ghazal Alagh in 2016. The parent company is Honasa Consumer Ltd. The company started with an initial investment of 90 lakhs, and today, it has more than 1.5 million consumers.



Honasa Consumer Ltd is classified as a Wholesale trading company, and the main products/services from which maximum revenue is earned are cosmetics, toilet preparations, soap, and washing preparations.

Mamaearth introduced a unique way by launching the Plant Goodness Initiative to plant 1 million trees by 2025, and they have already planted four lacs across Rajasthan, Uttar Pradesh, and Haryana. This initiative was started. If consumers order a product from Mamaearth, one plate will be grown, and the consumers can even track the growth of their trees. The saplings planted by each order received bear fruits so farmers can earn and increase their income opportunities. With this initiative, it has created an impact on the lives of more than 500 farmers since 2020.

Mamaearth mainly focuses on babies and others, offering more than products, including baby care, hair care, and skincare, with more than 140 natural products.

The beauty and Personal care products range of Mamaearth has been launched in 35 exclusive Brand outlets across 15 cities in India.

According to the reports, Mamaearth had a total revenue of 920 crores INR with a net profit of 24.6 crores INR for 2021-22.

The company's 20% of revenue comes from the baby care range, 80% from skincare and hair care, 65% from selling personal care products, and 50% of the revenue in marketing the brand in online and offline channels.

The company earned an operating margin of 2.2% and a net margin of 2.1% during the year ended 31<sup>st</sup> March 2022. [\[41\]](#) [\[42\]](#) [\[43\]](#)

17. **Shahnaz Hussain Group-** Shahnaz Hussain Group was founded by Shanaz Hussain in 1971. It was her first herbal clinic based on herbal care and cure. The products she curated were for skin and hair problems.



In 1979, the first franchise clinic was opened in Calcutta, and in a year only, they had 80 franchises. Moreover, in 1982, they opened the first clinic in London.

Shahnaz Hussain Group has a global network with franchise salons, retail outlets, beauty training academicians, and 380 Ayurvedic-formulated beauty and healthcare products.

She has also spoken at Harvard School in brand creation and at other international universities. The name of the case was “Emerging Markets”.

It sells its products online on its website and has 400 franchise ventures across the globe and 138 countries without animal testing.

They have also formulated premium therapeutic products for skin and hair, including 24-carat gold, oxygen, diamond, pearl, plant stem cells, and platinum range. They also have a premium Ayurveda Salon and spa treatment center. They have their products in more than 1,50,000 stores across the globe.

According to the article by Economic Times, Shanaz Herbal had a dominant presence in premium skincare, growing 9-10%, and the market for skin care alone has an estimated Rs.1500 crores. [\[44\]](#) [\[45\]](#) [\[46\]](#) [\[47\]](#)

18. **Coloressence**- Coloressence was founded by Saurabh Nanda in 2008 in Delhi, India. It is a made-in-India brand that manufactures and markets premium color cosmetics at a reasonably priced price. The factory of Color Essence is  GMP certified and is located in Haridwar, Uttarakhand.

Coloressence has over 500 SKUs, and the Kaleidoscopic product ranges in face care, eye care, lip care, and nails. The products include kajal, lipsticks, liquid lip colors, lip liners, mascaras, eyeshadows, primers, compact powder, foundation, concealers, shimmers, highlighters, blushes, sindoor, makeup remover, and sprays.

<sup>71</sup> The company also has a premium range of color cosmetics called Coloressence Gold, which has superior quality and eye-capturing packaging.

It has over 500 distributors and more than 1000 employees.

The company promotes social media platforms and is available on various kiosks.

The brand focuses explicitly on the skin tone of Indian women. It has over 800 BA counters across the country. [\[48\]](#)

19. **Godrej Consumers Products Ltd.-** Ardeshir Godrej was the first to set up a company after a few failed attempts in 1897. The world's first vegetable oil soap was called Chavi without animal fat in 1918. Many freedom fighters including Rabindranath Tagore, Annie Beasant, and Rajagopacharya, endorsed Godrej Soaps. In 1938, PPF was introduced in Godrej company. In 1952, Cinthol was the second-largest soap player in India. In 1974, the company introduced hair color and has made many innovations. Godrej Soaps merged into the chemical and MCG businesses. The first global acquisition was made in Keyline Brands, UK 2001.



Godrej Consumers products were classified as a Diversified manufacturing industry; the maximum revenue is diversified manufacturing.

Godrej Consumers products ranked 1<sup>st</sup> in Diversified manufacturing in sales revenue in 2021-22.

It is one of the largest homegrown personal care brands, and it has its core business in hair care.

The brands under Godrej Consumers products are Cinthol, Godrej Fair Glow, Godrej No.1, Godrej Shikakai, Godrej Power Hair Dye, Renew, and Coloursoft.

Godrej Consumers products earned an operating profit of 24.1% and a net profit of 19% during the year-end of March 2022. [\[49\]](#) [\[50\]](#) [\[6\]](#)

### 2.3. **Top Indian Origin Cosmetics Companies<sup>[51]</sup>**

1. Lakme
2. VLCC
3. Forest Essentials
4. Shahnaz Hussain
5. Jovees
6. Sugar Cosmetics

7. Himalaya Herbals
8. Ruby Organic's
9. Khadi Naturals
10. Juicy Chemistry
11. Biotique

5. **Jovees**- Jovees Herbals was founded by Rakesh Misri in 2004. It is <sup>62</sup>one of the leading brands in the herbal beauty and wellness segment. It initially started with only 24 products to create innovative and effective products.

The company claims to have paraben-free, Cruelty-free, Alcohol-free, clinically tested, high-quality, and natural ingredients.

The main products available in beauty and wellness are body care (eco-friendly), hair care, and skincare.



Today, the brand has more than 150 products and is present not only in India but also in Sri Lanka, Hong Kong, France, Maldives, Australia, and Spain.

Jovees Herbal has more than 30,000 multi-brand retail stores and plans to increase its network by 50%.

According to the article published by the Economic Times, Jovees Herbal has a target revenue of Rs.175 crores by the end of the financial year 2023. The brand is expected to increase its revenue by 40% and fiscal growth by 35%. It is also expected to increase online sales by 6%. [\[52\]](#) [\[53\]](#) [\[54\]](#)

8. **Ruby's Organic**- Ruby's Organic was founded by Rubeina Karachiwalla in 2003. It was started mainly designed for Indian skin tones and textures.

The company aims to have plant and mineral-based makeup, bio-actives, <sup>127</sup>ingredients that are not harmful to the skin, and a combination of seed butter, plant-derived oils, natural waxes,



clays, and minerals. The main segments in which the products are available are Skincare, lip care, eye care, and body care (makeup).

The company has no chemicals, and the products are designed in a lightweight, long-lasting, and trending way.

All the ingredients used are at minimum risk for humans, 100% biodegradable, ethically sourced, and licensed; most products are ECOCERT, COSMOS, or NATRUE certified. The operating revenue of Ruby Organics was one crore to 100 crore in the financial year ending 31<sup>st</sup> March 2021. [55] [56] [57]

**9. Khadi Naturals-** Khadi Naturals was founded by Gaurav Singh in 1963. The main aim was to help everyone by providing solutions with herbal remedies for healthcare-related issues.



Khadi Naturals is one of the leading manufacturers, exporters, and suppliers of natural and authentic products, and it is present in 25 states with 100 registered distributors; it exports its products to 25 countries and 50 authorized sellers and distributors globally.

The segments in which the products are available are skin care, hair care, body care, soaps, and baby care. They manufacture Khadi Natural herbal shampoo, natural and glycerine soaps, and paraben-free cleansers. All the products and formulations are according to WHO, GMP, and ISO guidelines, and they are organically cultivated from plant extracts under the supervision of qualified Ayurvedic doctors.

Khadi Natural Herbal products are of eminent purity, verified against harmful reactants, have no animal testing, and are ISO, WHO, and GMP certified. [58]

**10. Juicy Chemistry-** Juicy Chemistry was founded by Pritesh and Megha Asher in 2014 to formulate pure and nutrient-rich natural ingredients.



They would find organic approved farms that would cultivate the ingredients on the farm; they would steer and clear GMOs, pesticides, and fertilizers. They make smaller batches of botanical formulations.

They make the products through cold-pressing, steam distillation, sedimentation, and natural filtration. They are eco-friendly, and the waste generated can be reused or recyclable.

Juicy Chemistry claims to be sustainable, does not do animal testing, uses biodegradable products, has recyclable packaging, and uses organic and environmentally conscious ingredients. Juicy Chemistry receives most revenue from the B2C business model and 90% from e-commerce platforms via Nykaa, Amazon, Myntra and Juicy Chemistry websites.

The various cosmetics segments produced by Juicy Chemistry are face care, hair care, body care, and other products. It has one of its stores in Coimbatore. Juicy Chemistry products are certified products under ECOCERT's COSMOS certification. Juicy Chemistry's revenue in FY 2020 was Rs.6.25 crores, aiming to achieve Rs.25 crores in FY 2021. [59] [60]

**11. Biotique-** Biotique was founded in 1992 by Vinita Jain in Switzerland, and then in 1994, it started in India; the company started with the aim of creating cosmetic products with the concept of Ayurveda with the combination of old Ayurveda and modern biotechnology. The parent company of Biotique is Bio Veda Action Research.

The company's products are claimed to be 100% organically grown, preservative extracts of the plants, herbs, trees, and other contents in roots, leaves, fruits, and flowers. They are manufactured in the Himalayas along with the Advanced technology of Swiss Biotechnology.



There are no chemicals, preservatives, animal testing, or dermatology testing; packaging is recyclable and eco-friendly.

Biotique and the company exports have opened more than four thousand multi-brand locations to nations like Spain, the United States, France, the Netherlands, Italy, Malaysia, Nepal, Sri Lanka, Belgium, Singapore, and Switzerland.

The various segments produced are Skincare, Hair care, Body care, Baby care, Fragrances, and makeup.

The company <sup>129</sup> has more than 3000 employees, and 75% of them are women.

Biotique laboratories are one of the finest laboratories in the world. The company's primary mission is to provide the highest quality products by amalgamating Indian traditional medicine and advanced modern science and satisfying the cosmetics needs of consumers.

India's Food and Personal Care category is ranked 68 with >US\$ 1m in 2022. Big Basket, Jio Mart, and Nykaa are the top stores where the products are available. [\[61\]](#)  
[\[62\]](#)

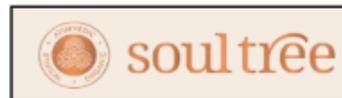
#### **2.4. List of Top 10 Indian Green/Organic cosmetic companies**

1. Soul Tree
2. Forest Essentials
3. Tribe Concepts
4. Bombay Hemp Company
5. Kama Ayurveda
6. Ilana
7. Pahadi Local
8. Neemli Naturals
9. Ras Luxury Oils
10. Sadhev

**1. Soul Tree-** Soul Tree was founded by Vishal Bhandari in 2006, and Vedicare Ayurveda Ltd introduced the company.

It was launched to formulate Ayurvedic recipes and 100% natural and organic products.

According to the company, all the materials used in their products are organic, homegrown, and harvested without harmful chemicals, ensuring that neither the crops nor environmental pollutants are damaged.



Thus, they do not have any synthetic fragrance, products are cruelty-free and 100% vegan, ingredients are sustainably sourced, and SLS/SLES, Paraben free.

Skin care, hair care, bath care, and makeup products are among the numerous categories and segments in which the items are classified. Other product types include shampoos, shower gels, hair oils, Ayurvedic kajals/mascaras/lip glosses, BB creams, and other hair products.

The company's central concept is the Triple Seal of their travel in the Himalayas, an amalgamation of Ayurvedic, Organic, and Natural.

Soul Tree products are available in stores in Delhi, Gurugram, Bangalore, and Trivandrum, and the products are also available on e-commerce platforms such as Amazon, Nykaa, Myntra, and Soul Tree's website.

According to an article published by The Economic Times, Soul Tree's market share was 27% in the premium skincare segment. [\[63\]](#) [\[64\]](#)

**3. Tribe Concepts-** Tribal Concepts was founded by Amritha Gaddam in India in 2019. It is considered India's first Plant-based hair and skin care brand. The brand originated from the banks of the river Godavari.



The brand has adopted the concept of "women in business," so 80% of the employees are women; from handpicking the ingredients used in the product making to shaping up the products, women play an essential role.

The brand uses ancient scientific methods for healing, such as Ayurveda.

They claim that all the products manufactured are plastic-free in packaging, zero chemical use, ethical in practice, and pollution-free.

The main product segments are Face, Body, and Hair care.

The main aim of the brand is to make pillars on Indian ingredients, sustainability, and native tribal practices; they believe in pure organic extracts from the plants and roots that are an ideal alternative for skin and hair care products, so all the products are in pure organic powder and cold pressed oil forms.

The next target of Tribe Concepts is to launch The Tribe Veda, which will have all the natural health alternatives that will help nourish.

Tribe Concepts' products are available on e-commerce platforms such as Nykaa, Amazon, Purplle, and Tribe Concepts' website.

Thus, Tribe Concepts started with a concept of 90-day miracle hair oil in 2019, and now, with 14 products and more than 2 lakh consumers, the brand has a turnover of 50 crores in 2022.

[\[65\]](#) [\[66\]](#) [\[67\]](#)

**4. Bombay Hemp Company-** Bombay Hemp Company is also popularly known as BOHECO and was founded to research and promote industrial hemp in the year 2013 by Jahan Jamas, Sanvar Oberoi, Sumit Shah, Avnish Pandya, Delzaad Deolaliwala, Chirag Tekchandaney and Yash Kotak.



The main things under the company are research, cultivation, harvesting, processing, manufacturing, trading, wholesaling, retailing, innovating, advocating, and creating a new market to encourage industry all across the country with the help of BOHECO.

They are an agro-based company that redefines the future of Indian agriculture. The use of cannabis is kaleidoscopic. The whole process includes pulling out fiber and turning it into yarn, then harvesting the seeds into wholesome nutrition, and studying genetics; the design of this whole process brings the existing industries of Agriculture, Technology, Nutrition, and the healthcare community together for the community, impact, and value.

The word Cannabis is a plant that is from the Himalayas. This plant has been helpful to the people living there for multi-purpose things like in the food they eat, the clothes they wear, and the ropes they tie to their cattle, and thus the use of this plant is quite medicinal and knowledgeable and passed down from generation to generation. Thus, BOHECO has brought cannabis back for health, wellness, and nutrition.

All the products used by the company are non-GMO, GMP certified, cruelty-free, plant-based, and have no additives. The various segments are skin care, body care, and health care, designed uniquely for the wellness of the consumers. [\[68\]](#) [\[69\]](#) [\[70\]](#)

5. **Kama Ayurveda**- In 2002, Vivek Sahni and his business partners Rajshree Pathy and Vikram Goyal launched Kama Ayurveda. To better understand the formulas and natural ingredients, Kama Ayurveda worked with a century-old Arya Vaidya Pharmacy in Coimbatore, Tamil Nadu, with the assistance of nearby forest communities, small-scale farmers, and artisans.



They have a Skincare, Haircare, and Body care product segment. Kama Ayurveda launched its website in 2014. Kama Ayurveda has 105 stores in India (around 50 stand-alone stores, other shops, hotels, and spas). Kama Ayurveda's products are sold on e-commerce platforms such as Amazon, Flipkart, Nykaa, and Kama Ayurveda's website. <sup>168</sup> They have more than 400 employees and a 100cr turnover in 2020. [\[71\]](#) [\[72\]](#)

6. **Ilana**- Ilana was founded by Amit Patil and Nikita Deshpande in 2018 with the aim of natural products.

The brand claims to have a 100% honest beauty brand from natural pigments; their flagship product, Beet Tint, is also made from the natural pigment of beets. They have cosmetic products in the makeup, skin, and body care segment. It has 18 products in total. They believe that the ingredients used in makeup products should be ethical and honest, innovative, toxin-free, performance-driven, clean, safe for the environment and planet, and cruelty-free. Their tagline is "One honest product at a time." Ilana has five stores in India and is also available on e-commerce platforms. [\[73\]](#)



7. **Pahadi Local**- Jesica Jayne founded Pahadi Local in the year, and the parent company is Pahadi Goodness Private Limited in Mumbai, India.



Pahadi Local is a brand that follows the SOURCE TO BOTTLE philosophy, and the products range from cold-pressed oils to orchard clays, salts, and flowers.

It claims the products are chemical-free, no preservatives, and stabilizer-free.

The products of Pahadi Local are available in JCB salons, Good Earth Stores, Taj Hotels, and other e-commerce platforms such as Amazon, Nykaa, and Myntra.

The products are ECO-CERT Audit, a French product certified, and the lab tests are according to International standards.

Thus, the brand defines luxury by mindfulness from the hills to consumers' homes; it also has various green initiatives, cooperative structures, and fair pricing. [\[74\]](#) [\[75\]](#) [\[76\]](#)

8. **Neemli Naturals**- Neemli Naturals was founded by Manu Seth, Bhaskara Seth, and Rameswari Seth in 2018 under the parent company Bandra Soap Company Pvt Ltd in Mumbai, India.



The products are natural, hand-made, cruelty-free, vegan, chemical-free, plant-based, non-toxic, safe, and effective for long-term and plant-based ingredients.

They studied the ancient Ayurveda manuscripts and modern formulations and finally launched a few products.

Ingredients such as activated charcoal, sea buckthorn from the Himalayas, and Olive Squalane from Japan are used.

The brand follows the rule “No compromises on Our Product Quality.”

The products are available online, with around 50,000 consumers and less than 01% of the market share. [\[77\]](#) [\[78\]](#)

9. **RAS Luxury Oils**- RAS Luxury Oils was founded by Shubhika Jain, Sangeeta Jain, and Suramya Jain in 2017 under RAS Beauty Private Limited. The word RAS means essence or happiness in the Sanskrit language.



RAS Luxury Oils is the first 'Farm to face' skincare venture in the country, as the owner have their own farms and research labs.

The products of this brand are Sulphate, Paraben, silicone-free, phthalates-free, non-preservative, SLS-free, without any synthetic fragrances, and additive-free.

All the ingredients used in the products are grown on their farms with the help of local farmers. All the products are PETA-certified. The segments in which the products are available are Face care, Lip care, Hair Care, Body Care, and wellness. All the products of RAS Luxury Oils are available online on e-commerce platforms. [\[79\]](#) [\[80\]](#)

**10. Sadhev-** The journey of this brand begins with the story of a boy who visits the ancestral home with his mother in the town of Vallapad, Kerala, to pay tribute to their forefathers, Cholayil Kunju Maami Vaidyar. He came to know how Vaidyar had unconventional healing techniques and countless Ayurveda treatments, and that was a trigger for him to start Sadhev.



That is how Lasakan, with his mother, Jayadevi, launched Sadhev in 2019 to create exotic beauty and wellness treatments.

The ingredients are grown on their land, and Sadhavana farmers use sustainable farming. The botanicals that do not grow in India are sourced from various countries: Argan Oil from Morocco, Saffron Petals from Afghanistan, Butters from Switzerland, and Rose from Bulgaria. The segments in which the products are available are Body Care, Face care, and Hair care. The formulations have secret therapeutic formulations that can heal, uplift, and transform oneself inside out. [\[81\]](#)

## **2.5. List of leading cosmetics companies of Gujarat [\[82\]](#)**

1. Iba Cosmetics
2. Zeel Beauty Care
3. Vimson Derma Glowel Cosmetics
4. Riviera Cosmetic

## 5. Zoic Cosmetics

1. **Iba Cosmetics**- Mauli Teli and Grishma Teli founded Iba Cosmetics in 2012 under EcoTrail Personal Care Pvt Ltd. Iba Cosmetics was launched properly after research, market understanding, and product development in 2014.



The products are vegan animal cruelty-free, and they have been curated so that the ethical needs of Muslims, Jains, Vegetarians and Vegans meet their expectations.

All Iba cosmetics products are certified by HALAL and PETA.

The company offers over 100 make-up, hair-care, and skin-care products. The Global Halal Cosmetics market includes skin care, hair care, color cosmetics, and Fragrances in the distribution channels. The products are sold in supermarkets, convenience stores, e-commerce platforms, and other countries. The global Halal cosmetics market is expected to grow from 33.3\$ billion in 2021 to 77.38\$ billion by 2028, 12.75% CAGR. Other significant brands, including EcoTrail, are Duck, Ivy, Inika Organic, and Clara. [\[83\]](#) [\[84\]](#) [\[85\]](#)

2. **Zeel Beauty Care**- Zeel Beauty Care was established in 2004 and is a Gujarat-based company.

The company has 68 products in the hair and skin care segments.

All the products are made using natural herbs and synthetic ingredients.

It has a turnover of more than 20 Lakhs. [\[86\]](#)



3. **Vimson Derma Glowel Cosmetics**- Vimson Derma was founded in 2014 with the aim of high-quality dermatology and cosmeceuticals by Vimal Bacchawat and Kalpesh Bacchawat.

They had more than 45 years of experience in dermatology, and then they started manufacturing facilities with the help of significant pharma, medical,



and life science companies. The main aim is “High Quality and Consistency”. They

mostly have Skincare products, from medicinal soaps to shampoos and face washes. [\[87\]](#)

4. **Riviera Cosmetic** – Riviera Cosmetic was founded in 2008 and is one of the leading cosmetic manufacturers in India.

All the products go through proper quality checks regarding material technology and quality.



The main segments in which the products are manufactured are Cleaners, toners, skincare, body care, and hair care. They had been awarded GMP and ISO 9000. The company's primary targets are to manufacture the highest quality in OEM and ODM and private label beauty brands and to fill, design, and package the products.

They also curated a Luxury Spa brand named “Sukham” in 2015.

Thus, the company’s vision is to be a leading manufacturer and trader by manufacturing high-quality skin care products nationwide. [\[88\]](#)

5. **Zoic Cosmetics**- Zoic Cosmetics was founded in 1990 with the vision of being a leading healthcare company and increasing the quality of life.

The main aim of the company is to manufacture not only medicines but also Ayurvedic healing.



The brand has products in various segments, such as Skin care, Hair care, Personal hygiene, and Body care.

It has five units in the country for manufacturing products. [\[89\]](#)

## 2.6. List of Home grown beauty brands from Gujarat: [\[90\]](#)

- 1) Skin Yoga
- 2) Raw Rituals
- 3) Reve Organika
- 4) Aerth Naturals
- 5) Earth Origin

1. **Skin Yoga-** Skin Yoga was founded in 2013 by Radhika Choudhary, Deepika Choudhary, and Jagriti Choudhary in Gujarat, India.

It is a 100% natural luxury skincare brand.

All the products of Skin Yoga are based on the principles of Ayurveda.

It is a direct-to-consumer brand, and Skin Yoga products are available on e-commerce platforms. [\[91\]](#)



2. **Raw Rituals-** Raw Rituals was founded by Anita Agarwal in 2015 in Gujarat, India. The products are amalgamated with old traditions and modern therapeutic essentials.

The segments are Hair care, Body Care, and Skin care. [\[90\]](#)



3. **Reve Organika-** Jigna Shah founded Reve Organika, and nature inspires the brand.

It focuses on the purity of the products, and all <sup>111</sup>the essential oils are produced from the actual plant without any artificially added fragrances or colors.

The segments are generally Body care, skin care, and hair care, mainly in the form of essential oils. [\[92\]](#)



4. **Aerth Naturals**- Dhara Agrawal and Vidushi Agarwal founded Aerth Naturals, a Uttarakhand-based brand.

The segments in which the products are available are Hair care, Face care, and Body care. [\[90\]](#)



5. **Earth Origin**- Mamta Shah founded Earth Origin, a vegan luxury skincare brand emphasizing royal Indian beauty.

The products are an amalgamation of Ayurveda, and the segments are Body oils, Ubtans, natural flora, and plant extracts. [\[93\]](#)



CHAPTER-3

### **3. REVIEW OF LITERATURE**

### **3.1.Green Cosmetics**

#### **Attributes: (Sustainability, Consumer Preferences, Consumer Behavior, Purchase intention, Attitude, Awareness, social media, Brand, Gender)**

1. *(Matilde, 2021)* The study “Sustainable Cosmetics: The Impact Of Packaging Materials, Environmental Concern, And Subjective Norm On Green Consumer Behavior” by Bellomo Matilde to know the impact of environmental concern, subjective norms, and Consumer Perceived Effectiveness based on green consumer behavior through pro-environmental behavioral intention. For the same, quantitative research was conducted via an online survey of Italian consumers, and 223 questionnaires were collected and further analyzed using SPSS software. SEM was used to verify the framework, and <sup>114</sup> the hypothesis was tested using multiple linear regression and partial least squares. The result showed a significant relation between attitude towards behavior and consumers' perceived effectiveness in the TPB model. It is recommended that companies in the cosmetics industry communicate sustainability through their products to increase consumers' awareness of the use of and perception of sustainable products.
2. *(Mäkiä, 2021)* The study “How Cosmetics Companies Can Improve the Credibility of Green Marketing – A Consumer Perspective” was conducted to inform consumers and cosmetics companies about the credibility and improvement of green marketing in the cosmetics industry and how to identify greenwashing companies authentically. For the same, data was collected through an online survey, and 107 valid responses were collected. <sup>94</sup> The data was analyzed using content analysis methods, webropol, and Microsoft Excel. The hypothesis concluded that cosmetics companies could improve their credibility in the field of green marketing and should also be authentic in their certification. Thus, it would further help the companies to identify or recognize the greenwashing from green marketing.
3. *(Kapoor, Singh, & Misra, 2019)* In the paper “Green Cosmetics- Changing Young Consumer Preference and Reforming Cosmetics Industry,” a survey was conducted to identify the factors that motivate consumers to purchase green cosmetics products. For the same, a survey was conducted via questionnaire, and 150

respondents responded in Delhi, NCR, Noida, and Ghaziabad. Further analyzed using SPSS 18 software, multiple regression, correlation, and reliability tests (Cronbach Alpha Reliability test) were conducted. It examined the relationship between the variables for the responses received. It tried to identify the various pitfalls faced by consumers while they were shifting from non-green to green cosmetics products. The primary driver of green marketing is a concern for the environment. Thus, companies should concentrate on raising customer awareness and their propensity to favor eco-certified goods. Marketers should focus on the labeling and certification of green cosmetics, which will help to address consumers' environmental concerns. The paper further suggested the marketers' changes for targeting, segmenting, and motivating a more diversified consumer base.

4. (Wilson, Theodorus, & Tan, 2017) The study “Analysis Of Factors Influencing Green Purchase Behavior: A Case Study Of The Cosmetics Industry In Indonesia” was conducted to determine the factors that would influence consumers green purchase Behavior towards green cosmetics products in Indonesia. A questionnaire was conducted for the same, and 260 responses were collected from those who purchased and used green cosmetics products. The data was further analyzed by using AMOS 22.0. Based on the survey, the hypothesis concluded that the attitude of the consumers towards the behavior and the perceived behavioral control had a positive relationship with the behavioral intention. In comparison, the intention of the Behavior (consumers) did not have a significant relationship with the purchase of green cosmetics products. The study will further help the researchers improve the factors in understanding the factors that had positive relationship or affected the consumers while purchasing the green cosmetics products.
5. (Samanta, 2020) The study “Buying Behavior of Environmentally Sustainable Cosmetics- Indian Context” uses the TPB (Theory of Planned Behavior) while examining consumers' buying Behavior while purchasing green cosmetics products. For the same, a survey was conducted using a structured questionnaire, and data was analyzed by 154 valid responses from the overall responses received. Confirmatory factor analysis and reliability tests were used to analyze the data. The hypothesis concluded that the attitude towards the environment had less significance in driving purchase intention. Meanwhile, the effect of perceived price

and moral norms had a positive relationship with purchase intention. From the overall survey, the perceived benefit affected their purchase intention most. Thus, the study will help decide the marketing campaigns, promotional events, and investment for environmentally sustainable green cosmetics products.

6. (*Bom, Jorge, Ribeiro, & Marto, 2019*) The main aim of the paper “A step forward on sustainability in the cosmetics industry: A review” is to discuss the relationship between sustainability and the cosmetics industry- all the factors and tools related to sustainability and are impacted during the product life cycle. For the same, data collection was done by Science Direct, Google Scholar, SCOPUS, and Web of Science databases were used and various techniques used a cross reference snowball sampling strategy- Start set, Iterations, Backward snowballing, Forward Sampling, Inclusion and Exclusion, and overall 173 references were systematically listed in literature review based. From the overall observation, it was concluded that from the past few years, there were several aspects of sustainability that the cosmetics companies practiced, and various challenges were observed- the major one was the replacement of unsustainable synthetic ingredients for sustainable ingredients, single certification for organic or natural cosmetic products. Thus, companies should try to improve their cosmetics products journey by incorporating more green ingredients.
  
7. (*Amberg & Fogarassy, 2019*) The main aim of the paper “Green Consumer Behavior in the Cosmetics Market” is to find out to what extent the various features of nic cosmetics differ and which factors affect the consumers who For the same, data was collected via questionnaire online mode by sampling method, 197 responses were received. Further, descriptive statistical analysis and cluster analysis were used in the PASW Statistics 18 Programme. The hypothesis concluded that some consumers preferred natural cosmetics products whereas some bought traditional ones. From the results obtained, it is further suggested to examine the extent of the educational background, healthy lifestyle, and the harmful products used in each category and also the market of cosmetics products; health and environmental awareness will play an essential role for producers and consumers.

8. (*Matić & Puh, 2015*) The paper “Consumers Purchase Intention towards Natural Cosmetics” primarily aimed to identify which variables influence consumers' intention to purchase green cosmetics products. For the same, the data was collected through an online questionnaire survey. A sample of 204 respondents was collected. The variables in the regression analysis included age, gender, consumers' purchase intention with new green cosmetics brands, and health consciousness. Further, statistical analyses such as Binary logistic regression and correlation analysis were used. The hypothesis concluded in the binary logistic regression that gender consumers' intention towards purchasing new green cosmetics brands positively influenced the purchase intentions. Consumers' tendency towards health consciousness is not related to The correlation analysis, which concluded that there was a strong positive correlation between purchase intention towards natural cosmetics and consumer references towards natural cosmetics. The study might help online retailers, marketers, and practitioners understand new trends better.
  
9. (*Chin, Jiang, Mufidah, Persada, & Noer, 2018*) The research “The Investigation of Consumers Behavior Intention in Using Green Skincare Products: A pro-Environmental Behavior Model Approach” examines consumers' purchase intentions while purchasing green skincare products. For the same, data was collected from female consumers, and 251 respondents responded. The data analysis was done by taking the Pro-Environmental Reasoned Action (PERA); structured Equation Modelling was further conducted to determine the relationship between the various factors of the PERA model. The hypothesis concluded that the Perceived Authority Support (PAS) positively correlated with the Perceived Environmental Concern (PEC). Further, PAS and PEC positively related to Attitude, Subjective norms, and Behavioral intention to purchase green skincare products. It was suggested that green skincare cosmetics companies produce quality and sustainable products through quality processes, which increases consumers' attention to green cosmetics products.
  
10. (*Amberg & Magda, 2018*) The study “Environmental Pollution and Sustainability or the Impact of the Environmentally Conscious Measures of International Cosmetics Companies on purchasing organic cosmetics” examines the global environmental problems and the efforts made by international cosmetics companies

to protect the environment and the impact on the preferences, selection and the purchase of the green products or the sustainable products. For the same, expository and descriptive secondary research was conducted in the cosmetics market in the USA and Europe based on the Allied Market Research Report 2014- 2022 and Cosmetics Europe. Discussions occurred on various themes such as Ecological considerations of sustainability, market share of the global cosmetics market, factors that affect personal care, factors affecting the global cosmetics market, global market share, and the scope of future growth of the green cosmetics market. It further concluded that the tendency of a contaminated environment has increased, and with that, the awareness for using more sustainable products is also increasing. Thus, companies should increase their use of greener products.

11. (Lin, Yang, Hanifah, & Iqbal, 2018) The main aim of the paper “An Exploratory Study of Consumer Attitudes towards Green Cosmetics in the UK Market” is to explore and examine consumers' attitudes towards green cosmetics. For the same, qualitative research was conducted to discover in-depth consumer attitudes and feelings. For the same, data was collected from 30 British females in five focus groups, which included comments, shared attitudes, and experiences. A flexible structured questionnaire was used, and there was a close relationship between the moderator and informants. The hypothesis concluded that a neutral attitude towards green cosmetics was due to a lack of knowledge and market standards, and most of the respondents viewed price and performance as the most critical factors when choosing cosmetics instead of green cosmetics. The study will further help to ascertain the consumer’s attitude towards green cosmetics and greener standards as well as regulations in the industry for extracting natural ingredients.

12. (Akehurst, Afonso, & Goncalves, 2012) In the paper “Re-examining Green Purchase Behavior and the Green Consumer Profile: new evidences,” the main aim was re-examining the factors that are ecologically conscious consumer Behavior (ECCB) by taking the analysis of the consumers profile, which includes the socio-demographic and psychographic variables and also the factors of Effective green purchase Behavior by the green purchase intention, For the same, quantitative study was done for which data was collected via online survey and 186 respondents responded. Further, the hypothesis concluded that the demographic variables were

irrelevant while explaining ecologically conscious consumer Behavior, whereas the psychographic variables are more effective while examining ecologically conscious consumer Behavior. The results reinforce the role of PCE and ECCB given the support of attitude Behavior. It further suggests evaluating the influence of ecological consciousness in all the stages of the buying process to explore the barriers to green consumption, which will be helpful in a qualitative approach.

13. (Dimitrova, Kaneva, & Gallucci, 2009) The study “Customer Knowledge Management in the natural cosmetics industry” aims to examine the level of Customer Knowledge for the natural cosmetics company Bulgarian Rose and give solutions for the management. For the same, a questionnaire was formed where 236 respondents were collected from Bulgaria, Montenegro, and Italy, and a logit regression model was used to examine the results for effective knowledge transfer among the consumers and how to increase the buying behavior of the consumers and exchange high-grade information with the consumers, the results showed that the role of the consumers in the cognitive process of the knowledge acquired for the particular fragrance is confined and based on the new learning for the nature of product and application of the integrated marketing ideas for development and promotional activities. Further, this paper suggests the consumers' preference by organizing the communication systems by using the media mix of the internet, Television, and journals in Bulgaria's unique category of cosmetics products.

14. (Pop, Saplacan, & Alt, 2020) The paper “Social Media Goes Green—The Impact of Social Media on Green Cosmetics Purchase Motivation and Intention” aimed to examine the impact of Social Media on the consumers buying decisions and motivation taking altruism ego by the Theory of Planned Behavior (TPB) method, for the same a survey was conducted for measuring the framework by snowball sampling method by social networking sites who were the users and followers of green, natural, and organic cosmetics consumers, among them 180 responded and based on the respondents received, the reliability and validity of the reflective constructs by using the PLS- Partial Least Square modeling technique. The hypothesis concluded that social media impacted consumers' attitudes, altruistic attitudes, ego motivations, and green cosmetics buying intentions. Also, it revealed that external factors, such as social media, had an important role in motivating

consumers to purchase green cosmetics products. The results obtained from the paper will further help marketers implement good communication strategies on social media and help consumers purchase green cosmetics products.

15. (Kim & Seock, 2009) The study “Impact of Health and Environment Consciousness on Young Female Consumer’s Attitude Towards and Purchase of Natural Beauty Products” was conducted to examine the female consumer’s cosmetics Behavioral patterns, the importance of product attributes, and the attitudes while purchasing natural cosmetics products, it also examines the consumer’s product attitude. Their shopping Behavior influences their health and environmental consciousness. For the same, data was collected from 210 female respondents by convenience sampling method; the hypothesis concluded that health and environmental consciousness affected the cosmetics products attributes and also highly positive from the perspective of natural cosmetics products, whereas the ANOVA showed an analysis of two groups having a high level of environmental consciousness and the purchase of green cosmetics product also had a strong positive relation than the health consciousness purchased green cosmetics products. It was further suggested that future studies should include other variables that might show more insights into the purchasing decisions for green cosmetics products.

16. (Rekha & Gokila, 2015) The study “A study on consumer awareness, attitude and preference towards herbal cosmetics products with special reference to Coimbatore City” will help in understanding the attitude of the consumers towards the purchase of green cosmetics products with the help of demographic classification and also the factors that identify the various factors that would help in analyzing the future studies. A sample of 50 respondents was collected using a convenient sampling method to analyze the same. Karl Pearson’s rank correlation, average ranking analysis, and Chi-Square analysis were used. The hypothesis concluded that there was a positive correlation between family income and the amount spent on green cosmetics products; there was also a significant relation between age and the use of green cosmetic products, whereas there was no relation between educational qualification and the level of satisfaction concerning green cosmetic products. It further suggested reducing the price of green cosmetics products and conducting a more comprehensive survey.

17. (Kim & Chung, 2011) The aim of the paper “Consumer Purchase Intention for Organic Personal Care Products” was to study the effects of consumer values and their experiences on the buying Behavior of organic personal care products and also the effectiveness of perceived Behavioral control on the consumer attitude intention relation. For the same, the sample was collected, and 207 consumers responded via online marketing research through a questionnaire based on consumer value, TPB constructs, and the previous experience of the consumers. Data was analyzed using multiple regression analysis to test the variables' relationships. The hypothesis concluded that environmental consciousness and appearance had a positive relation when buying green cosmetics products, whereas when the experience was included with the perceived behavioral control as a moderator of attitude, the purchase intention relationship had improved on the TPB model. The study further suggested that retailers develop marketing strategies by focusing more on ecological beauty, product safety, and affordable prices to increase the consumer’s intention to purchase green cosmetics products.

18. (Wiwatanaputit, 2017) The aim of “A Study of Consumer Behavior Towards Organic Skin and Personal Care Products” was to know the factors- (attitude, consumer profile, subjective norms, internal factors, and perceived value) that affected consumers while purchasing green cosmetic products and also the factors that caused the consumer of not buying the green cosmetic products. For the same, quantitative and qualitative research was conducted via secondary data research and individual in-depth interviews with the respondents, and 206 respondents responded. SPSS software was used for data analysis, as well as percentage, mean, correlation analysis, and statistical tools. The hypothesis concluded that the consumers started trusting in the quality of the products having USDA certification, whereas the non-users did not wish to change as they had difficulty in purchasing the products; the two main factors that positively affected the buying Behavior were consumer value and profile, whereas the main categories that should be aimed were Life Balance user and Trendy Innovator and understand clearly by creating marketing strategies and messages. The study results will help people in business and marketers better understand consumer behavior and effective marketing strategies.

19. (Salo, 2014) The study “Consumer Behavior Towards Green Skincare Products” aims to examine the various factors that influence the purchasing decisions of facial products, the attitude towards natural cosmetic products and the value of the natural ingredients. A survey was conducted using a mixed research method, and 177 women responded. Further data was analyzed via SPSS software. It concluded that a clear difference between the Behavior of women from various age groups and life situations and also the various factors that affect the decision-making process, the impact of the validity of the results obtained is minimalistic. It suggested finding out the reasons for both companies and thinking about marketing strategy, opening more stores, promotions, and TV.
20. (Qalati et al., 2020) The main aim of the paper “Antecedents of Consumer Behavior: the Mediating Role of Brand Image in the Cosmetics Industry” was to explore the relationship among the celebrity’s endorsements, promotion events, packaging, brand image, and purchasing Behavior along with the role of brand image in the cosmetic industry in Pakistan. For the same, a close-ended questionnaire was prepared using a random sampling method, and 190 responses were received from the consumers. <sup>128</sup> Partial Least Square Structural Equation Modelling analyzed further data- PLS-SEM using ADANCO 2.0.1. The hypothesis concluded a positive relationship between celebrity endorsements, promotion events, packaging, brand image, and purchasing buying behavior, whereas partial mediation was observed between celebrity endorsement and purchasing behavior. The study will help practitioners and marketers evaluate and examine consumers' buying Behavior.
21. (Liobikiene & Bernatoniene, 2017) The paper “Why determinants of green purchase cannot be treated equally? The case of green cosmetics: Literature Review” examined the literature review methodology method from 2011 to 2017. The keywords used were “green products,” “consumption of environmentally friendly products,” “organic products,” “sustainable,” and “green purchase Behavior.” and 80 papers were reviewed, descriptive analysis was used to further categorize according to the distribution, products analyzed, and the factors

primarily analyzed. It concluded that most of the research was extensively done from 2014-17, and the authors obtained different analysis results in the overall category; it also concluded that the studies conducted on the Buying Behavior and the related factors were quite relevant and related. The past reviews also reveal the green purchase behavior promotional methods and the practical tools for implementing the sustainability and production policy. <sup>116</sup> At the end of the study, a model was presented for analyzing the green personal care products buying behavior, taking health into consideration and other brand and quality variables, including the color and style of the cosmetic products; it will be insightful for the researchers, policymakers and the marketers for the promotional events of the green cosmetic products.

22. (Mishra, 2018) “Understanding consumer Behavior towards toxic chemical-free cosmetics using Schwartz values – a study from India study” aims to understand the consumer’s buying behavior while buying cosmetic products that are chemically free and also to understand why cosmetic companies are shifting towards launching natural, organic, or chemical-free cosmetic products. For the same, a study was conducted to evaluate the consumer's attitudes, beliefs, and behavior; a questionnaire was circulated, and 196 consumers responded. The data was further analyzed by descriptive and regression analysis and Analysis of Variance, and it is a combined Theory of Reasoned Action(TRA) and Schwartz values to assess the factors that influences the consumers buying decision; the hypothesis concluded that from the four values- Self-transcendence and conservation are not positively related with the attitude, whereas open to change and self-enhancement positively impact the attitude of the respondents towards the chemical-free cosmetic products. The findings of the previous study, it is examined that women have a keen interest in such type of products that are toxic or chemical-free because of their health and are more conscious and concerned about the impact of cosmetic products; the study suggested that more responses and enhance the research in other cities of India, though the study may have research design inefficiency the internal validity but it will help the researchers for future optimistic research.

23. (Tengli & Srinivasan, 2022) The paper “An Exploratory Study to Identify the Gender-Based Purchase Behavior of Consumers of Natural Cosmetics” aimed to

identify the factors that impacted Indian consumers' buying intention and their buying behavior while they were purchasing green cosmetic products. For the same, the Theory of Planned Behavior (TPB) was used to examine the buying behavior of male and female consumers using green cosmetic products. A study was conducted among 335 men and women, and the differences between males and females were determined using Structural Equation Modelling of Smart PLS3.0. The hypothesis concluded that the attitude towards the environment and natural cosmetics had a strong positive impact on perceived Behavioral control on the buying intention, knowledge, and awareness about the product harmed the buying intention on the purchase behavior. Subjective norms had no positive relation, whereas the other variables hardly showed a <sup>38</sup> difference between male and female consumers, which proved the similarity between men and women in green cosmetic products.

24. (Al-Samydai , *Qrimea*, Yousif, Al-Samydai, & Aldin, 2020) In “The Impact of Social Media on Consumer's Health Behavior Towards Choosing Herbal Cosmetics,” the main aim was to examine how important the role of consumer’s health behavior towards green cosmetic products, for the same descriptive statistics was used to summarize the responses for each question overall. A questionnaire was designed for pharmacists and salespeople, and in the subsequent stage, interviews were conducted with around 450 consumers. Simple Random sampling was done, and sales differences between Herbal and Organic Cosmetic Products were analyzed by two-sample t-test using SPSS software 21. The hypothesis concluded that most of the respondents had more preference towards herbal cosmetics because of their safety; <sup>81</sup> more than 60% of the sample population desired to switch from organic to herbal cosmetic products, and according to the statistics, social media star influencers <sup>82</sup> play an essential role in the same.

25. (Gradinaru, Obada, Gradinaru, & Dabija, 2022) The main aim of the paper “Enhancing Sustainable Cosmetics Brand Purchase: A Comprehensive Approach Based on the SOR Model and the Triple Bottom Line” is to study the factors that impact economic, social, and environmental sustainability on brand attachment and activeness that will further have a correlation Word of Mouth, enhances the buying intention, and finally leads to join the online brand communities. The Triple Bottom Line and SOR model was used for the same, quantitative research was conducted

via an online questionnaire, and 1632 valid responses were received by snowball sampling. The hypothesis concluded that economic, social, and environmental factors had a strong positive relation with word of mouth and buying intention and helped join online brand communities. It further suggested that a proposed model using probability sampling can be used and should focus more on conducting longitudinal studies and performing more advanced data analysis.

26. (Ghazalia, Soonb, Mutumc, & Nguyend, 2017) The paper **Health and Cosmetics: Investigating Consumers' Values for Buying Organic Personal Care Products** aims to extend **the Theory of Planned Behavior** by including the perceived value dimensions as a predecessor of consumer's attitude. For the same, a survey was conducted on the factors that influenced the consumers' attitude and their intention for re-purchasing organic PCP who purchased within 12 months by probability purposive sampling method, and 343 responses were collected from organic shops, events, and the members of Malaysian organizations. Further, Harman's Single-factor test was used to access Common Method Variance (CMV); CMV is used when all variables load on one factor or other factor, explaining most of the variance. The hypothesis concluded that consumers perceived value construct-health, safety, hedonic, and environment with the behavior towards re-purchasing organic PCP. In contrast, social value was unimportant in forecasting the attitude; subjective norms also did not support the re-purchase intention. Attitude was the most critical predictor, followed by perceived Behavioral control, product knowledge, hedonic values, and environmental and safety values.

27. (N. & S. S, 2020) The study's primary aim, "Factors Influencing on Purchase Intention towards Organic and Natural Cosmetics," was to obtain knowledge regarding consumer attitude, subjective norms, and perceived behavioral control against the buying intention of organic and natural cosmetics. For the same, exploratory research was conducted among 15-year-old consumers in Colombo, Sri Lanka, and 200 respondents responded via a close-ended questionnaire. Data was analyzed by multiple regression in SPSS 19 software. The hypothesis concluded that **the theory of planned behavior** predictors and experience are strongly correlated with the buying **intention for organic** cosmetic products thus from the respondents,

consumer attitude is considered the best predictor while purchasing green cosmetic products, which can be further helpful in buying behavior, followed by the subjective norm of buying intention while purchasing green cosmetic products. It suggested creating a positive attitude while purchasing green cosmetic products for retailers to increase consumers' intention for green cosmetic products.

28. (*Maria, 2011*) In the paper “Attitudes And Intention Toward Organic Cosmetics In Greece: An Exploratory Study,” the focus was to examine the effect of environmental awareness/ consciousness, health, appearance, eco-literacy, and interpersonal influence on the consumer's attitudes while buying green cosmetics in Greece. For the same, a survey was conducted via a questionnaire of around 100 Greek consumers; the data was further analyzed by SPSS 19.0. Regression analysis was also used to test the relationships among the variables. From the hypothesis, it could be examined that environmental consciousness and information are the keen predictors of the consumer's attitude while buying green cosmetic products. In contrast, health consciousness, appearance, and eco-literacy do not impact the consumers' attitudes. The paper further suggested that marketers should develop efficient and improved strategies by adequately communicating the environmental benefits of green cosmetic products.

29. (*Recker & Saleem, 2014*) In the study “The Effects of Consumer Knowledge and Values on Attitudes and Purchase Intentions- A Quantitative Study of Organic Personal Care Products Among German Female Consumers,” the focus was to study the effect of the various types of consumer knowledge and the values on their attitude while purchasing the organic personal care products and their buying intentions of the same, also to make theoretical contribution in the research while buying the green/organic products, for the same a quantitative research was done by convenience sampling method of German female consumers via online questionnaire and 207 sample from 265 consumers were received. The data was analyzed using SPSS software. Tests were conducted using Cronbach's Alpha and Pearson correlation analysis and other regression analyses. The hypothesis concluded that consumers' environmental literacy, experience with organic personal care products along with environmental consciousness, health consciousness, and animal test well-being had a positive correlation on the attitude while purchasing

green/organic personal care products, whereas the buying intention while purchasing the organic personal care products towards consumers environment literacy had a negative impact. The study suggested that the practitioner's researchers must target enhancing consumers' experience and environmental literacy to enhance the consumers' attitudes while buying organic personal care products.

30. (*Bayaah Ahmad, 2018*) The main aim of “Female Consumers’ Attitude towards Natural Beauty Products: Malaysian Perspective” was to examine the female consumer perspective <sup>43</sup> on health and the environment. For the same, data was <sup>28</sup> collected from the women who had been using green cosmetic products for the last three years via questionnaire to understand green cosmetic products better and their consequences on the chemical substances in traditional/ conventional products. Regression analysis determined the buying intention while purchasing green cosmetic products. The hypothesis concluded that the three variables positively correlated with the women buying green cosmetic products. Another dimension of the consumer's attitude included the perceived health and environmental consciousness, where health consciousness played a keen role along with the highest variance value followed by environment consciousness. It is firmly recommended that both variables be included as leading indicators when purchasing green cosmetic products. Further, it suggested that retail cosmetic stores implement marketing strategies by focusing more on ecological beauty to satisfy the consumer's value.

31. (*Pudaruth, Juwaheer, & Seewoo, 2013*) The study “Gender-based differences in understanding the purchasing patterns of eco-friendly cosmetics and beauty care products in Mauritius: a study of female customers” was conducted to inspect the factors that influence the buying behavior patterns of eco-friendly cosmetic products along with the beauty care products among the female consumers in Mauritius. An exploratory factor analysis survey was conducted among 150 female consumers via 35 attributes in apprehensible factors affecting the buying behavior patterns of eco-friendly cosmetic products. For the same, data was analyzed by multiple regression to examine women's Behavioral intentions while purchasing green cosmetic products. The hypothesis examined that the buying behavior

patterns for eco-friendly cosmetics and beauty care products were influenced by the eight factors- women's lifestyle, health and economic considerations, ethical consumerism among female consumers, pharmacological importance, visual appearance, price consciousness, belief in the ethical claim, brand image and user experience, sales representative, and social influence. <sup>43</sup> It can be observed that female consumers have been putting more emphasis on their lifestyle, health, and economic considerations while buying green cosmetic products. It is strongly recommended that cosmetic dealers develop a better and more detailed understanding of the factors affecting buying behavior for eco-friendly and beauty care products.

32. (Shaw & Lahiri, 2022) The main aim of the study "Female Consumers Notion Concerning Nearness of Inhibitors, Facilitators and Purchase Intention: A Study on Eco-friendly Cosmetics in Kolkata" was to examine the variables (traditional barriers, value barriers, risk barriers, usage barriers) that affect the female consumers buying decision while purchasing the eco-friendly cosmetic products. For the same, data was collected quantitatively via an online survey, which included factors like Facebook and WhatsApp for the women who were using green cosmetic products from the experience. Out of the 362 respondents, 308 were considered valid responses. <sup>21</sup> The data was analyzed using SPSS software under regression analysis for inhibitors and exhibitors buying green cosmetic products. The hypothesis concluded that traditional barriers, value barriers, risk barriers as well and usage barriers do not have a positive relation on consumers' buying intention while purchasing green cosmetic products; it is also implied that <sup>76</sup> consumers who are more concerned about the environment and the health that are about to use more eco-friendly or green cosmetic products. As the survey was conducted in Kolkata city only and that of female consumers, the results obtained <sup>166</sup> may have been more appropriate if a sample size had been taken. The study suggested using innovative resistance theory as it will help in the detailed analysis of resistance from the consumer's point of view.

33. (Tun, 2019) The study "Consumers Behavior Intention towards Organic Cosmetics in Yango" mainly aimed to analyze <sup>37</sup> the factors that affect the consumers' attitudes and the subjective norm while purchasing green/ organic cosmetic products in Yango. For the same, the survey was collected from 8 organic/green cosmetic

shops, whereas the sample size was 385 respondents via a structured questionnaire along with a five-point Likert scale. The predecessor factors were environmental, health, appearance, eco-literacy, and interpersonal influence; they are further believed to be affected by consumers' attitudes and subjective norms. From the hypothesis results obtained, it can be examined that consumers' attitudes and the subjective norm do have an important role to play, and the primary determination of consumers buying intention was the subjective norm; it further can be examined that health consciousness, appearance, eco-literacy, and interpersonal influence had a strong positive relation on the consumer's attitude and subjective norms of the consumers buying green cosmetic products. The study suggested that more focused research could be done on specific groups of respondents as different age groups may have varied attitudes and requirements from the cosmetic products as well as find a unique way to cater to the green cosmetic needs of the consumers in the packaging, easy to carry while traveling and many other niche issues.

34. (Tewary, Gupta, Mishra, & Kumar, 2020) The main aim of “Young Working Women’s Purchase Intention towards Organic Cosmetic Products” was to evaluate the factors that affect the consumers' health, environmental health, price sensitivity, brand availability, which are organic, and the consumer's attitude while purchasing green cosmetic products. A non-probability sampling method was used, and a structured questionnaire was prepared; 166 responses were obtained. The data was further analyzed by factor analysis using SMART PLS software. From the hypothesis, it can be examined that environmental consciousness, health consciousness, availability, brand, and price consciousness can be influenced/affected while purchasing green cosmetic products. Also, it can be seen that more and more consumers have started switching to green/organic cosmetic products. Though a few consumers feel that the prices of such organic cosmetic products are high, there is an immense opportunity for green cosmetic products to create new strategies that could motivate consumers to purchase green cosmetic products. The study suggested from the data analyzed that the green/organic cosmetic industry should focus on products that consider the environment and health.

35. (*Acharya & Bali, 2021*) The paper “Green Cosmetic: Trends, Challenges and Future Scope in India” discusses the trends, challenges, and the future of green cosmetics in India; it examines explicitly the shift towards natural and organic products because of environmental concerns and consumer demand. The methodology used in this paper is secondary data sources, including academic articles, industry reports, and news articles, to understand the current state of green cosmetics in India. The data collated concluded that the organic beauty sector in India is projected to grow by 17.27% between 2017 and 2022. The paper's authors suggested an increasing demand for natural and organic cosmetics in India, but the marketers need to address their challenges in formulating products with limited raw ingredients by targeting a widely dispersed consumer base. The findings of the paper are considered limited by the quality and availability of the data sources as the paper does not provide any research based on primary sources, which might limit the study's depth and scope. Thus, as can be seen, the demand for green cosmetic products seems to be increasing, so marketers should try to develop new strategies for the future scope of the green cosmetics industry.

36. (*Kapoor, Singh, & Mishra, 2019*) The paper “Green Cosmetics - Changing Young Consumer Preference and Reforming Cosmetic Industry” focuses on the factors motivating consumers to purchase green cosmetics in Delhi and NCR of India. For the same, a structured survey was conducted of 150 respondents covering Delhi, Ghaziabad, Faridabad, and Noida. A non-probability-based convenience sampling method was used to collect the data, and SPSS 18 software was used to analyze the data. The Cronbach alpha reliability test was conducted to test the correlation between the construct and the items to ensure consistency of every factor. A multiple regression technique was also used to describe the comparative importance of the factors while predicting and examining the overall satisfaction of young consumers. The hypotheses and the study concluded that various factors motivate consumers to purchase green cosmetics, including health concerns, environmental awareness, and personal values. On the other hand, the study also examined that consumers faced several problems while shifting from non-green cosmetic products to green cosmetics, i.e., lack of awareness, high price, and availability issues. The study further suggested that marketers need to adopt such strategies for segmenting,

targeting, and motivating the vast and diversified consumers. Also, the method used for non-probability sampling might restrict the generalization of findings.

37. (*Santos, Antonio, & Chorilli, 2015*) The paper “Sustainability, natural and organic cosmetics: consumer, products, efficacy, toxicological and regulatory considerations” aims to discuss and examine the importance of sustainability and natural products in the cosmetics industry. It specifically highlights the need to evaluate natural products' efficacy and toxicological aspects. It focuses on the lack of harmonization in the guidelines of the agencies that have certified themselves for their proper regulatory compliance. For the same, the paper cites different sources, including regulatory agencies, industry reports, and scientific studies; thus, secondary data was used. As it was a review paper, it was examined that the consumers have been looking for products with less impact on the environment. However, the cosmetics industry responds to the demand by formulating products and packaging analytically that cause the least environmental harm. There is a lack of cooperation between certification agencies, and regulatory compliance is necessary to ensure the safety and efficacy of cosmetic products. The paper suggested that many natural/ organic products may be used in cosmetics that perform a biological function and toxicological examination. In comparison, the use of plants and herbs will tend to increase in the market of cosmetic products with more sustainability so that companies may acquire a larger share in the green cosmetic industry.

38. (*Annis, 2011*) The paper “Organic Cosmetics Attitude and Behaviors of College Women” examines the readiness of college women to adopt organic cosmetics Behaviors. Two methods were used to examine; the first was a cross-sectional study that used the Transtheoretical model to assess the readiness of college women while purchasing and using organic cosmetic products for the same 262 college women responded via online survey method. The second method was a mixed-method case study that consisted of two college women involved in semi-structured interviews and cosmetics tracking. From the first method of the survey, the hypotheses concluded <sup>28</sup> that the majority of the women who participated in the online survey were in the maintenance stage for the use of cosmetics (86.3%), 48.9% were in the pre-contemplation stage, 49.2% in the purchasing stage and 32.4% were in reading

cosmetic labels. In the second method, it was examined that the respondents used cosmetic products but were unaware of the regulatory definition of cosmetics. TTM 's Stages of Change construct, as defined by Velicer & Prochaska. It was examined that in both the methods and survey conducted, the organic products had a perceived value, but the organic cosmetics were hardly considered. One of the main limitations of the paper was that it was a cross-sectional study and not a longitudinal study; it would have provided a better understanding of the progress among all the stages of the change. Also, there were only a few participants in the stages of action and maintenance for all three Behavioral levels. Thus, the paper suggested that future studies should consider non-college respondents also as ready for its advantages and disadvantages and attitude while purchasing green cosmetic products as the more significant the audience, the more precise and comparison can be made at a larger scale.

39. (Minero & Diaz, 2018) The paper "The Use of Plants in Skin-Care Products, Cosmetics, and Fragrances: Past and Present" discusses the historical use of plants in personal care cosmetic products and the current use of natural resources, especially plants. The paper aimed to contribute to understanding the use of natural resources in personal care products and the benefits of using plant-based ingredients in cosmetic products. The literature review method was used as authors used information from previously published studies, articles, and books to discuss the historical use of plants for their personal care and current usage of plants. The data provides no new information; it explains the literature on using natural resources for personal use and the benefits of plant-based ingredients in cosmetic products. Thus, the major limitation of the paper is that it is only a literature review and analysis of the previous data, and new data has not been obtained; the paper covers only a tiny amount of plant species used in personal care, it does not provide any comprehensive analysis of the potential risks or drawbacks, and it does not discuss the environmental impact of using natural resources, especially in plants and personal care products.

40. (Rawat & Garga, 2012) The paper "Understanding Consumer Behavior Towards Green Cosmetics" discusses consumer behavior shifting towards eco-friendly products due to the perceived threat of climate change in the environment. The main

aim is to study the potential of green marketing in the cosmetic industry and know the perception of working women towards eco-friendly products, along with the importance of consumer behavior while making the decision process for acquiring and purchasing. For the same, the primary data collection method was used via a survey of 200 working women in Pune, India. The respondents were selected through stratified sampling using a questionnaire and in-depth interviews with the sample. The data was collected by focusing on consumers whose incomes were beyond three lacs, comprising executives, academicians, and workers. The hypothesis concluded that despite the higher prices of eco-friendly cosmetic products, working women have been willing to pay for environmentally friendly products despite the demographic and economic factors. The paper concluded with an examination that green marketing is a potential solution for reducing the impact of climate change, and the cosmetic industry can play an important role by promoting eco-friendly products. It also highlighted the need to create awareness among consumers regarding the benefits of green products and the challenges faced while implementing green marketing practices, specifically in the cosmetic industry.

41. (Sharma, Trivedi, & Deka, 2021) The main aim of the paper “A paradigm shift in consumer behavior towards green cosmetics: an empirical study” was to measure consumers' awareness level and intention while purchasing green cosmetic products in Delhi/NCR. For the same, primary data was collected via questionnaire in a structured manner, and out of the 160 responses received, 141 were considered valid responses. Five hypotheses in the paper and statistical tools used for analyzing the data were mean, one sample test, one-way ANOVA table, correlation, and regression analysis. The hypothesis concluded that there was a positive relationship between consumer awareness and the intention of the consumers to purchase green cosmetic products; environmental sustainability and health factors motivated the consumers to buy green cosmetic products. On the other hand, the company's claims and high pricing of green cosmetic products demotivate them from purchasing. One of the study's main limitations is the geographical constraints; thus, while doing further research, the sample size and location must be considered.

42. (Indra, Balaji, & Velaudham, 2020) The paper “Impact of Social Influence And Safety On Purchase Decision Of Green Cosmetics” aims to understand the impact of social influence and their safety while buying green cosmetic products. The paper takes in all the concerns of buying behavior, from pre-buying behavior to post-purchase behavior, assessment, and all the other activities. It also considers the people who are directly or indirectly involved in the buying decisions, including brand influencers and leaders. For the same, a pilot survey was conducted among 50 female teachers of a school in Tamil Nadu. The descriptive research design was used, and the primary data collection was conducted via a structured questionnaire. For analyzing the data, path analysis was used to identify the influence of social influence and safety on the purchasing decision of green cosmetics. The hypothesis concluded that safety and social influence influenced consumers’ buying decisions when considering green cosmetics. However, the study found no relation between the influence of safety or purchase decisions on consumer satisfaction while purchasing green cosmetics. The paper suggested that future research should focus on the impact of price on the buying decision of green cosmetics and other factors that may influence the consumers' buying behavior.

43. (Akter & Islam, 2020) The paper “Factors Influencing the Attitude of Women Towards Purchasing Green Products: An Exploratory Case Study of Organic Cosmetics in Sweden” examines the factors influencing women’s attitudes while purchasing green cosmetic products in Sweden. A quantitative data collection method was used via an online survey of 220 women in Sweden. The data was analyzed using the theory of planned behavior (TPB), considering the factors influencing women’s attitudes toward purchasing organic cosmetic products. It concluded that consumers' attitudes toward green cosmetic products had a positive relation. It was also examined that education and income levels positively related to attitude and future purchase intention. The study considered only internal influencing factors and did not include any external factors important to fully understand green consumers and their attitudes while purchasing green cosmetic products.

44. (Borges & Paananen, 2020) In the paper “Consumer Perception and Purchasing Behavior Towards Green Cosmetics A Market Research,” the main aim was to

examine the intentions of the consumers. At the same time, they purchase traditional cosmetic products and green cosmetic products, and how the consumers perceive their quality and integrity, global eco-certifications, and standards used were also analyzed for their accuracy and what “green” means. For the same, a literature review was studied to identify the difference between green and traditional products. The data was collected via a cross-sectional, close-ended survey shared online via Facebook, Instagram, and Twitter, and 140 valid responses were considered for data analysis. Excel pivot charts analyzed the data. The hypothesis concluded that knowledge of eco-certifications had a positive relation to consumers' buying decisions, green cosmetic products should focus more on the quality and transparency of the products, and the respondents who followed influencers or trends had a positive attitude towards purchasing green cosmetics. There were many limitations in the survey; it further suggested that brands or products the consumers trust more, and also a larger sample size should be considered for more accurate results.

45. (Paramita & Saputri, 2022) The main aim of the paper “The Influence of Brand Loyalty on Customers’ Repurchase Decisions of Green Beauty Products” is to identify the relationship between green cosmetic products and the consumer's repurchasing decisions and the intervening variable brand loyalty. For the same, a study was conducted via purposive sampling, and a questionnaire was given to 236 consumers, especially Body shop users. The data was analyzed using SEM analysis and SPSS software. The hypothesis concluded that green cosmetic products had a positive relationship while consumers repurchasing decisions and brand loyalty mediated their relationship; consumers are willing to pay more for green cosmetic products as long as they trust the brand. One of the main limitations of the paper is that it has a marginal fit result for one indicator, the AGFI, in terms of structural model fit.

46. (Nguyen, Nguyen, & Vo, 2019) The main aim of the paper “Key Determinants of Repurchase Intention toward Organic Cosmetics” is to identify the factors that influence the repurchase of green cosmetics in Vietnam, and the main segment that has been focused is demographic (gender, age, income, educational qualification, type of product, production). For the same, based on previous literature review,

twenty scales were designed to match the 5-point Likert scale for measurement. The data was collected via a survey among 295 Vietnamese consumers who had experience using green cosmetic products. The data was analyzed using PLS-SEM (Partial Least Squares Structural Equation Modelling). The hypotheses concluded that there has been a positive relationship between the attitude of consumers and their intention towards acquiring green cosmetic products, green perception, and consumer satisfaction. The results also provided helpful information for businesses to determine the factors influencing their decision to purchase green cosmetic products and develop new marketing strategies.

47. (Singhal & Malik, 2018) The main aim of the paper “The Attitude and Purchasing of Female Consumers Towards Green Marketing Related to Cosmetic Industry” is to examine the relationship between the attitude and the consumer buying behavior of females using eco-friendly cosmetic products and the impact on the demographic factors, i.e., age, income, and education. For the same, data was collected by primary and secondary research. For primary data, a structured questionnaire was formed for responses from women of Delhi, and 100 responses were received (cluster analysis was used to group the females) by the questionnaire method. The data was analyzed using SPSS software, and factor analysis was used to combine the correlated variables and multivariate tests, chi-square, and correlation to find the objectives. The hypothesis concluded that female consumers of varied ages and education do not have different attitudes towards green cosmetic products, whereas the income factor had an impact. Another hypothesis concluded that a positive correlation existed between green cosmetic products and the buying behavior of female consumers. The last hypothesis concluded that there had been a negative or no relation between the attitude and female consumers while buying green cosmetic products. One of the main limitations of the paper is that the variables considered were only age, income, and education, and the marketing strategies can be changed or re-framed as there are high chances for an increase in the demand for green cosmetic products.

48. (Jaini, Quoquab, Mohammad, & Hussin, 2019) The paper “Antecedents Of Green Purchase Behavior Of Cosmetics Products: An Empirical Investigation Among Malaysian Consumers” aimed to understand the factors that affect the green buying

behavior of Malaysian consumers, specifically in the cosmetic industry. It also examines the altruistic and hedonic values and the mediating factor of personal and environmental norms. The exact, non-probability sampling data was collected via a self-administered online questionnaire; 150 responses were considered for the analysis. The data was analyzed by structural equation modeling by partial least squares via smart PLS version 3.7. The hypothesis concluded that altruistic and hedonic values positively impacted personal and environmental norms. It also found that personal and environmental norms mediated <sup>47</sup> the relationship between values and green purchase behavior. The study will be helpful to marketers and policymakers in executing better marketing strategies.

49. (Santos, Brito Silva, da Costa, & Batista, 2023) The paper “Go Vegan! Digital Influence And Social Media Use In The Purchase Intention Of Vegan Products In The Cosmetics Industry” mainly focuses on the relationship between the source credibility and social media usage and the consumer's intention to purchase green/vegan cosmetic products. For the same, primary data was collected via an online survey through a close-ended questionnaire, to which 190 valid responses were considered for analysis. Based on the previous literature review, the questionnaire was developed based on the intention scale, social media usage scale, and other source credibility scales. The data was analyzed via a cross-sectional survey, and Structural Equation Modelling (SEM) <sup>40</sup> was used to analyze the relationship between the variables; a pre-test was also conducted to evaluate the robustness of the questionnaire. To this, the hypothesis concluded that both the source credibility and the social media usage had a positive relation while the consumers ought to purchase green cosmetic products. Also, digital influencers can shape consumers' purchase intentions. One of the limitations of the paper is the single use of a cross-sectional survey method that prevents the evaluation of the evolution of consumption behavior. The authors further suggested that more dimensions should be considered for digital influence, such as authenticity and personality.

50. (Lee MS & Kwon, 2022) The main aim of the paper “The Significant Value Of Sustainable Cosmetics Fragrance In The Spotlight After COVID-19” was to examine why consumers have been paying more attention to more sustainable fragrances after COVID-19. For the same, a narrative approach was applied in the

study, and the review article was a literature review. Journal search engines, including PubMed, Google Scholar, Scopus, and RISS, were chosen, and 598 references were selected between 2004 and 2022, from which the PRISMA flowchart was used to complete 39 publications effectively. The hypothesis concluded that due to the changes amid COVID-19, there had been an increase in bad breath due to an increase in mask-wearing, and thus, there had been a need for fragrance because of mental health. Thus, the paper examined the perspective of cosmetic fragrances and essential marketing material.

51. (Minh Duyen, 2020) In the paper “Factors Influencing Finnish Generation Z Consumer Behavior Towards Green Purchase of Cosmetics,” the main aim is to examine the factors that affect the consumption intention of green cosmetic products among Gen-Z in Finland. The methodology used in the paper was mixed, including questionnaires and interviews. To this, 67 respondents were considered valid for data analysis between the age group of 15 to 25 years. Quantitative data was analyzed using SPSS 18 and the Cronbach alpha reliability test was conducted to determine the relationship between the constructs and internal consistency for each factor. Thematic analysis was used for qualitative data analysis. The hypothesis concluded that perceived consumer effectiveness, eco-certification, social norms, and reference groups positively impacted Generation Z. On the other hand, perceived behavioral control did not impact green cosmetic consumption. The authors of the paper suggested examining the different types of green cosmetic products buying intention, role of social media, attitudes and behavior, and all the cultural factors on green cosmetic consumption among Generation Z.

52. (Lestari, 2020) The paper “Green Cosmetic Purchase Intention: Impact of Green Brands, Attitude, and Knowledge” included four variables: green brand positioning, green brand attitude, green brand knowledge, and green cosmetic buying behavior concerning increasing demand and need for sustainability in the cosmetic industry. For the same, primary data was collected, and 180 respondents aged 18 to 40 years in Indonesia were considered valid. The data was analyzed based on validity, reliability, normality, and goodness to fit with the Structural Equation Model (SEM) tool and AMOS software version 23. The hypothesis concluded that from the four variables, Green brand positioning, green brand attitude, and green brand

knowledge had a positive relation with the buying behavior of green cosmetics. Moreover, it also examined whether the consumers would be interested in buying green cosmetic products if they had been provided with knowledge. The authors suggest that more variables could be added, considering the brand image and more samples should be considered for more specific results.

53. (Kar, 2022) The paper “Consumer Purchase Features Toward Natural Cosmetics In Online Environment” examines the impact of social media on the buying behavior of green cosmetic products. For the same, a self-structured questionnaire used the primary data collection method, and secondary data included research journals, books, and websites. One hundred female consumers aged 17 to 55 responded via the online survey questionnaire from Delhi NCR. From the data, 80% of the sample were aware of green cosmetic products, and 62% were already using them. Detailed charts and graphs were used to analyze the data further. The results showed that social media positively impacted the intention of consumers to buy green cosmetic products. It also concluded that social media promotions, celebrity endorsements, and product reviews indeed affected/ influenced the buying behavior of consumers buying cosmetic products. The authors suggested exploring the impact of social media while buying green cosmetic products, creating more awareness regarding green products that affected trust in green products among consumers.

54. (Snipiene & Jankauskienė, 2021) The main aim of the paper “Organic Personal Care Cosmetics: Behavior Of Choice And Consumption” was to examine the buying behavior of consumers who chose and used organic cosmetic products based on socio-demographic factors. A quantitative method was used, and a questionnaire was circulated for primary data collection. Three hundred thirty-five responses were considered valid based on the responses received. The data was analyzed by percentage frequencies, chi-square, mean, and correlation, and the tool used was SPSS version 26.0. It was examined that more than half of the women used organic cosmetic products, and the main reasons were health benefits, natural composition, recyclable packaging, and non-polluting products. The reasons for not choosing green cosmetic products were expensive and unclear labels. Thus, the hypothesis concluded that education and income did not affect their choice of not selecting green cosmetic products, and gender and age did affect the consumption of green

cosmetic products in choosing the different kinds of products. One of the main limitations of the paper is the lack of eco-certifications and packaging labels on green cosmetic products.

55. (*Genovese & Green, 2021*) In the paper “Cosmetics Gone Green - A Quantitative Experimental Study On Green Promotional Cues And Consumers’ Purchase Intention,” the author aims to understand how green promotional cues can impact consumers' belief and buying intention of green cosmetic products. For the same, the authors used a quantitative method via an online self-administered primary data questionnaire; 325 respondents responded. The data was analyzed using SPSS software to examine the relationship between green promotional cues and consumers' beliefs when buying green cosmetic products. The hypothesis concluded that intrinsic cues had a more substantial positive relation to green cosmetic products than extrinsic cues. The extrinsic cues had a strong influence when the subjective norms of the consumers were considered. The authors suggested that qualitative studies of consumer perspectives related to intrinsic and extrinsic cues could gain a deeper understanding of specific variables and generate more explicit and practical managerial implications.

56. (*Baptista, 2021*) The main aim of the paper “How Inner Motivations Can Influence the Purchase Intention for Green Packaged Cosmetics” is to understand how consumers' internal factors such as self-esteem, self-identity, morals, product ownership, purchase intention for eco-packaged cosmetic products, their willingness to pay and intention to buy the green cosmetic product. The author uses primary and secondary methods to see whether there is cause and effect link between the variables and the research questions. A survey questionnaire was circulated for primary data, and specific journals were chosen for secondary data. The data was analyzed Structural Equation Modelling and using Smart PLS 3.2.7. The hypothesis concluded that personal norms and self-identity indirectly affected the consumers' buying intention for eco-packaged cosmetics and their willingness to pay. The factors had a positive relation that depended on the variables and the willingness to pay and buy green cosmetic products. The author suggested to focus on more scales for further research.

57. (Nell, 2021) The main aim of the paper “An Exploratory Study On Consumer Attitudes Of Capetonian Female Millennials’ Towards Natural Skincare Product Consumption” is to examine the attitude of female millennial consumers while purchasing green cosmetic products, thus the factors that aims to understand the attitude of the consumers, for the same, quantitative research methodology involved semi-structured interviews and a thematic content analysis approach. Six female millennials were selected for semi-structured interviews based in Cape Town, Africa. The data was analyzed using qualitative thematic content analysis. To this, the hypothesis concluded that female millennial consumers had a positive relationship while purchasing green cosmetic products. It also concluded that factors such as product efficacy, affordability, and availability influence the buying behavior of natural skincare products. One of the main limitations was that the study was exploratory, interpretive, and not generalized. The authors suggested that a trust factor should be established among the consumers and their products, and the behavior of the consumers should be studied via focus groups, taking more samples in the future.

58. (Ayoub & Metawie, 2022) The paper “A Proposed Model of the Impact of Green Image on Green Loyalty: Application on Natural Cosmetics in Egypt” examines the impact of green brand image on loyalty through trust and satisfaction and how demographics mediate the relations. The methodology used in the paper conducted a pilot survey by collecting data from an online survey of female consumers; 284 responses were collected, and Structural Equation Modelling (SEM) was used to analyze the data. The hypotheses were about demographics such as age, income, and education level. All hypotheses had a positive impact except the relation between consumer satisfaction and environmental value; income had a relatively modern relationship between trust and consumer satisfaction. The authors further suggested that factors such as green pricing strategy should be considered, which might affect the green image and consumers' decision-making while purchasing green cosmetic products. It also suggested to focus on the male consumers.

59. (Wilson & Edelyn, 2022) The paper “Predicting Indonesian Consumers’ Intention To Buy Green Cosmetics Using The Modified Tpb Framework” focuses mainly on

Indonesian consumers and their intentions. At the same time, green cosmetic products should be purchased using the modified version of TPB (Theory of Planned Behavior). The data was collected by questionnaire using Google Forms, using a non-probability sampling method in purposive sampling. From all the responses received, 732 were considered valid responses for analyzing the data. The PLS-SEM method analyzed the data with Smart PLS 3.3.8 software. This method was specifically used for measuring the validity, reliability, and their impact on the variables. A mediation analysis was also conducted to assess the effect of attitude, subjective norm, and perceived price on purchasing green cosmetic products. The hypothesis concluded that attitude, perceived price, and subjective norms had a positive relation when purchasing green cosmetic products. The results obtained showed that the data was valid and reliable. It was also found that buying behavior impacted attitude, subjective norms, and perceived price when purchasing green cosmetic products.

60. (Charisma Mae, Maria Esmeralda C, & Jhonrhes A., 2019) In the paper “Green, Organic Cosmetics Purchasing Behavior of Residents in Metro Manila,” the main aim was to examine the factors that affected the buying behavior of Manila residents when purchasing green cosmetic products. For the same, data was collected via an online survey through a questionnaire; the target sample was 300 respondents, of which 314 responses were received and translated into Microsoft Excel. The hypothesis concluded that the consumers' attitude was one of the most critical factors for behavior intention; the consumer's value had a positive relationship between attitude and intention while buying green cosmetic products. The combination of subjective norms perceived emotional control, and attitude substantially impacted the buying of green cosmetic products. One of the main limitations of the paper was that it focused mainly on consumer values and attitudes toward buying intention; also, the data collected was limited to 18 and above. Thus, the authors suggested that further research must focus on more factors that affect the consumer's intention to buy green cosmetic products, such as price, quality, and reputation, and also promote varied marketing strategies while promoting green cosmetic products.

61. (T & L, 2021) The paper “Factors Affecting the Purchase Intention of Cruelty-Free Cosmetics: with special reference to Women Consumers in Colombo District, Sri Lanka” aims to examine the factors that affect the buying behavior of cruelty-free cosmetic products by female consumers in the Colombo district of Sri Lanka. A quantitative research approach was used, and the study developed a conceptual framework with five variables (financial sector, social media, altruism, environmental knowledge) along with one dependent variable (Purchase Intention); the data was collected via a questionnaire to which 202 respondents responded. The data was further analyzed using IBM SPSS software and analyzed by analysis, normality, reliability, multicollinearity, and correlation. The hypothesis concluded that factors such as the financial sector, social media, altruism, and environmental knowledge did not influence buying behavior when purchasing cruelty-free cosmetic products. One of the main limitations was that the study did not consider the cultural and social factors that might influence the buying intention of cruelty-free cosmetic products. Thus, the paper suggested that more factors should be identified for further research.

62. (Kumar & Kumar, 2019) In the paper “A Study Of Consumer Behavior Towards Chemical And Herbal Cosmetics Products And Its Impact On Marketing Strategies,” the main aim was to examine the impact of consumer behavior and marketing strategies while buying green cosmetic products; it also aims to show understanding demand for the consumers buying the cosmetic products. The data was collected via a questionnaire, and 153 respondents responded by convenience sampling. Secondary data was collected from books, journals, magazines, and web resources. The data was analyzed using the KMO Measure of Sampling Adequacy and Bartlett’s Tests of Sphericity, Reliability Test, Correlation, Regression, and ANOVA. The hypothesis concluded that consumers became more aware of the products and preferred organic cosmetic products due to natural ingredients. It also found that brand, quality, price, and recommendations from friends positively affected the consumers while purchasing green cosmetic products. For further research, it was suggested that the sample size should be more diverse and more cultural and social factors should be considered while considering the consumers' buying intention.

63. (*V & Aithal, 2022*) The paper “A Study on Performance Evolution of Indian Eco-friendly Cosmetic Brand: Mamaearth” examines and discusses explicitly the performance analysis of Mamaearth, a brand that produces toxic-free products. The study has used secondary data and conducted qualitative research from published sources such as research papers, newspapers, books, and articles. The data was analyzed to evaluate Mamaearth's marketing strategy, SWOC analysis, and corporate social responsibility. The data analyzed concluded that Mamaearth was indeed a toxic-free brand, and the standard quality of all of its products is maintained for the parents and babies. The authors suggest that Mamaearth needs to expand its business operations and customer services and diversify more varied products according to a large demographic segmentation; it also examined the positive impact of how the company has introduced green initiatives for the environment and making its efforts towards making an impact by Corporate social responsibility.
64. (*Atta, Abbas, & Syed, 2021*) In the paper “Study of Consumer Values for Organic Personal Care Products in the Fields of Health and Cosmetics,” the main aim was to focus on health, safety, environment, and hedonic and social values that would affect consumers' intention while buying green cosmetic products. For the same, a simple random sampling method was used to collect data, and the data was collected via a questionnaire, where 300 respondents who used organic products were questioned. Data was analyzed by SPSS and PLS software. The hypothesis concluded that perceived value impacted the consumers while they purchased green cosmetic products. It also examined that hedonic values had a positive relation. At the same time, consumers purchased green cosmetic products; environmental values did not have a positive relation, and health value also did not have a positive relation while consumers purchased green cosmetic products. One of the main limitations was that the consumers did not consider factors such as price, availability, and convenience. The authors suggested conducting a qualitative study with a deeper understanding of the consumers' needs and examining the social and cultural factors.
65. (*Kamila Nadim & Jani, 2021*) The main aim of the paper “Millennial's Behavior And Attitude Towards Natural Cosmetics: A Case Study In Universiti Malaysia

Terengganu” was to examine consumer behavior and their attitude and readiness while buying natural cosmetic products who were willing to switch from synthetic products to natural products among a university in Malaysia. The quantitative research method was used to collect the data via a close-ended questionnaire through an online survey. It was for the age group of 18 to 30 years old, and 521 responses were received via the questionnaire circulated. Microsoft Excel analyzed the data, and the percentage of respondents was used for each category; chi-square was used to find out the difference between fractions of the respondents. The data analyzed showed that 79% of the respondents claimed they used natural cosmetics, and 86% had a habit of reading the labels. However, they were unaware of differentiating between synthetic and natural cosmetic products. The study lacked demographic data and other variables that would influence the consumers while purchasing natural cosmetic products. The study suggested that suitable methods for future research should be used for green lifestyle consumer behavior and that companies should focus more on local natural cosmetic products.

66. (Kian & Chia, 2021) In the paper “Consumer Purchase Intention for Organic Personal Care Product,” the main focus was to examine the factors that affected the buying behavior of Generation Y while using organic cosmetic products in Malaysia. Eight variables were used: attitude, subjective norm, perceived behavioral control, and five demographic features (age, gender, income, education, and race). For the same, the data was collected via face-to-face interviews and online surveys, and 152 respondents were received and considered for further data analysis. The data was analyzed using statistical tools such as reliability test, normality test, ANOVA, Multi-linear regression, and t-test. The authors adopted the theory of planned behavior and demographic factors to examine consumers' buying behavior while purchasing organic cosmetic products. The hypothesis concluded that the attitude of the consumers and subjective norms had a positive relation between consumers buying organic cosmetic products among Generation Y Malaysian consumers; there was a difference in the buying intention based on demographic factors such as age, gender, income, education, and race. The study suggested that more variables, as well as experience, should be considered for future research.

67. (Mansoor, Saeed, Kartawinata, & Khan, 2022) In the paper “Drivers of Green Buying Behavior For Organic Skincare Products Through An Interplay Of Green Brand Evaluation And Green Advertisement,” the main aim was to examine the impact of green brand knowledge and the credibility of consumers. At the same time, they purchase green cosmetic products, especially skincare products, and it also examines the role of advertising on the consumer's evaluation of the brand. For the exact, multi-stage random sampling was used in Rawalpindi and Islamabad of Pakistan to collect data on organic skin care products that often visited the shopping malls and markets. To this, 587 responses were collected via surveying, and the same responses were used for analyzing the data. <sup>36</sup> The data was analyzed using Smart PLS software and the researchers used “Heterotrait-Monotrait” ratio (HTMT) to validate the constructs' study. The hypothesis concluded that consumers' knowledge of branding and credibility had a positive relation with the consumers buying green cosmetic products via a mediator green brand evaluation; it also concluded that green advertising played a very significant role while augmenting the consumer's positive evaluation when they purchase green cosmetic products. The authors suggested that further studies can consider more factors that impact social norms and individual buying behavior.

68. (Lili et al., 2022) The study “Celebrity Endorsement, Brand Equity, and Green Cosmetics Purchase Intention Among Chinese Youth” investigates the impact of celebrity endorsement and brand equity on consumers willing to purchase green cosmetic products among young Chinese people. For the same, quantitative data was collected via cross-sectional design through a structured questionnaire circulated on various social media platforms. Three hundred-one respondents responded to it. The data was analyzed by Smart PLS software, which included description analysis, reliability test, validity test, and influence relation; Cronbach's alpha reliability coefficient method was used for measuring AVE's standard and factor analysis, and CR was used for comparison between validity and correlation. The hypothesis concluded that celebrity attractiveness, trustworthiness, and celebrity cause fit positively affected consumers' attitudes while purchasing green cosmetic products. Consumer attitudes are also positively related to the purchase of green cosmetic products. The study suggested that the impact of other factors, such as price, product, design, and packaging, should be considered for future research.

At the same time, when consumers purchase green cosmetic products, the impact of demographic variables such as age, gender, and income should be examined.

69. (Revathi & Vasantha, 2020) In the paper “Factors Affecting Consumer Behavior Towards Purchase Of Cosmetic Products In Tiruchirappalli - A Study,” the main aim was to examine the factors that affected consumers' buying behavior when purchasing green cosmetic products. For the same, a purposive random sampling method was used to select the respondents via a questionnaire, and 100 were selected. In contrast, books, the web, and magazines were considered for secondary data. The same data was analyzed using a simple percentage technique and ranking methods using tables, figures, and charts. The hypothesis concluded that various factors such as brand name, quality of the product price, product packaging, and the specific product's availability positively affected the consumers buying green cosmetic products. The study suggested that companies should try to understand the buying habits of consumers who purchase green cosmetic products and revise their policies and marketing mix while considering all the variables. Also, marketers should prompt the distribution channels for all green cosmetic products to avoid unavailability when needed.

70. (Limbu, Pham, & Nguyen, 2022) The main aim of the paper “Predictors of Green Cosmetics Purchase Intentions among Young Female Consumers in Vietnam” was to find the influence of young Vietnamese women’s intentions while purchasing green cosmetic products. The model used was Information-motivation-behavioral skills (IMB). For the same, data was collected from 433 young female consumers of Vietnam via a self-administered online and offline survey through a questionnaire mainly distributed in public places such as shopping malls, cafeterias, and sports centers. The data was analyzed using the PROCESS macro of SPSS software for mediation and moderation analyses. The hypothesis concluded that green cosmetic knowledge and motivation had a positive relation that positively affected young female consumers while purchasing green cosmetic products; self-efficacy hardly affected the purchase decisions. The IMB model helped us understand the factors affecting green cosmetic products' buying behavior. The

authors suggested that actual green cosmetic purchase behavior should be calculated using a qualitative or mixed-method approach for deeper understanding.

71. (Cervellon, 2011) The paper “Consumers’ Perceptions Of “Green”: Why And How Consumers Use Eco- Fashion And Green Beauty Products” examines the behavior of consumers and their knowledge of green fashion and beauty products. For the same, in-depth interviews and focus groups were conducted with open-ended discussions in Monaco and Canada with questions related to green cosmetic products and eco-fashion. <sup>48</sup> They were asked to explain the meaning of eco-fashion and green cosmetic products according to their understanding, followed by discussions of what provoked them to purchase the same. Finally, they were asked for their perspective on certifications and the labels of green cosmetic products. The data was analyzed using a qualitative approach, and the themes and patterns were further identified via coding and categories. The data analysis concluded that the consumers had a limited understanding of green labels and certifications towards green cosmetic products and eco-fashion; protecting the environment was not considered a priority. In contrast, the consumers purchased green cosmetic products; instead, the respondents were motivated to purchase the products due to personal health and well-being along with social status and maintaining ethical standards. The paper's authors suggested that social norms and peers influence buying behavior while purchasing such products. Thus, the stakeholders and policymakers should promote more sustainable products.

72. (Adels, 2018) The thesis titled “A <sup>16</sup> research into the underlying factors influencing the intention to purchase and the intention to continue purchasing organic cosmetics among German consumers” examines the factors that affect the consumers' buying intention while purchasing green cosmetic products. The study used an online questionnaire to collect data from the consumers. The framework used was the social identity factor and theory of planned behavior (TPB); from the total responses, 256, 120 were organic cosmetic buyers, and 136 were non-purchasers. The data was analyzed using hierarchical regression analyses to test the hypothesis. The hypothesis concluded that the consumers' attitude and perceived behavioral control had a positive relation when the consumers purchased green cosmetic products. For the respondents who were non-purchasers, environmental self-

identity, attitude while purchasing green cosmetic products, and subjective norms were significant predictors; the attitude of brand communication did not influence both purchasers and non-purchasers while purchasing green cosmetic products. Subjective knowledge had a positive relation for both groups. The author<sup>16</sup> suggested that future research should test more factors influencing consumers' buying intention to purchase green cosmetic products.

73. (Acharya, Bali, & Bhatia, 2021) The paper “Exploring Consumer Behavior Towards Sustainability of Green Cosmetics” examined consumers' buying behavior toward sustainability and its impact on well-being. An explanatory approach was used in the paper for data collection via Google Forms, with a significant focus on issues related to sustainable development in green cosmetic products. The respondents were from the cities of Chandigarh, Mohali, and Panchkula, and 250 responses were considered to analyze data from the total respondents received. The data was analyzed in percentages and ratios in Excel and displayed in tables and charts. The data concluded that sustainability and the green cosmetic industry were significant issues. Most consumers who responded considered quality the most critical factor, affecting the consumers when purchasing green cosmetic products. It was also examined that the male community was more aware than female consumers of organic cosmetic products.

74. (Belanger, 2021) The paper “The Comparison of Effectiveness of Social Media Marketing by Brands and Influencers for Organic Cosmetics” aims to compare the effectiveness of social media marketing by the various brands and influencers while buying green cosmetic products; it examines which source is more effective while persuading the consumer's green cosmetic products. For<sup>49</sup> the same, data was collected by convenience sampling via social media platforms such as Snapchat, Instagram, Facebook, and LinkedIn through a survey between the ages of 18-23. One hundred three respondents participated in the survey and were considered for the data analysis. The data was analyzed by one-way ANOVA (analysis of variance) for manipulation check, and all the other essential information of the respondents was displayed in the form of charts, graphs, and tables. An experiment was conducted to compare the Instagram advertisement effect and the brand name of the organic cosmetic product. The hypothesis concluded that goodwill was positively

related to brand and consumer outcomes. It also concluded that brand condition positively impacted the brand condition of consumers buying green cosmetic products.

75. (Vergura, Zerbini, & Luceri, 2019) The paper “Consumers’ Attitude And Purchase Intention Towards Organic Personal Care Products: An Application Of The S-O-R Model” examines the factors that affect consumers' decisions when they purchase green cosmetic products. Six stimuli were considered for the S-O-R- model. An online survey method was used via a self-administered questionnaire among the Italian people; from the responses received from 209 consumers, 161 were valid and taken for analyzing the data ahead. The variables were measured and validated using the scales used in the previous literature. Structural Equation Modelling analyzed the data; internal consistency reliability was measured by Cronbach alpha, and overall measurement was done by the Satorra-Bentler method. The hypothesis concluded that natural content attributes and the quality of the products had a positive relation towards the consumers' attitude while purchasing green cosmetic products. On the other hand, practical and functional attitudes increase consumers' intention to purchase green cosmetic products. The paper's author suggested that longitudinal studies were also recommended to measure the actual behavior of consumers and examine the change in consumer attitudes and perspectives while purchasing green cosmetic products.

76. (Patmmaperuma & Fernando, 2018) The paper “Factors Affecting Consumer Purchasing Behavior Of Ayurvedic Skin Care Products: A Study Of Female Consumers In Colombo District, Sri Lanka” aimed to examine the factors that affected female consumers while purchasing green cosmetic products. For the same, a survey was conducted via a questionnaire for female consumers in Colombo district, Sri Lanka. The theory of Reasoned Action was used to find the relationship between beliefs and attitudes, normative influences, buying behavior, and the consumers' intentions while purchasing green cosmetic products. One hundred fifty female consumers responded and were considered for data analysis. The data was analyzed using uni-variate, bi-variate, and multi-variate analysis along with the mediation effect. The hypothesis concluded that the consumer's beliefs and attitudes had a positive relation when purchasing green cosmetic products; consumers

prioritized Sri Lankan products because of their trust, availability, and ease of accessibility. The authors suggested that sustainability should be considered for further research.

77. (Krishnan, Manimekalan, & Radhakrishnan, 2022) The main aim of “Factors Influencing Repurchase Intention of Organic and Natural Cosmetics for Sustainable Development” was to examine the factors affecting consumers' perceived quality and intention while repurchasing natural and organic cosmetic products. For <sup>49</sup> the same, data was collected via a structured questionnaire of 42 items distributed among the Indian consumers; the questionnaire was randomly circulated via email and other social media platforms, to which 210 consumers responded. Confirmatory Factor Analysis (CFA) was performed for analysis. The hypothesis concluded that there was a positive relation between perceived quality and repurchasing green cosmetic products. In contrast, environmental awareness did not affect green cosmetic products' perceived quality and repurchasing. Factors like perceived value, emotional value, and risk increased the repurchase of green cosmetic products. The paper's authors suggested that further research is needed on the impact of social media, online reviews, and perceived quality while repurchasing green cosmetic products.

78. (Marangon, Tempesta, Troiano, & Vecchiato, 2015) The paper “Sustainable Agriculture and No-Food Production: An Empirical Investigation on Organic Cosmetics” examines consumers' preferences between organic and conventional cosmetic products using choice experiments. It helps find the link between sustainability and the agricultural system through organic cosmetic products <sup>45</sup> in the form of a case study. The method used for the data collection was discrete choice modeling (DCM) based on a random utility maximization framework. It was used by consumers who were using organic cosmetics and conducting face-to-face surveys in Italy. The survey was conducted by four interviewers: organic cosmetic products sold at grocery stores, pharmaceuticals, and food shops, and 520 consumers responded to the questionnaire. The hypothesis concluded that consumers had a positive relationship between purchasing green cosmetic products and being willing to pay a higher price. Various factors influenced the consumers' preferences, including green cosmetic products' origin, certification, and

ingredients; it also concluded that educated consumers were more likely to be aware of environmental concerns.

79. (*Quoquab, Jaini, & Mohammad, 2020*) The paper “Does It Matter Who Exhibits More Green Purchase Behavior of Cosmetic Products in Asian Culture? A Multi-Group Analysis Approach” examines the factors that affect the purchasing behavior of green cosmetic products of Malaysian consumers using the Value Belief norm. It also examines the moderating effect of gender on the value-belief-norm relationships. For the same cross-sectional survey using Harman’s single factor technique, 240 consumers responded to the survey. Further, the data was analyzed using the Structural Equation Modelling (PLS-SEM) approach MGA technique as they may handle complicated mod with direct and indirect relationships. The hypothesis concluded that all the constructs had a positive relation, and gender moderators had a positive relation between altruistic values and pro-environmental. Gender did not have any link between hedonic values and pro-environmental. The paper's authors suggested that for future research, other demographic factors such as age, education, and income level could be moderators for gaining more insights while buying more green cosmetic products.
80. (*A.G, J., S., R.C, & K.J, 2016*) In the paper “Microplastics in personal care products: Exploring perceptions of environmentalists, beauticians, and students,” the main aim related to the use of plastic microbeads while using personal care products among environmental activists and trainee beauticians. For the same qualitative approach for an in-depth understanding of the consumers willing to use green cosmetic products, focus groups were used to capture the complexities of opinion formation, leading people to change their minds. The data analyzed proved that consumers lacked awareness of green cosmetic products, which was intended to lack visibility and immediacy. To their surprise, they are concerned about the amount of plastic in the range and their impact. The research could inform future communications along with the public industry. The authors suggested that policymakers should consider phasing personal green cosmetic products.

### 3.2. Cosmetic products

**Attributes : (Consumer Behavior, Brand Loyalty, Attitude, Awareness, Buying Intention, Ethical Value)**

81. (Chiang & Yu, 2010) The paper “Research of Female Consumer Behavior in Cosmetics Market Case Study of Female Consumers in Hsinchu Area Taiwan” helps in understanding the revolutionary change for women’s equal rights and their awareness during the past few years regarding the concept of cosmetics and further explores the attribute, result, and value attached importance by the female consumers towards the purchase of green cosmetics products. For the same, a study was conducted among female consumers based on their lifestyle and demographics, and the questionnaire approach obtained 390 valid responses; mean-end Chain Theory, Factor Analysis, and ANOVA were used to examine the hypothesis. The hypothesis concluded that a significant difference was shown between consumers of different lifestyles regarding attributes, results, and value. <sup>145</sup> At the same time, the product attribute - result value attached importance by the consumers of different demographic variances will not vary because of demographic factors. It further suggested that the researchers expand the population, perform sampling, and take metropolitan cities.
82. (Khraim, 2011) The main aim of the article “The Influence of Brand Loyalty on Cosmetics Buying Behavior of UAE Female Consumers” was to examine the influence of brand loyalty on the cosmetics buying behavior of the female consumers of Abu Dhabi in UAE. The seven factors were brand name, quality, pricing, design, promotions, service quality, and the store environment. A questionnaire was prepared, and 382 respondents obtained data. Further, Descriptive analysis, one-way- ANOVA, and Correlation were used for data analysis. The hypothesis concluded that the brand name had a strong positive correlation with brand loyalty and a positive relation among all the seven factors of brand loyalty with the consumer’s brand loyalty.

83. (Mohammed, Blebil, Dujaili, & Hassan, 2021) The main aim of the paper “Perception And Attitude Of Adults Towards The Cosmetic Products Amid COVID-19 Pandemic In Malaysia” was to examine and explore the consumer’s attitudes and perceptions towards cosmetics in the context of the COVID-19 pandemic. For the same, out of the 559 cosmetic consumers, 484 responded. The data was analyzed using SPSS version 25, which used descriptive and inferential statistical analysis, and the demographic analysis was done using an ANOVA test. The hypothesis concluded that the overall perspective of the consumers indicated a low level of perception and a moderate level of attitude towards the purchase of green cosmetics industry, and there was a strong positive correlation between the respondents towards the purchase of green cosmetics products; it further suggests to focus more on aesthetics than health safety.

84. (Ayob et al., 2015) The paper “Malaysian Consumers Awareness, Perception, And Attitude Towards Cosmetics Products: Questionnaire Development And Pilot Testing” aims to develop a reliable and valid tool for assessing the consumers’ knowledge, perspective, and attitude towards green cosmetics products. For the same, data was collected from 66 respondents, and a cross-sectional study design was conducted via questionnaire mode- online and offline; further data was analyzed by SPSS version 20 via Mann Whitney U-test and Kruskal Wallis test, Descriptive statistics such as mean, standard deviation was used, whereas Spearman’s rank correlation was used for reliability testing, Cronbach’s alpha for examining the knowledge, perspective and attitude. The hypothesis concluded that internal consistency and consumers' attitudes had a positive relationship, whereas differences were observed between perception scores for religion and race and monthly expenditures for cosmetic products. The reliability showed good tests and acceptable internal consistency.

85. (Pham & Chiu, 2021) The main aim of the study “The Impact of CSR and Product Innovation on Brand Image and Purchase Intention” is to examine the impact of CSR and the innovative products on brand image along with clarifying the features of the cosmetic market in the Vietnamese market. For the same, a questionnaire was collected online to test the hypothesis and the conceptual framework; from the total

responses received, 603 429 valid responses were taken further for data analysis. SPSS Cronbach Alpha test was used to examine the variables used for measurement. The hypothesis concluded that the perspective of the consumers regarding CSR and product invention had a strong positive correlation on the brand image; the Brand image had more impact than the functional brand image on consumer purchase intention, and technology innovation was stronger than new product in increasing the consumer's buying intention. In contrast, the increase in the consumer's knowledge of CSR is considered a purchase, and environmental CSR has a strong impact. Thus, the study will help managers specify their goals and future development.

86. (*Bharathi & Dinesh, 2018*) The main aim of “Female Consumers: Importance Of Cosmetics And Beautification In Their Buying” is to study how vital cosmetic products are for female consumers. For the same exploratory and descriptive research by convenience sampling method, a sample size of 50 female consumers was collected between the age group of 20-40. The data was further analyzed using simple Excel tools such as averages, percentages, and measurement scales. The data analyzed shows that female consumers are quite cautious about cosmetic products and are willing to use the same regardless of age. Also, it was examined that the advertisements and their peer groups easily influence females; they are more interested in organic/natural/herbal/green cosmetic products and do not take the exact pricing. They can be easily motivated and influenced by the salesperson or beauty professionals; most female respondents used top brands of cosmetic products. The money spent and the frequency of purchasing cosmetic products depend on the economic status.

87. (*Sharma & Mehta, 2020*) The paper “Effect Of Covid-19 Consumer Buying Behavior Towards Cosmetics: Study Based On Working Females” aimed to understand the behavior of working females while purchasing cosmetic products during the Covid-19 pandemic. The hypothesis was to examine the change in the buying behavior of working females due to Covid-19. A <sup>67</sup>convenience sampling method was used to collect data from across the Indian cities during September

2020. A questionnaire was used to collect the respondents, and 116 females responded to the questionnaire circulated. The data was further analyzed using a multiple regression method in SPSS software 21. From the data analyzed, it was found that there was, as such, no change in the buying behavior of female consumers when purchasing cosmetic products. However, the demand for certain products increased during Covid. The study also examined factors such as income, lockdown, distribution of supply chain, unavailability of the product, and accessing the product, which significantly impacts female consumers buying cosmetic products. The few limitations of the study could be that <sup>45</sup> the size of the female consumers selected was relatively small, and the focus was kept only on working females. The impact of socio-cultural factors was also not considered while evaluating the factors. Thus, all the above limitations can be considered for further research.

88. (Caruana, 2020) The paper “Ethical Consumerism in The Cosmetics Industry: Measuring how Important Sustainability is to The Female Consumer” mainly studies the relationship between female consumers' being environmentally sustainability-conscious and their preferences while purchasing cosmetic products. The method used in the paper includes a single multi-part survey instrument containing a conjoint analysis and an environmentally sustainable consciousness via a questionnaire followed by a series of post-survey interviews and brand product research into sustainable product offerings. Here, the conjoint analysis was used to simulate a market study without informing the participants of the true intention of measuring sustainability consciousness. Two hundred forty respondents were considered valid from the total responses received. The hypothesis concluded that there was a positive relation between the environmental sustainability consciousness of the females and their product choice by giving more importance to sustainable packaging. The environmental sustainability consciousness factor explains only 7.2% of the relative importance of sustainable packaging. It also examined the frequency of makeup use, which has increased, and the importance of sustainable packaging concerning the product attribute has decreased. The post-survey interviews suggested that the consumers felt helpless in increasing the sustainable product consumption and believed that cosmetic producers and the

government authorities must take the lead to improve the availability of alternatives for more sustainable products.

89. (Rybowska, 2014) The paper “Consumers' Attitude With Respect To Ecological Cosmetic Products” examines the opinions of consumers about innovations in cosmetic products, intending to provide proper insights into the behavior of consumers toward eco-friendly cosmetic products that are important for marketing and producers to understand. For the same, a survey was conducted among 185 women who were clients of a salon in Pamerania province; the survey included close-ended questions with single or multiple-choice questions. The responses were divided into four age groups, and the questionnaire included questions about their opinions on the new types of cosmetic products. These factors discourage them from purchasing cosmetic products and the influence of other people’s opinions on their choice of them. The hypothesis concluded that consumers were interested in new types of cosmetic products, especially ecologically friendly ones. The other factors that encouraged them to purchase the cosmetic products were gentleness to the skin, a small number of preservatives, and better quality products. On the other hand, the barriers were poor accessibility in the market and high prices, and consumers were found to be highly influenced by other people’s opinions while purchasing new products. The limitations of the paper were that the survey was conducted only among a specific group of women going to a specific salon, the survey was close-ended, and the study did not examine the actual effect of the cosmetics but focused on the opinion about the products. Therefore, it was suggested that further research could explore the potential of marketing strategies for increasing the accessibility and affordability of ecological cosmetics.

90. (Sharma, Trivedi, & Deka, 2021) The main aim of the paper “A Paradigm Shift In Consumer Behavior Towards Green Cosmetics: An Empirical Study” was to measure consumers' awareness level and intention while purchasing green cosmetic products in Delhi/NCR. For the same, primary data was collected via questionnaire in a structured manner, and out of the 160 responses received, 141 were considered valid responses. Five hypotheses in the paper and statistical tools used for analyzing the data were mean, one sample test, one-way ANOVA table, correlation, and

regression analysis. The hypothesis concluded that there was a positive relationship between consumer awareness and the intention of the consumers to purchase green cosmetic products; environmental sustainability and health factors motivated the consumers to buy green cosmetic products. On the other hand, the company's claim and high pricing of green cosmetic products demotivate them from purchasing. One of the study's main limitations is the geographical constraints; thus, while doing further research, the sample size and the location must be considered.

91. (Randiwela & Mihirani, 2015) The paper "Consumer Buying Behavior and Attitudes Towards Eco-Friendly Fast-Moving Consumer Goods – Cosmetics & Personal Care Products " focuses on consumers' buying behavior and attitudes while purchasing fast-moving consumer goods, especially Cosmetic products in Sri Lanka. The paper mainly highlights the need for environmental safety and the emergence of pressure to protect the environment; it also mentions how businesses are shifting their focus towards eco-friendly products. For the same, the paper makes a conceptual framework that identifies four major factors that affect the consumers' buying decision: individual judgmental sampling, a non-probability sampling technique, was used. The data was collected via a questionnaire, and 153 valid responses were considered valid. Further, the data was analyzed using descriptive and inferential statistical analysis, and the Lifestyles of Health and Sustainability (LOHAS) model was used to measure buying behavior. The hypothesis concluded that most respondents were not concerned and only a few people considered environmental factors while purchasing green cosmetic products. It also concluded that only gender, income, and marital status affected consumers' buying behavior. The paper suggests a need for national policy towards green marketing, consumerism, and production regulation.

92. (Oe & Yamaoka , 2022) The paper "The Impact of Communicating Sustainability and Ethical Behavior of the Cosmetic Producers" examines the factors that influence consumers' buying behavior in Thailand from the sustainability perspective. It also analyses the impact of the quality of a particular product, communicating sustainability and ethical behavior on consumers' buying behavior. A quantitative method was used to collect the data via a questionnaire, and 800 responses were received. Structural Equation Modelling analyzed the data for

validating a conceptual model along with the measurements based on quality, ethical behavior and communication sustainability via SPSS version 26, which included descriptive analysis and relational analysis that incorporated factor analysis with relevant variables. The hypothesis concluded that the quality of a product and communicating sustainability positively affected consumers' brand loyalty towards green cosmetic products. Ethical behavior did not have a positive relation to brand loyalty. One of the main limitations is that the analysis is for the highly educated population, and thus, it cannot be generalized. Thus, the authors suggest that the results obtained must be tested on broader data and more comprehensive investigations of the attitude of the consumers' perspective. The measured scales should be considered for other sectors and different marketing strategies.

93. (Osman, Cheng, & Wider, 2022) The paper “Factors Affecting the Halal Cosmetics Purchasing Behavior in Klang Valley, Malaysia” examines the relationship between halal awareness, knowledge, and attitude while purchasing among adult consumers in Malaysia. For the same, a cross-sectional design and a systematic sampling method were used to collect data via a self-administered questionnaire, and 389 respondents were selected to analyze the data. The data was analyzed by SPSS version 28.0 and Smart PLS version 3.3.9. The hypothesis concluded that halal awareness, knowledge, and attitude positively related to the buying behavior of consumers who purchased green cosmetic products. The value of R square was an endogenous latent variable. The study suggested that the Malaysian government should design more educational programs to increase awareness among consumers, as very few were aware of its importance. It might help consumers learn more about the advantages of using such products.

94. (Santoro, 2022) The paper “Sustainability And Transparency In The Cosmetic Industry: The Clean Beauty Movement And Consumers’ Consciousness” examines the importance of sustainability in the green cosmetic market and how green marketing can be used for establishing transparency with the consumers; it also aimed at understanding how consumers perceived the green cosmetics, its impact on greenwashing and how companies can help the consumers in contributing to a greener planet. For the same, quantitative research methods have been used to

gather the information via a questionnaire from the respondents along with the marketing tools the company used for marketing strategies to promote brands and services. Two hundred respondents were targeted, and data was analyzed accordingly. The hypothesis concluded that product performance and reputation were the main factors that impacted the buying behavior of the consumers, and most of the respondents were unaware of the ingredients used in the cosmetic products; it emphasized that companies should focus more on avoiding greenwashing and gain consumers trust by adopting sustainable practices by the supply chain.

95. (Graciano, Gularte, Lermen, & Barcellos, 2021) The paper “Consumer Values In The Brazilian Market For Ethical Cosmetics” examines the personal values of Brazilian consumers while buying cosmetic products ethically. For the same, an online survey was conducted, and 302 respondents were using ethical cosmetics. The study used psychometric values and lifestyle scales (VALS). The sample was identified using an exploratory factor analysis, and in order to correlate the demographic factors, cluster analysis was used for the hierarchical clustering technique. The data was analyzed, and eight VALS were identified in the study’s sample of respondents. It was observed that demographically homogenous groups were mostly placed among VALS original factors. The ethical demands about health and environmental preservation were no longer acceptable, and this particular analysis could help retail strategists meet the expected demands.

96. (Sajincic, Gordobil, Simmons, & Sandak, 2021) The paper “An Exploratory Study of Consumers’ Knowledge and Attitudes about Lignin-Based Sunscreens and Bio-Based Skincare Products” mainly focuses on the attitude of consumers when buying a potential product with lignin. This natural biopolymer can replace synthetic ingredients as consumers are interested in natural, healthy, and environmentally friendly sunscreen and are concerned about the price. The data was collected via an online survey through a questionnaire circulated on various social media platforms and via email, and 230 participants responded to the survey. The data was further analyzed using descriptive statistics, the Mann-Whitney U test, and Spearman’s rank correlation. The data analyzed concluded that consumers were genuinely interested in natural, healthy, and environmentally friendly products but were also

concerned about lower sun protection factors and prices. The hypothesis concluded that consumers familiar with environmentally friendly products had a positive relation towards bio-based ingredients and were willing to purchase more environmentally friendly products. Though lignin-based sunscreen can be more sustainable and healthier than synthetic cosmetic products, awareness, and education are needed to inform the consumers. The authors suggested that for future research, consumers with darker skin should be included to understand the disadvantages of pigmented sunscreen better, and valid multiple scales should be used to measure the constructs.

97. (Banna & Jannah, 2022) In the paper “The Push, Pull, And Mooring Effects Toward Switching Intention To Halal Cosmetic Products,” the primary purpose was to examine the factors that affected the intention of Muslim consumers to switch from synthetic to halal cosmetic products. For the same, data was collected from primary sources through a self-administered questionnaire divided into two parts. The first part had demographic information about the consumers, and the other part had 23 questions related to variables; partial least squares further analyzed the data. Structural Equation Modelling of 220 Indonesian females under 24 years old and monthly income was Rs.2,000,000. To this, the hypothesis concluded that regret, perceived value, and religious beliefs were the main factors that influenced consumers to switch from synthetic to green cosmetic products. Dissatisfaction highly impacted regret, and the brand of the product also impacted the perceived value. The authors suggested that social and cultural values should be explored for further research, and the impact of certification on consumers buying green cosmetic products should be considered.

98. (Taima, Robin, & Nathalie, 2019) The paper “Factors Driving Purchase Intention for Cruelty-Free Cosmetics” aimed to investigate the factors that affected millennial females’ intention to purchase cruelty-free cosmetic products. For the same, a quantitative method was used to collect the data via a questionnaire through a survey, and 108 females responded. Secondary data was read by relevant and peer-reviewed literature on the ethical consumption and intention for purchasing green cosmetics for constructs for the frame of reference. The data was analyzed using SPSS software; the researchers used descriptive statistics to analyze the participants’

demographic data and inferential statistics such as correlation and regression analysis to analyze the relationship between the variables. The hypothesis concluded that the attitude and the environmental knowledge had a positive relation while the consumers were willing to purchase cruelty-free cosmetic products. **Social media and financial factors do not have a positive** relation when purchasing the same products. The researchers suggested that for future studies, other factors such as brand loyalty, quality of the product, and packaging design should be considered, including the differences between age groups and gender and the consumer's intention to purchase cruelty-free cosmetic products.

Chapter 4

## **4. Research Methodology**

## RESEARCH METHODOLOGY - **INDEX**

In the above study, Chapter 4 of the thesis titled “AN EMPIRICAL STUDY OF CONSUMER BEHAVIOR TOWARDS GREEN COSMETICS IN SELECTED CITIES OF GUJARAT” is the Research Methodology. The chapter outlines the topic of the study, research study, objectives of the study, scope of the study, hypothesis, research design, data collection methods and tools, the population of the study, sampling frame, sample size, sampling method, sampling media, limitations of the study for the data collected.

- a) Topic of the study
- b) Rationale of the Research Study
- c) Objectives of the study
- d) Scope of the study
- e) Hypothesis
- f) Research Design
- g) Sources of data and the collection
- h) Population of the study
- i) Sampling Designs- Formula of sampling

#### **4.1. Topic of the study**

The above research is an empirical study based on consumer behavior toward purchasing green cosmetic products in the three cities of Gujarat. The topic was chosen based on the availability of resources such as time, information access, existing literature, statistical tools, and techniques.

The study aimed to understand consumer behavior while purchasing green cosmetic products by gathering empirical evidence from the survey and secondary data collection data.

The study's findings can be used to inform the firms' marketing strategies and develop the green cosmetic industry in the cities of Ahmedabad, Vadodara Surat, and Gujarat.

The topic for this research:

“An Empirical Study of Consumer Behavior towards Green Cosmetics in Selected Cities of Gujarat State”

#### **4.2. Rationale of the Research Study**

The study mainly focuses on understanding consumer behavior when purchasing green cosmetic products. The main factors considered were whether they were satisfied with the product, the consumers' expectations, and their perception of using green cosmetic products.

The study will be helpful to stakeholders such as researchers, consumers, companies, and the government, as it will help understand the consumers' needs and how they affect the cosmetic market. The research will help with consumer satisfaction, modify the product need, and benefit all parties involved in helping and understanding the market at a broader level.

The research will help compare the two types of cosmetics, enabling the researchers to determine the type of cosmetics consumers would prefer.

The research will also investigate how companies' marketing strategies will help them advertise, market, brand loyalty, promotions, and price affect. The research will help explore

how environmental sustainability affects consumer buying behavior and how it influences the decision to adopt green consumer behavior.

The research will also help in knowing the green cosmetics for providing better, sustainable products and also the gender influences (men and women) that affect buying behavior.

#### **4.3. Objectives of the study**

1. To find out the awareness among the people regarding green marketing in the cosmetic industry.
2. To analyze consumer buying behavior.
3. To study the influence of 4P's-Price, Product, Place, and promotion based on consumer behavior and attitude toward green cosmetics.
4. To know the factors that motivate or demotivate the consumers for green cosmetic product use/purchase.
5. To understand the level of expectation of consumers towards Green Cosmetics products.
6. To examine the level of quality and satisfaction of consumers with Green Cosmetic products.
7. To study the influence of gender on consumers when they purchase green cosmetic products.
8. To know the consumers' intentions/attitudes regarding green products.
9. To recommend measures to encourage green cosmetic products.

10. To study the opinion of the consumers regarding not using green cosmetic products.

11. To examine the associations between environmental behavior and consumer demographic factors.

#### **4.4. Scope of the study**

The primary data is collected through a non-disguised structured questionnaire. The primary data can then be analyzed to get accurate data. The study will also help examine the consumer behavioral patterns of whether they are willing to switch from traditional cosmetics to green cosmetics in Gujarat's three cities (Ahmedabad, Vadodara, and Surat).

The demographic insights include age, gender, occupation, monthly income of the respondents, and region (the city they live). The study also focuses on the market changes or dynamics for understanding the capability or potential of green cosmetic products among consumers, and the same analysis can be interpreted by secondary research that includes market analysis, overview, industrial research, pricing, and the influence of gender. <sup>164</sup> At the same time, they purchase cosmetic products and green cosmetic products.

It also helps understand why or how they will switch from cosmetic to green or natural cosmetic products. The study will help focus on promotional and marketing tactics while implementing green marketing. The overall scope of the study will also help analyze the trend and understand the demand and supply of green or natural cosmetic products in the three cities of Gujarat.

The study will help evaluate the challenges faced regarding awareness of green cosmetics, brand loyalty, and the effect of pricing. It can also determine whether consumers are satisfied when purchasing new green or natural cosmetic products. The research study also explores the impact of social media and the kind of advertising influencing green cosmetic products among the respondents.

The study will help the government, companies, researchers, and marketers take green initiatives and understand the potential of green or natural cosmetic products in Ahmedabad,

Vadodara, and Surat of Gujarat state. However, the scope of the study is limited to only three cities in Gujarat.

**Research Question:**

What factors influence consumer behavior towards purchasing green cosmetics in selected cities of Gujarat State, and how do demographic characteristics, environmental awareness, and perceived product benefits impact consumers' willingness to choose green cosmetics?

**4.5. Hypothesis**

<b>H0<sub>1</sub></b>	<i>Gender has no direct relation with usage of Cosmetic Products</i>
<b>H0<sub>2</sub></b>	<i>Purchase of green cosmetic products does not have a direct relation with the income of the consumers.</i>
<b>H0<sub>3</sub></b>	<i>Impact of the promotional method of green cosmetics has no relationship on switching of the brands by the consumers.</i>
<b>H0<sub>4</sub></b>	<i>Female don't believe gender impact purchase Behavior of Green Cosmetic Products</i>
<b>H0<sub>5</sub></b>	<i>The female consumers are not loyal as compared to male consumers while purchasing the green cosmetic products</i>
<b>H0<sub>6</sub></b>	<i>Increase in Number of Female Family members has no relation of Male using Cosmetic Products</i>
<b>H0<sub>7</sub></b>	<i>The consumers of Vadodara city do not intend to pay more towards the purchase of green cosmetic products than the consumers of Ahmedabad city.</i>
<b>H0<sub>8</sub></b>	<i>Quality of product has no Impact on the consumers of Ahmedabad city during purchase of Green Cosmetic Products</i>
<b>H0<sub>9</sub></b>	<i>Environmental awareness of the consumer has no relation on the purchase of green cosmetic products</i>
<b>H0<sub>10</sub></b>	<i>Increase in Education level for person using Cosmetic Product has no impact on his awareness on Green Cosmetic Product</i>
<b>H<sub>011</sub></b>	<i>Person who hears about green cosmetics from only Friends/Family has no relation to his likeliness to purchase Green Cosmetic product from departmental store</i>

<b>H<sub>012</sub></b>	<i>Person who hears about green cosmetics from social media and has purchased Green Cosmetic product has no relation to increase spending on Cosmetic Products</i>
<b>H<sub>013</sub></b>	<i>Gender Subjective norm has no relation on the purchase of premium products</i>
<b>H<sub>014</sub></b>	<i>Person who used CP for Skin has no favoring likeliness to have purchased Green Cosmetic Product</i>
<b>H<sub>015</sub></b>	<i>An Individual who has used Cosmetic Product for certain body part (Skin, hair, etc.) has no relation with the usage of green cosmetic for same body part</i>
<b>H<sub>016</sub></b>	<i>Individual who gets motivated by Green Cosmetic product not causing harm to environmental has no relation on checking environmental impact while purchasing green cosmetic product</i>
<b>H<sub>017</sub></b>	<i>Consumer who considers packaging as important factor to evaluate quality is not willing to pay more for Green Cosmetic Product</i>
<b>H<sub>018</sub></b>	<i>Allergic Reaction don't impact the willingness of consumers to use Green Cosmetic Products</i>
<b>H<sub>019</sub></b>	<i>Consumers of Vadodara city when compared to Surat do not have direct relation with sustainable and environmental impact of Green Cosmetic Product</i>
<b>H<sub>020</sub></b>	<i>Brand Name has no relation on perception of quality of the Green Cosmetic product</i>
<b>H<sub>021</sub></b>	<i>Consumer aware of Green cosmetic product do not have direct relation of perceiving green cosmetics as chemical free products</i>
<b>H<sub>022</sub></b>	<i>Consumers of Ahmedabad city when compared to Surat do not have any influence of social media while purchase of Green Cosmetic Product</i>
<b>H<sub>023</sub></b>	<i>Consumers of Surat city when compared to Vadodara do not have any influence of Brand Reputation while purchasing Green Cosmetic Product</i>
<b>H<sub>024</sub></b>	<i>Influence via Word of Mouth has no relation in generating Positive emotions towards Purchase of Green Cosmetic Products</i>

#### **4.6. Research Design**

The research <sup>165</sup> of the current study is Descriptive and Analytical. Descriptive research is a method used for examining the phenomenon that helps in understanding and analyzing of what all is taking place, descriptive research usually involves the formulations using the data collected via surveys, observations, interviews or focus groups. It helps in better understanding the concept and its trend.

Whereas Analytical research will test the hypotheses and answer the questions by comparing the data collected by the existing theories. It includes the uses of measures of central tendency, methods of variations, hypotheses testing, regression analysis for examining and analyzing the relationships, trends, patterns and evaluation.

As the research design in the current study includes both the type of research, it helps in describing the concept of green cosmetics and its relationship with the consumers, as they establish the relationship between green cosmetics and consumer buying behavior, demographic profile theoretically. It also includes the scientific analysis of data by using the central tendency, measures of variations, hypothesis testing, regression analysis.

The amalgamation of descriptive and analytical methods will help in providing an overall comprehensive overview of the green cosmetic industry and the relationship with the consumer behavior and their profiles.

Hypothesis testing will help in conducting the significant differences between the demographics of the respondents who purchase green cosmetics and the respondents who purchase the traditional cosmetic products. Statistical analysis will help in determining the capabilities of the trends in the consumption according to the demographic and respondents profile information.

Regression analysis will help in assessing the potential of the consumer's buying behavior. Thus, overall descriptive and analytical components of the research design will provide a detailed comprehensive picture of how green cosmetics impact the cosmetic industry. Understanding the relationship between consumer behavior and green cosmetics products is crucial for the companies who are considering entering the cosmetic market in the future. The findings will <sup>93</sup> be useful for making better decisions and ensuring that the companies succeed in the long run.

#### 4.7. Sources of data and the collection

The data is collected by primary and secondary sources of data for collecting the information and further analysis.

Type of Data	How is it collected?
Primary Data	Non-disguised close-ended questionnaire from Ahmedabad, Vadodara, and Surat cities of Gujarat
Secondary Data	Reliable sources, library, research papers, online statistical data, articles, journals

#### 4.8. Population of the study

All the residents for the population of the study are from the cities of Ahmedabad, Vadodara, Surat, Gujarat State:

Male age group	Between 13 to 27
Female age group	Between 13 to 55

#### 4.9. Sampling Designs

- i. Sample frame:

The sample frame consists of randomly selected respondents from the selected cities of Gujarat State (Ahmedabad, Vadodara and Surat).

ii. **Sample Size:**

Approximately, sample size of 1200 respondents is drawn from the selected cities of Ahmedabad, Vadodara, Surat in Gujarat state, for the same the bifurcation is below:

City	Sample Size (N)	Female/Girls (70%)	Age Group	Male/Boys (30%)	Age Group- (Teenagers and College going)
Ahmedabad	600	420	Between 13 to 55	180	Between 13 to 27
Surat	400	280	Between 13 to 55	120	Between 13 to 27
Vadodara	200	140	Between 13 to 55	60	Between 13 to 27
Total	1200	840	-	360	-

**108** The sample size was selected according to the below mentioned formula:

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2}$$

Here, P=Estimated Population, assume that 50% them uses cosmetic products= 50/100= 0.5  
 Z= 95% confidence level=value=1.96  
 e= 5% (allowable error) = 0.05

$$n = \frac{0.5 (1-0.5) (1.96^2)}{0.0025}$$

$=0.9604/0.0025= 384.16$  (approximately)= 390

As there are three cities,  $390*3= 1170$

The sample size after approximation was taken as **1200** (it might change according to the validity of the data received by the respondents).

Ahmedabad	Surat	Vadodara
80,59,441	71,85,000	21,90,000

\*Sample % taken according to the population of the three cities as per census 2011.

iii. **Sampling Method:**

Stratified and convenience sampling <sup>104</sup> were used from randomly selected respondents for the study.

iv. **Sampling Media:**

Sampling Media is in the form of filling out a non-disguised close-ended questionnaire.

v. **Limitations of study:**

The study is based on primary data and will depend on respondents' responses.

Many <sup>152</sup> statistical tools are employed for the study, but they have limitations.

# 5.Data Analysis & Interpretation

## 5.1. Introduction:

After the research methodology chapter comes data analysis. Data analysis is the process of

systematically applying statistical tools or techniques that help describe, illustrate, and evaluate the data. Without analyzing the data and usage, drawing conclusions will not be possible. Thus, in this chapter, the data has been analyzed, and interpretations have been drawn for further analysis and the scope of future study.

Data was collected from 1154 respondents from Ahmedabad, Surat, and Vadodara, the cities of Gujarat State. The data was analyzed by various statistical tools such as frequency, mean, median, continuous average analysis, chi-square, regression analysis, Single factor ANOVA, Paired Two sample t-test, Paired two-sample t-test with equal variance, candle stick analysis, correlation, and Cronbach alpha was used to check the reliability of the data.

## 5.2. Demographic Analysis:

Gender	Frequency	Relative Frequency
Female	739	64.04%
Male	415	35.96%
<b>Grand Total</b>	<b>1154</b>	<b>100.00%</b>

City	Frequency	Relative Frequency
Ahmedabad	580	50.26%
Surat	376	32.58%
Vadodara	198	17.16%
<b>Grand Total</b>	<b>1154</b>	<b>100.00%</b>

Distribution of city	Frequency	Relative frequency
<b>Ahmedabad</b>	<b>580</b>	<b>50.26%</b>
Female	391	33.88%
Male	189	16.38%
<b>Surat</b>	<b>376</b>	<b>32.58%</b>
Female	221	19.15%
Male	155	13.43%
<b>Vadodara</b>	<b>198</b>	<b>17.16%</b>
Female	127	11.01%
Male	71	6.15%
<b>Grand Total</b>	<b>1154</b>	<b>100.00%</b>

Education Qualification	Frequency	Relative Frequency
Graduate	546	47.31%
Others	16	1.39%

Postgraduate	441	38.21%
Professional	5	0.43%
Upto 12th	146	12.65%
<b>Grand Total</b>	<b>1154</b>	<b>100.00%</b>

Monthly Income	Frequency	Relative Frequency
21,000 to 40,000	207	17.94%
41,000 to 60,000	148	12.82%
61,000 to 80,000	53	4.59%
81,000 and above	192	16.64%
Upto Rs.20,000	554	48.01%
<b>Grand Total</b>	<b>1154</b>	<b>100.00%</b>

Occupation	Frequency	Relative Frequency
Business	81	7.02%
Home-Maker	77	6.67%
Other	11	0.95%
Service	42	3.64%
Student	551	47.75%
Working Professional	392	33.97%
<b>Grand Total</b>	<b>1154</b>	<b>100.00%</b>

#### Demographic Analysis Interpretation:

- **Gender:** From the data collected, 1154 valid responses were taken to analyze the final data. Out of the 1154, 739 were female and 415 males. As per the data, the percentage

of female respondents is higher, so the marketing strategies for green cosmetic products should focus more on female consumers. However, the male respondents suggest an inclusive marketing strategy targeting males and females.

- **City:** The data collected shows that 580 respondents were of Ahmedabad, of which 391 were female and 189 were male. In Surat, from the total 376 respondents, 221 were female and 155 were male. Whereas in Vadodara, from the total 198, 127 were female and 71 were male respondents. Ahmedabad has the highest percentage of female respondents, followed by Vadodara and Surat. Surat has the most balanced gender distribution. The data suggests that female consumers are the primary demographic, but some notable male consumers <sup>46</sup> should not be avoided.
- **Education Qualification:** The above data shows that most respondents are either graduates (47.3%) or post-graduates (38.21%), and marketing strategies can be more effective if they are targeted to higher educational qualifications for green cosmetic products. Overall, tailoring strategies to leverage educational insights can help improve marketing strategies' effectiveness.
- **Monthly Income:** The above data shows that half of the respondents (48%) earn up to Rs.20,000 per month, thus cost-effective and affordable products for attracting this consumer segment. The middle-income groups (Rs.21000 to 60,000) emphasize quality and value for money more. Whereas <sup>115</sup> the respondents with income more than 60,000 are likely to purchase premium category products.
- **Occupation:** From the above data, Respondents' occupations are dominated by students and working professionals, with notable involvement from business owners and homemakers.

### 5.3. Basic Questionnaire Outline:

Q1	<b>Do you use Cosmetic Products?</b>	<b>Total</b>	<b>Frequency</b>
	Yes	1006	87.18%
	No	148	12.82%
		<b>1154</b>	<b>100%</b>
Q2	<b>What is the monthly expenditure you spend on cosmetic products?</b>	<b>Total</b>	<b>Frequency</b>
	Upto Rs.500	531	54.93%
	501- 2,000	452	38.78%
	2,000-3,500	128	3.77%
	More than 3,500	43	2.52%
		<b>1154</b>	<b>100%</b>
Q3	<b>What type of cosmetic products you purchase?</b>	<b>Total</b>	<b>Frequency</b>
	Skin care	848	-
	Hair care	772	-
	Body care	532	-
	Make up	403	-
	Fragrances	646	-
Q4	<b>Have you heard about the term "Green Cosmetics"</b>	<b>Total</b>	<b>Frequency</b>
	Yes	<b>757</b>	<b>65.60%</b>
	No	397	34.40%
		<b>1154</b>	<b>100%</b>
Q5	<b>If Yes, how did you get to know about the term "Green Cosmetics"</b>	<b>Total</b>	<b>Frequency</b>
	Friends/Family	279	-
	Social media	577	-
	Advertisement	261	-
	Newspaper	42	-
Q6	<b>According to you, what are green cosmetic products?</b>	<b>Total</b>	<b>Frequency</b>
	Sustainable	447	-
	Chemical free	620	-
	Renewable plant ingredients	392	-
	No animal testing	301	-
Q7	<b>30 Have you ever purchased Green Cosmetic products?</b>	<b>Total</b>	<b>Frequency</b>
	Yes	<b>477</b>	<b>41.33%</b>
	No	677	58.67%
		<b>1154</b>	<b>100%</b>

**Details of the above table:**

**Q1:** From the questionnaire circulated, respondents were asked if they use or have used cosmetic products. Of the total of 1154 respondents, 1006 replied that they use cosmetic products, and 148 do not use cosmetic products.

**Q2: Monthly expenditure:** Of the total of 1154 respondents, more than 50% of them spend up to Rs.500 monthly on cosmetic products. For this category, a variety of affordable products should be given.

Thus, though most of the respondents spend a relatively modest amount while purchasing cosmetic products, they are willing to spend some amount every month. Thus, understanding their spend patterns for better segmentation and target market strategies can help maximize the reach.

**Q3: Type of cosmetic products:** From the total respondents, when asked about what type of cosmetic products are used, most of the respondents use skin-care cosmetic (73%) products, followed by Haircare (67%), Body care (46%), Makeup (35%) and then fragrances (56%).

**Q4: About the term green cosmetics:** From the total respondents, 757 (65.6%) knew about green cosmetics when further asked if they had heard about green cosmetics. So, all the further questions were aligned and asked the respondents who did hear or are/were aware of the term green cosmetics.

**Q5: Source of green cosmetics:** In alignment with the above question, when asked where they heard the term green cosmetics, almost 76% of the respondents got to know from social media, followed by friends/family, via advertisement and newspaper.

**Q6: Green cosmetics meaning:** <sup>117</sup> The respondents were asked about their perspective of green cosmetics and what, according to them, are green cosmetics. Most respondents replied to chemical-free products, followed by sustainability, renewable plant ingredients, and no animal testing.

**Q7: Purchase of Green Cosmetics:** After the basic questions, the respondents <sup>58</sup> were asked if they had ever purchased green cosmetic products. To which 477 responded yes and 677 no.

#### 5.4. Data Analysis and Interpretation:

**H<sub>01</sub>: Gender has no direct relation with usage of Cosmetic Products (B2, Q1)**

The hypothesis was to set the basis of the study with the most apparent but unproven indication of the relation of usage of cosmetics in females.

Gender (M/F) and Cosmetics usage (Y/N) data for 1154 individuals were taken to analyze the Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

##### Chi-Square:

Observed:

Do you use Cosmetic Products?	Male	Female
Yes	307	699
No	108	40
	415	739

Expected:

Do you use Cosmetic Products?	Male	Female
Yes	361.7764	644.2235702
No	53.22357	94.77642981
	415	739

Chi-Square calculations:

Do you use Cosmetic Products?	Male	Female
Yes	8.293678	4.657478244
No	56.3746	31.65826428

Chi Square: **100.984** >3.841 (df=1,p=0.05)  
Degree of Freedom (*df*) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (2-1)\*(2-1) =1

Reference table for chi-square value:

DF	P											
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001	
1	.0004	.00016	1.642	2.70	3.841	5.024	5.412	6.635	7.879	9.55	10.828	
2	0.01	0.0506	3.219	4.60	5.991	7.378	7.824	9.21	10.597	12.429	13.816	
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266	
4	0.207	0.484	5.989	7.77	9.488	11.143	11.668	13.277	14.86	16.924	18.467	
5	0.412	0.831	7.289	9.23	11.07	12.833	13.388	15.086	16.75	18.907	20.515	
6	0.676	1.237	8.558	10.64	12.592	14.449	15.033	16.812	18.548	20.791	22.458	
7	0.989	1.69	9.803	12.01	14.067	16.013	16.622	18.475	20.278	22.601	24.322	
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124	
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877	
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588	
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264	
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909	
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528	
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123	
15	4.601	6.262	19.511	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697	
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252	
17	5.697	7.564	21.615	24.76	27.587	30.191	30.995	33.409	35.718	38.648	40.79	
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312	
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82	
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315	

**Conclusion:** From the above calculation, **reject the null hypothesis**. Here, the high chi-square value (100.984), compared to the critical value, shows a significant relationship between gender and the use of cosmetic products. Thus, gender has no direct relation with the use of cosmetic products.

**Regression:**

Regression was done taking Y = Usage of Cosmetics against X = Gender

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.295817196							
R Square	0.087507813							
Adjusted R Square	0.086715719							
Standard Error	0.319679864							
Observations	1154							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	11.29017618	11.29017618	110.4765634	9.73306E-25			
Residual	1152	117.7288879	0.102195215					
Total	1153	129.0190641						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.739759036	0.015692467	47.14102766	4.2284E-271	0.708970017	0.770548055	0.708970017	0.770548055
Gender	0.206113765	0.019609744	10.5107832	9.73306E-25	0.16763895	0.24458858	0.16763895	0.24458858

**P value < 0.05**

**Conclusion:** As the value of p is less than 0.05, **reject the null hypothesis**. Here, as the p-value is  $9.733 \times 10^{-25}$ , it is significant against the null hypothesis. It proves that the null hypothesis states that a <sup>119</sup> significant relationship exists between gender and the use of cosmetic products.

Both Analyses indicate that Cosmetics Product usage is dependent on Gender. The conclusions can be used to understand further specific usage of the Cosmetics specific to Gender. Assumptions of analysis considering consumer behavior as Gender neutral may not be accurate, as observed in the above hypothesis conclusion.

**H<sub>02</sub>: <sup>30</sup> Purchase of green cosmetic products does not have a direct relation with the income of the consumers. (Q7, B6)**

The hypothesis was to set the basis of the study that, whether the consumers' income is related to the purchase of green cosmetic products.

Monthly income and purchase of green cosmetic products (Y/N) data for 1154 individuals were taken to analyze the Hypothesis since data has binary variables Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

Have you ever purchased Green Cosmetic products?	21,000 to 40,000	41,000 to 60,000	61,000 to 80,000	81,000 and above	Upto Rs.20,000	Grand Total
No	110	95	30	123	319	677
Yes	97	53	23	69	235	477
<b>Grand Total</b>	<b>207</b>	<b>148</b>	<b>53</b>	<b>192</b>	<b>554</b>	<b>1154</b>

Expected:

Have you ever purchased Green Cosmetic products?	21,000 to 40,000	41,000 to 60,000	61,000 to 80,000	81,000 and above	Upto Rs.20,000	Grand Total
No	121	121	121	121	121	677
Yes	86	61	22	79	229	477
<b>Grand Total</b>	<b>207</b>	<b>148</b>	<b>53</b>	<b>192</b>	<b>554</b>	<b>1154</b>

Chi-square calculations:

Have you ever purchased Green Cosmetic products?	21,000 to 40,000	41,000 to 60,000	61,000 to 80,000	81,000 and above	Upto Rs.20,000
No	1.08	5.76	68.85	0.02	321.41
Yes	1.53	1.09	0.05	1.35	0.16

Chi Square: **401** > 9.488 (df=4, p=0.05)  
 Degree of Freedom (df) = (No of Variable in X - 1) \* (No of Variable in Y - 1) = (5-1) \* (2-1) = 4

Reference Table for Chi-Square

DF	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.299	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.78	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **reject the null hypothesis**. Here, chi-square value is 401 which is **higher than the critical value 9.488**, which proves **that there is a significant relationship between purchase of green cosmetic products and income of the consumers.**

**Regression:**

Regression was done taking Y = Income X = **Purchase of green cosmetics**

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SUMMARY OUTPUT								
Regression Statistics								
Multiple R		0.050744055						
R Square		0.002574959						
Adjusted R Square		0.001709139						
Standard Error		1.493433699						
Observations		1154						
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	6.633067907	6.633068	2.974011	0.084880076			
Residual	1152	2569.356533	2.230344					
Total	1153	2575.989601						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	2.302806499	0.05739732	40.12045	5.9E-221	2.190191501	2.415421497	2.190191501	2.415421497
Purchased Green Cosmetics	-0.153959539	0.089276124	-1.72453	<b>0.08488</b>	-0.32912156	0.021202482	-0.32912156	0.021202482

**P value > 0.05**

**Conclusion:** As the value of p is more than 0.05, **fail to reject the null hypothesis**. Here, the p-value is 0.08 which is higher than the significance value 0.05, which shows that the relationship between the purchase of green cosmetic products and the consumers' income is not statistically significant.

The result of the test indicated in chi-square were significant, but while evaluating regression, the value of P was 0.05, failing to reject the null hypothesis and concluding that the income of the consumers and the purchase of green cosmetic products do not have a relation.

**H03: Impact of the promotional method of green cosmetics has no relationship on switching of the brands by the consumers. (Q37,Q42)**

The hypothesis was to set the basis of the study of whether the impact of the promotional method of green cosmetics is related to the consumers who are switching brands.

From the questionnaire, promotional activities to increase awareness and loyalty towards the purchase of brand (Y/N) data of 477 individuals were taken to analyze the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

Observed	According to you, are you loyal towards towards the brand you purchase?		Grand Total
	No	Yes	
Promotional activities can be used to increase the awareness of the green cosmetic products			
Agree	42	236	278
Disagree	0	8	8
Neutral	8	43	51
Strongly Agree	31	105	136
Strongly Disagree	0	4	4
<b>Grand Total</b>	<b>81</b>	<b>396</b>	<b>477</b>

Expected:

Expected	According to you, are you loyal towards towards the brand you purchase?		Grand Total
	No	Yes	
Promotional activities can be used to increase the awareness of the green cosmetic products			
Agree	47	231	278
Disagree	1	7	8
Neutral	9	42	51
Strongly Agree	23	113	136
Strongly Disagree	1	3	4
<b>Grand Total</b>	<b>81</b>	<b>396</b>	<b>477</b>

Chi-square calculations:

Chi-Square Calculations:	According to you, are you loyal towards towards the brand you purchase?	
	No	Yes
Promotional activities can be used to increase the awareness of the green cosmetic products		
Agree	0.574453645	0.117502
Disagree	1.358490566	0.277873
Neutral	0.050355572	0.0103
Strongly Agree	2.706267727	0.553555
Strongly Disagree	0.679245283	0.138937

Chi Square: **6.466** < 9.488 (df=4, p=0.05)  
 Degree of Freedom (*df*) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (2-1)\*(5-1) = 4

Reference Table for Chi-Square

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.362	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.684	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.988	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.549	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.811	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.302	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.542	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.766	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.988	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.204	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **fail to reject the null hypothesis**. Here, the chi-square value of 6.466 is less than the critical value of 9.488, which shows no significant relationship between the promotional method of green cosmetics and consumer switching of brands.

### **Regression:**

Regression was done taking Y = Promotional activities for the use of green cosmetic products  
X = Loyal towards the brand

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SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.10311146							
R Square	0.010631973							
Adjusted R Square	0.008549093							
Standard Error	0.718990438							
Observations	477							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	2.638735362	2.638735	5.104458	0.024316872			
Residual	475	245.5499439	0.516947					
Total	476	248.1886792						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.283950617	0.079887826	53.62457	1.2E-203	4.126973373	4.440927861	4.126973373	4.440927861
Q42	-0.198092031	0.087678316	-2.2593	0.024317	-0.370377361	-0.025806702	-0.370377361	-0.025806702

**P value < 0.05**

**Conclusion:** As the value of p is less than 0.05, **reject the null hypothesis**. Here, as the p-value is 0.02 below the significance value, it suggests a statistically significant relationship between the promotional method of green cosmetics and brands switching.

Thus, While using a chi-square test of independence and regression analysis, found a significant relation between the variables  $6.466 > 3.841$  ( $df=1, p=0.05$ ).

It can be concluded that the effectiveness of the promotional methods plays an essential role in influencing the brands switching behavior among the green consumers.

**H04: Female don't believe gender impact purchase Behavior of Green Cosmetic Products (Q23, B2)**

The hypothesis was to set the basis of the study on whether the female consumers have an impact while purchasing green cosmetic products.

Gender influence and their impact on purchasing green cosmetic products (Y/N) data for 477 individuals were taken to analyze the given Hypothesis. Since data has binary variables Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

<b>Gender can influence the buying behavior of Green cosmetics by consumers preference and attitude</b>	<b>Male</b>	<b>Female</b>	<b>Grand Total</b>
No	24	75	99
Yes	96	282	378
<b>Grand Total</b>	<b>120</b>	<b>357</b>	<b>477</b>

Expected:

<b>Gender can influence the buying behavior of Green cosmetics by consumers preference and attitude</b>	<b>Male</b>	<b>Female</b>	<b>Grand Total</b>
No	24.90566038	74.09433962	99
Yes	95.09433962	282.9056604	378
<b>Grand Total</b>	<b>120</b>	<b>357</b>	<b>477</b>

Chi-square calculations:

<b>Gender can influence the buying behavior of Green cosmetics by consumers preference and attitude</b>	<b>Male</b>	<b>Female</b>
No	0.034175863	0.010936276
Yes	0.008543966	0.002908584

Chi Square: **0.05** < 3.841 (df=1,p=0.05)  
 Degree of Freedom (*df*) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (2-1)\*(2-1) = 1

Reference Table for Chi-Square:

DF	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.77	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.23	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.64	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.01	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.76	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** Here, the chi-square value of 0.05 is much less than the critical value of 3.841, which shows that there is no significant relationship the belief that gender impacts the purchase behavior of green cosmetic products among the female. Thus, **fail to reject the null hypothesis**.

**Regression:**

Regression was done taking Y = Income X = Purchase of green cosmetics

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.010789356							
R Square	0.00011641							
Adjusted R Square	-0.001988608							
Standard Error	0.406379904							
Observations	477							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	0.00913271	0.009133	0.055301	0.814184151			
Residual	475	78.44369748	0.165145					
Total	476	78.45283019						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.8	0.03709724	21.56495	2.03E-72	0.727105008	0.872894992	0.727105008	0.872894992
Gender	-0.010084034	0.042881175	-0.23516	0.814184	-0.09434429	0.074176223	-0.09434429	0.074176223

**P value > 0.05**

**Conclusion:** As the value of p is more than 0.05, **fail to reject the null hypothesis**. Here, as the p-value is 0.81, which is above the significance level 0.05 and thus there is no significant relationship the belief that gender impacts the purchase behavior of green cosmetic products among the female.

**H05: The female consumers are not loyal as compared to male consumers while purchasing the green cosmetic products (B2, Q42)**

The hypothesis was to set the basis of the study that whether the female consumers are loyal towards the purchase of green cosmetic products when compared to male consumers.

Loyalty towards the brand (Y/N) and gender data for 477 individuals were taken to analyse the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Expected:

According to you, are you loyal towards the brand you purchase?	Male	Female	Grand Total
No	23	58	81
Yes	97	299	396
<b>Grand Total</b>	<b>120</b>	<b>357</b>	<b>477</b>

Observed:

According to you, are you loyal towards the brand you purchase?	Male	Female	Grand Total
No	20.37735849	60.62264151	81
Yes	99.62264151	296.3773585	396
<b>Grand Total</b>	<b>120</b>	<b>357</b>	<b>477</b>

Chi-square calculations:

According to you, are you loyal towards the brand you purchase?	Male	Female
No	0.299054282	0.118590491
Yes	0.070909778	0.023004176

Chi Square: **0.51** < 3.841 (df=1,p=0.05)

Degree of Freedom ( $df$ ) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (2-1)\*(2-1) = 1 = 1

Reference Table for Chi-Square:

DF	p										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.237	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.363	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.683	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.987	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.277	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.541	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.811	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.301	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.766	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.201	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **fail to reject the null hypothesis**. Here, the chi-square value of 0.51 is less than the critical value 3.841, which clearly shows that there is no significant relationship between gender and loyalty while purchasing green cosmetic products.

**Regression:**

Regression was done taking Y = Loyalty X = Purchase of green cosmetics

SUMMARY OUTPUT								
Regression Statistics								
Multiple R		0.033747568						
R Square		0.001138898						
Adjusted R Square		-0.000963967						
Standard Error		0.376042264						
Observations		477						
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	0.07658554	0.076586	0.541594	0.46213632			
Residual	475	67.16869748	0.141408					
Total	476	67.24528302						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.808333333	0.034327805	23.54748	8.21E-82	0.7408802	0.875786467	0.7408802	0.875786467
B2	0.029201681	0.03967995	0.73593	0.462136	-0.048768261	0.107171623	-0.048768261	0.107171623

**P value > 0.05**

**Conclusion:** As the value of p is more than 0.05, **fail to reject the null hypothesis**. Here, the p-value is 0.46 which is more than the significance level 0.05, thus indicating that there is no significant difference in loyalty between female and male consumers. It implies that no statistically significant evidence supports the idea that female consumers, compared to male

consumers, are not loyal towards the brand while purchasing green cosmetic products. As a result, it can be concluded that females are less loyal than male consumers when purchasing green cosmetic products.

**H06: Increase in Number of Female Family members has no relation of Male using Cosmetic Products (B7,B2,Q1)**

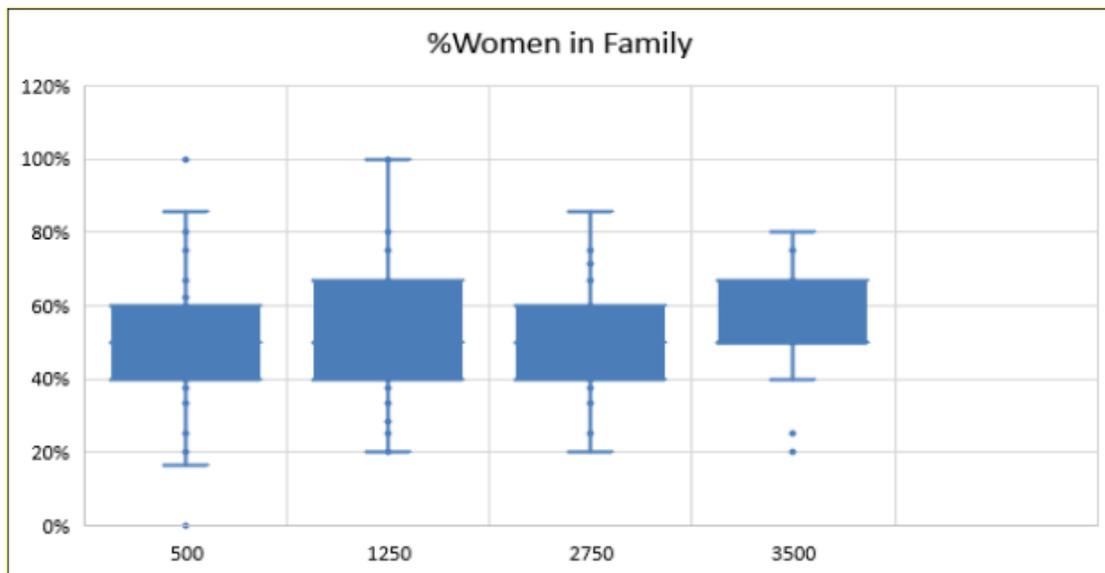
The Hypothesis was designed to understand the influence of female in the Family on usage of Cosmetics product by Male in the Family

Data on the Number of Females in Family and Number of total Members in Family were used to get the continuous data on %Women in Family acting as independent variable

The <sup>142</sup> data was only considered for responses where gender of respondent was Male giving us a sample data size of 415 respondents.

To understand the General Trend of Data a candle stick analysis on the avg spend was done against the %women in family (ignoring outliers)

**Candle-Stick:**



**Conclusion:** From the above Trend, one can see a trend of avg increase in % women as there is increase in Spend. However, the data is not significant enough to draw any conclusions hence **fail to reject the Null Hypothesis**. If one puts a trendline on the averages of given data the p value for the analysis is  $\sim 0.17$  (tan 10°)

A general Sense of Avg Women where Male uses Cosmetics also shows no significant relation:

Male using Cosmetics	Average of Female in Family
No	52%
Yes	46%
<b>Grand Total</b>	<b>50%</b>

**Continuous Average Analysis:**

Analysis was done taking Y = %Male using Cosmetics against X = %Female in Family

%Female in Family	%Male using Cosmetic
Less than 10%	100%
10-20%	100%
20-30%	71%
30-40%	73%
40-50%	74%
50% above	74%

**Conclusion: Fail to reject the null Hypothesis.**

Assuming the first and Second rows as outliers the trend shows <sup>51</sup> an increase in % males using cosmetics with an increase in % women in Family

Trying to take out p value = 0.1091 (assuming initial 2 lines as outliers)

**P value > 0.05**

If not the p value in negative, **fail to reject the null hypothesis.** Here, the relationship between % women in family and Male using Cosmetics was examined by using trend analysis of continuous averages and Candle Stick as no direct Regression or other standard tests were possible. However, it was still not able to establish any relations between the independent and dependent variable. This concludes that there is not enough evidence to reject null hypothesis, indicating that %Women in Family may or May Not impact the usage of Cosmetics by Male.

**H07: The consumers of Vadodara city do not intend to pay more towards the purchase of green cosmetic products than the consumers of Ahmedabad city. (B3,Q43)**

The hypothesis was to set the basis of the study that whether the consumers of Vadodara city are willing to pay more when compared to the consumers of Ahmedabad city while they purchase green cosmetic products.

From the questionnaire, whether the consumers are willing to pay more and the city for which data of 477 individuals were taken to analyze the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Expected:

Are you willing to pay more for better green cosmetic products?	Ahmedabad	Surat	Vadodara	Grand Total
Maybe	105	59	32	196
No	19	8	6	33
Yes	115	97	36	248
<b>Grand Total</b>	<b>239</b>	<b>164</b>	<b>74</b>	<b>477</b>

Observed:

Are you willing to pay more for better green cosmetic products?	Ahmedabad	Surat	Vadodara	Grand Total
Maybe	98.20545073	67.38784067	30.4067086	196
No	16.53459119	11.34591195	5.119496855	33
Yes	124.2599581	85.26624738	38.47379455	248
<b>Grand Total</b>	<b>239</b>	<b>164</b>	<b>74</b>	<b>477</b>

Chi-square calculations:

Are you willing to pay more for better green cosmetic products?	Ahmedabad	Surat	Vadodara
Maybe	0.439675236	1.192472392	0.079330547
No	0.319907399	1.399390847	0.129214298
Yes	0.745624552	1.419391243	0.169990541

Chi Square: **5.99** < 9.488 (df=4,p=0.05)  
 Degree of Freedom (*df*) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (3-1)\*(3-1) =4

Reference Table for Chi-Square

DF	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.362	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.682	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.987	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.681	17.275	19.675	21.92	22.618	24.725	26.757	29.554	31.264
12	3.074	4.404	15.812	18.549	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.811	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.301	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.542	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.613	24.766	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.988	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.204	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, fail to reject the null hypothesis. Here, the chi-square value of 5.99 is less than the critical value 9.488, which shows that there is no significant relationship between the consumers of Vadodara and Ahmedabad city and their intention for paying more while purchasing green cosmetic products.

**Regression:**

Regression was done taking Y = Promotional activities for the use of green cosmetic products  
X = Loyal towards the brand

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.099883779							
R Square	0.009976769							
Adjusted R Square	0.00789251							
Standard Error	0.619431993							
Observations	477							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	1.836645832	1.836646	4.786721	0.029166533			
Residual	475	182.2555974	0.383696					
Total	476	184.0922432						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	1.324469738	0.064303834	20.59706	7.85E-68	1.198114584	1.450824892	1.198114584	1.450824892
city	0.068518697	0.031317712	2.187858	0.029167	0.006980309	0.130057085	0.006980309	0.130057085

**P value < 0.05**

**Conclusion:** As the value of p is less than 0.05, **reject the null hypothesis**. Here, the p-value is 0.02, which is less than 0.05 significance value. It shows that there is a significant difference in the intention to pay more for green cosmetic products between consumers of Vadodara and Ahmedabad.

It clearly indicates that consumers' buying behavior when they purchase green cosmetic products hardly impacts their decision-making. It can be concluded that the consumers of Vadodara do not intend to pay more towards the purchase of green cosmetic products than the consumers of Ahmedabad.

**H08: Quality of product has no Impact on the consumers of Ahmedabad city during purchase of Green Cosmetic Products (B3, Q29)**

The hypothesis was to set the basis of the study whether the quality of the products has impact on the consumers of Ahmedabad city while they purchase green cosmetic products.

Quality and Performance (Scale) and city data for 477 individuals were taken to analyse the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

Quality and Performance	Ahmedabad	Surat	Vadodara	Grand Total
Agree	82	61	25	168
Disagree	3	4	3	10
Neutral	26	19	4	49
Strongly Agree	116	74	41	231
Strongly Disagree	12	6	1	19
<b>Grand Total</b>	<b>239</b>	<b>164</b>	<b>74</b>	<b>477</b>

Expected:

Quality and Performance	Ahmedabad	Surat	Vadodara	Grand Total
Agree	84.17610063	57.76100629	26.06289308	168
Disagree	5.01048218	3.438155136	1.551362683	10
Neutral	24.55136268	16.84696017	7.601677149	49
Strongly Agree	115.7421384	79.42138365	35.83647799	231
Strongly Disagree	9.519916143	6.532494759	2.947589099	19
<b>Grand Total</b>	<b>239</b>	<b>164</b>	<b>74</b>	<b>477</b>

Chi-square calculations:

Quality and Performance	Ahmedabad	Surat	Vadodara
Agree	0.012850974	0.014698736	0.043473561
Disagree	0.929812284	0.18470173	0.089138007
Neutral	0.034295028	0.04137922	0.902898367
Strongly Agree	0.008582406	0.015566097	0.018633699
Strongly Disagree	0.052447224	0.197562443	8.688281494

Chi Square: **11.23** < 15.507 (df=8,p=0.05)  
 Degree of Freedom (*df*) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (3-1)\*(5-1) = 8

Reference Table for Chi-Square:

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.362	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.683	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.989	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.549	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.812	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.302	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.541	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.769	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.989	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.204	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **fail to reject the null hypothesis**. Here, the chi-square value is 11.23, less than the critical value 15.507. It clearly indicates that there is no significant relationship between the quality of the product and the purchasing behavior of the consumers purchasing green cosmetic products.

**Regression:**

Regression was done taking Y = Quality & Performance impact X = City

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.003829313							
R Square	1.46636E-05							
Adjusted R Square	-0.002090569							
Standard Error	0.998227911							
Observations	477							
<i>ANOVA</i>								
	df	SS	MS	F	Significance F			
Regression	1	0.006940665	0.006941	0.006965	0.933522093			
Residual	475	473.3180069	0.996459					
Total	476	473.3249476						
<i>Coefficients</i>								
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	4.225791239	0.103627004	40.77886	2.9E-157	4.022167205	4.429415273	4.022167205	4.429415273
B3	-0.004212083	0.050469162	-0.08346	0.933522	-0.103382512	0.094958346	-0.103382512	0.094958346

**P value > 0.05**

**Conclusion:** As the value of p is more than 0.05, **fail to reject the null hypothesis**. Here, the p-value is 0.93, more than the significance value 0.05. It indicates that there is no significant

relationship between <sup>44</sup> the quality of product and the purchasing behavior of the consumers purchasing green cosmetic products.

It implies that no statistically significant evidence supports the idea that the quality of the products of Ahmedabad city impact the consumers while they purchase green cosmetic products. As a result, it can be concluded that quality does not impact the consumers of Ahmedabad city.

**H09: Environmental awareness of the consumer has no relation on the purchase of green cosmetic products (Q16,Q30)**

The hypothesis was to set the basis of the study that whether the consumers' environmental awareness has any relation while they purchase green cosmetic products.

From the questionnaire, whether the consumers consider the environmental impact before they purchase green cosmetic products is compared with environmental impact (scale) which data of 477 individuals were taken to analyze the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

<b>Observed:</b>	<b>Environmental Impact and comparison</b>					
<b>Do you consider the environmental impact before purchasing the Green cosmetic products?</b>	<b>Agree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Strongly Agree</b>	<b>Strongly Disagree</b>	<b>Grand Total</b>
No	16	12	60	5	1	94
Yes	182	3	89	93	16	383
<b>Grand Total</b>	<b>198</b>	<b>15</b>	<b>149</b>	<b>98</b>	<b>17</b>	<b>477</b>

Expected:

<b>Expected:</b>	<b>Environmental Impact and comparison</b>					
<b>Do you consider the environmental impact before purchasing the Green cosmetic products?</b>	<b>Agree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Strongly Agree</b>	<b>Strongly Disagree</b>	<b>Grand Total</b>
No	39.01887	2.955975	29.36268344	19.31236897	3.350104822	94
Yes	158.9811	12.04403	119.6373166	78.68763103	13.64989518	383
<b>Grand Total</b>	<b>198</b>	<b>15</b>	<b>149</b>	<b>98</b>	<b>17</b>	<b>477</b>

Chi-square calculations:

Chi-square calculations	Environmental Impact and comparison				
Do you consider the environmental impact before purchasing the Green cosmetic products?	Agree	Disagree	Neutral	Strongly Agree	Strongly Disagree
No	33.11677	6.816199	15.6440861	40.96878112	5.522992673
Yes	2.911364	27.2648	10.5465749	2.202622641	0.345187042

Chi Square: **145.33** > 9.48 (df=4, p=0.05)  
 Degree of Freedom ( $df$ ) = (No of Variable in X - 1) \* (No of Variable in Y - 1) = (5-1)\*(2-1) =

Reference Table for Chi-Square

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.361	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.684	16.919	19.023	19.679	21.866	23.589	26.056	27.877
10	2.156	3.247	13.442	15.987	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.541	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.307	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.542	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.778	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.988	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.204	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **reject null hypothesis**. Here, the chi-square value is 145.33, significantly more than critical value 9.488. It thus shows that there is a significant relationship between environmental awareness and the purchase of green cosmetic products.

**Regression:**

Regression was done taking Y = Purchase of Green Cosmetics Product, X = Environmental impact

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SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.313165669							
R Square	0.098072736							
Adjusted R Square	0.096173942							
Standard Error	0.896708214							
Observations	477							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	41.53102815	41.53102815	51.65000725	2.58714E-12			
Residual	475	381.94067	0.804085621					
Total	476	423.4716981						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	3.127659574	0.09248839	33.81678027	1.528E-128	2.945922591	3.309396558	2.945922591	3.309396558
Do you consider the	0.741792123	0.103216	7.186793948	2.58714E-12	0.5389757	0.944608546	0.5389757	0.944608546

### P value < 0.05

**Conclusion:** As the value of p is less than 0.05, **reject the null hypothesis**. Here, the p-value is  $2.58 \times 10^{-12}$ , much less than the significance value 0.05. It thus shows a strong statistically significant relationship between environmental awareness and the purchase of green cosmetic products.

44 It can be concluded that the consumers do not consider environmental factors while they purchase green cosmetic products.

**H010: Increase in Education level for person using Cosmetic Product has no impact on his awareness on Green Cosmetic Product (B4,Q4)**

The hypothesis was to set the basis of the study that whether a person's qualification impacts their awareness while they purchase green cosmetic products.

From the questionnaire, whether the consumers have heard about the green cosmetics is compared with the qualification of the consumers, data of 1154 individuals were taken to analyse the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

<b>Observed:</b>	<b>Qualification</b>					
<b>Have you heard about the term "Green Cosmetics"</b>	<b>Upto 12th</b>	<b>Professional</b>	<b>Graduate</b>	<b>Post Graduate</b>	<b>Others</b>	<b>Grand Total</b>
No	72	3	184	134	4	397
Yes	74	2	362	307	12	757
<b>Grand Total</b>	<b>146</b>	<b>5</b>	<b>546</b>	<b>441</b>	<b>16</b>	<b>1154</b>

Expected:

<b>Expected:</b>	<b>Qualification</b>					
<b>Have you heard about the term "Green Cosmetic"</b>	<b>Upto 12th</b>	<b>Professional</b>	<b>Graduate</b>	<b>Post Graduate</b>	<b>Others</b>	<b>Grand Total</b>
No	50.2270364	1.720103986	187.835355	151.713171	5.5043327	397
Yes	95.7729636	3.279896014	358.164644	289.28682	10.495667	757
<b>Grand Total</b>	<b>146</b>	<b>5</b>	<b>546</b>	<b>441</b>	<b>16</b>	<b>1154</b>

Chi-square calculations:

Chi-square calculations	Qualification				
	Upto 12th	Professional	Graduate	Post Graduate	Others
No	6.584193669	0.546044602	0.079945381	2.34146602	0.56575426
Yes	6.406242488	0.819066903	0.040635221	1.02200797	0.1885847

Chi Square: **18.59** > 9.48 (df=4, p=0.05)  
 Degree of Freedom (df) = (No of Variable in X - 1) \* (No of Variable in Y - 1) = (5-1) \* (2-1) = 4

Reference Table for Chi-Square

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.60	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.64	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.01	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.78	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **reject the null hypothesis**. Here, the chi-square value is 18.59, higher than the critical value 9.488. It suggests a strong relationship between an increase in education level and awareness of green cosmetic products.

### Regression:

Regression was done taking Y = Awareness X = Education

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SUMMARY OUTPUT									
<b>Regression Statistics</b>									
Multiple R	0.106432358								
R Square	0.011327847								
Adjusted R Square	0.010469625								
Standard Error	0.47275943								
Observations	1154								
<b>ANOVA</b>									
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>				
Regression	1	2.950040295	2.950040295	13.19919812	0.000292399				
Residual	1152	257.4737032	0.223501478						
Total	1153	260.4237435							
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>	
Intercept	0.530864198	0.037143489	14.29225459	8.82279E-43	0.45798773	0.603740665	0.45798773	0.603740665	
Educational Qualification	0.145547093	0.040061736	3.633070068	0.000292399	0.066944951	0.224149235	0.066944951	0.224149235	

**P value < 0.05**

**Conclusion:** As the value of p is less than 0.05, **reject the null hypothesis**. Here, the p-value is 0.0002, much less than the significance level 0.05. It shows a significant relationship between an increase in education level and awareness of green cosmetic products.

It can be concluded that impact on education does not have any impact when consumers purchase green cosmetic products.

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**H011: Person who hear about Green cosmetics from only Friends/Family has no relation to his likeliness to purchase Green Cosmetic product from departmental store (Q5,Q10, Q20)**

The hypothesis was to set the basis of the study: whether the people who hear about green cosmetics from friends/family are more likely to purchase green cosmetics from a departmental store.

Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

Observed	Influence (Family)	Purchase GCP from Dept Store		Grand Total
		No	Yes	
No	No	294	65	359
No	Yes	70	49	119
Yes	No	104	27	131
Yes	Yes	94	54	148
Grand Total		<b>562</b>	<b>195</b>	<b>757</b>

Expected:

Expected	Influence (Family)	Purchase GCP from Dept Store		Grand Total
		No	Yes	
No	No	266.5231176	92.477	359
No	Yes	88.34610304	30.654	119
Yes	No	97.25495376	33.745	131
Yes	Yes	109.8758256	38.124	148
Grand Total		<b>562</b>	<b>195</b>	<b>757</b>

Chi-square calculations:

Chi-square calculations:	Influence (Family)	Purchase GCP from Dept Store	
		No	Yes
No	No	2.832696372	8.164
No	Yes	3.809783172	10.98
Yes	No	0.467797752	1.3482
Yes	Yes	2.293878912	6.6111

Chi Square: **36.51** > 7.815 (df=3,p=0.05)  
 Degree of Freedom (*df*) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (4-1)\*(2-1) = 3  
 =1

Reference Table for Chi-Square

DF	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.60	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.64	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.01	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.99	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.78	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.196	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **reject the null hypothesis**. Here, the chi-square value is 36.51, higher than the critical value 7.815. It suggests a strong relationship who hear about Green cosmetics from only Friends/Family has to his/her likeliness towards purchasing Green Cosmetic product from departmental store.

**Regression:**

Regression was done taking Y = Awareness X = Influence

SUMMARY OUTPUT							
<i>Regression Statistics</i>							
Multiple R	0.216399023						
R Square	0.046828537						
Adjusted R Square	0.044300231						
Standard Error	0.427796637						
Observations	757						
<i>ANOVA</i>							
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>		
Regression	2	6.779312245	3.389656123	18.52170269	1.40436E-08		
Residual	754	137.9895121	0.183009963				
Total	756	144.7688243					
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i> <i>Upper 95.0%</i>
Intercept	0.188893482	0.02131346	8.862638189	5.56446E-18	0.147052706	0.230734259	0.147052706 0.230734259
Awareness (Family)	-0.004258064	0.033617094	-0.12666366	0.899240378	-0.070252292	0.061736164	-0.070252292 0.061736164
Influence (Family)	0.199234583	0.033940837	5.870055105	6.52618E-09	0.13260481	0.265864356	0.13260481 0.265864356

**P value < 0.05**

**Conclusion:** As the value of p is less than 0.05, **reject the null hypothesis**. Here, the p-value is 6.52E-09, much less than the significance level 0.05. It shows a relationship who hear about green cosmetics from only Friends/Family has to his/her likeliness towards purchasing Green Cosmetic product from departmental store.

While analyzing regression analysis, the p-value is much less than the significance value of 0.05, showing a significant relationship and the null hypothesis is to be rejected.

**H012: Person who hear about Green cosmetics from Social Media and has purchased Green Cosmetic product has no relation to increase spending on Cosmetic Products (Q5, Q2)**

The hypothesis was to set the basis of the study that whether the consumers who know about green cosmetic products from social media and have purchased have any relation for their increase in expenditure of cosmetic products.

Average sampling, ANOVA single factor and Two sample t-test has been used:

**Average Sampling:**

<b>Have you ever purchased Green Cosmetic products?</b>	<b>Yes</b>
---	------------

<b>Row Labels</b>	<b>Average Spending of</b>	<b>Count of From where do you purchase Green cosmetic products?</b>
None	872.4	145.0
Only Research	1041.3	109.0
Research & Purchase	1145.7	223.0
<b>Grand Total</b>	<b>1039</b>	<b>477</b>

**ANOVA Single factor:**

<b>ANOVA: Single Factor</b>						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Column 1	3	3059.438	1019.813	19022.57		
Column 2	3	477	159	3396		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	1111498	1	1111498	99.15868	0.000571	7.708647
Within Groups	44837.13	4	11209.28			
Total	1156335	5				

**Conclusion:**

For ANOVA, the p-value is less than 0.05, so **reject the null hypothesis**, which means that there is a statistically significant difference in average spending between the two groups. Persons who hear about Green cosmetics from social media and have purchased Green

Cosmetic products <sup>144</sup> are likely to have different (in this case, increased) spending on cosmetic products compared to those who do not.

**Two-Sample t-test:**

<b>t-Test: Two-Sample Assuming Equal Variances</b>		
	<i>Variable 1</i>	<i>Variable 2</i>
Mean	872.4137931	1111.446
Variance	429789.272	479989.4
Observations	145	332
Pooled Variance	464770.8657	
Hypothesized Mean Difference	0	
df	475	
t Stat	-3.522333169	
P(T<=t) one-tail	0.000234543	
t Critical one-tail	1.648067866	
P(T<=t) two-tail	0.000469086	
t Critical two-tail	1.964970773	

**Conclusion:**

For Two-sample t-test, p-value (both one-tailed and two-tailed) is significantly less than 0.05, therefore **reject the null hypothesis**. It concludes that social media's influence significantly impacts consumer spending on green cosmetic products.

**H013: Gender Subjective norm has no relation on the purchase of premium products (Q24, Q2, B2)**

The hypothesis was to set the basis of the study that whether gender impacted the consumers while they purchased premium cosmetic products.

Gender, their monthly expenditure and whether they are likely to purchase the premium category based on the gender data for 477 individuals were taken to analyse the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

Observed:		What is the monthly expenditure you spend on cosmetic products?				
Gender	Women are more likely to purchase premium products than men	Upto Rs.500	501-2,000	2,000-3,500	More than 3,500	Grand Total
Female	No	13	36	7	5	61
	Yes	106	131	42	17	296
Male	No	7	9	3	2	21
	Yes	45	34	14	6	99
<b>Grand Total</b>		<b>171</b>	<b>210</b>	<b>66</b>	<b>30</b>	<b>477</b>

Expected:

Expected:		What is the monthly expenditure you spend on cosmetic products?				
Gender	Women are more likely to purchase premium products than men	Upto Rs.500	501-2,000	2,000-3,500	More than 3,500	Grand Total
Female	No	22	27	8	4	61
	Yes	106	130	41	19	296
Male	No	8	9	3	1	21
	Yes	35	44	14	6	99
<b>Grand Total</b>		<b>171</b>	<b>210</b>	<b>66</b>	<b>30</b>	<b>477</b>

Chi-square calculations		What is the monthly expenditure you spend on cosmetic products?			
Gender	Women are more likely to purchase premium products than men	Upto Rs.500	501-2,000	2,000-3,500	More than 3,500
Female	No	3.6	3.1	0.2	0.4
	Yes	0.0	0.0	0.0	0.1
Male	No	0.0	0.0	0.0	0.3
	Yes	2.5	2.1	0.0	0.0

Chi Square: **12.5** < 16.919 (df=9,p=0.05)  
 Degree of Freedom (df) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (4-1)\*(4-1)=9

Reference Table for Chi-Square:

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.362	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.684	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.988	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.549	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.811	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.302	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.542	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.769	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.988	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.202	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, fail to reject the null hypothesis. Here, the chi-square value is 12.5, less than the critical value 16.99. It indicates that there is no relationship between gender subjective norm and the purchase of premium products.

**Regression:**

Regression was done taking Y = Monthly Expenditure X = Premium

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.006167077							
R Square	3.80328E-05							
Adjusted R Square	-0.00206715							
Standard Error	0.486262624							
Observations	477							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.004271798	0.004272	0.018066	0.893134601			
Residual	475	112.3143865	0.236451					
Total	476	112.3186583						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.622047244	0.024911989	24.96979	1.63E-88	0.573095914	0.670998574	0.573095914	0.670998574
Premium	-0.007463911	0.05553055	-0.13441	0.893135	-0.116579819	0.101651997	-0.116579819	0.101651997

**P value > 0.05**

**Conclusion:** As the value of p is more than 0.05, fail to reject the null hypothesis. Here, the p-value is 0.89 which is more than significance value 0.05. It indicates that there is no

statistically significant relationship between gender subjective norm and the purchase of premium products.

It implies that no statistically significant evidence supports the gender norm has any relation with the purchase of premium category cosmetic products. As a result, it can be concluded from the analysis of chi-square as well as regression analysis, gender has no relation on the purchase of premium products.

**H014: Person who used CP for Skin has no favouring likeliness to have purchased Green Cosmetic Product (Q7, Q3)**

The hypothesis was to set the basis of the study that whether the consumer who uses skin care cosmetic products have likelihood towards green cosmetic products.

From the questionnaire, whether the consumers have purchased green cosmetics along with their preference in the purchase of cosmetic products (only skin care), data of 1154 individuals were taken to analyse the given Hypothesis.

Here, Chi-Square, Linear Regression analysis and Paired t-test.

**Chi-Square:**

Observed:

<b>Observed:</b>	<b>What type of cosmetic products you purchase? (Only skin care)</b>		
<b>Have you ever purchased Green Cosmetic products?</b>	<b>No</b>	<b>Yes</b>	<b>Grand Total</b>
No	257	49	306
Yes	420	428	848
<b>Grand Total</b>	<b>677</b>	<b>477</b>	<b>1154</b>

Expected:

<b>Expected:</b>	<b>What type of cosmetic products you purchase? (Only skin care)</b>		
<b>Have you ever purchased Green Cosmetic products?</b>	<b>No</b>	<b>Yes</b>	<b>Grand Total</b>
No	180	126	306
Yes	497	351	848
<b>Grand Total</b>	<b>677</b>	<b>477</b>	<b>1154</b>

Chi-square calculations:

<b>Chi-square calculation</b>	<b>What type of cosmetic products you purchase? (Only skin care)</b>	
<b>Have you ever purchased Green Cosmetic products?</b>	<b>No</b>	<b>Yes</b>
No	33	47
Yes	12	17

Chi Square:  $110 > 3.841$  ( $df=1, p=0.05$ )  
 Degree of Freedom ( $df$ ) = (No of Variable in X - 1)\*(No of Variable in Y - 1) =  $(2-1)*(2-1) = 1$

Reference Table for Chi-Square

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.678	1.237	8.558	10.64	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.01	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.76	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.058	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **reject the null hypothesis**. Here, the chi-square value is 110, much higher than the critical value of 3.841. It shows that there is a significant relationship between the use of skincare cosmetic products and the purchase of green cosmetic products.

**Regression:**

Regression was done taking Y = Purchase of Green Cosmetic Product X = Usage of Skin Cosmetic Product

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0.30888945							
R Square	0.095412692							
Adjusted R Square	0.09462746							
Standard Error	0.420198735							
Observations	1154							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	21.45446155	21.45446	121.5089	6.213E-27			
Residual	1152	203.4051572	0.176567					
Total	1153	224.8596187						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	0.620384047	0.016149549	38.41494	1.6E-208	0.588698222	0.652069873	0.588698222	0.652069873
Green Cosmetic Purchase	0.276890586	0.025119103	11.02311	6.21E-27	0.227606269	0.326174903	0.227606269	0.326174903

**P value < 0.05**

**Conclusion:** As the value of p is less than 0.05, **reject the null hypothesis**. Here, the p-value is  $6.21 \times 10^{-27}$  which is very less than the significance value of 0.05. It thus shows a strong relationship between using cosmetic products for skin and purchasing green cosmetic products.

**t-Test: Two-Sample Assuming Equal Variances:**

t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>
Mean	0.160130719	0.504717
Variance	0.134929819	0.250273
Observations	306	848
Pooled Variance	0.219735006	
Hypothesized Mean Difference	0	
df	1152	
t Stat	-11.02310817	
P(T<=t) one-tail	3.1065E-27	
t Critical one-tail	1.646177414	
P(T<=t) two-tail	6.213E-27	
t Critical two-tail	1.962025376	

**Conclusion:** As the p-value is **extremely small (3.1065E-27 for one-tail and 6.213E-27 for two-tail)** indicate that the observed data are highly unlikely under the null hypothesis. Thus, it has a strong evidence to **reject the null hypothesis**.

While calculating t-test of two-sample assuming equal variances, the p-value of one-tailed and two-tailed are much smaller than 0.05, whereas the absolute value of the t-statistic is greater than the critical value, so reject the null hypothesis.

It concludes that there is statistically significant difference in the likeliness of purchasing green cosmetic products between people who use CP for skin and those who do not. Specifically, the data suggest that using CP for skin does influence the likelihood of purchasing green cosmetic products.

**H015: An Individual who has used Cosmetic Product for certain body part (Skin, hair, etc.) has no relation with the usage of Green cosmetic for same body part (Q3, Q9)**

The hypothesis was to set the basis of the study that the consumers who use cosmetic products for certain body parts do not have relationship with the use of green cosmetic products.

From the questionnaire, type of cosmetic products is compared with the type of green cosmetic products.

Here, Paired t-test is used for analysing the data.

**t-Test: Two-Sample Assuming Equal Variances:**

t-Test: Paired Two Sample for Means		
	<i>Count if same</i>	<i>Count if Different</i>
Mean	0.967196819	0.095427435
Variance	1.739221388	0.122227827
Observations	1006	1006
Pearson Correlation	0.162179245	
Hypothesized Mean Difference	0	
df	1005	
t Stat	21.13302003	
P(T<=t) one-tail	1.30132E-82	
t Critical one-tail	1.646371222	
P(T<=t) two-tail	2.60264E-82	
t Critical two-tail	1.96232725	

**Conclusion:**

The null hypothesis is rejected because the p-values (both one-tailed and two-tailed) are much smaller than 0.05 and the t-statistic is much larger than the critical values.

Based on the paired t-test results, it can be concluded that there is significant relationship between the use of cosmetic products on specific body parts and the use of green cosmetics on those same body parts. The findings strongly suggest that people who use cosmetic goods in specific body areas are more likely to utilize green cosmetics in those same body regions. This insight can be helpful for marketers and product developers working on green cosmetics since it identifies a target demographic that already uses cosmetics and may be more open to green alternatives.

**H016: Individual who gets motivated by Green Cosmetic product not causing harm to environmental has no relation on checking environmental impact while purchasing green cosmetic product (Q11, Q16)**

The hypothesis was to set the basis of the study: Is there a relationship between individuals who are motivated by green cosmetic products not causing harm to the environment and their behavior of checking the environmental impact while purchasing green cosmetics?

From the questionnaire, whether the consumers consider the environmental impact before they purchase green cosmetic products along with the consumers who are motivated to purchase green cosmetic products, data of 477 individuals were taken to analyse the given Hypothesis.

Here, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

<b>Observed:</b>	<b>What motivates you to purchase Green cosmetic products? (Do not harm the environment)</b>		
<b>Do you consider the environmental impact before purchasing the Green cosmetic products?</b>	<b>0</b>	<b>1</b>	<b>Grand Total</b>
No	72	22	94
Yes	108	275	383
<b>Grand Total</b>	<b>180</b>	<b>297</b>	<b>477</b>

Expected:

<b>Expected:</b>	<b>What motivates you to purchase Green cosmetic products? (Do not harm the environment)</b>		
<b>Do you consider the environmental impact before purchasing the Green cosmetic products?</b>	<b>0</b>	<b>1</b>	<b>Grand Total</b>
No	35	59	94
Yes	145	238	383
<b>Grand Total</b>	<b>180</b>	<b>297</b>	<b>477</b>

Chi-square calculations:

Chi-square calculation	What motivates you to purchase Green cosmetic products? (Do not harm the environment)	
Do you consider the environmental impact before purchasing the Green cosmetic products?	0	1
No	37.61637896	22.79780543
Yes	9.232218336	5.59528384

Chi Square:  $75.24 > 3.841$  ( $df=1, p=0.05$ )  
 Degree of Freedom ( $df$ ) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (2-1)\*(2-1)= 1

Reference Table for Chi-Square

DF	p										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.78	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **reject the null hypothesis**. Here, the chi-square value is 75.24, more than the significance value 0.05. It indicates a **significant association between being motivated by green cosmetic products that do not cause harm to the environment and checking the environmental impact while purchasing green cosmetic products.**

### Regression:

Regression was done taking Y = Environmental Impact X = Motivation to save environment

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SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.397164179							
R Square	0.157739385							
Adjusted R Square	0.155966205							
Standard Error	0.365831052							
Observations	477							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	11.90552061	11.90552061	88.95846067	1.79145E-19			
Residual	475	63.57037037	0.133832359					
Total	476	75.47589099						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.6	0.027267437	22.00426856	1.67314E-74	0.546420284	0.653579716	0.546420284	0.653579716
What motivates you to purchase Green Cosmetic Products?	0.325925926	0.034556144	9.431779295	1.79145E-19	0.258024112	0.393827739	0.258024112	0.393827739

**P value < 0.05**

**Conclusion:** As the value of p is less than 0.05, **reject the null hypothesis**. Here, the p value is  $1.791 \times 10^{-19}$ , which is very low compared to significance level 0.05. It suggests a very strong and significant relationship between being motivated by environmental considerations and checking the environmental impact of purchasing green cosmetic products.

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**H017: Consumer who considers packaging as important factor to evaluate quality is not willing to pay more for Green Cosmetic Product (Q13, Q43)**

The hypothesis was to set the basis of the study that whether the consumers who consider packaging as a significant factor impacts or have willingness to pay more while they purchase green cosmetic products.

Here, questions taken were how they evaluate the quality of green cosmetic products (only packaging) with if they are willing to pay more for better green cosmetic products, data of 477 individuals were taken to analyse the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

<b>Observed:</b>	<b>Are you willing to pay more for better green cosmetic products?</b>			
<b>How do you evaluate the quality of the Green cosmetic products? (Packaging)</b>	<b>Yes</b>	<b>Maybe</b>	<b>No</b>	<b>Grand Total</b>
0	185	156	20	361
1	63	40	13	116
<b>Grand Total</b>	<b>248</b>	<b>196</b>	<b>33</b>	<b>477</b>

Expected:

<b>Expected:</b>	<b>Are you willing to pay more for better green cosmetic products?</b>			
<b>How do you evaluate the quality of the Green cosmetic products?</b>	<b>Yes</b>	<b>Maybe</b>	<b>No</b>	<b>Grand Total</b>
0	188	148	25	361
1	60	48	8	116
<b>Grand Total</b>	<b>248</b>	<b>196</b>	<b>33</b>	<b>477</b>

Chi-square calculations:

Chi-square calculations	Are you willing to pay more for better green cosmetic products?		
How do you evaluate the quality of the Green cosmetic products?	Yes	Maybe	No
0	0.0	0.4	1.0
1	0.1	1.2	3.1

Chi Square:  $5.9 = 5.9$  (df=2, p=0.05)  
 Degree of Freedom (df) = (No of Variable in X - 1) \* (No of Variable in Y - 1) = (3-1) \* (2-1) = 2

Reference Table for Chi-Square:

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.60	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.77	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.23	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.64	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.01	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.334	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.78	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.058	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion: Fail to reject the null hypothesis.** The Chi-Square value of 5.9 is equal to the critical value of 5.991. There is no significant association between considering packaging as an important factor and willingness to pay more for green cosmetic products.

### **Regression:**

Regression was done taking Y = Monthly Expenditure X = Premium

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SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.01797492							
R Square	0.000323098							
Adjusted R Square	-0.001781485							
Standard Error	0.429839607							
Observations	477							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.028364867	0.028365	0.153521	0.695368711			
Residual	475	87.76199153	0.184762					
Total	476	87.79035639						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.26119437	0.049996283	5.224276	2.62E-07	0.162953135	0.359435604	0.162953135	0.359435604
Pay More	-0.012412882	0.031680256	-0.39182	0.695369	-0.07466366	0.049837895	-0.07466366	0.049837895

**P value > 0.05**

**Conclusion:** As the value of p is more than 0.05, **fail to reject the null hypothesis**. Here, the p-value is 0.69 which is more than the significance value 0.05. It suggests that there is no statistically significant relationship between considering packaging as an important factor and willingness to pay more for green cosmetic products.

It implies that no statistically significant evidence supports consumers who considers packaging as an important factor for evaluating the quality are willing to pay more for green cosmetic products.

**H018: Allergic Reaction don't impact the willingness of consumers to use Green Cosmetic Products (Q46,Q45)**

The hypothesis states that allergic reactions do not impact the willingness of consumers to use green cosmetic products, indicating no significant relationship between experiencing allergic reactions and the decision to use green cosmetics.

From the questionnaire, the reason they have not purchased green cosmetic products and why they are not using cosmetic products are taken as variables, data of 1154 individuals out of which 43 were taken to analyse the given Hypothesis.

Here, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

<b>Observed:</b>	<b>I have not purchased Green cosmetic products:</b>		
<b>Why don't you use cosmetic products?</b>	<b>0</b>	<b>1</b>	<b>Grand Total</b>
0	929	182	1111
1	26	17	43
<b>Grand Total</b>	<b>955</b>	<b>199</b>	<b>1154</b>

Expected:

<b>Expected:</b>	<b>I have not purchased Green cosmetic products:</b>		
<b>Why don't you use cosmetic products?</b>	<b>0</b>	<b>1</b>	<b>Grand Total</b>
0	919	192	1111
1	36	7	43
<b>Grand Total</b>	<b>955</b>	<b>199</b>	<b>1154</b>

Chi-square calculations:

<b>Chi-square calculation</b>	<b>I have not purchased Green cosmetic products:</b>	
<b>Why don't you use cosmetic products?</b>	<b>0</b>	<b>1</b>
0	0.1	0.5
1	2.6	12.4

Chi Square:  $15.6 > 3.841$  (df=1, p=0.05)  
 Degree of Freedom (df) = (No of Variable in X - 1) \* (No of Variable in Y - 1) = (2-1) \* (2-1) = 1

Reference Table for Chi-Square

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.01	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.78	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.196	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **reject the null hypothesis**. Here, the chi-square value is 15.6 which is higher than the critical value 3.841. It shows that there is a positive relationship between allergic reactions and the willingness of consumers to use green cosmetic products.

**Regression:**

Regression was done taking Y = use of cosmetic products X = Not purchased

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.116084681							
R Square	0.013475653							
Adjusted R Square	0.012619295							
Standard Error	0.188285128							
Observations	1154							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.557861677	0.557861677	15.73601	7.73198E-05			
Residual	1152	40.83988529	0.035451289					
Total	1153	41.39774697						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.027225131	0.006092764	4.468437059	8.66E-06	0.015270974	0.039179288	0.015270974	0.039179288
I have not purchased Green cosmetic products:	0.058202005	0.014672047	3.966863409	7.73E-05	0.029415077	0.086988933	0.029415077	0.086988933

**P value < 0.05**

**Conclusion:** As the value of p is less than 0.05, **reject null hypothesis**. Here, the p-value is  $7.73 \times 10^{-5}$ , much less than the significance value 0.05.

While analyzing regression analysis, given that the p-value is less than 0.05, reject the null hypothesis that suggests <sup>118</sup> a statistically significant relationship exists between experiencing allergic reactions and the willingness of consumers to use green cosmetic products. In other words, allergic reactions impact consumers' willingness to use green cosmetic products.

**H019: Consumers of Vadodara city when compared to Surat do not have direct relation with sustainable and environmental impact of Green Cosmetic Product (Q30, Q31, B3)**

The hypothesis states that consumers of Vadodara city when they are compared with Surat they do not have a relationship when compared with sustainability and environmental impact.

Here, Two sample t-test has been used:

<b>Environmental Impact and comparison</b>		
t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>
Mean	3.707317073	3.878378
Variance	0.834056561	0.902814
Observations	164	74
Pooled Variance	0.855324682	
Hypothesized Mean Difference	0	
df	236	
t Stat	-1.320795512	
P(T<=t) one-tail	0.093924432	
t Critical one-tail	1.65133585	
P(T<=t) two-tail	0.187848865	
t Critical two-tail	1.970066853	

Here, taking Green cosmetic product impact:

- Mean for Vadodara consumers (Variable 1): 3.707
- Mean for Surat consumers (Variable 2): 3.878
- Pooled variance: 0.855
- t Statistic: -1.321
- Degrees of freedom (df): 236
- Two-tailed p-value: 0.188

**Conclusion:**

The p-value of 0.188 is greater than the standard significance level of 0.05, indicating that there is no statistically significant difference in the perceived impact of Green Cosmetic Products between customers in Vadodara and Surat. As a result, fail to reject the null hypothesis that there is no difference in perceptions of the impact of Green Cosmetic Products across the two cities.

<b>Sustainability</b>		
t-Test: Two-Sample Assuming Equal Variances		
	<i>Variable 1</i>	<i>Variable 2</i>
Mean	3.81097561	3.972973
Variance	0.74319168	0.656794
Observations	164	74
Pooled Variance	0.716466906	
Hypothesized Mean Difference	0	
df	236	
t Stat	-1.366655909	
P(T<=t) one-tail	0.086516873	
t Critical one-tail	1.65133585	
P(T<=t) two-tail	0.173033745	
t Critical two-tail	1.970066853	

Here, taking sustainability impact:

- Mean for Vadodara consumers (Variable 1): 3.811
- Mean for Surat consumers (Variable 2): 3.973
- Pooled variance: 0.716
- t Statistic: -1.367
- Degrees of freedom (df): 236
- Two-tailed p-value: 0.173

**Conclusion:**

The p-value is 0.173 which states that there is no significant difference in the perceived impact on sustainability between the consumers of Vadodara and Surat cities. Thus, **fail to reject the null hypothesis.**

**H020: Brand Name has no relation on perception of quality of the Green Cosmetic product (Q13)**

The study is to examine whether the brand name has any relationship from the perspective of quality of green cosmetic products.

**Single factor ANOVA:**

Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
Brand Name	477	200	0.419287	0.243997		
Ingredients	477	421	0.8826	0.103835		
Certification	477	263	0.551363	0.247882		
Packaging	477	116	0.243187	0.184434		
Place of Manufacturing	477	50	0.104822	0.094031		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	171.6268	4	42.90671	245.4116	1.2E-176	2.375667
Within Groups	416.109	2380	0.174836			
Total	587.7358	2384				

**Conclusion:**

Here, F-statistic tests if the means of the perception score across different brands are different. If the value of F is high, then the value of p is extremely low, indicating the failure to accept the null hypothesis suggesting a significant relationship between the brand name and the perception of green cosmetic products.

Therefore, Brand Name has no relation on perception of quality of the Green Cosmetic product" is rejected based on the ANOVA analysis. Brand Name does indeed play a significant role in shaping how consumers perceive the quality of Green Cosmetic products. Thus, reject the null hypothesis.

**H021: Consumer aware of Green cosmetic product do not have direct relation of perceiving green cosmetics as chemical free products (Q6, Q4)**

The hypothesis was to set the basis of the study that whether the consumers awareness have a relationship while perceiving green cosmetic products as chemical free.

From the questionnaire, whether the consumers know what green cosmetic products are and whether it impacts chemical free products are taken.

Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

According to you, what are green cosmetic products?	No	Yes	Grand Total
No	148		148
Yes	364	642	1006
<b>Grand Total</b>	<b>512</b>	<b>642</b>	<b>1154</b>

Expected:

According to you, what are green cosmetic products?	No	Yes	Grand Total
No	65.66377816	82.33622184	148
Yes	446.3362218	559.6637782	1006
<b>Grand Total</b>	<b>512</b>	<b>642</b>	<b>1154</b>

Chi-square calculations:

According to you, what are green cosmetic products?	No	Yes
No	103.2419032	82.33622184
Yes	15.18866965	12.11308234

Chi Square: **212.87** > 3.841 (df=1, p=0.05)  
 Degree of Freedom (df) = (No of Variable in X - 1) \* (No of Variable in Y - 1) = (2-1) \* (2-1) = 1

Reference Table for Chi-Square

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.25	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.851	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.01	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.99	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.78	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.196	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.058	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **reject null hypothesis**. Here, the chi-square value is 211.87, which is much higher than the critical value 3.841. It shows **that there is a significant** relationship between the consumers awareness have a relationship while perceiving green cosmetic products as chemical free.

**Regression:**

Regression was done taking Y = Purchase of Green Cosmetic Product X = Usage of Cosmetic Product

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SUMMARY OUTPUT								
Regression Statistics								
Multiple R		0.429501219						
R Square		0.184471297						
Adjusted R Square		0.183763373						
Standard Error		0.449048217						
Observations		1154						
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	52.5445869	52.54459	260.5806	5.31515E-53			
Residual	1152	232.2942346	0.201644					
Total	1153	284.8388215						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	3.33067E-16	0.036911536	9.02E-15	1	-0.07242137	0.07242137	-0.07242137	0.07242137
Do you use Cosmetic Products?	0.638170974	0.03953357	16.14251	5.32E-53	0.560605107	0.715736841	0.560605107	0.715736841

**P value < 0.05**

**Conclusion:** As the value of  $p$  is less than 0.05, **reject the null hypothesis**. Here, the  $p$ -value is  $5.32E-53$  which is very less than the significance value of 0.05.

It concludes <sup>9</sup> that there is statistically significant difference in the likeliness of purchasing green cosmetic products between people who use CP for skin and those who do not. Specifically, the data suggest that using CP for skin does influence the likelihood of purchasing green cosmetic products.

**H022: Consumers of Ahmedabad city when compared to Surat do not have any influence of social media while purchase of Green Cosmetic Product (Q21, B3)**

The hypothesis was to set the basis of the study that the consumers of Ahmedabad city and consumers of Surat city do not have an impact of social media while they are purchasing green cosmetic products.

Here, Paired t-test is used for analysing the data.

**t-Test: Two-Sample Assuming Equal Variances:**

t-Test: Two-Sample Assuming Equal Variances		
	<i>Abad</i>	<i>Surat</i>
Mean	1.640167364	1.719512
Variance	0.718715938	0.66931
Observations	239	164
Pooled Variance	0.698633302	
Hypothesized Mean Difference	0	
df	401	
t Stat	-0.936186447	
P(T<=t) one-tail	0.174870327	
t Critical one-tail	1.648662397	
P(T<=t) two-tail	0.349740653	
t Critical two-tail	1.965897465	

**Conclusion:**

Here, p-value is greater than 0.05, and thus it falls under critical value, and **fail to reject the null hypothesis.** Based on the t-test results, **no statistically significant difference** was found between consumers of Ahmedabad and Surat regarding **the influence of social media** on their purchase behavior of Green Cosmetic Products.

Therefore, there is insufficient evidence to conclude that there is any difference in how social media influences consumers from these two cities in their purchase decisions related to Green Cosmetic Products.

**H023: Consumers of Surat city when compared to Vadodara do not have any influence of Brand Reputation while purchasing Green Cosmetic Product (Q32, B3)**

The hypothesis was to set the basis for whether the consumers of Surat city compared to the consumers of Vadodara city are impacted by the brand factor while they purchase green cosmetic products.

City and whether the brand reputation (scale) impacts, data for 477 individuals were taken to analyse the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

<b>Observed:</b>	<b>Brand reputation</b>					
<b>City</b>	<b>Agree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Strongly Agree</b>	<b>Strongly Disagree</b>	<b>Grand Total</b>
Ahmedabad	118	12	50	53	6	239
Surat	97	5	28	31	3	164
Vadodara	44	1	14	15	0	74
<b>Grand Total</b>	<b>259</b>	<b>18</b>	<b>92</b>	<b>99</b>	<b>9</b>	<b>477</b>

Expected:

<b>Expected:</b>	<b>Brand reputation</b>					
<b>City</b>	<b>Agree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Strongly Agree</b>	<b>Strongly Disagree</b>	<b>Grand Total</b>
Ahmedabad	129.77148	9.01886	46.09643	49.60377	4.50943396	239
Surat	89.048218	6.188679	31.631027	34.03773	3.09433962	164
Vadodara	40.18029	2.792452	14.272536	15.35849	1.39622641	74
<b>Grand Total</b>	<b>259</b>	<b>18</b>	<b>92</b>	<b>99</b>	<b>9</b>	<b>477</b>

Chi-square calculations:

	<b>Brand reputation</b>				
<b>City</b>	<b>Agree</b>	<b>Disagree</b>	<b>Neutral</b>	<b>Strongly Agree</b>	<b>Strongly Disagree</b>
Ahmedabad	1.174304583	0.740595704	0.304756229	0.217629318	0.370297852
Surat	0.651864294	0.28259167	0.470869961	0.297672229	0.002966655
Vadodara	0.331594494	3.212887148	0.005305446	0.008567699	0

Chi Square:  $12.5 < 15.51$  ( $df=8, p=0.05$ )  
 Degree of Freedom ( $df$ ) = (No of Variable in X - 1)\*(No of Variable in Y - 1) =  $(5-1)*(3-1)=8$

Reference Table for Chi-Square:

DF	P										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.257	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.78	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.136	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.058	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **fail to reject the null hypothesis**. Here, the chi-square value is 12.5, less than the critical value of 15.51. Thus, there is no significant association between city of residence (Surat vs. Vadodara) and the influence of brand reputation while purchasing green cosmetic products.

**Regression:**

Regression was done taking Y = Impact X = City

SUMMARY OUTPUT								
<b>Regression Statistics</b>								
Multiple R	0.039069857							
R Square	0.001526454							
Adjusted R Square	-0.000575596							
Standard Error	0.842190767							
Observations	477							
<b>ANOVA</b>								
	<b>df</b>	<b>SS</b>	<b>MS</b>	<b>F</b>	<b>Significance F</b>			
Regression	1	0.515064532	0.515065	0.726174	0.394555603			
Residual	475	336.910512	0.709285					
Total	476	337.4255765						
	<b>Coefficients</b>	<b>Standard Error</b>	<b>t Stat</b>	<b>P-value</b>	<b>Lower 95%</b>	<b>Upper 95%</b>	<b>Lower 95.0%</b>	<b>Upper 95.0%</b>
Intercept	3.815734757	0.087428637	43.64399	2.5E-168	3.64394004	3.987529474	3.64394004	3.987529474
B3	0.036285007	0.042580118	0.852158	0.394556	-0.047383681	0.119953695	-0.047383681	0.119953695

**P value > 0.05**

**Conclusion:** As the value of p is more than 0.05, **fail to reject the null hypothesis**. While analyzing regression analysis, the value of p exceeds 0.05. Because this p-value is much higher than the conventional threshold of 0.05, it cannot reject the null hypothesis. It implies that no statistically significant evidence supports that consumers of Surat city, compared with the consumers of Vadodara city, have any influence of brand reputation while purchasing green cosmetic products.

As a <sup>89</sup> result, it can be concluded from the analysis of chi-square and regression analysis that the null hypothesis should be accepted.

**H024: Influence via Word of Mouth has no relation in generating Positive emotions towards Purchase of Green Cosmetic Products (Q18, Q14)**

The hypothesis was to set the basis that word of mouth has any relation in generating positive emotions among the consumers while they purchase green cosmetic products.

For the same, kind of research consumers do while they purchase green cosmetic products (Word of Mouth) and the emotions <sup>155</sup> they have been compared for 477 individuals were taken to analyse the given Hypothesis. Since data has binary variables, Chi-Square and Linear Regression analysis.

**Chi-Square:**

Observed:

<b>Observed:</b>	<b>What kind of emotions affects the consumer's decision while purchasing Green cosmetic products?</b>		
<b>What kind of research you do before purchasing Green cosmetic products? -WOM</b>	<b>0</b>	<b>1</b>	<b>Grand Total</b>
0	32	209	241
1	37	199	236
<b>Grand Total</b>	<b>69</b>	<b>408</b>	<b>477</b>

Expected:

<b>Expected:</b>	<b>What kind of emotions affects the consumer's decision while purchasing Green cosmetic products?</b>		
<b>What kind of research you do before purchasing Green cosmetic products? -WOM</b>	<b>0</b>	<b>1</b>	<b>Grand Total</b>
0	35	206	241
1	34	202	236
<b>Grand Total</b>	<b>69</b>	<b>408</b>	<b>477</b>

Chi-square calculations:

Chi-square calculation	What kind of emotions affects the consumer's decision while purchasing Green cosmetic products?	
What kind of research you do before purchasing Green cosmetic products? -WOM	0	1
0	0.2	0.0
1	0.2	0.0

Chi Square:  $0.6 < 3.841$  ( $df=1, p=0.05$ )  
 Degree of Freedom ( $df$ ) = (No of Variable in X - 1)\*(No of Variable in Y - 1) = (2-1)\*(2-1)=1

Reference Table for Chi-Square:

DF	p										
	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.36	15.507	17.535	18.168	20.09	21.955	24.952	26.124
9	1.735	2.7	12.242	14.68	16.919	19.023	19.679	21.666	23.589	26.056	27.677
10	2.156	3.247	13.442	15.98	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.27	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.54	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.81	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.06	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.30	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.54	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.76	27.587	30.191	30.995	33.409	35.718	38.648	40.79
18	6.265	8.231	22.76	25.98	28.869	31.526	32.346	34.805	37.156	40.196	42.312
19	6.844	8.907	23.9	27.20	30.144	32.852	33.687	36.191	38.582	41.61	43.82
20	7.434	9.591	25.038	28.41	31.41	34.17	35.02	37.566	39.997	43.072	45.315

**Conclusion:** From the above calculation, **fail to reject the null hypothesis**. Here, chi-square value is 0.6 which is less than the critical value 3.481. Thus, there is no significant association between influence via word of mouth and generating positive emotions towards the purchase of green cosmetic products.

**Regression:**

Regression was done taking Y = Influence (WOM) X = Emotions

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SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0.034112496							
R Square	0.001163662							
Adjusted R Square	-0.000939151							
Standard Error	0.500732402							
Observations	477							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	1	0.138751495	0.138751	0.553384	0.457306262			
Residual	475	119.0981458	0.250733					
Total	476	119.2368973						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95.0%</i>	<i>Upper 95.0%</i>
Intercept	0.536231884	0.060281097	8.895523	1.22E-17	0.41778129	0.654682479	0.41778129	0.654682479
What kind of emotions affects the consumer's decision while purchasing Green cosmetic products?	-0.048486786	0.065179385	-0.7439	0.457306	-0.176562372	0.0795888	-0.176562372	0.0795888

**P value > 0.05**

**Conclusion:** As the value of p is more than 0.05, **fail to reject the null hypothesis.** While analyzing regression analysis, the value of p exceeds 0.05. Because this p-value is much higher than the conventional threshold of 0.05, cannot reject the null hypothesis. It implies that no statistically significant evidence supports influence via word of mouth has any relation to generate positive emotions while they purchase green cosmetic products.

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As a result, it can be concluded from the analysis of chi-square and regression analysis that the null hypothesis should be accepted.

## 5.5. Correlation Analysis:

### Correlation Analysis:

The below analysis is correlation matrix. It was tested from questions 28 to 41, and the range of correlation coefficients lies between -1 and +1. The values close to one indicate a strong positive relation, which means that as one variable increases, the other also increases. A value that is close to -1 indicates a negative relation and around 0 indicates no relation.

Correlation	Q28	Q29	Q30	Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40	Q40.5	Q41
Q28	1														
Q29	0.374833	1													
Q30	0.287187	0.395521	1												
Q31	0.284175	0.417021	0.756132	1											
Q32	0.171076	0.411054	0.191803	0.228563	1										
Q33	0.238468	0.380129	0.362331	0.324048	0.292032	1									
Q34	0.262885	0.342836	0.502096	0.526544	0.206773	0.67562	1								
Q35	0.154973	0.277748	0.291663	0.258402	0.335531	0.577803	0.440645	1							
Q36	0.308679	0.33052	0.471631	0.520539	0.294666	0.536923	0.578523	0.490141	1						
Q37	0.281894	0.259568	0.468159	0.482934	0.334126	0.381841	0.437829	0.34418	0.634078	1					
Q38	0.351513	0.343476	0.361669	0.416176	0.197177	0.489166	0.532599	0.315623	0.52355	0.562014	1				
Q39	0.22622	0.323072	0.36174	0.369577	0.282758	0.401893	0.483573	0.392354	0.486311	0.531002	0.600549	1			
Q40	0.286804	0.315806	0.405656	0.406667	0.336899	0.431256	0.551104	0.384665	0.587998	0.609325	0.623657	0.658003	1		
Q40.5	0.261005	0.314378	0.412985	0.432185	0.304139	0.448393	0.579797	0.34498	0.635505	0.565676	0.564879	0.597974	0.67233	1	
Q41	0.221	0.15595	0.263432	0.373377	0.30586	0.344107	0.372717	0.381193	0.521533	0.55253	0.439848	0.379956	0.57315	0.541493	1

Q28	Price and affordability
Q29	Quality and Performance
Q30	Environmental Impact and comparison
Q31	Sustainability
Q32	Brand reputation
Q33	Green cosmetic products are made with natural, sustainable and are chemically free.
Q34	Green cosmetic products are better for environment and can help in the reduction of the carbon footprint
Q35	Green cosmetic products have higher quality ingredients and may offer better performance than traditional cosmetic products
Q36	Consumers should be made more educated about the benefits of using green products especially environment and health benefits
Q37	Promotional activities can be used to increase the awareness of the green cosmetic products
Q38	Products can be made available in the online and offline stores to increase the accessibility
Q39	Green cosmetic products should be tested to meet the quality standard

Q40	Good customer service should be provided after the purchase of green cosmetic products
Q40.5	Consumers should be provided with accurate and proper information regarding the green cosmetic products
Q41	Offers, Discounts and rewards should be given to the consumers purchasing green cosmetic products

**Interpretation of Correlation:**

<b>Strong Positive Correlation</b>	<b>Moderate Positive Correlation</b>	<b>Low Positive Correlation</b>	<b>No Correlation</b>
Q31 and Q30 (0.756132)	Q31 and Q34 (0.526544)	Q32 and Q29 (0.411054)	Q28 and Q35 (0.154973)
Q34 and Q33 (0.67562)	Q36 and Q34 (0.578523)	Q41 and Q37 (0.55253)	Q32 and Q28 (0.171076)
Q40 and Q40.5 (0.67233)	Q40 and Q36 (0.587998)	Q39 and Q40 (0.658003)	Q41 and Q29 (0.15595)
Q36 and Q37 (0.634078)			

Thus, Variables with strong correlations might be measuring similar underlying constructs or be directly influencing each other. Variables with weak or no correlations likely represent different constructs or independent phenomena.

## 5.6. Cronbach Alpha Analysis:

Cronbach Alpha is a statistic that determines the internal consistency or reliability of data over multiple items or how dependable replies are when compared to the questionnaire. In this study, 15 questions (in the form of a Likert scale, with one representing strongly disagree and five representing strongly agree) were internally tested.

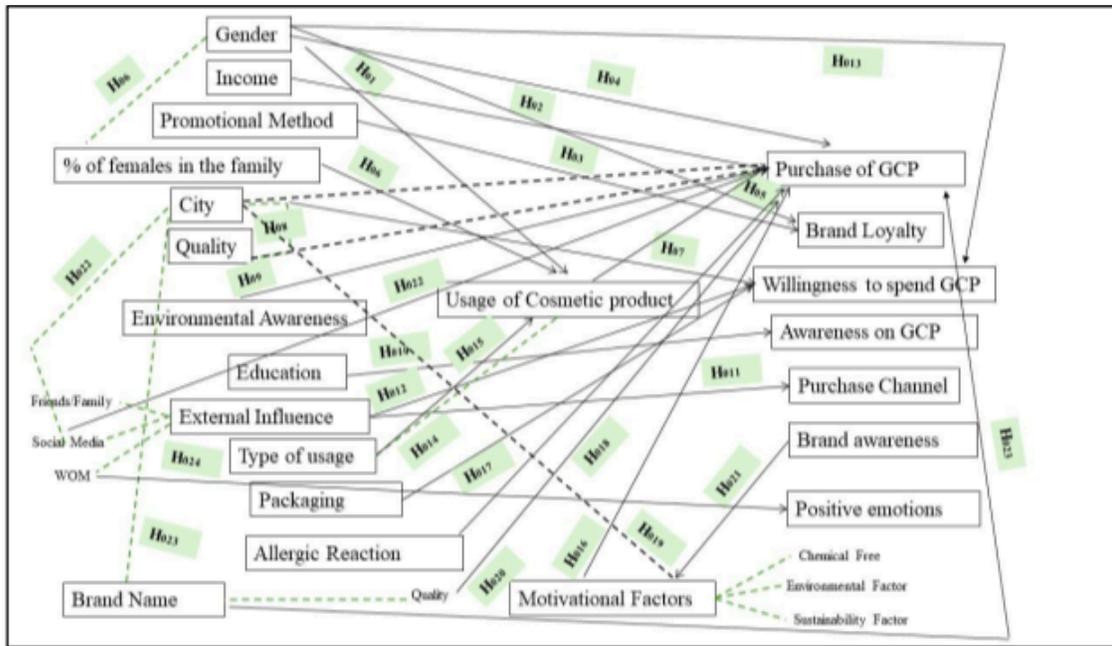
$$r_{11} = \left[ \frac{k}{(k-1)} \right] \left[ 1 - \frac{\sum \sigma_b^2}{\sigma_t^2} \right]$$

<b>Questions components</b>	<b>15</b>
The sum of the item variances	11.042
Variance of total scores	71.989
<b>Cronbach Alpha</b>	<b>0.907</b>

**Cronbach's alpha value is 0.907**, the data's internal consistency or reliability. A high value close to 1 indicates strong reliability, suggesting that the variables in the data sets are highly correlated.

## 5.7. Overall Analysis of Hypothesis:

Hypothesis	Analysis	Result	Accept or Reject the null hypothesis
H01	Regression Analysis	p-value= 9.733E-25 < 0.05	Reject
	Chi-square	100.984 > 3.841 (df=1,p=0.05)	Reject
H02	Regression Analysis	p-value= 0.08 > 0.05	Reject
	Chi-square	401 > 9.488 (df=4,p=0.05)	Accept
H03	Regression Analysis	p-value= 0.02 < 0.05	Accept
	Chi-square	6.466 < 9.488 (df=4,p=0.05)	Accept
H04	Regression Analysis	p-value= 0.81 > 0.05	Accept
	Chi-square	0.05 < 3.841 (df=1,p=0.05)	Accept
H05	Regression Analysis	p-value= 0.46 > 0.05	Accept
	Chi-square	0.51 < 3.841 (df=1,p=0.05)	Accept
H06	candle stick analysis	~0.17 (tan 10 <sup>0</sup> )	Accept
	Continuous Average Analysis	p value = 0.1091	Accept
H07	Regression Analysis	p-value= 0.03 < 0.05	Reject
	Chi-square	5.99 < 9.488 (df=4,p=0.05)	Accept
H08	Regression Analysis	p-value= 0.93	Accept
	Chi-square	11.23 > 5.99 (df=2,p=0.05)	Accept
H09	Regression Analysis	p-value= 2.587E-12 < 0.05	Reject
	Chi-square	145.33 > 9.48 (df=4,p=0.05)	Reject
H010	Regression Analysis	p-value= 0.0003 < 0.05	Reject
	Chi-square	18.59 > 9.48 (df=4,p=0.05)	Reject
H011	Regression Analysis	p-value= 6.52E-09 < 0.05	Reject
	Chi-square	36.51 > 7.815 (df=3,p=0.05)	Reject
H012	Single factor ANOVA	p-value= 0.00057 < 0.05	Reject
	Two-sample t-test	p-value= 0.00023 < 0.05	Reject
H013	Regression Analysis	p-value= 0.89 > 0.05	Accept
	Chi-square	12.5 < 16.919 (df=9,p=0.05)	Accept
H014	Regression Analysis	p-value= 6.21E-27 < 0.05	Reject
	Chi-square	110 > 3.841 (df=1,p=0.05)	Reject
	Two-sample t-test	3.11E-27	Reject
H015	Two-sample t-test	1.30E-82	Reject
H016	Regression Analysis	p-value= 1.7914E-19 < 0.05	Reject
	Chi-square	75.24 > 3.841 (df=1,p=0.05)	Reject
H017	Regression Analysis	p-value= 0.69 > 0.05	Accept
	Chi-square	5.9 = 5.9 (df=2,p=0.05)	Accept
H018	Regression Analysis	p-value= 7.73E-05 < 0.05	Reject
	Chi-square	15.6 > 3.841 (df=1,p=0.05)	Reject
H019	Two-sample t-test (Env)	p-value= 0.188 > 0.05	Accept
	Two-sample t-test (Sustainability)	p-value= 0.17 > 0.05	Accept
H020	Single factor ANOVA	p-value= 1.2E-176 < 0.05	Reject
H021	Regression Analysis	p-value= 5.23E-53 < 0.05	Reject
	Chi-square	212.87 > 3.841 (df=1,p=0.05)	Reject
H022	Two-sample t-test	p-value= 0.35 > 0.05	Accept
H023	Regression Analysis	p-value= 0.39 > 0.05	Accept
	Chi-square	12.5 < 15.51 (df=8,p=0.05)	Accept
H024	Regression Analysis	p-value= 0.45 > 0.05	Accept
	Chi-square	0.6 < 3.841 (df=1,p=0.05)	Accept



## **6. Conclusions, Findings and Recommendations**

## **6.1. Introduction**

An attempt is made to summarize the study findings and recommendations that have been made following the objectives. Objectives have been designed to understand the Behavioral Aspects that go in the mind of consumers while making decisions about purchase of greener products specific to Cosmetics Industry considering factors like Demographics, Attitude, Influence of Promotions, social media, Family recommendations, and many other factors. The study also provides insight into the emotions that lead to an eventual purchase, such as fear of side effects, harmful chemicals, allergic reactions, such as negative emotions and hope of improvement, and performance optimism as positive emotions. Exertion was also made to understand brand loyalty and factors that help consumers build trust around the product, such as packaging, quality, brand, and environmental benefits.

The study was conducted via a Respondent Questionnaire among the cities of Ahmedabad, Surat, and Vadodara. The respondents were picked proportionately to maintain the Demographics of specific Cities. 1154 responses were collected and used to analyze the research objectives.

The data was structured and analyzed jointly to draw certain conclusions to meet the study's objectives using various statistical tools.

## **6.2. Findings and Recommendations of the study:**

Out of the total of 1154 respondents, 87% of the respondents had used cosmetic products. Of the respondents who used cosmetic products, 75% were aware of green cosmetic products. Overall, 65% of the respondents were aware of green cosmetic products. Of the total 1154 respondents, 739 were female and 415 were male. 95% of females and 74% of males had used cosmetic products. Of the respondents who had used cosmetic products, 82% of female and 60% of male were aware of green cosmetic products. Overall, 77% of females and 45% of male respondents were aware of the term green cosmetic products. From the data, it can be inferred that females' awareness of green cosmetic products is higher than male respondents. Based on

statistical tool analysis, <sup>65</sup> it has been observed that with the increase in the education level of the consumers, there was a significant increase in the awareness of the term green cosmetic products. (Reference H<sub>010</sub>). For the above objective, it is recommended that educational campaigns should be organized primarily for male consumers by leveraging the platforms with female consumers as they have higher awareness, the companies should recommend the government to include the importance of the green cosmetic and include the same in the syllabus so that the young upcoming generation can be made more aware.

From the total respondents 1154, it can be observed that while purchasing the cosmetic behavior, 73% of the respondents bought skin-care products, followed by 45% body-care products, 35% of makeup, 56% of fragrances, 67% of hair-care products and 13% of the respondents did not purchase cosmetic products. From the 477 respondents who have purchased green cosmetic products, 47% of the respondents purchased cosmetic products from social media, 50% of the respondents from the company website, 41% of the respondents from the departmental stores and 9% from other places such as exhibitions. Furthermore, 88% of respondents were influenced to purchase green cosmetic products by the ingredients of the product, 24% by packing, 55% of respondents by its certification, 42% of respondents by the brand name, and 10% of respondents by the place of manufacturing. On the basis of statistical tools, it has been inferred that likeliness of place to purchase green cosmetic products had direct relationship of the respondents getting recommended to use green cosmetic products referred by friends/family (Reference H<sub>011</sub>). Respondents using cosmetic products for certain purposes are likelier to use green cosmetic products for the same purpose (Reference H<sub>014</sub>, H<sub>015</sub>). Respondents perceived quality of green cosmetic products depended on the product's brand name (Reference H<sub>020</sub>). To fulfil the above objective, it is further recommended that the companies enhance their social media presence and optimize their websites to increase consumer reach and engagement ratio. As it can be inferred that natural ingredients, certification and brand name significantly influence the purchasing decisions, the companies should focus on these factors.

Out of 1154 total respondents, 23% of respondents are willing to spend up to Rs.500 per month on green cosmetic products (46% on cosmetic products), 16% of respondents between Rs.500-Rs.2000 per month (39% on cosmetic products), 2% between Rs. 2000-3500 (11% on cosmetic

products) and 1% willing to spend more than Rs.3500 per month (4% on cosmetic products). From the statistical tool analysis, it can be inferred that consumer loyalty is directly related to the promotional methods employed by brands (Reference H<sub>03</sub>). Consumers of Vadodara city was willing to pay more when compared to the respondents of Ahmedabad city (Reference H<sub>07</sub>). Consumers purchasing green cosmetic products from social media tend to spend more. (Reference H<sub>012</sub>). Consumers may or may not evaluate the quality of cosmetic products based on the packaging (Reference H<sub>017</sub>). To increase the consumer's spending on green cosmetic products, brands should focus on the various promotional methods that will help build the loyalty among the consumers. The marketing strategies such as promotions and premium packaging on green cosmetic products should be offered for the consumers of Vadodara city as they are willing to pay more. More emphasize should be made on quality of the products to reach a wider audience.

Consumers using green cosmetic products, 62% of respondents gets motivated to purchase green cosmetic products by the factor of not harming the environment, 70% of respondents by the factor of health benefits, 26% by the factor of ethical values, 52% by the factor of no side effects and 4% due to social pressure. While deciding whether to purchase green cosmetic products, 38% of respondents consider price, 88% consider quality, 58% consider brand reputation, 38% consider environmental sustainability, and 24% consider ease of availability of the cosmetic products. Of the respondents, the main demotivating factors for not purchasing green cosmetic products, 37% of respondents found that the green cosmetic products were expensive, 30% of respondents had allergic reactions, 41% considered environmental non-sustainability, 12% of respondents had personal preference and 3% of respondents had health concerns. From the analysis obtained from statistical tool, it can be inferred that respondents who gets motivated by green cosmetic products not causing harm to the environment has environmental impact as the most significant factor while they purchase green cosmetic products (Reference H<sub>016</sub>).

For enhancing the adoption of green cosmetic products, it is recommended that companies should emphasize on health benefits, environmental sustainability and the ethical values for marketing strategies. They should try to cater the price sensitivity part of green cosmetic products and ensure high quality product with minimizing allergic reactions by standardization norms.

Consumers expectations towards green cosmetic products was analyzed on the Likert scale (1-5 from Strongly disagree to Strongly agree). 45% of the 477 respondents agreed (scale 4) that price and affordability as one of the major factor, 26% were neutral (scale 3), 16% strongly agreed (scale 5), 8% strongly disagree (scale 1) and 5% disagreed (scale 2). Considering quality and performance as another factor, 4% of respondents strongly disagreed, 2% disagreed, 10% were neutral, 35% agreed and 48% strongly agreed. Considering environmental impact and comparison as another factor, 4% of respondents strongly disagreed, 3% disagreed, 31% were neutral, 42% agreed and 21% strongly agreed. Considering sustainability as another factor, 2% of respondents strongly disagreed, 4% disagreed, 25% were neutral, 49% agreed and 20% strongly agreed. Considering brand reputation as another factor, 1% of respondents strongly disagreed, 4% disagreed, 19% were neutral, 54% agreed and 21% strongly agreed. From the statistical tool analysis, it can be inferred that purchase of green cosmetic products had a significant relationship with the environmental awareness of the consumers (Reference H<sub>09</sub>). To better understand and meet the consumer expectations for green cosmetic products, companies should focus on high-quality products as consumers strongly values. It can maintain competitive pricing and affordability and will address consumers' concerns by building a solid brand reputation.

To examine the quality and satisfaction for green cosmetic products, the factors were analyzed by Likert scale (1-5 from Strongly disagree to Strongly agree). Considering that green cosmetic products should be tested to meet quality standards as a satisfactory factor, 1% of respondents strongly disagreed, 2% disagreed, 12% were neutral, 45% agreed, and 40% strongly agreed. Considering good customer service after purchase of green cosmetic product as a satisfactory factor, 3% of respondents strongly disagreed, 1% disagreed, 14% were neutral, 50% agreed and 33% strongly agreed. Considering that consumers should be provided with accurate information as a satisfactory factor, 1% of respondents strongly disagreed, 1% disagreed, 10% were neutral, 43% agreed, and 45% strongly agreed. Considering offers, discounts and rewards as a satisfactory factor, 2% of respondents strongly disagreed, 1% disagreed, 20% were neutral, 47% agreed and 30% strongly agreed. Focusing on quality assurance, post-purchase customer service, transparency in the ingredients, production methods, and product benefits will help the companies build credibility and meet customer expectations with the product features by implementing promotional strategies and education initiatives.

For analyzing the gender influence among the consumers while they purchase green cosmetic products for factors preference and attitude, 79% of respondents believe that gender does impact the purchase behavior. 83% of respondents believe <sup>112</sup> that women are more likely to purchase the premium products as compared to male, 81% of respondents speculate that gender plays an important role while evaluating and perceiving quality and safety of green cosmetic products, 86% of respondents deemed different expectations of men and women when it comes to packaging and 77% regarding sustainability. While analyzing the results of statistical tool, it can be inferred that usage of cosmetic products had direct relationship with the gender of the respondents (Reference H<sub>01</sub>). It can also be inferred that gender may or may not impact purchase behavior and brand loyalty (Reference H<sub>04,5</sub>). Based on the findings of the above objective on the influence of gender on consumer behavior while purchasing green cosmetic products, the companies should try to highlight various aspects such as product benefits, packaging, sustainability and try to make product differentiation based on gender, try to implement brand loyalty programs and try to strengthen their brand positioning.

For evaluating the consumer's intention or attitude towards green products, 82% of respondents dependent on online reviews, 50% of respondents dependent on social media, 49% of respondents dependent on word of mouth, 6% of respondents dependent on other factors such as influencers, blogs, personal research, and eco-labels. 93% of respondents were influenced by reviews, ratings or word of mouth while purchasing green cosmetic products. While analyzing the respondents' emotions while purchasing green cosmetic products, 86% of respondents were guided by positive emotions like hope of improvement and performance optimism. 14% of respondents were impacted by negative emotions such as fear of side effects, harmful chemicals and allergic reactions. By statistically analyzing, it was inferred that word of mouth may or may not generate positive emotions toward purchasing green cosmetic products (Reference H<sub>024</sub>). Based on the influence of consumer attitude and emotions while purchasing green cosmetic products, the companies should try to improve their online reputation, leverage social media platforms, fostering on positive word of mouth by encouraging the satisfied customers their experience with friends/ family.

While dissecting alternatives to encourage usage of green cosmetic products Likert scale (1-5 from Strongly disagree to Strongly agree) has been used. Considering natural, sustainable and

chemical-free products, 4% of respondents strongly disagreed, 2% disagreed, 20% were neutral, 58% agreed, and 16% strongly agreed. Considering that green cosmetic products are better for the environment and help reduce carbon footprint, 3% of respondents strongly disagreed, 4% disagreed, 18% were neutral, 59% agreed, and 16% strongly agreed. Considering that green cosmetic products have high performance, 2% of respondents strongly disagreed, 6% disagreed, 23% were neutral, 56% agreed, and 14% strongly agreed. Considering the accessibility of green cosmetic products in online and offline stores, 2% of respondents strongly disagreed, 1% disagreed, 10% were neutral, 50% agreed and 36% strongly agreed (Reference H<sub>03</sub>). Consumers perceiving green cosmetic products as chemical-free products has a significant relation with the awareness of green cosmetic products (Reference H<sub>021</sub>). From the above objective findings, it can be further recommended that companies highlight natural, sustainable, and chemical-free green cosmetic products via marketing communication strategies. Message for reducing carbon footprint and supporting eco-friendly activities, measuring performance assurance, expand the availability of green cosmetic products by making to available online and offline, develop a holistic approach for attracting new customers and foster loyalty among the existing customers.

Consumers not using green cosmetic products were dissected to understand their motive: 33% of respondents felt green cosmetic products to be highly expensive, 42% of respondents felt lack of clarity in communication of products benefits and sustainability position, 21% of respondents felt change in habits as a barrier to shift while purchasing green cosmetic products, 17% of respondents felt they were unable to trust the concept of green or organic cosmetic products. Moreover, 38% of respondents were willing to try green cosmetic products if prices were reduced. To encourage the non-users to try green cosmetic products, companies should introduce affordable green cosmetic products, enhance clear communication and explain the importance of the environmental impact of green cosmetic products by providing information such as certification, ingredients. The companies should offer starter kits in trial, small packs so consumers will try to purchase.

For examining the associations between the environmental Behavior and demographic factors, for 62% of respondents, one motivating factor was to green cosmetic product not harming the

environment. The number remained similar specific to gender. For education up to 12<sup>th</sup>, 67% of respondents felt the importance of environmental awareness, while only 62% of graduates and postgraduate student felt environmental awareness as a significant factor. Respondents of the Vadodara (69%) city were more proactive towards environmental awareness compared to Surat (62%) and Ahmedabad (60%). While examining the occupation specific to environment awareness, 65% of respondents in business were pro-environment, 63% of service class, 50% of home-makers and 63% of students considered environment awareness as a significant factor. From the statistical tool analysis, it can be inferred that purchase of green cosmetic products had a significant relationship with the environmental awareness of the consumers (Reference H<sub>09</sub>). Based on the findings of the above objective for adoption of green cosmetic products via environmental awareness, it is recommended that companies should focus more on Vadodara consumers as environmental awareness is higher and a strong customer base can be built, the same can be used in expanding the market in Surat and Ahmedabad. Companies should try to simplify the communication strategies and create engagement programs and initiatives that actively includes consumers in environmental sustainability practices and promote the benefits of green cosmetic products.

## **7. Managerial Implications and Delimitations with Future Scope of Study, Concluding Remarks**

## 7.1. Managerial Implications:

The analysis provides many managerial implications that can help companies / brands use the research as a base and build upon it in the green cosmetics market.

The research's first and most important outcome is the lack of awareness among consumers concerning green cosmetics; awareness campaigns are the need of the hour to create a strong base of consumers for the green cosmetics market. Multiple channels like television, social media, and influence marketing workshops must be used to develop awareness. Investments in the education of consumers needs to be part of strategic marketing for any cosmetic companies focusing on green cosmetic products.

The research shows the reading response of consumers with varying demographics. The cosmetic industry has always been a woman-dominant industry, the green cosmetic industry follows similar trend with women being more aware to the new and upcoming trends in the industry. However, the industry has observed an increase in men's participation in acceptance of cosmetics products.

As the data collected and analyzed in the study, <sup>65</sup> it has been observed that men have also started showing a keen interest in the use of cosmetic products and thus marketing strategies need to be gender specific and tailored to the demographic. Demographic variations like education and occupation directly relate to consumer purchase Behavior as seen in the research. Spending capacity is also related to the income as well as education level of the consumers.

Research has shown that price is essential in deciding whether to purchase green cosmetic products. Marketers need to be aware of competitive pricing compared to regular cosmetic products as well as value for money to that particular segment of consumers. Pricing is one of a company's most important decisions while entering the green cosmetic market. Consumer perceiving price compared to regular cosmetic products may have a direct relation with pursued quality of the green cosmetic products; hence the price of Green cosmetic products must be at least at a slight premium compare to regular cosmetic products.

In many cases <sup>113</sup> it has already been observed that shifting to green cosmetic products may not necessarily increase price for the manufacturer. In such cases, clarity in communication and

transparency are required. Certifications and collaborations with pro-environment agencies can help get credibility.

Generally, the cost of acquiring customer is high in the cosmetic industry, for Green cosmetic products it is important to build loyalty of customers to derive the maximum mutual benefit. Since the industry is hugely competitive, consumer loyalty has become even more important. Some factors like the availability of products, new development as per consumer demand, value for money, high quality and safe application, and brain trust have become more critical in maintaining loyal consumers.

The current trend shows many companies entering into green cosmetic products. Existing cosmetic companies must venture into green cosmetics as early as possible to ensure minimum loss of market share. With consumers be more aware the industry is moving in the right direction and companies need to develop and update the current products seamlessly transition to Organic, environmentally friendly and sustainable products.

## **7.2. Delimitations and Future scope of the study:**

The study's main objective was to determine the factors that influence consumer behavior towards purchasing green cosmetics in and how they relate to its demographic characteristics, environmental awareness and perceived product benefits that impacted consumers' willingness to purchase green cosmetic products. The study's limitations can help in reaching out the future scope of the study.

The present study was carried out only in the cities of Ahmedabad, Surat, and Vadodara, which are the cities of Gujarat state. So, <sup>73</sup> the findings of the research are limited to the perception of these cities consumers only. If the researcher takes different geographical locations the consumers will have a different perspective towards the awareness of cosmetic products, their knowledge, habits, environment awareness, product use and benefits. Thus, in the future, the researcher can cater different geographical locations for more specific insights.

Along with the geography, the researcher should also focus on cross cultural study, it will help to deep dive into culture of one another with the awareness of what is right or wrong and what are the differences, customs, religion, economic status and gender.

As the cosmetic market evolves, longitudinal studies can be conducted to allow researchers to monitor consumer perceptions continuously, how long a consumer is loyal to a brand, and the effectiveness of marketing efforts and strategies. The study will help the researchers and provide a detailed understanding of how environmental awareness, societal value, and market trends affect consumer buying behavior. Keeping an eye on the same consumers over a long period of time will help the researchers to know how loyal a consumer is towards a particular brand, product satisfaction, trustworthiness, and what factors influence the consumers to switch to a different brand. It can also help the companies determine what marketing strategies will be helpful for them in the long term.

On the other hand, with the increase in emerging technologies such as (Augmented Reality) AR, (Virtual Reality) VR and (Artificial Intelligence) AI, researchers can investigate more detail of how they can use these technologies which will help to companies to reach to the consumers more quickly and efficiently. The researchers should analyse how effective the social media and digital marketing impacts. More focus should be there in what kind of social media campaigns can help the companies engage and reach towards their brand of green cosmetic products, are influencers required for their branding and what the consumers require all buying intentions for purchasing green cosmetic products.

The researcher should focus on psychographic factors such as values, lifestyles, personality traits, and environmental awareness to develop more effective and targeted marketing strategies.

Though the concept of green cosmetics is coming around, there are hardly any laws in India for the specifications of ingredients that are to be used and fair for skin compared to the international standards. The government should focus on creating regulations for the formulations of cosmetic products and the standardization process should be made mandatory for all the companies. After that, the researcher can try to develop a green cosmetic product life cycle from its raw ingredients to packaging, sustainability, manufacturing, recycling and the

source of the products. This will help the companies maintain their standards while manufacturing green cosmetic products.

The researchers should try to understand the economic impact for the companies adopting green cosmetic products. They should be made aware of the cost-benefit analysis for companies planning to switch to green cosmetic products; specific metrics should be identified for measuring green cosmetic products.

### 7.3. Concluding Remarks

The above study presented in the thesis is distinguished by its comprehensive and empirical investigation by evaluating the relationships between the variable factors that influence consumers buying behavior while purchasing green cosmetic products. The study has defined <sup>39</sup> the problem statement, research methodology, objectives very meticulously.

According to the major outcomes of the statistical analysis, the key insights from the hypothesis, while evaluating demographic factors, gender, education, city of residence, occupation all of the above plays a crucial role in shaping the behavior of the consumer. Though women were more inclined towards premium green cosmetic products and higher education levels correlated with the increase in environmental awareness. While considering consumer motivation and barriers consumers were motivated to purchase green cosmetics due to their perceived environmental benefits, health advantages, and sustainability. However, high prices, lack of clear communication, habitual purchasing patterns, and trust issues with the concept of green products were identified as primary barriers. Online reviews, social media, word of mouth were significantly important for shaping the consumer attitudes and their intention of purchasing green cosmetic products, the emotional response were predominantly positive and were driven by the factors such as hope of improvement and performance optimism.

The study showed a significant impact on the relationship between environmental awareness and purchase of green cosmetic products. Vadodara city showed the highest engagement and awareness ratio when compared with Ahmedabad and Surat cities. Consumers were giving most importance to the quality of the products; customer service and accurate information and these factors can help to determine satisfaction and loyalty of the consumers towards green

cosmetic products. Based on the findings of the study, the companies should try to focus on enhancing communication strategies and transparency, develop more cost-effective and reasonable green cosmetic products, develop localized marketing strategies as per geographic and demography, launch educational campaigns and find out ways to get customer feedback by which they can develop a deeper connection with the consumers by positively spreading environmental awareness. The study will be valuable for empirical future studies and developing strategies in the green cosmetic industry.

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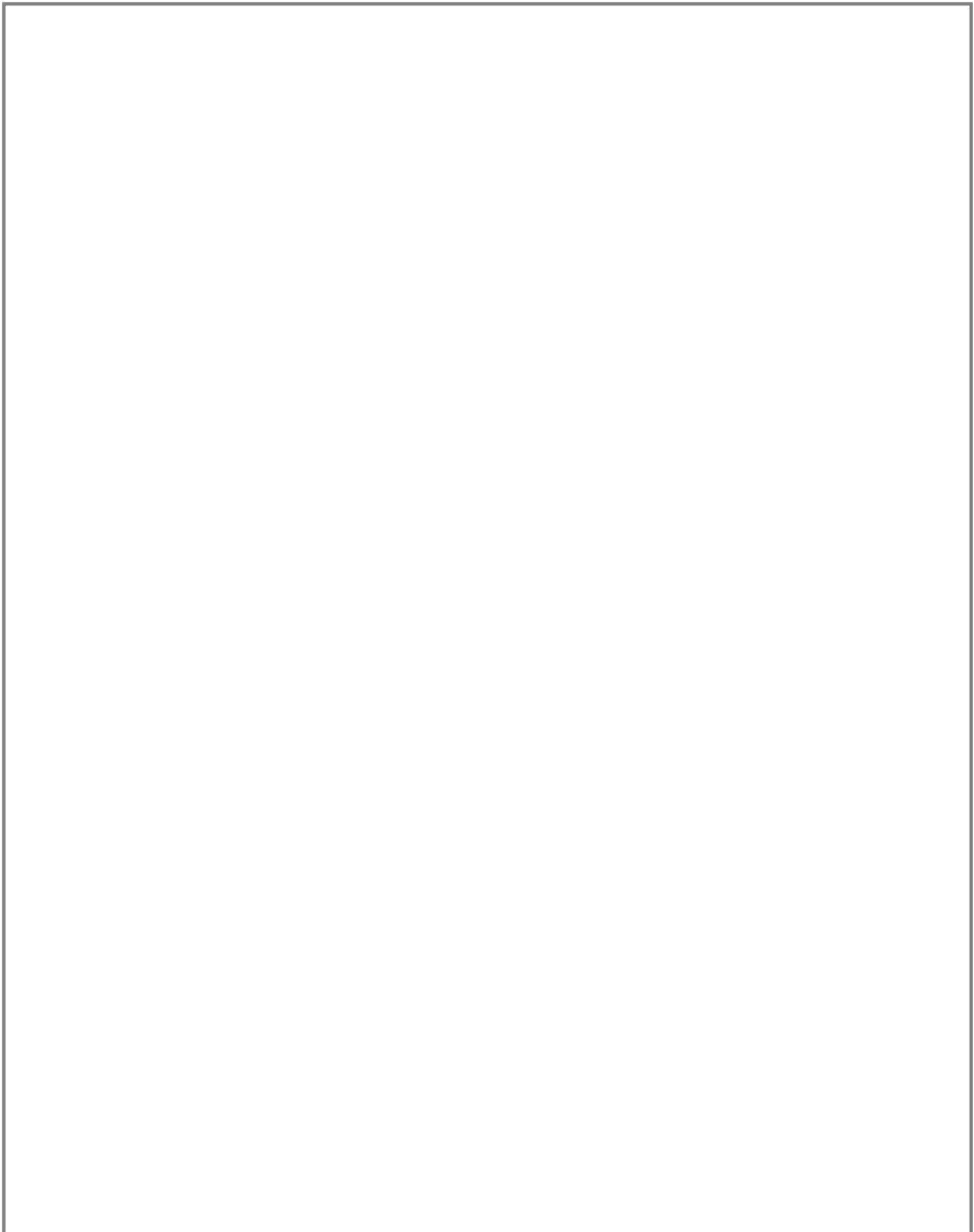
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