

Sentiment Analysis Using Search Engine Drifts for Green Marketing and Related Terms: A Geographical Analysis Based on Counties

Jatinder Kaur^{1,*}

Abstract

This exploratory study's main goal was to find out how interested Google users in India will be in green products, marketing, causes, and affiliate concepts between May 2021 and May 2022. Google Trends are being used more and more for various opinion research purposes to gauge popular sentiment. We monitor Google Trends for certain keywords that correspond to our green marketing-related characteristics. As the next step, we compare the interest towards various affiliated keywords for the pre-determined time frame. Afterwards, a geographical regional analysis related to identify keywords is performed for various Indian states so as to identify the geographical regions of most interest in our selected variables. The findings of the study have allowed us to recognize important 'green' keywords that most concern people based on seasons and regions in India.

Keywords: Green marketing, sentiment analysis, textual analysis, media platforms, sustainable development

INTRODUCTION

New technologies allow users to not only share their views on new media but also search for terms and terminology of their interest over the new media platforms and search engines. Thanks to emerging technology, the basic considerations of the individual community's particular interest which are in service to both consumers and the organizations that establish the action strategy vis-à-vis these issues can now be accessed, investigated, or collected.

One such subject is related to 'green marketing' and 'green products', the impact of 'green products' and their impact on humans both concerning health or economics. The global situation is steadily worsening after pioneers of sustainable development started researching the environmental

effects of human activity many decades ago. It has now reached the point that the use of natural resources is 40% more than the amount that the planet should withstand. The growth of such events is connected with climate and the atmosphere in general so that investigations like this can lead to the reduction of such events by providing knowledge and methodological methodologies for future experiments or studies in that area. Furthermore, today it is important that resources be not only controlled but also assured for future generations that these resources are available and to mitigate the environmental and public health effects of human activities. This

*Author for Correspondence

Jatinder Kaur
E-mail: jeetu.jazz@gmail.com

¹Assistant Professor, Department of Management, Management Institute of Maharishi Markandeshwar, Maharishi Markandeshwar Deemed to be University, Mullana, Haryana, India

Received Date: February 21, 2023
Accepted Date: March 09, 2023
Published Date: March 30, 2023

Citation: Jatinder Kaur. Sentiment Analysis Using Search Engine Drifts for Green Marketing and Related Terms: A Geographical Analysis Based on Counties. NOLEGEIN Journal of Global Marketing. 2022; 5(2): 19–25p.

exploratory study's main goal was to find out how interested Google users in India will be in green products, marketing, causes, and affiliate concepts between May 2021 and May 2022. Google Trends was used as a platform to measure public interest.

Search engines has become essential in recent years in which people are able to search topics about their interest such as atmosphere, well-being, and other public-interest issues. In reality, internet and search platforms are a very high global usage platform in the production of day-to-day operations and a valuable source for information on internet users' interactions and views. Millions of tweets, searches and text messages are released every minute. Among search engines, Google is the one which is highly used to search terms and topics of interest. This provides a platform, which encourages free flow of information between seekers and purveyor of information and to exchange opinion as quickly as possible.

Multiple studies have tried to understand the digital media platforms for communication stressing that social network is an atmosphere where users with the same interests will interact and shape groups, and also to exchange and look for knowledge. Google has subsequently been more and more used for research, particularly for public opinion studies. Google may also help businesses to recognize important causes for the atmosphere and public health that can help improve their management and offer customer insights. Google is an internet search and media network of immense relevance.

REVIEW OF LITERATURE

The field of research known as “sentiment analysis” examines the attitudes, sentiments, opinions, and perceptions of people as well as the feelings of organizations, including things like groups, issues, problems, activities, and themes. Sentiment analysis is frequently referred to as “opinion mining”. This area poses a serious risk. Additionally, there are a number of widely used terminologies and operations, including thought analysis, viewpoint processing, viewpoint retrieval, sentiment mining, analysis of subjectivity, impact analysis, emotion analysis, mining review, and so on. However, both of these now refer to perspective mining or the study of emotions. Despite the fact that the term “sentiment analysis” is utilized in industry, both sentiment analysis and opinion mining are commonly employed in academia. In theory, they include the same domain of analysis. Perhaps first to arise was the word feeling research [1], which also appeared as the phrase perception mining [2].

Yet prior sentiment and opinion assessments were conducted [3–8]. The terms sentiment analysis and opinion mining are used interchangeably in this work. The word opinion was used to denote viewpoint, attitude, evaluation, appraisal, mood, and emotion throughout this book in order to make the introduction more concise. While sentiment analysis and opinion mining both express the same concept, they are distinct from one another and should ideally not be used interchangeably. Opinion's significance is also rather vast in and of itself. The primary focus of sentiment and opinion mining analysis is on opinions that indicate or imply either positive or negative emotions.

RESEARCH METHODOLOGY

Sample

The sample includes Google Trends interest for five phrases, including (1) Green Marketing, (2) Energy Ratings, (3) Green Electronic Goods, (4) Green Products, and (5) Energy Efficiency, over the Indian subcontinent from May 2021 to May 2022. Data points frequency is weekly.

Data Collection and Extraction

The five phrases green marketing, energy ratings, green electronic goods, green products, and energy efficiency are entered into the Google Trends website to extract data, which is then adjusted to get data for the prior year.

Tools

The performance of interest received by the aforementioned five terms is compared using graphs after data extraction from the Google Trends website using the five terms (1) Green Marketing, (2) Energy Ratings, (3) Green Electronic Goods, (4) Green Products, and (5) Energy Efficiency and subsequent adjustment to retrieve data for the previous year. Additionally, a graphic comparison of the geographical interest garnered for these five phrases throughout the geography of India is shown. To examine the tendency in the interest received among the terms, the interest received for the five terms are compared using Karl Pearson's correlation coefficient.

ANALYSIS AND DISCUSSION

Figure 1 shows the trend in affiliate terms and green marketing from May 2021 to May 2022. *Increasing interest:* The interest over time metric displays the search interest for the specified area and period in relation to the graph's highest point. The word's popularity peaked at a value of 100. A score of 50 means the term is just half as common. A score of 0 for this term indicates that the evidence was insufficient.

The aforementioned figure (Figure 1) shows the interest on Google for five phrases from May 2017 to May 2018: (1) Green Marketing, (2) Energy Ratings, (3) Green Electronic Goods, (4) Green Products, and (5) Energy Efficiency (data points frequency is weekly). Over a 12-month period, "Energy Efficiency" was determined to be the most popular phrase, followed by "Green Products," "Green Marketing," and "Energy Ratings." Due to insufficient searches, the phrase "Green Electronic Goods" failed to receive a trends score.

In India, the "Energy Efficiency" trend has increased throughout the summer months of April to June, then decreased during the early monsoon month of July, and then increased once again during the late monsoon months of August and May. Energy Efficiency consistently has a higher interest score than the other four concepts (Table 1).

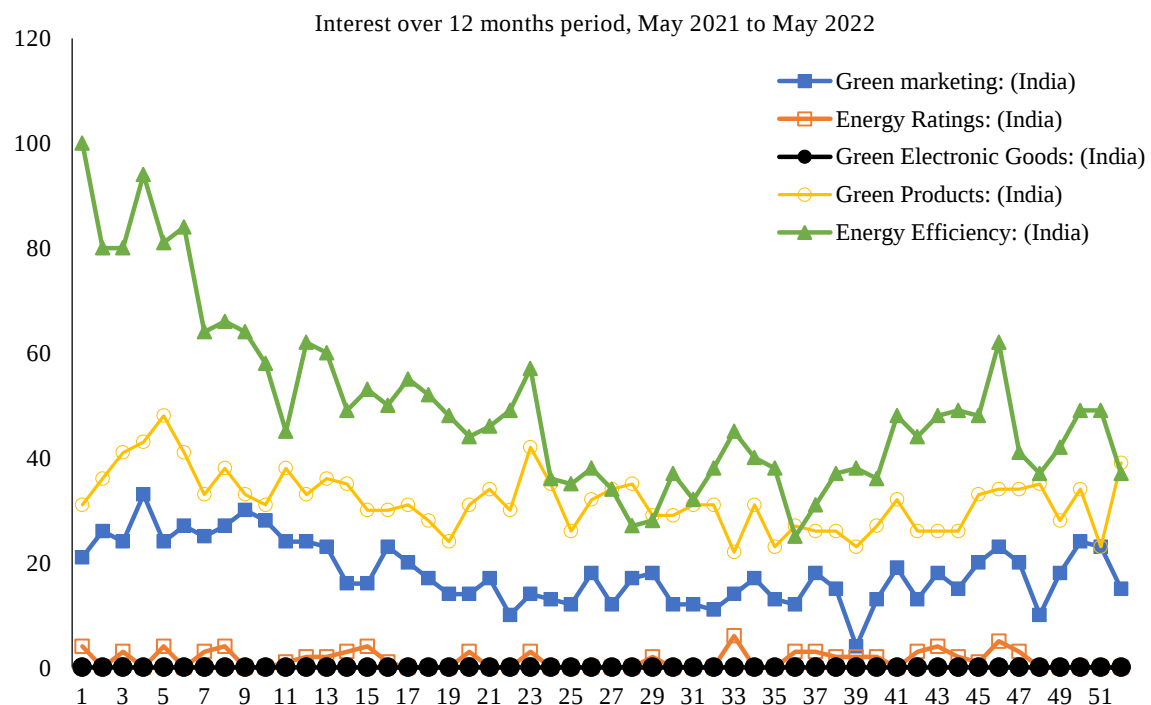


Figure 1. Interest for green marketing and affiliate terms from May 2021 to May 2022.

Source: Google Trends: weekly trend from May 2021 to May 2022.

Table 1. Correlation matrix between the affiliate terms.

	Green marketing	Green products	Energy ratings	Energy efficiency
Green marketing	1	-	-	-
Green products	-0.252301594	1	-	-
Energy ratings	-0.035579183	0.21497288	1	-
Energy efficiency	-0.122390443	0.560997694	0.296673459	1

For the time period under consideration, there has been a tendency in the movement of interest for the phrases “Energy Efficiency” and “Green Products”; however, the interest for the former has been lower than the latter. The similar conclusion can be drawn from Table 1, where “Energy Efficiency” and “Green Products” have a 0.56 correlation coefficient.

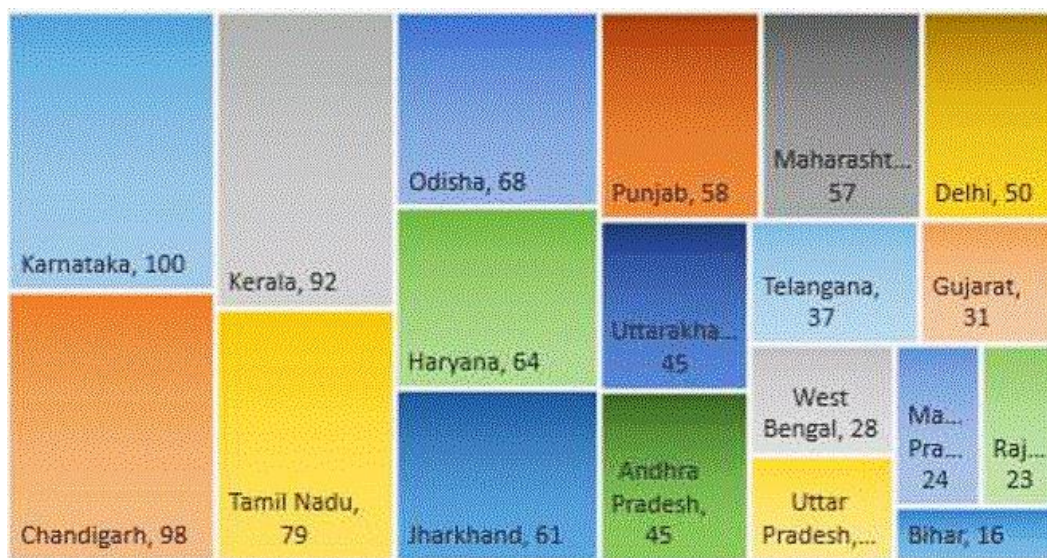
From May 2021 to February 2022, the phrase “Green Marketing” displayed interest levels below 40, and from March 2022 to May 2022, interest rates remained regularly below 20. The terms “green marketing” and “energy efficiency” also exhibit a slightly inverse interest trend association.

Over time, the word “Energy Ratings” has continuously attracted muted attention, with ratings below 10. Google Trends was unable to detect significant interest in the phrase “Green Electronic Goods.”

Interest by Sub-region

Interest by sub-region reveals how popular your term was during the specified time period. The values are based on a scale from 0 to 100, where 100 represents the position that receives the most number of searches, and 50 represents the position that receives the least number of searches. A point where the data for this term were inappropriate is indicated by a 0 value. A higher figure, rather than a bigger number of queries, denotes a larger percentage of all requests. A tiny country with 80% of the questions for “bananas” is twice as ranked as a big country with just 40% of the questions for a specific term such as “x”.

Figure 2 displays interest in the term “Green Marketing” by subregion. The graph demonstrates that Karnataka, which received a score of 100, came in first for the term's popularity, followed by Chandigarh (98), Kerala (92), and Tamil Nadu (79). The last-place finishers are Bihar (16), Rajasthan (23), and Madhya Pradesh (24). The states and union territories that are not listed received zero points.

**Figure 2.** Interest by subregion: green marketing.

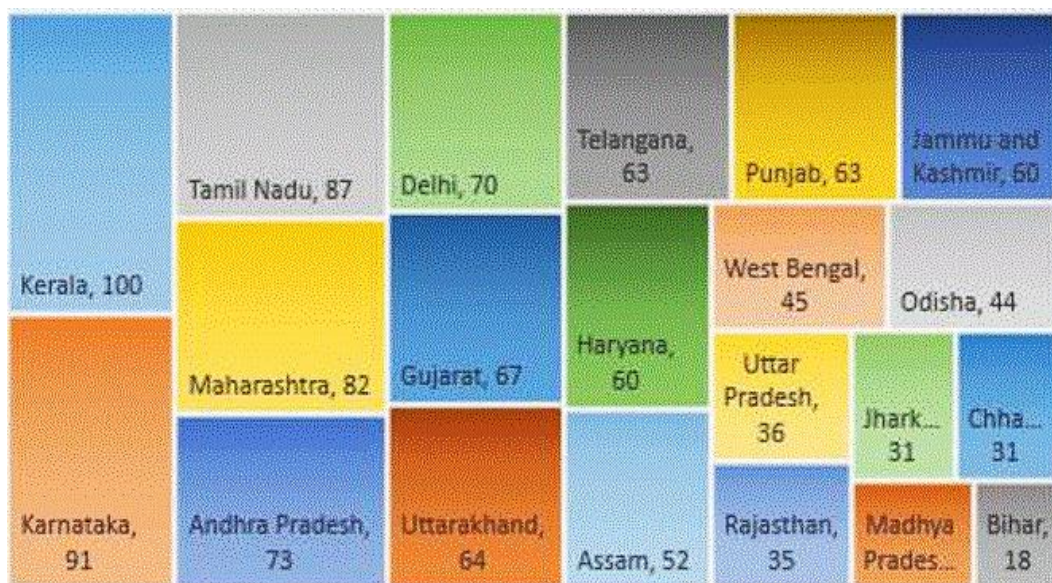


Figure 3. Interest by region: green products.

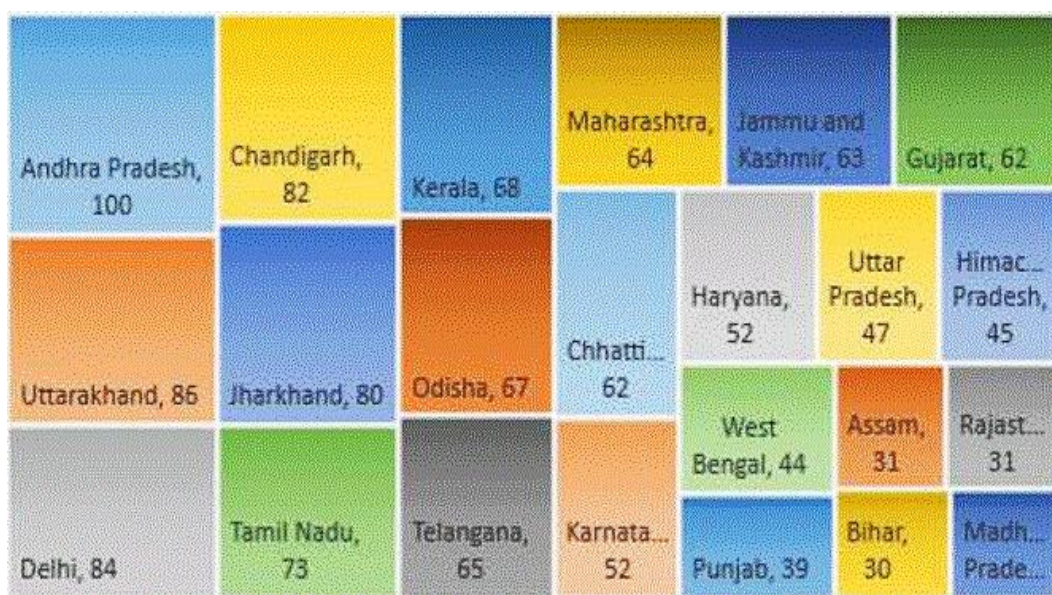


Figure 4. Interest by region : energy efficiency.

Figure 3 displays interest in “Green Products” by subregion. According to the graph, Kerala scored 100 out of 100 for the term's popularity, followed by Karnataka (91), Tamil Nadu (87), and Maharashtra (82). Madhya Pradesh and Bihar, both with 18 points, come in last. The states and union territories that are not listed received zero points.

Figure 4 displays interest in the keyword “Energy Efficiency” by subregion. The graph demonstrates that Andhra Pradesh, which received a score of 100, came in first for the term's popularity, followed by Uttarakhand (86), Delhi (84), and Chandigarh (82). Madhya Pradesh and Bihar have the lowest scores, both at 30. The states and union territories that are not listed received zero points.

FINDINGS

1. Of the five terms listed above—Green Marketing, Energy Ratings, Green Electronic Goods, Green Products, and Energy Efficiency—“Energy Efficiency” is the most well-known and in-demand.

2. Between the months of July and August 2022, the word “Energy Efficiency” attained its highest level of popularity.
3. In India, the term “Energy Efficiency” becomes more common in the summer and after the winter season has ended.
4. Among the five terms—Green Marketing, Energy Ratings, Green Electronic Goods, Green Products, and Energy Efficiency—“Green Products” is the second most common.
5. The phrases “Energy Efficiency” and “Green Products” have a tendency to fluctuate in popularity, although the interest in “Green Products” fell below 40 points in the first half of the research period and below 60 points in the second half.
6. The phrase “Green Marketing” has generated only moderate interest throughout the course of the investigation and scores below 40.
7. The top three states that have attracted the most attention in the term “green marketing” are Karnataka, Chandigarh, and Kerala.
8. Kerala, Karnataka, Tamil Nadu, and Maharashtra are the top four states where the keyword “Green Products” has garnered the highest attention.
9. The top four states that have attracted the most interest in the word “Energy Efficiency” are Andhra Pradesh, Uttarakhand, Delhi, and Chandigarh.

CONCLUSION

A representation of the new technical settings, particularly the internet and social media, has been the introduction of new technologies. Individuals, social movements, political parties, corporations, non-profit organizations, or communities may now express their opinions on a particular topic via the internet, search engines, and social media, in particular. The search interest review with the terms (1) Green Marketing, (2) Energy Ratings, (3) Green Electronic Goods, (4) Green Products, and (5) Energy Efficiency allowed us to identify the “Green” terms/affiliate issues that concern India and may have an impact on the economic growth of the planet, public health, and the environment. The importance of Google Trends' public opinion research on these topics determines how valuable our findings are. According to our findings, the analysis of opinions in Google Trends may help identify social, economic, environmental, and cultural issues in India that are related to the seasons and months in that country as well as certain geographies/sub-regions. The study may have management ramifications for businesses that manufacture electronic items, helping them to better coordinate their sales and marketing strategies throughout specific seasons and months in India and in certain states within the Indian geographic market.

REFERENCES

1. Nasukawa T, Yi J. Sentiment analysis: capturing favorability using natural language processing. In: Proceedings of the 2nd International Conference on Knowledge Capture, Sanibel Island, FL, USA, 2003, October 23–25. New York: ACM; 2003. pp. 70–77.
2. Dave K, Lawrence S, Pennock DM. Mining the peanut gallery: opinion extraction and semantic classification of product reviews. In: Proceedings of the 12th International Conference on World Wide Web, Budapest, Hungary, 2003, May 20–24. New York: ACM; 2003. pp. 519–528.
3. Das S, Chen M. Yahoo! for Amazon: extracting market sentiment from stock message boards. In: Proceedings of the Asia Pacific Finance Association (APFA) Annual Conference, 2001, July 22. Vol. 35, p. 43.
4. Morinaga S, Yamanishi K, Tateishi K, Fukushima T. Mining product reputations on the web. In: Proceedings of the Eighth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Edmonton, Alberta, Canada, 2002, July 23–26. New York: ACM; 2002 pp. 341–349.
5. Pang B, Lee L, Vaithyanathan S. Thumbs up? Sentiment classification using machine learning techniques. arXiv preprint cs/0205070. 2002, May 28.

6. Tong S, Koller D. Support vector machine active learning with applications to text classification. *J Machine Learn Res.* 2001; 2 (Nov): 45–66.
7. Turney PD. Thumbs up or thumbs down? Semantic orientation applied to unsupervised classification of reviews. *arXiv preprint cs/0212032.* 2002 December 11.
8. Wiebe J. Instructions for annotating opinions in newspaper articles. Technical Report TR-02-101. Pittsburgh, PA: University of Pittsburgh; 2002.