

# Impact of “Green Fuel Promotion” on Customer Buying Behavior in Indian Retail Fuel Outlets : A Mix-Method Approach Using fsQCA and NVIVO

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## Abstract

**Purpose :** Oil companies in India have been increasingly investing in green fuel initiatives, including biofuels and renewable energy sources. These efforts aimed to reduce carbon emissions and supported the country's shift toward a sustainable energy future. This study investigated the effect of green fuel promotions in Indian retail fuel outlets on customer purchasing behaviour.

**Methodology :** Six independent latent variables (namely brand image, awareness, loyalty program, technological progression, social engagement, and cultural values) that impacted purchase decisions were undertaken in the study. A mixed-method approach, combining both qualitative and quantitative techniques, was employed in this research, using NVIVO-14 and fsQCA 3.0 software.

**Findings :** This short communication explored psychological, social, and cultural aspects of green promotion that are driving impetus toward customer buying behaviour in Indian retail fuel outlets. We found that customer awareness and loyalty programs under 'Psychological Factor' had a noteworthy impact on customers' green-fuel purchase decisions.

**Practical Implications :** It was recommended that oil companies must invest in consumer education initiatives to enhance awareness and implement effective loyalty programs. This study will also help oil companies to understand different important facets of green fuel promotion, which will facilitate to increase in customer satisfaction and survival in a competitive market.

**Originality :** Unlike prior research on green promotion, this research built a model to examine consumer buying behaviour impacted by green fuel promotion in Indian retail fuel outlets. In this study, this model was developed using the consumer behavior model.

**Keywords :** green fuel promotion, customer buying behaviour, Indian retail fuel outlets, mix-method approach, consumer behaviour model

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To address the pressing environmental challenges in India, the adoption of green fuels is an unavoidable solution. The country now faces immense pressure to reduce pollution and transition to sustainable energy sources. Retail fuel stations play a crucial role in promoting the use of green fuels, as they serve as key touchpoints for consumers (Pethig & Wittlich, 2009). Oil companies are recognizing the importance of educating

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consumers and employing effective marketing strategies to increase awareness and acceptance of these alternatives (Joshi & Rahman, 2015; Kulshrestha et al., 2022). To frame the contribution of our current study, we employed the “Consumer Behavior Model” to emphasize the various factors influencing customer purchasing behavior regarding green fuel. Schiffman and Kanuk (2007) stated that this method examines the social, psychological, and cultural factors that affect the decisions made by consumers. This study investigates how different factors (psychological, social, and cultural) affect customers' purchase decisions with regard to green fuel promotions. The oil industry can engage the customer more effectively with the help of innovative promotional initiatives considering the factors mentioned above.

## Objectives of the Study

- To understand how green fuel marketing of Indian retail fuel outlets influences consumer purchase behavior.
- To find out different key parameters of green fuel promotion that impact purchase decisions.
- To highlight useful knowledge that can direct and assist the oil sector in developing policies to advance cleaner energy in the future.

## Review of Literature

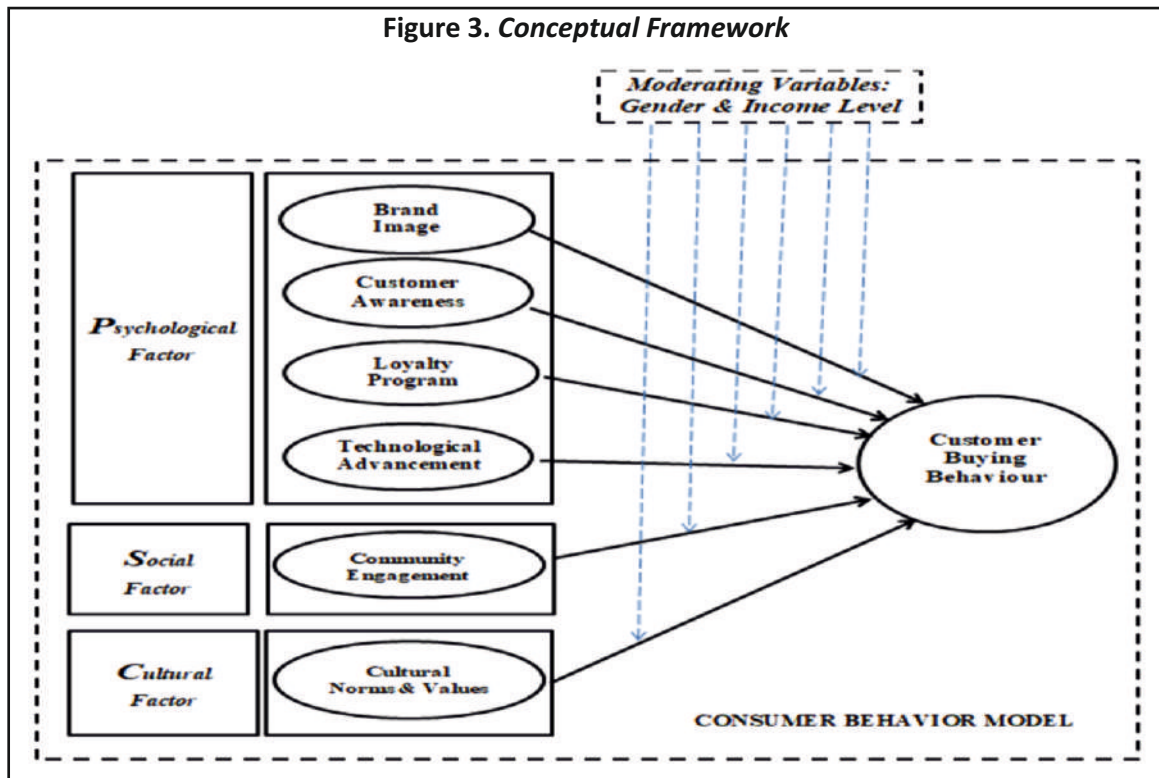
Oil companies enhanced their reputation as environmental-friendly enterprises by actively marketing green fuels. Customers were more inclined to select green gasoline over rival brands when it had a stronger reputation for sustainability (Sharma et al., 2023). Spreading awareness of the benefits of green fuels was essential to increasing public acceptance of them. Public awareness of pollution control using green fuels enabled customers to make wise purchase decisions. When consumers learned about the advantages of green fuel and its favorable effects on the environment, they became interested in switching from conventional options (Laheri, 2020). Technological advancement in green fuel, which increases production and service efficiency, enhances customer trust in it. Customers became more receptive to green fuels as their knowledge of technological developments grew (Mehmood & Bhaumik, 2023). Offering discounts and loyalty points to customers for purchasing green fuels encouraged them to switch from traditional options (Haws et al., 2014).

Bhatti and Negi (2018) asserted that consumer sentiments toward green fuels are significantly influenced by peer behavior and cultural norms. Consumers were persuaded to switch to green fuels and sustainable behaviors after witnessing the endorsements of friends, family, and the community. The adoption of green fuels spread throughout the community as a result of this social influence, which encouraged more people to use and embrace green options (Nekmahmud & Fekete-Farkas, 2020). Indian customers may be more willing to adopt green fuel if they feel it is beneficial to both the environment and their community (Sangroya & Nayak, 2017). On the other hand, cultural norms and values have a big impact on customers' attitudes toward sustainable green fuel (Premi et al., 2021). Furthermore, Zhang and Dong (2020) discovered that there is a significant moderating effect of income level and gender on the purchasing decisions of customers.

## Method, Data Analysis, and Findings

A qualitative and a quantitative phase were conducted for the mixed-method study (Giri et al., 2019a). In the first phase, we collected 27 in-depth interviews on our research topic. The convenience sampling method was used to select the interviewees (Giri et al., 2022). The NVivo 14 program was used to import each interview transcript. We have identified six components (themes) and 18 items (3 items/theme) under the psychological, social, and





The criteria and items were then validated by an expert panel made up of scholars and academics (Giri & Chatterjee, 2020). The panel kept all the components and elements. With the aid of the consumer behavior model (Giri et al., 2019b) (Figure 3), a qualitative study was utilized to derive the conceptual framework.

In the second phase, 387 responses were gathered using a convenience sample strategy for a further quantitative analysis using fuzzy set qualitative comparative analysis (fsQCA) following the expert's validation of the questionnaire. The study has been conducted in 2024. Responses were rated on a 7-point Likert scale, with 1 denoting *strongly disagree* and 7 denoting *strongly agree* (Giri & Pandey, 2016). fsQCA analysis was carried out following data validity and reliability checks. The present study employed the fsQCA3.0 program to investigate the variables associated with the elevated levels of green fuel consumer purchasing behavior. Fuzzy-set-based fsQCA foundation allows it to capture meaningful combinations of different situations (Pappas & Woodside, 2021). To find the causal elements causing high degrees of consumer buy behavior for green fuel, need and sufficiency studies were conducted (Table 1). The condition is considered to be in “sufficient condition” if the consistency score is higher than the cut-off value of 0.80. It is the “necessary condition” for the output construct if the consistency is greater than 0.9 (Pappas & Woodside, 2021).

Furthermore, conditions with a coverage score of greater than 0.50 are deemed nontrivial (Ragin, 2008). The total consistency (0.903) and coverage (0.791) values of the intermediate solution for customer buying behaviors (CBB's) high level are greater than threshold values, which makes it considered informative. Moreover, a high degree of causal coupling ensures the intended outcome. Table 1 shows that four variants have been removed from the intermediate solution for a high degree of CBB. In this case, the third solution, BI\*CA\*LP\*CV, has the maximum consistency (0.93) and coverage (0.70) according to the intermediate solution. Since CA and LP are present in all cases, these solutions highlight how important they are to achieving high levels of CBB. It implies that “Customer Awareness” and “Loyalty Program” under “Psychological Factor” have a noteworthy impact on customer's green-fuel purchase decisions.

**Table 1. fsQCA Results : Necessity and Sufficiency Analysis**

High Levels of Customer Buying Behavior (CBB)										
Intermediate Solution										
Model : $CBB = f(BI, CA, LP, TA, CE, CV)$										
Sl. No.	Solution Configuration	Causal Conditions with Tabular Form						Metrics		
		BI	CA	LP	TA	CE	CV	Raw Cov.	Uni Cov.	Cons.
1	$BI*CA*LP*CE$	•	•	•		•		0.68	0.03	0.92
2	$CA*LP*\sim TA$	•		•	◦			0.61	0.12	0.85
3	$BI*CA*LP*CV$	•	•	•			•	0.70	0.04	0.93
4	$CA*LP*\sim TA*CE$	•		•	◦	•		0.52	0.01	0.81

Overall Solution Coverage: 0.791.

Overall Solution Consistency: 0.903.

**Note.** 1. "~" & "◦" indicate the absence of a condition. "•" indicates the presence of a condition. Empty cell stands for "not part of a causal condition." Raw Cov., Uni Cov. & Cons indicate raw coverage, unique coverage, and consistency, respectively.

2. Brand Image = BI, Customer Awareness = CA, Loyalty Program = LP, Technological Advancement = TA, Community Engagement = CE, Cultural Norms and Values = CV.

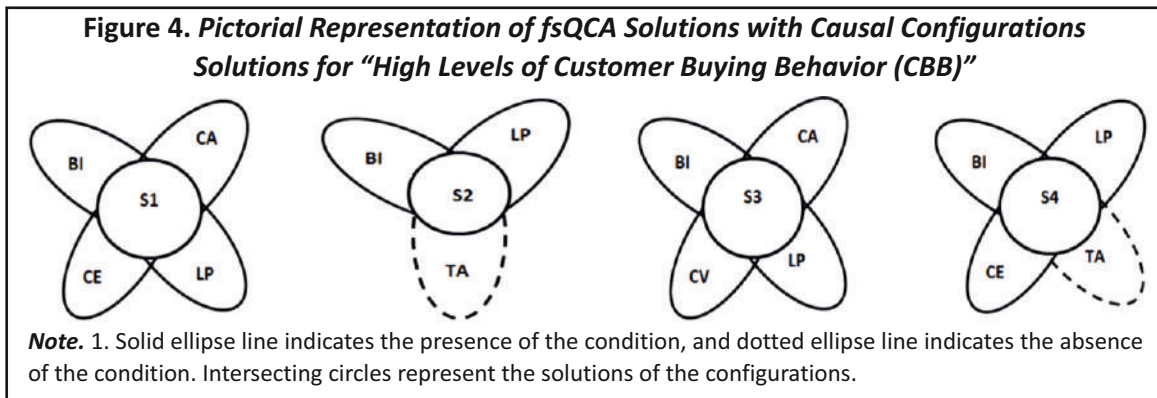


Figure 4 provides a graphic representation of the different causal links for high levels of consumer purchasing behavior for green fuel.

## Conclusion

Our study reveals that the promotion of green fuels significantly impacts consumer purchasing behavior at Indian retail fuel outlets. Effective marketing and educational programs are needed to speed adoption since consumers are growing increasingly conscious of the environment. The study emphasizes how several factors, such as brand image, customer awareness, loyalty program, technological advancement, community engagement, and cultural norms and values interact to shape consumer preferences. Oil firms may increase consumer participation and speed up the switch to renewable energy sources by coordinating their advertising activities with consumer values (Paul et al., 2019). In the end, increasing the adoption of green fuels is essential to fulfilling India's environmental and ecological objectives.



## Theoretical and Managerial Implications

A conceptual framework to quantify the effect of “Green Fuel Promotion” on customer buying behavior has been created by the present study. In order to get more understanding of this study field, this short communication framework will support and motivate researchers and academicians to carry out different investigations with several full-length research papers. In this study, a conceptual model has been developed to analyze various promotional aspects that influenced customer purchase behavior, with important implications for management decision-making processes. The findings of this research emphasize the importance of targeted marketing strategies for promoting green fuels in Indian retail fuel outlets. Oil companies must invest in consumer education initiatives to enhance awareness and implement effective loyalty programs. This study will also help oil companies to understand different important facets (psychological, social and cultural factors) of green fuel promotion, which will facilitate to increase in customer satisfaction and survival in a competitive market. Therefore, the oil industry should focus on these facets to provide superior services and serve their customers in a better way. Policymakers and industry participants can use these data to help cultivate a more sustainable energy sector.

## Authors' Contribution

Manash Routray participated in the literature review and modeling and generated the conceptualization. Dr. Arunangshu Giri carried out the project administration and reviewing & editing of the final draft. He verified the study method and identified the implications of this study.

## Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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