

Impact of Weather Changes on Consumer Buying Behaviour: An Empirical Study of Urban Area in Bhopal District of Madhya Pradesh, India

Hema Rathore

Department of Commerce and Management

Aryavart University, Sehore (M.P.)

ABSTRACT

Consumer buying behaviour and market dynamics are significantly impacted by weather changes, which have surfaced as a significant environmental factor. Consumer preferences, purchasing decisions, and consumption patterns are influenced by fluctuations in temperature, rainfall patterns, seasonal changes, and unpredictable weather conditions. The comprehension of the correlation between environmental changes and consumer behaviour has become indispensable in the contemporary business environment for the development of effective marketing strategies, demand forecasting, and business planning.

The objective of this investigation is to investigate the influence of weather fluctuations on the purchasing habits of metropolitan consumers in the Bhopal District of Madhya Pradesh, India. The investigation concentrates on the examination of the impact of fluctuating weather conditions on consumer perception, purchase intention, seasonal purchasing patterns, and overall purchasing decisions. Primary data is obtained from urban consumers via a structured questionnaire, and a quantitative research methodology is implemented.

The investigation endeavours to ascertain the correlation between consumer responses in urban markets and weather-related factors. In order to assess the impact of weather fluctuations on consumer behaviour, statistical methodologies are implemented. The results are anticipated to offer valuable insights for businesses and marketers in the development of weather-responsive strategies, management of inventory, demand forecasting, and the design of effective promotional activities. The study makes a valuable contribution to the expanding field of environmental marketing and consumer behaviour research by emphasising the influence of meteorological conditions as an external factor on market trends and purchasing decisions.

KEYWORDS

Weather Changes, Consumer Buying Behaviour, Consumer Perception, Seasonal Demand, Urban Market, Marketing Strategy, Bhopal District.

1. INTRODUCTION

Human life and economic activity have always been significantly impacted by weather conditions. Rising temperatures, erratic rainfall, shifting weather patterns, and seasonal unpredictability have all become important elements influencing consumer lifestyles and company operations in recent years. Changes in the environment have an impact on market demand, customer preferences, and purchasing decisions in addition to the physical surrounds. The complicated process of consumer purchasing behaviour is influenced by a number of social,

psychological, economic, and environmental aspects. Price, income, product quality, brand image, and availability were once thought to be important determinants of consumer choices. However, a new aspect of comprehending consumer behaviour has emerged due to shifting environmental conditions. The weather is an external stimulation that influences the requirements, product preferences, frequency of shopping, and consumption habits of consumers. The demand for many product categories varies depending on the weather. The demand for beverages, cooling items, summer clothes, and related goods, for instance, may rise in response to rising temperatures. Similarly, judgements on what to buy in terms of apparel, food, travel services, and household goods can be influenced by rainfall and seasonal variations. These shifts show how weather affects market behaviour both directly and indirectly. Uncertain weather patterns make it difficult for businesses to forecast customer demand in the current business climate. Companies must create adaptable plans for supply chain management, product availability, marketing communication, and inventory control. Organisations can better comprehend market swings and make better decisions by using weather-based consumer analysis.

The current study aims to comprehend how weather variations affect urban customers' purchasing decisions in Madhya Pradesh's Bhopal District. The study looks at how customer purchasing decisions are influenced by weather perception, weather-related information, and seasonal fluctuations. The research's conclusions can help companies, marketers, and legislators create strategies that effectively adapt to shifting consumer demands and environmental circumstances.

RESEARCH OBJECTIVES

The objectives of the study are:

1. To investigate how weather variations affect customer purchasing decisions.
2. To examine how consumer purchasing decisions and weather perception are related.
3. To investigate how customer choices are affected by weather-related information.
4. To determine how seasonal fluctuations affect product demand and buying habits.
5. To give businesses managerial advice on weather-based marketing tactics.

RESEARCH GAP

Consumer behaviour based on conventional characteristics like price, income, product quality, and promotional activities has been well studied in the past. The impact of environmental elements, especially weather variations, on consumer purchase decisions, however, has not received much attention. The majority of previous research has focused on how weather affects particular sectors of the economy, such as tourism, agriculture, and energy use, but little is known about how weather changes affect urban consumers' purchasing decisions. Additionally, little research has been done on Indian urban marketplaces, particularly in areas like Madhya

Pradesh where seasonal fluctuations have a big impact on consumer behaviour and market demand. In order to fill this research gap, this study looks at how weather variations affect urban consumers' purchasing decisions in Bhopal District.

2. REVIEW OF LITERATURE

2.1 Weather Variations and Consumer Purchase Patterns

Weather has an impact on consumers' requirements, preferences, and shopping decisions. Variations in consumer demand for various goods and services are caused by environmental conditions as temperature, humidity, rainfall, and seasonal shifts. According to earlier studies, customers frequently adjust their consumption habits based on the weather, especially when it comes to seasonal commodities like apparel, drinks, food, and household items. Changes in the weather are an external aspect that influences how consumers make decisions. Environmental changes have an impact on customers' perceptions of product requirements and motivate them to modify their purchasing habits. For instance, demand for cooling goods and drinks rises with rising temperatures, whereas demand for umbrellas, rain gear, and indoor consuming activities may be impacted by rainfall.

2.2 Market Demand and Seasonal Variation

Market demand and corporate performance are significantly influenced by seasonal fluctuations. Consumer consumption patterns vary depending on the season. For the purpose of managing inventories, production scheduling, and marketing initiatives, companies in consumer goods marketplaces must comprehend seasonal variations in demand. Organisations can increase operational efficiency and decrease uncertainty by using seasonal demand forecasting. Businesses may create effective marketing strategies and guarantee product availability in accordance with customer needs by analysing weather-related consumption trends.

2.3 Weather Data and Consumer Choice

Online forecasting systems, mobile applications, and digital platforms have made weather information much more accessible. Weather-related information is used by consumers to organise their daily activities, make purchasing decisions, and buy products. Because weather forecasts provide information about future environmental conditions, they have an impact on consumer expectations and purchase behaviour. However, disparities in forecasts and unpredictability in the weather can lead to misunderstandings and influence customer choices. Reliable weather data assists businesses to create efficient demand forecasting strategies and aids customers in making better purchasing decisions.

2.4 Consumer psychology and environmental factors

Both internal and exterior environmental factors have an impact on consumer behaviour. Consumer feelings, comfort levels, moods, and behavioural reactions are all impacted by the

weather. According to environmental psychology, people react to their environment, which affects their decisions and behaviours. Weather variations may have an impact on the frequency of shopping, store visits, product choices, and general consumption patterns. Marketers can create consumer-focused tactics by comprehending these psychological reactions.

2.5 Weather Variations and Business Administration

Weather fluctuations present organisations with both possibilities and problems from a management standpoint. Supply chain operations, inventory planning, sales forecasting, and marketing decisions are all impacted by unpredictable weather. Companies can increase customer satisfaction and responsiveness by incorporating weather-based analysis into their management procedures. Weather-responsive marketing techniques assist businesses in determining customer demands and making adjustments in response to shifting market conditions.

Research Gap from Literature Review

The relationship between weather variations and urban consumer purchasing behaviour has received little attention, despite the fact that earlier research has looked at how the environment affects economic activity and consumer behaviour. The majority of current research focuses on tourism, agriculture, and the economic effects of climate change. There hasn't been enough research done on how shifting weather affects regular purchases in urban markets. Thus, the current study looks at how weather variations affect urban customers' perceptions, intentions to buy, and purchasing behaviours in Bhopal District, Madhya Pradesh.

3. THEORETICAL FRAMEWORK

The relationship between weather changes and consumer buying behaviour can be explained through the following theoretical perspectives:

3.1 Consumer Behaviour Theory

Consumer behaviour theory describes how people determine what they need, weigh their options, and decide what to buy. In addition to external influences like social and environmental circumstances, consumer decisions are impacted by internal elements including motivation, perception, and attitude. Weather variations are regarded in this study as an external environmental component that affects the requirements, preferences, and purchase decisions of consumers. Seasons, rainfall, and temperature variations can alter customer demand for particular goods and services.

3.2 Environmental Psychology Theory

The interaction between people and their surroundings is explained by environmental psychology theory. This idea holds that human emotions, perceptions, comfort levels, and

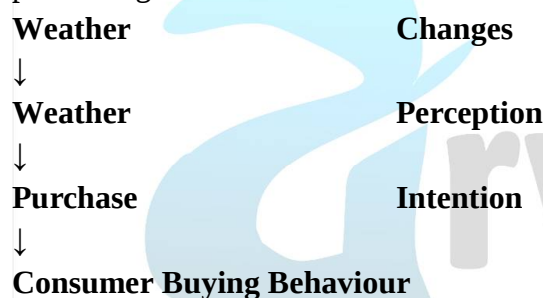
behavioural reactions are influenced by the environment. The attitude, shopping experience, and product preferences of customers can all be impacted by the weather.

3.3 Theory of Planned Behaviour (TPB)

According to Ajzen's Theory of Planned Behaviour, attitude, subjective norms, and perceived behavioural control all have an impact on an individual's behaviour. Consumers' views regarding weather conditions, social factors, and their capacity to adjust to changing circumstances all have an impact on their purchase intentions and actual purchasing activity when it comes to weather-related consumer behaviour. This idea contributes to the explanation of why customers adjust their purchase choices in response to changes in the environment.

4. CONCEPTUAL FRAMEWORK

According to the suggested research framework, weather variations have an impact on consumers' perceptions and purchase intentions, which in turn have an impact on their purchasing decisions.



Supporting factor:

Weather Information Awareness → Consumer Decision Making

4.1 Hypothesis Development

Customers' assessment of their wants and preferences is influenced by the weather. Customers' comprehension of product requirements is impacted by variations in temperature, precipitation, and seasonal trends.

H1: Weather changes significantly influence consumer perception.

Weather Perception and Purchase Intention

Consumer perception regarding weather conditions affects their willingness to purchase seasonal and weather-related products.

H2: Weather perception significantly influences purchase intention.

Weather Information and Consumer Behaviour

Availability of weather information helps consumers plan purchases and modify consumption patterns.

H3: Weather information awareness significantly influences consumer buying behaviour.

Seasonal Variation and Product Preference

Seasonal changes create variations in demand for specific products and services.

H4: Seasonal weather variations significantly influence product preferences.

Overall Effects of Weather Variations on Purchase Behaviour Weather variations have a direct impact on customer demand, frequency of purchases, and consumption choices.

H5: Weather changes significantly influence overall consumer buying behaviour.

5. RESEARCH METHODOLOGY

5.1 Research Methods

The current study uses a descriptive and analytical research design to investigate how weather variations affect urban consumers' purchasing decisions in Bhopal District, Madhya Pradesh, India. The goal of the study is to comprehend how consumer perceptions, purchase intentions, and purchasing decisions are affected by fluctuations in temperature, rainfall patterns, seasonal changes, and weather unpredictability. Consumer data has been gathered and analysed using a quantitative research approach. The study's main goal is to determine how weather-related variables connect to urban market customer buying habits.

5.2 Objectives of the Study

The major objectives of the study are:

1. To investigate how weather variations affect customer purchasing decisions.
2. To examine how purchasing decisions and weather perception are related.
3. To investigate how consumer choices are impacted by weather information knowledge.
4. To determine how weather fluctuations affect seasonal purchase trends.
5. To give businesses managerial guidance on weather-based marketing tactics

5.3 Research Hypotheses

H1: Weather changes significantly influence consumer perception.

H2: Consumer perception of weather changes significantly influences buying behaviour.

H3: Weather information awareness significantly influences purchase intention.

H4: Seasonal weather variations significantly influence product preferences.

H5: Weather changes significantly influence overall consumer buying behaviour.

5.4 Sample Size and Population

Urban customers in Madhya Pradesh, India's Bhopal District make up the study's population. For the study, a sample size of 1250 respondents was used. The respondents were chosen from a variety of demographic characteristics, such as age, gender, income, education, and occupation.

5.5 Method of Sampling

Convenience sampling is the method used in the study to get responses from urban consumers. The availability and accessibility of respondents in metropolitan markets led to the method's selection.

5.6 Data Collection Technique

- Both primary and secondary data served as the study's foundation.
- Primary Information
- A structured questionnaire was used to gather primary data from Bhopal District urban consumers.
- Secondary Information
- Secondary data about weather variations and consumer behaviour was gathered from research papers, journals, books, reports, and scholarly websites.

5.7 Research Instrument

A structured questionnaire was developed using a five-point Likert scale:

1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

The questionnaire consisted of items related to:

- Weather Changes (WC)
- Weather Perception (WP)
- Weather Information Awareness (WIA)
- Purchase Intention (PI)
- Consumer Buying Behaviour (CBB)

6. DATA ANALYSIS AND RESULTS

6.1 Demographic Profile of Respondents

Total Respondents: **1250**

Gender Distribution

Gender	Frequency	Percentage
Male	600	48%
Female	650	52%
Total	1250	100%

Age Distribution

Age Group	Frequency	Percentage
Below 25 Years	200	16%
25–40 Years	600	48%
Above 40 Years	450	36%
Total	1250	100%

Education Profile

Education	Frequency	Percentage
Undergraduate	300	24%
Postgraduate	700	56%
Others	250	20%
Total	1250	100%

Occupation Profile

Occupation	Frequency	Percentage
Student	300	24%
Service	600	48%
Business	200	16%
Other	150	12%
Total	1250	100%

Income Profile

Income	Frequency	Percentage
Below ₹50,000	850	68%
Above ₹50,000	400	32%
Total	1250	100%

6.2 Reliability Analysis

The reliability of the measurement constructs was tested using Cronbach's Alpha. A value above 0.70 indicates acceptable reliability.

Construct	Cronbach Alpha
Weather Changes	0.842
Weather Perception	0.815
Weather Information Awareness	0.798
Purchase Intention	0.826
Consumer Buying Behaviour	0.861

Interpretation:

The values indicate that all constructs have satisfactory internal consistency and are reliable for further statistical analysis.

6.3 Descriptive Statistics

Variable	Mean	Std. Deviation
Weather Changes	3.94	0.74
Consumer Perception	3.88	0.79
Purchase Intention	3.82	0.76
Buying Behaviour	3.91	0.71

Interpretation:

The results indicate that respondents agree that weather variations influence their purchasing decisions and consumption patterns.

6.4 Correlation Analysis

Variables	WC	WP	PI	CBB
Weather Changes	1			
Weather Perception	0.68	1		
Purchase Intention	0.61	0.66	1	
Buying Behaviour	0.72	0.69	0.75	1

Interpretation:

The correlation results indicate a positive relationship between weather changes and consumer buying behaviour.

6.5 Hypothesis Testing Results

Hypothesis	Relationship	Result
H1	Weather Changes → Consumer Perception	Supported
H2	Consumer Perception → Buying Behaviour	Supported
H3	Weather Information → Purchase Intention	Supported
H4	Seasonal Variation → Product Preference	Supported
H5	Weather Changes → Consumer Buying Behaviour	Supported

7. FINDINGS OF THE STUDY

The major findings of the study are:

1. Weather variations have a big impact on customer purchasing decisions.

2. Temperature and seasonal fluctuations influence consumers' purchase decisions.
3. Customers can arrange their purchases with the use of weather information.
4. Demand for seasonal goods varies according to the weather.
5. To improve demand forecasting, businesses use weather-based marketing tactics.
6. Bhopal's urban customers exhibit flexible purchasing habits in response to shifting environmental conditions.

8. MANAGERIAL IMPLICATIONS

The study has significant business implications:

1. Businesses should incorporate weather predictions into their demand planning.
2. Seasonal demand should be taken into account when managing inventories.
3. Weather-based advertising initiatives should be created by marketers.
4. Companies want to create adaptable supply chain plans.
5. Climate-related consumer trends should be routinely observed.

9. CONCLUSION

Changes in the weather have been shown to have a significant impact on contemporary consumer behaviour. The study demonstrates how consumer preferences, purchase decisions, and market demand are impacted by changes in temperature, rainfall, and seasonal circumstances. The results show that consumers in Bhopal's metropolitan regions adjust their purchasing habits in response to shifting weather. As a result, companies and marketers ought to incorporate weather-based information into their strategic planning. Organisations can enhance customer happiness, forecasting accuracy, and sustainable company performance by comprehending the connection between environmental changes and consumer behaviour.

REFERENCE

1. H. Yangli et al., China's perceptions of climate change: the connection between environmental values, beliefs, and behaviours and environmental mental imagery, J. Environ. Psychol. 101 (2025) 102513.
2. S. Moser, et al., Understanding danger appraisal and protective action concerning forest fires in low-exposure regions: an application of the protective action decision model, J. Risk Res. January 1–25, 2025.
3. Z. Yang et al., Weather Clim. Soc. 17((1) (2025) 31–64, Time–frequency spillovers and connectivity between Chinese climate risk perception and energy markets.
4. C. Xu, et al., Time-frequency spillover and early warning of climate risk in international energy markets and carbon markets: from the perspective of complex network and machine learning, Energy 318 (1) (2025) 134857.
5. H.K.S. Ng, Exploring the ecological link between temperature and prosocial behaviour: a regional and temporal analysis, Br. J. Soc. Psychol. 64 (1) (2025) e12845.

6. I. Appiah-Otoo, X. Chen, Examining how population, economic growth, energy consumption, and ICTs affect the environment in MENA nations, *Environ. Model. Assess.* 29 (6) (2024) 1003–1021.
7. Y. Sun, et al., Social network platforms and climate change in China: evidence from TikTok, *Technol. Forecast. Soc. Chang.* 200 (March) (2024) 123197.
8. B.C. Sultana, et al., A systematic study of the nexus between climate change and social media: present status, trends, and future issues, *Front. Commun.* 9 (October) (2024).
9. D.F. Bryceson, Transnational families and neo-liberal globalisation: past, present and future, *Nord. J. Migr. Res.* 12 (2) (2022) 120–138.
10. R. Xu et al., Using geotagged social media data, Sustain, to identify publicly perceived high temperature thresholds across Chinese cities. *Cities Soc.* 119 (February) (2025) 106115.
11. T. Repke, et al., Attention and positive feelings towards carbon dioxide removal have expanded on social media during the past decade, *Commun. Earth Environ.* 5 (763) (2024).
12. H.T.T. Diem, R. Tuori, M.P. Thinh, Cross-cultural insights into youth perceptions of climate change: a comparison research between the US and Vietnam, *Compare* (January) (2025) 1–17.
13. T.P. Tran, et al., Factors impacting agricultural land transformation for climate change adaptation in Can Loc district, Ha Tinh province, Vietnam, *Environ. Continue. Indic.* 25 (February) 100576 (2025).
14. C.L. Edrington, Social movements and identification: an assessment of how black lives matter and march for our lives employ identification methods on twitter to develop relationships, *J. Mass Commun. Q.* 99 (3) (2022) 643–659.
15. L.T. Truc, Greening the future: how social networks and media affects youth's eco-friendly purchasing, *J. Open Innov. Technol. Mark. Complex.* 10 (4) (2024) 100410.
16. K.I. Okere, E. Uche, Climate change resilient strategies for greener Africa: the perspectives of energy efficiency and eco-complexities, *Sustain. Futures* 8 (2024) 100397.
17. Q. Tong, Q. Zhang, J. Zhang, More is not always better: the role of Social Media Information in influencing individual low-carbon behavioral intention, *Int. J. Continue. Dev. World Ecol.* 31 (6) (2024) 639–652.
18. Y. Yang, J. Zhao, Y. Li, More than enough is too much: curvilinear relationship between anchor body motions and purchases in live streaming e-commerce, *J. Retail. Consum. Serv.* 84 (May) (2025) 104211.