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# Sustainable Futures

## Strategies for SDG Implementation



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Editors

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# Sustainable Futures: Strategies for SDG Implementation

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## About the Book

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In recent years, the global community has been actively pursuing sustainable development goals (SDGs) to address pressing social, environmental, and economic challenges. This edited volume, *Sustainable Futures: Strategies for SDG Implementation*, brings together diverse perspectives on how innovative strategies, technological advancements, and policy measures can contribute to achieving a more sustainable and equitable future.

The book encompasses a range of studies that explore key themes such as green logistics, digital transformations, sustainable consumption, climate action, and financial inclusivity. These themes reflect the intricate interplay of environmental consciousness, technological progress, and human behavior in advancing sustainable development.

Each chapter offers unique insights and empirical findings that provide valuable frameworks for both academic and practical applications. Below is an overview of the papers included in this collection:

### **1. Customer Perspectives on Sustainable Supply Chain Practices**

This study examines customer opinions on green logistics, focusing on product returns, recycling, and eco-friendly packaging. It highlights the pivotal role of consumer behavior in shaping sustainable supply chain strategies.

### **2. Sustainable Smart Ticketing**

This paper explores the transition from traditional ticketing to digital solutions in public transportation. It underscores the role of smart ticketing systems in enhancing efficiency, reducing environmental impact, and aligning with SDG targets.

### **3. Determinants of Consumer Behavior Towards Organic Food Products**

This research delves into the motivating and limiting factors influencing organic food consumption. It provides valuable insights into the challenges and opportunities for promoting sustainable food consumption.

### **4. Renewable Realities and Greenwashing Challenges**

This paper addresses the dual challenges of integrating renewable energy and combating greenwashing in climate action strategies.

### **5. Investment Inclination of Young Investors**

This study focuses on financial literacy and investment preferences among young investors in Belagavi, shedding light on their awareness and engagement with sustainable financial products.

### **6. Efficiency and Security of Paperless Banking Systems**

By analyzing technological adoption in the banking sector, this paper evaluates the impact of digital transformation on operational efficiency and environmental sustainability.

## About the Book

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### **7. National Skill Development Mission for Sustainable Development**

This conceptual analysis examines India's skill development initiatives and their alignment with SDGs, emphasizing workforce empowerment for sustainable growth.

### **8. Economic Impact of Green Fiscal Measures**

This research evaluates the effectiveness of green fiscal policies, such as tax incentives and subsidies, in fostering sustainable economic growth in India.

### **9. Enhancing Women's Empowerment through SIDBI**

This paper highlights the role of financial and non-financial support mechanisms in promoting women's entrepreneurship and empowerment in India.

### **10. Innovative Approaches to Climate Action and Environmental Care**

This paper proposes innovative approaches to climate action, focusing on advanced technologies and renewable energy systems to combat climate challenges

### **11. Breaking Barriers: Social Inclusion for Mental Well-being**

Focusing on marginalized populations, this study examines the positive impact of social inclusion on mental health, offering policy recommendations for inclusive growth.

### **12. Impact of Emotional Appeals in Advertising**

This paper explores the psychological mechanisms behind emotional appeals in advertising and their role in shaping consumer behavior toward sustainable practices.

### **13. Innovative Approaches to Climate Action and Environmental Care**

Highlighting cutting-edge technologies and policy frameworks, this study discusses strategies for mitigating climate change and promoting environmental sustainability.

Together, the contributions in this volume address critical aspects of sustainability, offering actionable insights for academics, policymakers, and practitioners. By advancing knowledge on sustainable practices and their intersection with SDGs, this book serves as a vital resource for those committed to building a sustainable future.

## About the Editors

---

**Prof. Jyoti Jamnani** currently serving as an Associate professor at KLS, Gogte Institute of Technology, Department of MBA is an accomplished finance academician with a robust background in teaching and research. She holds an MBA in finance from KLS, Gogte Institute of Technology and earned her PhD in banking and finance from Karnatak University, Dharwad, with a focus on Economic Value Added by Indian Banks. She has over 15 years of teaching experience, she teaches various finance-related subjects and fulfills several administrative roles. Her expertise includes financial accounting, corporate valuation, financial derivatives, financial management, Management control systems, Mergers and acquisition and project appraisal, along with excellent public speaking and mentoring skills. Prof. Jamnani has an extensive list of publications, including studies on banking performance, green banking, and financial inclusion, showcasing her depth of knowledge in banking and finance.

**Dr. Nupur Veshne**, an Assistant Professor in KLS, Gogte Institute of Technology, Department of MBA, specializes in human resource management. With a strong foundation in both technical and management domains, she holds a BCA, MBA, and a Ph.D. in Management. Dr. Veshne has over 15 years of teaching experience and 8 years of research expertise. Her academic journey is marked by extensive work in grooming students in programming languages such as C++ and JAVA, as well as in human resource management, marketing management, and strategic management. She excels in technical writing and delivering clear, insightful presentations on core HR topics. Dr. Veshne has presented her research at numerous national and international conferences and has published extensively in reputable journals. Her work covers a wide range of topics, including employee engagement, emotional intelligence, artificial intelligence, HR analytics, start-up management, knowledge management, employee well-being, organizational communication, and soft skills.

**Prof. Sanjeevini Gurjar**, an Assistant Professor in KLS, Gogte Institute of Technology, Department of MBA, specializes in human resource management and marketing. She has 10 years of experience working with both the corporate and teaching. She holds a BBA, MBA and a PG Diploma in Counseling Psychology. Her academic expertise is in the areas of Human Resource Management, Organization Behaviour, Organization development and Marketing Management. She is a certified NLP Practitioner and a counsellor. She is currently pursuing her PhD in the area of Organization behaviour and Performance Management from VTU.

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## Preface

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The Sustainable Development Goals (SDGs), adopted by the United Nations in 2015, have laid a clear and ambitious blueprint for global progress. Achieving these goals requires the collective effort of governments, businesses, civil society, and individuals. It is a journey that demands collaboration, innovation, and systemic change. This edited volume presents a collection of research papers submitted to the conference Empowering Change: Achieving Sustainable Development Goals (SDGs) for a Better Tomorrow, organized by Karnatak Law Society's Gogte Institute of Technology, Department of MBA, on 27th & 28th September 2024. The papers reflect the diverse perspectives and innovative ideas that were discussed at the event, aiming to foster the transformative action needed for a more sustainable, equitable, and prosperous world.

The conference brought together experts and stakeholders from various sectors, including business, technology, science, education, design, and law, to explore how the SDGs can be leveraged to create a better tomorrow. Each contribution in this book highlights the multifaceted approaches needed to address the complex challenges of sustainable development, providing insights into how we can break down barriers, implement innovative solutions, and foster long-lasting change.

The goal of the conference was to inspire new ways of thinking about sustainability and provide a platform for the exchange of knowledge and best practices. From community-driven grassroots initiatives to policy discussions at the national and local levels, the contributions in this book emphasize the importance of cross-sectoral collaboration in achieving the SDGs. The research presented here showcases successful sustainability projects, innovative technologies, and practical strategies that have been implemented globally.

The themes covered in this volume reflect the critical areas that need attention to create a sustainable future. These include innovation and technology for sustainability, climate action, social inclusion, education for sustainable development, corporate social responsibility, health and well-being, and global partnerships. The sub-themes, ranging from youth empowerment to policy and governance for sustainability, provide a holistic view of the challenges and opportunities that lie ahead.

As you explore the chapters in this book, you will find valuable insights into the innovative solutions and collaborative efforts required to turn the aspirations of the SDGs into tangible realities. It is my hope that this volume will not only inform and inspire but also serve as a call to action for all stakeholders to continue working together toward a sustainable and equitable future.

I would like to extend my deepest gratitude to all the contributors, whose work has been instrumental in making this book possible. Their commitment to sustainable development and their willingness to share their knowledge and expertise is a testament to the power of collective action.

## **Preface**

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I would also like to thank the organizers, sponsors, and participants of the conference, whose support has made this event and this book possible.

As we strive to achieve the SDGs, let us remember that each small step contributes to the greater vision of a better tomorrow. Together, we can create the change we wish to see in the world.

### **Editors**

Dr. Jyoti Jamnani  
Dr. Nupur Veshne  
Prof. Sanjeevini Gurjar

## Acknowledgments

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We express our heartfelt gratitude to everyone who contributed to the success of the conference, “Empowering Change: Achieving Sustainable Development Goals (SDGs) for a Better Tomorrow,” held on 27th and 28th September 2024 at KLS Gogte Institute of Technology (GIT), Belagavi. This event stands as a testament to KLS GIT’s unwavering commitment to academic excellence and its pioneering role in shaping the future of education.

We extend our sincere appreciation to the esteemed patrons of the event, Shri A.N. Mandgi, President of Karnatak Law Society; Shri. Ram Bhandari and Shri. D. V Kulkarni, Vice Presidents of Karnatak Law Society; Shri Pradeep Sawkar, Chairman of Karnatak Law Society; Shri Vivek Kulkarni and Shri Sudheendra Ganachari, Secretaries of Karnatak Law Society; Shri Pramod Khatavi, Chairman of KLS Gogte Institute of Technology (MAM); and Shri Rajendra Belgaumkar, Chairman of KLS Gogte Institute of Technology (Engg). Their invaluable support and visionary guidance played a pivotal role in bringing this conference to completion.

Our deepest thanks go to the organizing committee, whose unwavering dedication ensured the event’s seamless execution. We particularly commend the leadership of our Convenors, Dr. M. S. Patil, Principal of KLS GIT, and Prof. D.A. Kulkarni, Dean of the Department of MBA. Special thanks to the Co-Convenors, Dr. Jyoti Jamnani, Dr. Nupur Veshne, and Prof. Sanjeevini Gurjar, for their meticulous planning and coordination.

We are profoundly grateful to our keynote speaker, Dr. Basanta Sahu for sharing his valuable insights, which greatly enriched the discussions. We extend our heartfelt gratitude to the jury and reviewers for their meticulous evaluation and unwavering dedication. Their keen judgment and patience were instrumental in upholding the quality and integrity of the event. To the authors, presenters, and participants, we owe our thanks for their remarkable contributions, which made the conference a vibrant platform for the exchange of ideas and knowledge.

Lastly, we appreciate the faculty of the MBA Department, faculty of KLS GIT, the administrative and support staff of KLS GIT, along with the students of the MBA department, whose dedication and hard work were instrumental in the event’s success.

As we reflect on this achievement, we eagerly anticipate continued collaborations in advancing sustainable development for a brighter and better tomorrow.

### Editors

Dr. Jyoti Jamnani  
Dr. Nupur Veshne  
Prof. Sanjeevini Gurjar

# CHAPTER 1

## Customer Perspectives on Sustainable Supply Chain Practices: A Study of Green Logistics

*Pooja Takalkar\*, Sajjan S. Gowda\*\*, Santhosh J.\*\*\**

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### ABSTRACT

This study focusses on product returns, recycling, and disposal as it examines customer opinions on green logistics. The main objective is to comprehend the variables affecting customers' perceptions of green logistics. To obtain quantitative insights, a descriptive study approach was employed to collect data via structured surveys. Using R programming, Excel, and Jamovi for data analysis, the research methodology combined qualitative and quantitative analysis. Regression analysis and chi-square tests were important methods. The results offer insightful information about how consumer perceptions affect sustainable supply chain strategies. Green logistics-savvy customers are more likely to support sustainable activities, pay extra for carbon-neutral shipping and eco-friendly packaging, and support sustainable practices overall. These discoveries have practical implications for firms looking to improve consumer engagement and sustainability strategy. Furthermore, by expanding our knowledge of the connection between consumer behaviour, corporate social responsibility, and supply chain sustainability, the study adds to the body of knowledge in academia.

**Keywords:** Sustainable supply chain; Consumer perception; Product returns; Recycling; Product Packaging; End of Life Disposal.

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### 1.0 Introduction

The transfer and storage of resources, information, and items from the point of origin to the site of consumption are all included in the planning, coordinating, and carrying out of logistics. Logistics is the efficient method of controlling the flow of goods from producer to consumer in contemporary commercial operations. Frequently compared to an essential bridge, it closes the gaps in products' journeys to guarantee effective client delivery. Given the importance of time in the fast-paced world of today, logistics is essential to the timely delivery of products.

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Its primary goal is to guarantee the precise, timely delivery of goods to the appropriate locations, greatly enhancing corporate profitability. Sustainability has become a crucial requirement in today's corporate environment, prompting companies all over the world to review their supply chain procedures and operational procedures. Businesses are under increasing pressure to implement sustainable methods that reduce their ecological footprint while satisfying the changing needs of socially conscious customers due to growing environmental concerns and more consumer awareness. The idea of "green logistics," which stresses eco-friendly methods of supply chain waste management, packaging, distribution, and transportation, is essential to this sustainability agenda.

The focus of this study is on customer perceptions on sustainable supply chain operations, specifically in the context of green logistics, as it explores the nexus of sustainability, supply chain management, and consumer behaviour. By means of an extensive investigation, our goal is to examine how customers view and react to green logistics programs that companies have put in place. This will help to illuminate the obstacles, chances, and consequences that face organisations that operate in the current environmentally sensitive market.

## **2.0 Statement of the Problem**

The study aims to investigate and understand the consumer perception in sustainable supply chain practices within the context of green logistics, addressing the challenges and opportunities associated with product returns, recycling, and disposal, with the goal of enhancing the efficiency and effectiveness of the logistics process.

## **3.0 Objectives of the Study**

- To examine the attitudes of customers towards green logistics with reference to sustainable supply chain practices.
- To analyze perceptions of customers towards green logistics initiatives, including product packaging, transportation modes, and end-of-life disposal.

## **4.0 Literature Review**

Souza *et al.* (2021) Due to the study's identification of a measurement gap in green logistics (GL) performance, a single index and tool have been developed. Limitations include an emphasis on theoretical constructs and the requirement for broader assessment beyond environmental elements, despite the fact that these are valuable for improving GL implementation. Notwithstanding their limitations, the suggested instruments make noteworthy enhancements to GL procedures, promoting market competitiveness by means of circularity.

Agyabeng-Mensah *et al.* (2022) The study examines the applicability of the theory of Natural Resource-Based View (NRBV) and offers empirical support for the application of Green Logistics Management Practices (GLMPS) to enhance sustainability and economic performance. Furthermore, it bridges a gap in the literature by examining the direct contribution of Supply Chain Transparency (SCT) to sustainability enhancement and investigates the mediating role of SCT between GLMPS and sustainability performance parameters.

Kawa & Pierański (2021) This study emphasises how e-commerce has grown quickly, helped along by the epidemic. There are advantages to this expansion, such as a lower carbon footprint because fewer cars are on the road, but there are drawbacks as well, like problems with last-mile deliveries, more packing, and more waste being produced. Although the effects of internet shopping on the environment have not been proven beyond a reasonable doubt, it is nevertheless imperative to take urgent action to reduce any negative effects.

Khan *et al.* (2019) The study emphasises how important it is to have sustainable logistics laws in order to support environmentally friendly products and lower carbon dioxide emissions. The study examines the logistics performance of 42 nations and finds that while carbon dioxide emissions have a negative impact on sustainability, FDI inflows and renewable energy have a favourable affect on green logistics operations. This emphasises how crucial it is to have laws supporting FDI and renewable energy in order to solve environmental issues.

Thu *et al.* (2024) “Impact of reverse logistics on customer satisfaction: An investigation using Vietnamese e-commerce platforms” This research investigates how customer happiness in Vietnamese e-commerce platforms is affected by reverse logistics. Through the use of an OLS model, it is discovered that while return costs have a negative impact on satisfaction, customer service has a positive correlation. Enhancing return procedures, processing effectiveness, cost control, and customer service are among the recommendations made by the study.

Adabayo (2022) “An analysis of retailing’s response times for reverse logistics and customer satisfaction The operational responsiveness has a substantial impact on customer satisfaction, highlighting the significance of formal return policies and clear communication, according to this research of reverse logistics responsiveness and customer satisfaction among Nigerian online shoppers.

Fatma & Kartika (2016) The article “Improving Reverse Logistics Performance in E-Retailing: A Consumer’s Perspective” examines the difficulties and methods e-retailers face while handling reverse logistics. It emphasises how crucial precise product descriptions and return guidelines are to customer happiness and loyalty. In order to improve performance and preserve a positive reputation in e-retailing, the study highlights the importance of matching reverse logistics with customer expectations. Saravanan *et al.* (2023) Reverse logistics’ (RL) critical role in raising customer satisfaction is highlighted in “The Conceptual Framework for Reverse Logistics (RL) in Online Shopping.” The literature study emphasises the

need for explicit return policies, the difficulties in handling returns, and how technology affects RL performance. It highlights how important it is to have reliable return management systems in order to satisfy customers and preserve competitive advantages. Anh & Khoa (2024) “Impact of Reverse Logistics on Online Shoppers’ Shopping Experience” This study examines the impact of reverse logistics on the pleasure and purchasing experiences of online shoppers. Effective reverse logistics is positively correlated with customer satisfaction, indicating that optimising RL can improve overall logistics operations and increase customer confidence and contentment with online buying.

## 5.0 Hypothesis

*Null hypothesis (H0):* There is no significant relationship between perception of customers towards initiatives of green logistics and their attitudes towards sustainable supply chain practices.

*Alternate hypothesis (H1):* There is significant relationship between perception of customers towards initiatives of green logistics and their attitudes towards sustainable supply chain practices.

## 6.0 Research Methodology

This research uses a mixed-methods approach, which combines both qualitative and quantitative techniques to capture a comprehensive understanding of consumer perspectives on green logistics.

*Data Collection:*

- *Primary Data:* Surveys/questionnaires conducted with customers and bankers.
- *Secondary Data:* Gathered from literatures, magazines, and websites for additional information. Sampling Strategy:

The sample will be drawn from various demographic segments to ensure diversity and representativeness, capturing a range of perspectives across different age groups, genders, socioeconomic backgrounds, and geographical regions.

*Tools:*

- R programming, Excel and Jamovi.
- Surveys/questionnaires for customers.
- Secondary data collected from literatures, magazines, and websites.

## 7.0 Data Analysis and Techniques to be Applied

- *Data analysis:* Quantitative analysis techniques will be applied.
- *Techniques*
  - Regression analysis
  - Chi-square test

## 8.0 Data Analysis

**Gender:** Based on data coding as per Table 1: Demographic details, the average value of 0.343 suggests that most individuals would belong to category 0, which could indicate one gender. At 0.476 for the standard deviation, the degree of variability is modest. More than half of the participants are coded as 0, according to a median of 0.

**Age:** The mean age of 1.21 indicates that the majority of participants are probably closer to one, on the younger end of the spectrum. A standard deviation of 0.519 suggests that there is some variation in ages, but not a lot. When the median is 1, it indicates that a majority of the participants fall into that category.

**Table 1: Demographic Details**

Descriptives		
	Gender	Age
N	185	185
Missing	4	4
Mean	0.343	1.21
Median	0	1
Standard deviation	0.476	0.519
Minimum	0	1
Maximum	1	5

**Table 2: Chi-square Test (A&B)**

Contingency Tables							
B	A					How familiar are you with the concept of green logistics?	Total
	4	2	3	5	1		
1	1	0	0	0	0	0	1
3	1	3	5	1	4	0	14
4	89	6	25	5	5	0	130
5	4	24	6	3	0	0	37
2	0	1	0	0	1	0	2
How likely are you to purchase a product with minimal or biodegradable packaging, even if it costs slightly more?	0	0	0	0	0	1	1
<b>Total</b>	<b>95</b>	<b>34</b>	<b>36</b>	<b>9</b>	<b>10</b>	<b>1</b>	<b>185</b>



**Table 3: Chi-square Test (A&B)**

$\chi^2$ Tests			
	Value	df	P
$\chi^2$	297	25	<0.001
N	185		

**Hypothesis**

*Null Hypothesis (H<sub>0</sub>):* There is no association between the familiarity with green logistics concept and the likelihood of purchasing products with minimal or biodegradable packaging, even if it costs slightly more.

*Alternative Hypothesis (H<sub>1</sub>):* There is an association between the familiarity with the concept of green logistics and the likelihood of purchasing products with minimal or biodegradable packaging, even if it costs slightly more.

Interpretation of  $\chi^2$  Test Results:

Chi-square Value ( $\chi^2$ ): 297

Degrees of Freedom (df): 25

p-value: <0.001

Sample Size (N): 185

As per Table 3, the chi-square value is 297, with 25 degrees of freedom and a p-value of less than 0.001.

**Interpretation:** Given that the p-value is less than 0.001, the null hypothesis (H<sub>0</sub>) is rejected. This suggests that, even if the cost is a little higher, there is a statistically significant correlation between the chance of buying products with minimum or biodegradable packaging and one's knowledge with the notion of green logistics. The outcome implies a relationship between people's purchasing behaviour with regard to ecologically friendly packaging and their level of acquaintance with green logistics. Even if the cost is slightly greater, those who are more knowledgeable about green logistics are probably more likely to choose products with minimum or biodegradable packaging.

**Hypothesis**

*Null Hypothesis (H<sub>0</sub>):* There is no association between the willingness to pay a little extra fee for carbon-neutral shipping methods and the likelihood of purchasing products with minimal or biodegradable packaging, even if it costs more.

*Alternative Hypothesis (H<sub>1</sub>):* There is an association between the willingness to pay a little extra fee for carbon-neutral shipping methods and the likelihood of purchasing products with minimal or biodegradable packaging, even if it costs more.

Interpretation of  $\chi^2$  Test Results

Chi-square Value ( $\chi^2$ ): 305

Degrees of Freedom (df): 25

p-value: <.001

Sample Size (N): 185

In this case, the chi-square value is 305, with 25 degrees of freedom and a p-value of less than 0.001.

**Table 4: Chi Square Tests (B&C)**

Contingency Tables							
B	C					How willing would you be to pay a little extra to ensure your online orders are shipped using carbon-neutral methods (environmental friendly packaging)?	Total
	2	4	5	3	1		
1	1	0	0	0	0	0	1
3	8	3	0	2	1	0	14
4	9	62	56	3	0	0	130
5	1	31	3	1	1	0	37
2	0	0	0	1	1	0	2
How likely are you to purchase a product with minimal or biodegradable packaging, even if it costs slightly more?	0	0	0	0	0	1	1
Total	19	96	59	7	3	1	185

**Table 5: Chi Square Tests (B&C)**

$\chi^2$ Tests			
	Value	df	P
$\chi^2$	305	25	< .001
N	185		

**Interpretation:** Given that the p-value is less than 0.001, the null hypothesis ( $H_0$ ) is rejected. This suggests that, even at somewhat higher costs, there is a statistically significant correlation between the chances of buying products with minimum or biodegradable packaging and the willingness to pay a tiny additional premium for carbon-neutral transportation options. The findings imply that people's propensity to buy ecologically friendly packaging is correlated with their willingness to pay extra for carbon-neutral delivery options. Even if the cost of the product is slightly greater, those who will to pay an extra fee for carbon-neutral shipping are probably more likely to buy products with little or biodegradable packaging.

### Hypothesis

*Null Hypothesis ( $H_0$ ):* There is no association between the willingness to pay a little extra for carbon-neutral shipping methods and the opinion on whether companies should be accountable for managing the after-life disposal of their products, even if it means costs more for customers.

*Alternative Hypothesis (H<sub>1</sub>):* There is an association between the willingness to pay a little extra for carbon-neutral shipping methods and the opinion on whether companies should be accountable for managing the after-life disposal of their products, even if it means costs more for customers.

Interpretation of  $\chi^2$  Test Results

Chi-square Value ( $\chi^2$ ): 320

Degrees of Freedom (df): 25

p-value: < .001

Sample Size (N): 185

In this case, the chi-square value is 320, with 25 degrees of freedom and a p-value of less than 0.001.

**Table 6: Chi Square Tests (C&D)**

C	D					In your opinion, should companies be accountable for managing the after-life disposal of their products (recycling, composting) even if it costs more for customers?	Total
	2	3	4	5	1		
2	1	11	7	0	0	0	19
4	0	6	33	57	0	0	96
5	0	2	51	6	0	0	59
3	0	1	5	0	1	0	7
1	0	0	2	1	0	0	3
How willing would you be to pay a little extra to ensure your online orders are shipped using carbon-neutral methods (environmental friendly packaging)?	0	0	0	0	0	1	1
Total	1	20	98	64	1	1	185

**Table 7: Chi Square Tests (C&D)**

$\chi^2$ Tests			
	Value	Df	p
$\chi^2$	320	25	< .001
N	185		

**Interpretation:** Given that the p-value is less than 0.001, the null hypothesis (H<sub>0</sub>) is rejected. This suggests that there is a statistically significant correlation between the willingness to pay a minor extra cost for carbon-neutral shipping methods and the belief that businesses should handle the disposal of their products at the end of their useful lives, even if doing so results in higher costs for customers.

The findings imply that people’s willingness to pay extra for carbon-neutral delivery methods is correlated with their opinions on companies’ accountability for disposing of products. Individuals who are prepared to shell out extra money for carbon-neutral delivery are probably also of the opinion that businesses ought to handle product disposal at the end of its useful life, even if it means charging customers more.

**Table 8: Likert Scale**

	How familiar are you with the concept of green logistics?	How likely are you to purchase a product with minimum or biodegradable packaging, even if it costs more?	How willing would you be to pay a little extra to ensure your online orders are shipped using ways and methods that are carbon-neutral?	In your opinion, should companies be accountable for managing after-life disposal of their products even if it costs more for customers?
Mean	3.320555	4.086837	4.027056	4.211833

The means of the Likert scale (Table 8 Likert Scale) responses provide a summary measure of central tendency, giving an average response level for each question. The responses typically range from 1 (strongly disagree) to 5 (strongly agree).

**How familiar are you with the concept of green logistics?**

Mean: 3.320555

Interpretation: The respondents are moderately familiar with the green logistics concept. A mean of around 3.3 suggests a neutral to slightly positive familiarity level.

**How likely are you to purchase a product with very less packaging or packaging that is biodegradable, even if it costs a little more?**

Mean: 4.086837

Interpretation: Respondents are generally likely to purchase products with very less packaging or packaging that is biodegradable even if it costs more. A mean of around 4.1 indicates a positive inclination towards environmentally friendly packaging.

**How willing would you be to pay a little extra to ensure your online orders are shipped using ways and methods that are carbon-neutral?**

Mean: 4.027056

Interpretation: Respondents are generally willing to pay a little extra to ensure your online orders are shipped using ways and methods that are carbon-neutral. A mean of around 4.0 suggests a positive willingness to support environmentally friendly shipping practices.

**In your opinion, should companies be accountable for managing the after-life disposal of their products even if it costs more for customers?**

Mean: 4.211833

Interpretation: Respondents strongly agree that companies should be accountable for managing the after-life disposal of their products even if it costs more for customers. A mean of around 4.2 indicates strong support for corporate responsibility in product disposal.

**Table 9: Multiple Regression**

Model Fit Measures		
Model	R	R <sup>2</sup>
1	0.678	0.46

**Table 10: Multiple Regression**

Model Coefficients - Pay for Green_				
Predictor	Estimate	SE	T	p
Intercept	-0.0708	0.1788	-0.3959	0.693
EOL Disposal Responsibility	0.0939	0.034	2.7642	0.006
Convenient Recycling	8.12E-04	0.034	0.0239	0.981
Take-Back Programs	0.0134	0.0326	0.4106	0.682
Pay for Carbon-Neutral	0.1266	0.0209	6.0579	< .001
Eco Shipping	-0.0655	0.0248	-2.6452	0.009
Transparency Confidence	0.0996	0.0263	3.7806	< .001
Green Logistics Familiarity	0.0686	0.0187	3.6591	< .001
Transportation Awareness	-0.1101	0.0249	-4.4189	< .001

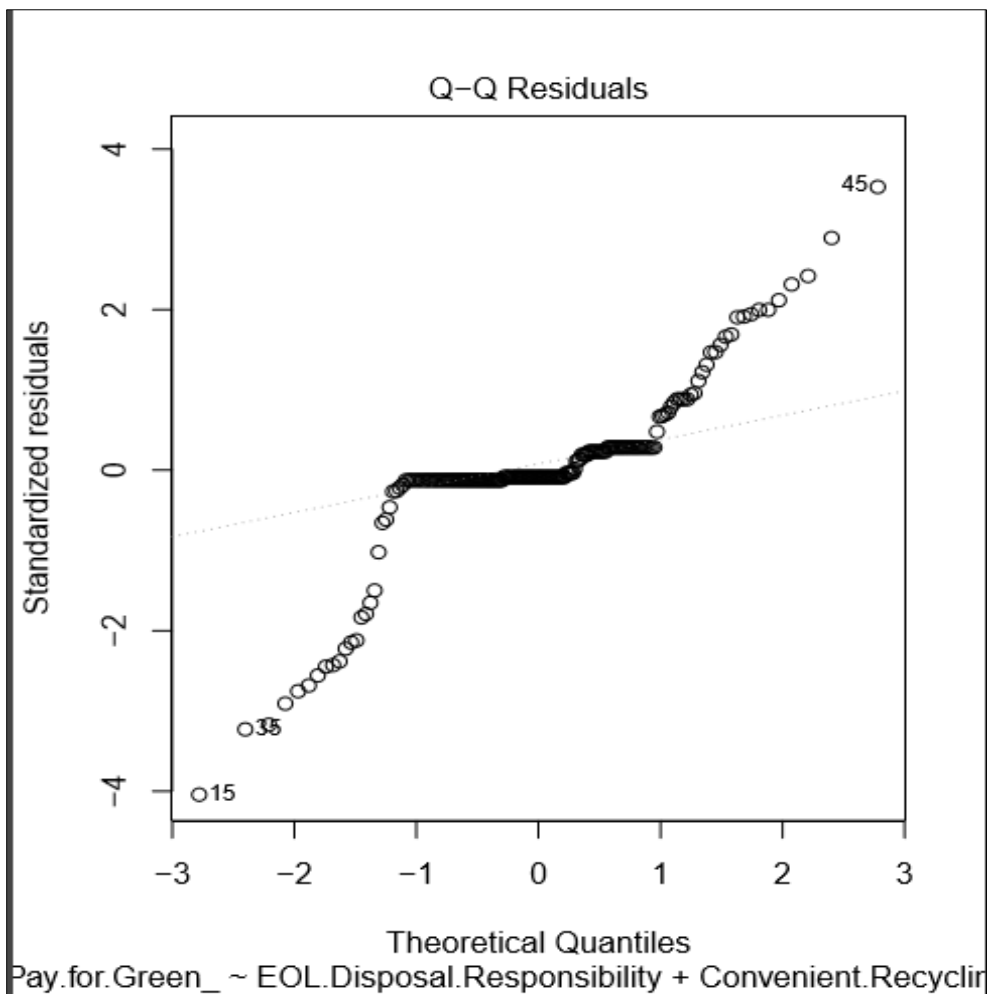
The analysis in Table 10 examines the relationship between the dependent variable Pay.for.Green and several independent variables. Here is an interpretation of the model and the coefficients:

- *EOL Disposal Responsibility: 0.104169*: A unit increase in ‘EOL Disposal Responsibility’ is associated with an average increase of 0.104169 in ‘Pay for Green’, holding other variables constant.
- *Convenient Recycling: -0.016883*: A unit increase in ‘Convenient Recycling’ is associated with an average decrease of 0.016883 in ‘Pay for Green’, holding other variables constant.
- *Take Back Programs: 0.001599*: A unit increase in ‘Take Back Programs’ is associated with an average increase of 0.001599 in ‘Pay for Green’, holding other variables constant.
- *Pay for Carbon Neutral: 0.125809*: A unit increase in ‘Pay for Carbon Neutral’ is associated with an average increase of 0.125809 in ‘Pay for Green’, holding other variables constant.
- *Green Logistics Familiarity: 0.058697*: A unit increase in ‘Green Logistics Familiarity’ is associated with an average increase of 0.058697 in ‘Pay for

Green', holding other variables constant.

- *Transparency Confidence: 0.117410*: A unit increase in 'Transparency Confidence' is associated with an average increase of 0.117410 in 'Pay for Green', holding other variables constant.
- *Transportation Awareness: -0.109294*: A unit increase in 'Transportation Awareness' is associated with an average decrease of 0.109294 in 'Pay for Green', holding other variables constant.

**Figure 1: Q-Q Plot (Quantile-Quantile Plot) for Residuals**



Interpreting the Q-Q Plot:

**1. Linearity of Points:**

- If the points on the Q-Q plot lie along the 45-degree reference line, it indicates that the residuals follow a normal distribution.
- Deviations from this line suggest departures from normality.

## 2. Pattern of Deviations:

- **Systematic Deviations:**

- **Upward or Downward Curvature:** If the points form a curve (either upwards or downwards), it indicates skewness in the residuals. Upward curvature indicates positive skewness (long tail on the right), while downward curvature indicates negative skewness (long tail on the left).
- **S-shaped Pattern:** This indicates issues with the tails of the distribution. If the points deviate towards the ends (forming an S-shape), it suggests heavy tails, meaning more extreme values than expected in a normal distribution.

## 3. Specific Observations

- **Outliers:** Points that are far from the reference line, especially at the ends of the plot, may indicate outliers. These outliers can have a significant impact on the model.

## 9.0 Findings

- The willingness of the customers to pay for carbon-neutral shipping and their purchase behaviour regarding eco-friendly packaging are positively influenced by their knowledge with green logistics. There is a strong correlation between this level of familiarity with the probability of selecting minimum or biodegradable packaging and opting for carbon-neutral transportation at an additional cost.
- Green logistics-aware customers are more likely to favour sustainable supply chain methods, pay more for environmentally friendly packaging, and choose carbon-neutral delivery. Their attitudes towards sustainable supply chain methods are positively correlated with their willingness to pay for green logistics efforts.
- Despite increasing expenses, there is strong consumer support for corporate accountability in product disposal. This is demonstrated by the strong correlation found between the idea that businesses should handle product disposal and the willingness to pay for carbon-neutral transportation

## 10.0 Managerial Implications

- **Consumer Education and Transparency:** To inform customers about green logistics, start campaigns on websites, social media, and product labelling. To foster loyalty and trust, place a strong emphasis on openness in sustainability initiatives through yearly reports and product labelling.
- **Eco-Friendly Packaging:** To draw in environmentally conscientious customers, use and promote recyclable or biodegradable packaging materials. Draw attention to these modifications in marketing collateral and packaging.

- Provide delivery options that are carbon-neutral during the checkout process. To attract customers who care about the environment, clearly explain the advantages to them.
- Advocacy and Compliance: Speak with legislators to support legislation that promotes sustainability, such as tax breaks for using renewable energy in transportation. To remain ahead of regulatory changes and improve reputation, keep an eye out for new rules and norms and make adjustments accordingly.
- Advocacy and Compliance: Speak with legislators to support legislation that promotes sustainability, such as tax breaks for using renewable energy in transportation. To remain ahead of regulatory changes and improve reputation, keep an eye out for new rules and norms and make adjustments accordingly.
- Investment in Technology: Make investments in cutting-edge technologies such as big data analytics for route optimisation and emission reduction, blockchain for supply chain transparency, and Internet of Things for effective logistics management. Encourage studies and research aimed at developing cutting-edge environmentally friendly logistics techniques.
- Customer Feedback and Continuous Improvement: Use surveys to regularly get customer input on sustainable projects. Set up key performance indicators (KPIs) to gauge how well green logistics projects are working. Share these metrics with the relevant parties to guarantee openness and responsibility.

## **11.0 Conclusion**

In the larger context of sustainable supply chain operations, this study emphasises the vital significance of green logistics. According to the investigation, customer attitudes and views regarding green logistics have a substantial impact on their overall support for sustainability projects as well as their purchasing behaviours. Key findings show that positive consumer sentiments towards sustainable practices are substantially correlated with knowledge of green logistics and willingness to pay extra for environmentally friendly solutions.

To achieve customer expectations and support environmental sustainability, organisations must invest in green logistics projects, enhance reverse logistics procedures, and implement transparent supply chain standards. To further propel industry-wide breakthroughs, governmental measures that incentivise and promote sustainable practices as well as continued research and development are essential. In the end, matching corporate plans to consumer desires for sustainability is critical for solving global environmental concerns as well as for fostering market competitiveness. Businesses may create a sustainable future by balancing economic performance with ecological responsibility through coordinated efforts and creative solutions.



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## CHAPTER 2

### Sustainable Smart Ticketing: Revolutionizing Transit for a Greener Future

*Deepali Virupaxi\**, *Madhu Jambhale\*\**, *Tanuja Hadimani\*\*\**, *Steffi Borges\*\*\*\**

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#### ABSTRACT

This paper examines the growing role of smart ticketing systems in public transportation, highlighting the transition from traditional paper-based tickets to digital options such as contactless cards, mobile apps and QR codes. The research indicates that these digital solutions can greatly improve operational efficiency, enhance the passenger experience and support environmental sustainability. The findings emphasize that smart ticketing systems help reduce paper consumption, streamline the ticketing process and provide a more convenient and accessible experience for users. Additionally, this transformation aligns with the United Nations Sustainable Development Goals (SDGs), particularly those related to SDG 11 (Sustainable Cities and Communities), SDG 9 (Industry Innovation and Infrastructure), and SDG 12 (Responsible Consumption and Production). In conclusion, smart ticketing is not just a technological upgrade, but it is a critical step towards advancing global sustainability and improving public transportation.

**Keywords:** Smart ticketing; Public transportation; Sustainable Development Goals (SDGs); Operational efficiency; Environmental sustainability.

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#### 1.0 Introduction

As a key component of the 2030 Agenda for Sustainable Development, the United Nations established the Sustainable Development Goals (SDGs) in 2015. According to the United Nations (2015), these 17 global objectives are aimed at addressing significant problems such as poverty, inequality, climate change, and environmental damage. Governments, corporations, civil society organisations, and individuals worldwide must work together to achieve meaningful progress on these interconnected goals (United Nations, 2015).

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In this context, the integration of smart ticketing systems represents a significant advancement in urban transportation, directly contributing to sustainability and efficiency (Gordon, 2023). Smart ticketing systems leverage advanced technologies like digital payment platforms, real-time data analytics, and automated processing to transform how transportation is managed (Smith & Johnson, 2023). By reducing reliance on paper tickets and minimizing waste, these systems align with SDG 12: Responsible Consumption and Production (United Nations, 2015). Furthermore, their digital nature enhances the efficiency of urban transportation, supporting SDG 11: Sustainable Cities and Communities (United Nations, 2015). Beyond environmental benefits, smart ticketing fosters technological innovation, optimizing transport routes and reducing operational costs, thereby contributing to SDG 9: Industry, Innovation, and Infrastructure (Gordon, 2023). As cities continue to grow, smart ticketing systems offer a promising solution to the challenges of congestion, environmental impact, and equitable access to public services (Andhale *et al.*, 2020).

### **1.1 Sustainable Development Goals (SDGs)**

The Sustainable Development Goals (SDGs) are a worldwide project designed to promote a world that is more equitable, wealthy and sustainable. In September 2015, the UN General Assembly adopted these goals as a part of the 2030 Agenda for Sustainable Development, a comprehensive plan aimed at addressing the world's most pressing issues. These issues cover social, economic, and environmental facets, with eradicating poverty, decreasing inequality, and protecting the environment as primary priorities.

The Millennium Development Goals (MDGs), which were established in 2000 and completed in 2015, provided the framework for the Sustainable Development Goals. While the MDGs were successful in addressing several critical issues, such as infectious diseases, reducing poverty, and granting access to education they were often criticized for being too narrow in scope and for insufficiently integrating the environmental and economic considerations. On the other hand, the SDGs aim to be universally applicable and have a more comprehensive and interconnected framework, addressing a wider range of concerns in a more comprehensive manner. (United Nations, 2015)

### **1.2 17 Goals for sustainable development**

The 17 Sustainable Development Goals (SDGs) include particular targets and indicators for handling a variety of global issues. The following are the goals:

- No Poverty (Goal 1): End severe poverty, which is characterised as the existence of a person on less than \$1.90 per day, globally.
- Zero Hunger (Goal 2): End hunger, ensure food security, improve nutrition, and advance sustainable farming methods.

- Health and Well-Being (Goal 3): Ensure healthy lives and foster wellbeing for people of all ages.
- Quality Education (Goal 4): Promote opportunities for lifelong learning and guarantee inclusive, equitable, and high-quality education for everyone.
- Gender Equality (Goal 5): Empower all women and girls and achieve gender equality.
- Goal 6: Clean Water and Sanitation: Guarantee all individuals have access to sustainable and safe water and sanitation services.
- Affordable and Clean Energy (Goal 7): Ensure that everyone has access to dependable, reasonably priced, and environmentally friendly energy.
- Decent Work and Economic Growth (Goal 8): Encourage steady, equitable, and sustainable economic development and provide full employment and fair labour for all.
- Industry, Innovation, and Infrastructure (Goal 9): Foster innovation, advance sustainable industrialization, and build resilient infrastructure.
- Reducing Inequality (Goal 10): Deal with and lessen disparities both within and between nations.
- Sustainable Cities and Communities (Goal 11): Promote resilient, safe, inclusive, and sustainable urban and rural communities.
- Responsible Consumption and Production (Goal 12): Encourage patterns of sustainable production and consumption.
- Climate Action (Goal 13): Take prompt, decisive action to mitigate the effects of climate change.
- Life Below Water (Goal 14): To safeguard and sustainably manage marine resources, oceans, and seas in order to promote sustainable development.
- Life on Land (Goal 15): Preserve, rejuvenate and encourage the sustainable utilisation of terrestrial ecosystems; sustainably manage forests; combat desertification; reverse land degradation; and stop the loss of biodiversity.
- Peace, Justice, and Strong Institutions (Goal 16): Encourage inclusive, peaceful societies for long-term growth; guarantee that everyone has access to justice; and establish strong, efficient institutions at all levels.
- Partnerships for the Goals (Goal 17): Strengthen and revitalise international alliances in order to promote sustainable development. (United Nations, 2015)

### **1.3 Smart ticketing**

Smart ticketing refers to the use of advanced technological solutions for issuing, purchasing, and validating tickets for various transportation services, events, and other activities that require access control. Unlike traditional paper-based ticketing systems, smart ticketing leverages digital technologies to offer a more efficient, convenient, and secure way of managing ticketing processes. Smart ticketing systems have been increasingly adopted in public transportation, sports,

entertainment, and tourism sectors due to their potential to enhance the user experience, reduce operational costs, and minimize environmental impact. The emergence of smart ticketing is closely linked to advancements in information and communication technology (ICT), particularly in the areas of mobile computing, contactless payments, and cloud computing. These technological developments have enabled the creation of systems that can handle large volumes of transactions in real-time, provide seamless integration with other digital services, and offer enhanced security features to prevent fraud and ensure the privacy of users' data.

#### 1.4 Core principles of smart ticketing

Smart ticketing systems are designed around several key principles that differentiate them from traditional ticketing methods:

- *Convenience:* Smart ticketing systems offer a seamless and easy-to-use experience by allowing customers to buy and store tickets electronically. This eliminates the need for physical tickets, making it easier for users by removing concerns about carrying, losing, or damaging paper tickets.
- *Efficiency:* These systems enhance the ticketing process by minimizing the time and effort needed for purchasing, validating, and processing tickets. This is especially advantageous in busy environments like public transportation, where speed and precision are essential.
- *Security:* Smart ticketing systems employ advanced security features to prevent fraud, counterfeiting, and unauthorized access. Techniques like encryption, tokenization, and biometric authentication help ensure that only authorized users can access the services they've purchased.
- *Interoperability:* Smart ticketing systems are often designed to be interoperable, meaning they can be used across multiple services and platforms. This interoperability allows users to access different modes of transportation or services with a single ticket or payment method, enhancing the overall convenience and utility of the system.
- *Sustainability:* Smart ticketing systems support environmental sustainability by cutting down on paper ticket use and reducing the need for physical infrastructure. This leads to less waste, decreased carbon emissions, and encourages the adoption of digital solutions that are more eco-friendly.

#### 1.5 Different methods of smart ticketing

Smart ticketing encompasses a variety of methods and technologies, each with its own advantages and applications. Some of the most common methods of smart ticketing include:

- *Contactless Smart Cards:* Contactless smart cards are a popular type of smart ticketing solution. These cards, roughly the size of a credit card, feature an embedded microchip and antenna that enable communication with a reader using

radio frequency identification (RFID) or near-field communication (NFC) technology. Users can load credits for travel or events onto the card and validate their tickets by simply tapping the card on a reader.

- *Mobile Ticketing:* Mobile ticketing leverages smartphones and mobile applications to enable users to purchase, store, and validate tickets directly from their devices. Tickets are typically delivered in the form of QR codes, barcodes, or NFC-based digital passes that can be scanned or tapped at the point of entry.
- *QR Code and Barcode Ticketing:* QR code and barcode ticketing involves the use of two-dimensional (QR) or one-dimensional (barcode) codes that can be scanned by a reader to validate a ticket. These codes can be printed on paper or displayed on a mobile device, making them versatile for both physical and digital ticketing environments.
- *Biometric Ticketing:* Biometric ticketing involves the use of biometric data, such as fingerprints, facial recognition, or iris scans, to authenticate and validate tickets. This method eliminates the need for physical or digital tickets by using unique biological traits to grant access.
- *Account-Based Ticketing (ABT):* Account-based ticketing shifts the focus from the physical or digital ticket itself to the user's account. In an ABT system, users create an account that is linked to their payment information and travel or event history. When the user accesses a service, the system automatically deducts the appropriate fare or fee from their account based on their usage.

## **1.6 Sustainable Development Goals (SDGs) and smart ticketing**

Smart ticketing systems hold considerable potential to advance the Sustainable Development Goals by fostering sustainable development across various sectors, particularly in urban environments.

- *SDG 9: Industry, Innovation, and Infrastructure*  
Smart ticketing is an essential element of modern infrastructure, contributing to the development of resilient, efficient and environmentally friendly urban transportation networks. By promoting innovation in payment technologies and infrastructure design, smart ticketing helps build the robust foundations needed for sustainable industrialization and economic expansion.
- *SDG 11: Sustainable Cities and Communities*  
The implementation of smart ticketing systems supports the creation of sustainable cities by enhancing the efficiency and accessibility of public transportation. By reducing the reliance on private vehicles and encouraging the use of public transit, smart ticketing contributes to lower carbon emissions, reduced traffic congestion, and improved urban air quality. Furthermore, the inclusive design of smart ticketing systems ensures that public services are accessible to all, including vulnerable populations.

- *SDG 12: Responsible Consumption and Production*

Smart ticketing minimizes environmental impact by reducing the need for physical tickets and optimizing resource use. By promoting digital transactions and reducing waste, smart ticketing aligns with the principles of responsible consumption and production, a core objective of SDG 12.

The integration of smart ticketing within the framework of the Sustainable Development Goals demonstrates how technological innovations can contribute to global sustainability efforts. Smart ticketing not only enhances the efficiency and inclusivity of public services but also directly supports the achievement of key SDGs related to infrastructure, urban sustainability, responsible consumption, climate action, and global partnerships.

However, to fully realize the potential of smart ticketing in advancing the SDGs, it is essential to address challenges related to accessibility, data privacy, infrastructure costs, and policy alignment. By fostering collaboration across sectors and leveraging technological advancements, smart ticketing can play an important role in building a sustainable, equitable and resilient societies.

The main objectives of the research are stated as follows: i. Assess the Current State of Ticketing in Karnataka's Public Bus Transportation. ii. Evaluate the existing ticketing systems, focusing on their operational efficiency, environmental impact, and user experience. iii. Explore the Potential of Smart Ticketing Systems: Investigate how digital solutions like contactless cards, mobile apps, and QR codes can improve the efficiency, convenience, and sustainability of public bus transportation in Karnataka. iv. Align with the Sustainable Development Goals (SDGs): Examine how the implementation of smart ticketing systems can contribute to the achievement of SDG 9, SDG 11, and SDG 12 within Karnataka's public transportation sector.

## **2.0 Literature Review**

In recent years, the evolution of public transportation systems has been marked by a growing emphasis on leveraging technology to enhance efficiency and user experience. A significant focus has been on developing smart bus ticketing and tracking systems that integrate various technologies like RFID, GPS, QR codes, and mobile applications.

One notable development is the RFID-based ticketing systems, which automate fare collection and minimize disputes by using RFID cards. These systems authenticate passengers and automatically deduct fares based on the distance traveled, thus improving scheduling and tracking within public transportation networks (Hamilton and Sankaranarayanan, 2013).

Building upon this, mobile-enabled tracking and ticketing systems integrate RFID and GPS technologies to provide real-time bus tracking, arrival notifications, and smart ticket top-ups. This approach has proven effective in improving



operational efficiency and passenger convenience (Hamilton and Sankaranarayanan, 2014). In addition, the use of Android apps and rechargeable RFID cards has streamlined the ticketing process further by incorporating features such as passenger counting and GPS tracking, which helps reduce manual errors and enhance service quality (Beaulin *et al.*, 2016).

Mobile ticketing systems have also emerged as a significant advancement, managing passenger records, schedules, fares, and seat availability. These systems aim to address inefficiencies in traditional manual ticketing processes, thereby streamlining operations and minimizing customer disputes (Ibrahim and Ta'a, 2015). In metropolitan areas, smart e-ticketing systems have been introduced to reduce waiting times and improve accessibility. These systems include features such as digital seat reservations, payments, and automatic seat allocation, which collectively enhance public transportation efficiency (Kazi *et al.*, 2018).

The incorporation of IoT technology has further revolutionized public transportation by offering micro-navigation, crowd-aware route recommendations, and real-time bus arrival time estimation. This integration significantly improves urban mobility and user convenience (Apoorva *et al.*, 2018). Additionally, QR code-based ticketing systems, combined with GPS and GSM technologies, have been developed to reduce passenger waiting times and facilitate cashless transactions, providing a scalable and user-friendly method for ticketing (Shirsath *et al.*, 2018).

Addressing environmental concerns, RFID-based systems have been proposed to minimize paper usage in ticketing processes. By tracking passenger entry and exit and calculating fares based on distance traveled, these systems help reduce paper waste and support more sustainable practices (Andhale *et al.*, 2020). The development of sustainable smart transportation systems has also emphasized the need for public-private collaboration and supportive regulatory frameworks to address financial and technical challenges effectively (Vaithilingam *et al.*, 2021).

A smart digital bus ticketing system using QR codes, which includes Android applications for both passengers and conductors, and a web portal for administration. This system aims to improve operational efficiency and reduce waiting times. (Harini *et al.*, 2021) The effectiveness of using QR codes for e-ticket payments in the transportation sector is evaluated to simplify and speed up ticket transactions. QR codes aim to enhance the ease of payment and boost ticket sales. (Kuncara *et al.*, 2021)

Similarly, an automatic bus ticketing system using RFID cards has been proposed to streamline the ticketing process and minimize disputes. This system enhances convenience and accuracy in fare collection. (Khedekar *et al.*, 2021)

Further innovation includes the development of an advanced system that combines RFID and mobile applications to automate fare collection and passenger management. This approach reduces the reliance on physical tickets and human intervention, aiming for greater operational efficiency. (Suvarna *et al.*, 2022) An automated fare collection system using advanced technologies, including predictive

models and machine learning, can improve customer experience, create new business opportunities, and lower emissions. (Bieler et. al, 2022)

Additionally, there is a growing emphasis on adopting smart ticketing systems to promote sustainable mobility within green cities. Such systems are advocated to improve efficiency and reduce the environmental impacts of public transportation. (Gordon, 2023) Local bus ticketing systems can be improved by implementing an online platform that simplifies purchasing, payment processing and ticket validation. This system offers features such as destination selection, email or SMS confirmations, and options for ticket cancellations and refunds, addressing common challenges and enhancing convenience. (Kavitha and Senbagavalli, 2023) A smart ticketing application can improve the experience by providing optimized routes, seat availability, and digital tickets, including options for users without smartphones, which can be verified by ticket checkers. (Om et. al, 2023)

Recent innovations have focused on secure e-ticketing systems that utilize NFC technology to prevent ticket cloning and replay attacks. These systems aim to enhance security and adaptability, offering a robust solution to traditional paper tickets (Gudymenko *et al.*, 2024). Overall, these technological advancements reflect a significant shift towards more efficient, user-friendly, and environmentally sustainable public transportation systems.

### **3.0 Research Methodology**

This research focuses on the integration of smart ticketing systems within Karnataka's public bus transportation network. The scope includes an analysis of current ticketing methods, an exploration of smart ticketing technologies, and an examination of how these systems align with the Sustainable Development Goals. The study is geographically concentrated on urban areas in Karnataka, where the need for efficient and sustainable transportation solutions is most pressing. The research will also consider the perspectives of various stakeholders, including government organizations, transportation authorities, technological businesses and passengers, to develop a comprehensive understanding of the opportunities and challenges associated with smart ticketing systems.

### **4.0 Discussion**

The rapid urbanization of Karnataka has led to significant challenges in public transportation, including congestion, inefficiencies, and environmental degradation. Traditional paper-based ticketing systems in public bus transportation contribute to these issues by increasing operational costs, generating waste, and providing limited convenience for passengers. As the state strives to meet the United Nations Sustainable Development Goals (SDGs), particularly SDG 9 (Industry, Innovation, and Infrastructure), SDG 11 (Sustainable Cities and Communities), and

SDG 12 (Responsible Consumption and Production), there is an urgent need to transition to smart ticketing systems. These systems can address the inefficiencies in public bus transportation, reduce environmental impacts, and enhance the overall user experience, thereby contributing to a more sustainable urban mobility framework.

To bridge the gap between traditional systems and the future of public transportation, there is a clear and urgent need to adopt smart ticketing systems. These systems not only align with global sustainability goals but also directly address the specific challenges Karnataka faces in its public transport sector. By integrating digital solutions, Karnataka can move towards a more efficient, eco-friendly, and user-centric transportation framework that supports sustainable urbanization.

**Inefficiency in Current Ticketing Systems:** The traditional paper-based ticketing system in Karnataka's public buses is inefficient, leading to longer boarding times, higher operational costs, and increased paper waste, contributing to environmental degradation. **Positive Environmental Impact of Smart Ticketing:** Smart ticketing systems, by reducing reliance on paper, can significantly lower the environmental footprint of public transportation. This aligns with SDG 12 by promoting responsible consumption and reducing waste. **Enhanced Operational Efficiency:** Smart ticketing systems streamline the ticketing process, reduce manual errors, and provide real-time data for better route and schedule optimization. This supports SDG 9 by fostering innovation in transportation infrastructure. **Improved Accessibility and Convenience:** Digital solutions offer a more convenient and accessible ticketing experience for passengers, particularly through mobile apps and contactless payments, enhancing the inclusivity and sustainability of urban transport, in line with SDG 11. **Challenges in Implementation:** Barriers such as the initial cost of technology adoption, resistance from stakeholders, and the need for robust digital infrastructure present challenges to the widespread adoption of smart ticketing systems in Karnataka.

## **5.0 Conclusion**

**Public-Private Partnerships:** Foster collaborations between the government and private technology companies to share the costs and expertise required for implementing smart ticketing systems. **Phased Implementation:** Start with pilot projects in major cities like Bengaluru, and gradually expand to other regions, allowing for the resolution of issues on a smaller scale before broader deployment. **Awareness and Training Programs:** Conduct awareness campaigns and provide training to ensure that both passengers and transportation staff are comfortable with and fully understand the new smart ticketing systems. **Infrastructure Investment:** Allocate resources to enhance digital infrastructure, including dependable internet connectivity and secure payment systems, to ensure the effective functioning of smart ticketing systems throughout Karnataka. This investment will facilitate seamless

operations and support the widespread adoption of smart ticketing technologies. Policy Support: Develop supportive policies that encourage the adoption of smart ticketing, including subsidies for technology deployment and incentives for sustainable transportation practices.

The adoption of smart ticketing systems in Karnataka's public bus transportation holds the potential to revolutionize urban mobility by enhancing operational efficiency, improving the passenger experience, and significantly reducing environmental impacts. By aligning with the Sustainable Development Goals, particularly SDG 9, SDG 11, and SDG 12, Karnataka can lead the way in building a more sustainable and resilient public transportation system. However, the successful implementation of smart ticketing requires a strategic approach that addresses technological, financial, and policy-related challenges. With the right investments and collaborative efforts, smart ticketing can be a critical step towards achieving sustainable urban development in Karnataka.

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## CHAPTER 3

### **Determinants of Consumer Behavior towards Organic Food Products: A Study on Motivating and Limiting Factors**

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#### **ABSTRACT**

The growing global awareness of health, environmental sustainability, and ethical consumption has paved way to substantial rise in the demand for organic food products. However, consumer behavior towards organic foods is influenced by a complex interplay of motivating factors and limiting factors. This study explores the factors influencing consumer behavior towards organic food products, with a focus on both motivating and limiting factors. Data was collected with the help of a questionnaire from respondents of various demographic backgrounds to assess their purchasing habits, perceptions, and preferences regarding organic food. Key motivating factors such as health benefits, environmental concerns, and support for local farmers were analyzed alongside limiting factors like high costs, limited availability, and lack of awareness. The findings indicate health concerns and environmental sustainability are the primary drivers for organic food consumption, while price and accessibility remain significant barriers. It also highlights demographic variations in organic food purchasing behavior. The study provides valuable insights for marketers, retailers, and policymakers in promoting sustainable consumption practices and enhancing the accessibility of organic food.

**Keywords:** Organic food; Consumer behavior; Motivating factors; Limiting factors; Sustainability.

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#### **1.0 Introduction**

Organic food consumption has been gaining traction globally as consumers become more conscious of the health and environmental impacts of their dietary choices. This empirical study aims to investigate the key motivating and limiting factors that influence consumer behavior towards organic food products.

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The organic food sector has been extensively studied for the past two decades, yet our understanding of consumer behavior at different levels of consumption remains limited. Previous research has identified several factors that shape consumer attitudes and purchasing decisions, including perceived quality, health benefits, environmental concerns, and availability. (Melovic *et al.*, 2020) While these factors are well-documented, their relative importance and interaction effects are not well understood. (Melovic *et al.*, 2020)

To address this gap, this study adopts a comprehensive approach to analyze the determinants of organic food consumption across different market segments. The qualitative findings indicate that consumer intention, habit, availability, false assumptions, visibility and access, sensory cues, and price are critical factors that can either facilitate or hinder organic food purchases at the point of purchase. Furthermore, the quantitative analysis reveals significant differences in the motivations and limiting factors among consumers with varying purchasing frequencies. (Furno *et al.*, 2021)

The results from this study provide valuable insights for organic food producers, retailers, and policymakers. Targeted marketing strategies, improved product visibility, and pricing policies that account for consumer heterogeneity can help overcome the barriers to organic food consumption and foster the growth of this sector. (Henryks *et al.*, 2014) (Melović *et al.*, 2020)

This study addresses these gaps by examining the most salient determinants of organic food consumption among a sample of consumers in a developing market. To address these gaps, this study examines the most significant determinants of organic food consumption among a diverse sample of consumers in a developing market context.

## **2.0 Literature Review**

The rising global concern for environmental sustainability and health consciousness has fostered an increased demand for organic and green products across different regions. This literature review analyzes various studies attitudes of consumers and intentions on purchase towards organic food and green products. The review aims to identify common findings, gaps, and implications, focusing on how factors such as environmental awareness, health concerns, and gender influence these behaviors.

### **2.1 Environmental consciousness**

A recurring theme across multiple studies is the concern towards awareness of environment that would shape consumer attitudes toward organic and green products. Several studies highlight that consumers are motivated by environmental concerns when purchasing organic foods. For instance, Ayub *et al.* (2020) found that environmental consciousness was a significant factor influencing young consumers'



purchase intentions for organic products in Malaysia. Similarly, Dangi *et al.* (2020) and Eynade *et al.* (2021) identified environmental concerns as key determinants in their studies on organic food consumption in different regions. Moreover, research by Tandon *et al.* (2020) emphasizes the controlling part of environmental concerns in organic food purchases, showing that trust in environmental claims significantly boosts organic food consumption. Similarly, Srivastava (2021) found that while health and product quality were primary motivators, environmental concerns were less significant, suggesting regional variations in consumer priorities.

## **2.2 Health concerns**

Health consciousness is another prominent factor driving organic food consumption. Studies consistently report that consumers perceive organic products as healthier alternatives to conventional ones. Rana & Paul (2020) identified health motives as the most influential factor in organic food purchases over the past 25 years, a finding echoed by Singh & Verma (2017) and Dangi *et al.* (2020), who noted that health awareness significantly impacts organic food buying behavior. This health-focused motivation is also highlighted by Guru *et al.* (2024) in Western India, where personal health concerns are a key driver of organic food consumption.

## **2.3 Gender differences**

Gender differences in attitudes toward organic and green products also emerged as a common theme. Patil & Hasalkar (2021) found that attitude of male consumer's toward green products were less as compared to female consumers in both rural and urban areas. This aligns with findings by Kumar & Ali (2011), who identified gender as a moderate factor in influencing awareness of organic foods in India, although it played a smaller role compared to education and ICT usage.

## **2.4 Price and availability concerns**

Price and availability barriers are commonly discussed as significant challenges to the broader adoption of organic products. Singh & Verma (2017) and Pilelienė & Tamulienė (2021) observed that consumers are often reluctant to pay a premium for organic goods despite recognizing their health and environmental benefits. Similarly, Tandon *et al.* (2020) highlighted that while organic food is perceived positively, limited availability and higher prices restrict wider adoption in India.

## **2.5 Variations across regions and consumer segments**

While there is a consensus on the importance of environmental and health concerns, regional variations and differences in consumer segments are notable. For example, Ayub *et al.* (2020) found that social influence and health consciousness did not significantly impact young Malaysian consumers' purchase behavior, which contrasts with findings from India, where health is a significant factor (Singh &

Verma, 2017; Guru *et al.*, 2024). Similarly, studies conducted in Europe, such as Pilelienė & Tamulienė (2021) in Lithuania, show a high level of environmental consciousness but lower awareness of health benefits. This highlights the importance of regional context in shaping consumer behavior. Research from China by Li & Jaharuddin (2020) further suggests that key purchase factors for organic food in Beijing include trust and environmental awareness, with less emphasis on price barriers compared to other regions.

## **2.6 Research gaps**

Several research gaps were identified across the studies reviewed. First, there is inadequate research on the longstanding impact of consumer education and awareness campaigns, particularly in emerging markets like India. While many studies highlight education as a key factor (Kumar & Ali, 2011; Dangi *et al.*, 2020), few have examined the sustainability of its impact over time. Second, the role of digital media and e-commerce in shaping organic food consumption, particularly post-pandemic, remains underexplored. Chaturvedi *et al.* (2021) noted an increase in online sales of organic products throughout the pandemic, but additional research was needed to assess how this shift might impact long-term consumer behavior. Third, the influence of trust in organic certifications and eco-labels is another area that requires further investigation. While Tandon *et al.* (2020) discussed the role of trust in promoting organic food consumption, there is a lack of studies examining how consumers perceive various certification standards across different regions.

The key findings from the literature review suggest that consumer attitudes toward organic and green products are primarily shaped by environmental and health concerns, with regional and demographic variations. Gender differences, price sensitivity, and the role of education also play critical roles. The studies reviewed emphasize the need for marketers and policymakers to focus on endorsing the environmental and concerns of health for organic products to increase consumption. Price and availability challenges remain significant barriers, particularly in emerging economies like India and Lithuania, where customers are reluctant to pay a premium for organic goods (Singh & Verma, 2017; Pilelienė & Tamulienė, 2021).

The literature reviewed highlights the growing importance of organic and green products in the global market, driven by health and environmental concerns. However, regional differences and price sensitivities suggest that marketing strategies need to be tailored to local contexts. There is also a need for further research on the impact of digital platforms and consumer trust in eco-certifications to promote organic food consumption more effectively.

## **3.0 Research Methodology**

The study collected data from 182 respondents to analyze consumer behavior towards organic products purchased from local stores. The data were analyzed using

SPSS, and factor analysis was adopted to assess the reliability and validity of the factors influencing organic food purchases. Frequencies of age, gender, income level, and occupation were examined to understand the profile of respondents. A chi-square test was conducted to examine the relationship between income levels and the belief that organic food is overpriced.

#### 4.0 Data Analysis

Table 1 indicates the demographic data of the respondents. A majority of respondents (70.3%) are aged 18-30, supporting research that younger consumers are more inclined to organic products due to greater health and environmental awareness. While males dominate the sample (57.7%), prior studies suggest that females are typically more conscious of organic products. With 56.6% of respondents earning below ₹2,00,000, affordability emerges as a significant limiting factor. Additionally, 47.8% of the respondents are students, further emphasizing price sensitivity and access as key influences.

**Table 1: Demographic Details of the Respondents**

<b>Age</b>			
<b>Particulars</b>	<b>Counts</b>	<b>% of Total</b>	<b>Cumulative %</b>
18 – 30	128	70.3 %	70.3 %
30 – 60	43	23.6 %	94.0 %
60 and above	3	1.6 %	95.6 %
Under 18	8	4.4 %	100.0 %
<b>Gender</b>			
Female	77	42.3 %	42.3 %
Male	105	57.7 %	100.0 %
<b>Income level</b>			
2,00,000 - 5,00,000	54	29.7 %	29.7 %
5,00,000 - 10,00,000	20	11.0 %	40.7 %
Above 10,00,000	5	2.7 %	43.4 %
Below 2,00,000	103	56.6 %	100.0 %
<b>Occupation</b>			
Employed	57	31.3 %	31.3 %
Other	6	3.3 %	34.6 %
Retired	4	2.2 %	36.8 %
Self- employed	19	10.4 %	47.3 %
Student	87	47.8 %	95.1 %
Unemployed	9	4.9 %	100.0 %
<b>Purchase frequency of organic food products</b>			
Always	45	24.7 %	24.7 %
Often	68	37.4 %	62.1 %
Rarely	13	7.1 %	69.2 %
Sometimes	56	30.8 %	100.0 %

Source: Field Survey

### 4.1 Hypothesis testing

Researcher tested the association between categorical variables (e.g., income level and the belief that organic food is overpriced) to check if the price remains a barrier

**Table 2: Contingency Table**

<b>Do you believe that organic products are overpriced?</b>				
<b>Income level</b>	<b>No</b>	<b>Not sure</b>	<b>Yes</b>	<b>Total</b>
2,00,000 - 5,00,000	13	12	29	54
5,00,000 - 10,00,000	5	2	13	20
Above 10,00,000	2	2	1	5
Below 2,00,000	19	14	70	103
<b>Total</b>	<b>39</b>	<b>30</b>	<b>113</b>	<b>182</b>

*Source: Field Survey*

**Table 3: Chi-Square Results**

$\chi^2$ Tests			
	<b>Value</b>	<b>df</b>	<b>P</b>
$\chi^2$	7.95	6	0.242
N	182		

*Source: Field Survey*

Statements for testing the hypothesis

- *Null Hypothesis (H<sub>0</sub>):* There is no significant association between income level and the belief that organic food products are overpriced.
- *Alternate Hypothesis (H<sub>1</sub>):* There is a significant association between income level and the belief that organic food products are overpriced.

The chi-square test was conducted to examine the association between income level and the belief that organic food is overpriced and results were obtained as indicated in Table 2 and Table 3. With a  $\chi^2$  value of 7.95 (from table 3), 6 degrees of freedom, and a p-value of 0.242, the result indicates no statistically significant association between income level and the perception of organic food being overpriced. Since the p-value > 0.05, we fail to reject the null hypothesis, meaning that the belief about organic products being overpriced does not significantly differ across income groups.

### 4.2 Factor analysis

Table 4 presents the results of the factor analysis, demonstrating that the data is suitable for analysis. This is supported by a KMO measure of 0.679 and a significant Bartlett's Test of Sphericity (p < 0.001), indicating that the sample size is sufficient for factor extraction.

**Table 4: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.679
Bartlett's Test of Sphericity	Approx. Chi-Square	264.336
	df	36
	Sig.	.000

Source: Obtained from SPSS using data from field survey

**Table 5: Communalities**

	Initial	Extraction
I believe that organic food is healthier than conventional food	1.000	.324
I buy organic food because I am concerned about the harmful effects of pesticides.	1.000	.551
The nutritional quality of organic food motivates me to purchase it.	1.000	.727
I buy organic food to support environmentally friendly farming practices.	1.000	.659
Organic farming methods are better for the environment, which influences my buying decisions.	1.000	.701
Reducing my carbon footprint motivates me to choose organic products	1.000	.469
Organic food tastes better than conventional food.	1.000	.640
I prefer the natural taste of organic food products	1.000	.725
The quality of organic products motivates me to buy them.	1.000	.540

Source: Obtained from SPSS using data from field survey

Table 5 give the communality scores indicating varying levels of importance for the items, with the nutritional quality and environmental practices showing relatively higher extraction values, emphasizing their significance in consumer motivation towards organic food products.

**Table 6: Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.550	28.338	28.338	2.550	28.338	28.338	2.002	22.240	22.240
2	1.731	19.237	47.576	1.731	19.237	47.576	1.891	21.008	43.248
3	1.056	11.730	59.305	1.056	11.730	59.305	1.445	16.057	59.305
4	.853	9.480	68.785						
5	.756	8.396	77.181						
6	.641	7.121	84.303						
7	.560	6.218	90.521						
8	.489	5.430	95.951						
9	.364	4.049	100.000						

Source: Obtained from SPSS using data from field survey

The Total Variance Explained results in table 6 from provides insights into the dimensionality of the data regarding consumer behavior towards organic food products. Three components were identified, with the first component accounting for 28.34% of the total variance and the second for 19.24%, cumulatively explaining 47.58% indicating substantial portion of the variability in consumer motivations.

The third component contributes an additional 11.73%, bringing the total explained variance to 59.31%. This suggests that the three components together account for nearly 60% of the variance in the responses, which is a satisfactory level for understanding underlying factors in consumer behavior.

**Table 7: Rotated Component Matrix<sup>a</sup>**

	<b>Component</b>		
	<b>1</b>	<b>2</b>	<b>3</b>
I believe that organic food is healthier than conventional food	.568	.005	.041
I buy organic food because I am concerned about the harmful effects of pesticides.	.738	-.031	.071
The nutritional quality of organic food motivates me to purchase it.	-.051	.850	.043
I buy organic food to support environmentally friendly farming practices.	.055	.224	.779
Organic farming methods are better for the environment, which influences my buying decisions.	.071	.809	.204
Reducing my carbon footprint motivates me to choose organic products	.192	.635	.167
Organic food tastes better than conventional food.	.777	.123	.147
I prefer the natural taste of organic food products	.021	.117	.843
The quality of organic products motivates me to buy them.	.695	.172	-.168

*Source: Obtained from SPSS using data from field survey*

Table 7 showcases the results of rotated component matrix. Three distinct components were extracted, explaining a cumulative variance of 59.3%. The first component is characterized by high loadings for items related to health perceptions and taste preferences (e.g., “Organic food tastes better than conventional food” and “I believe that organic food is healthier than conventional food”), indicating a primary concern for health and sensory attributes. The second component emphasizes environmental motivations, including concerns about pesticide effects and support for eco-friendly practices. The third component focuses on taste preferences, specifically the natural taste of organic products.

#### **4.3 To check accessibility as barrier**

Results from Table 8 indicate that consumers face significant challenges regarding the availability and variety of organic food products. Many respondents perceive a lack of ready access to organic products in their area, which affects their ability to purchase them. Additionally, the limited variety of organic products makes it difficult for consumers to find a diverse range of options. There is also a common

struggle to locate organic food in local stores, highlighting accessibility issues. Overall, these results emphasize that lack of accessibility (availability, limited variety, and difficulties) in finding organic products are major barriers to consumer purchasing behavior in the organic food market

S. No.	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Organic food is not readily available in my area.	10%	15%	26%	32%	17%
2	The limited variety of organic products makes it difficult for me to buy them.	11%	14%	26%	31%	19%
3	I often struggle to find organic food products in local stores.	10%	15%	24%	30%	21%

Source: Field survey

## 5.0 Findings

The study reveals that consumer behavior towards organic food is influenced by various factors such as health, environmental concerns, price sensitivity, and availability. Younger consumers show greater inclination toward organic products, but accessibility and affordability emerge as major barriers. While health and sensory perceptions are strong motivators, the limited availability and variety of organic products, particularly in local stores, deter purchases. Price is a concern, but income level does not significantly affect the perception that organic food is overpriced.

## 6.0 Managerial Implications

Organic food producers and retailers need to improve product availability and variety to address accessibility challenges. Tailored marketing strategies emphasizing health benefits and environmental sustainability can boost demand. Pricing strategies should also consider consumer heterogeneity, offering affordable options for price-sensitive segments. Expanding visibility in local stores and online platforms could further drive adoption

## 7.0 Conclusion

Despite growing interest in organic food, challenges like limited availability and variety, alongside price concerns, hinder wider adoption. Addressing these barriers through targeted marketing, better accessibility, and strategic pricing could foster the growth of the organic food market, particularly in developing regions

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## **Appendix**

### 9.1 Questionnaire Consumer behaviour towards organic food products (Motivating Factors)

#### 1. Age:

- Under 18
- 18-30
- 30-60
- 60 & above

#### 2. Gender:

- Male
- Female
- Non-binary
- Prefer not to say

#### 3. Income Level:

- Below ₹2,00,000
- ₹2,00,000 - ₹5,00,000
- ₹5,00,000- ₹10,00,000
- ₹10,00,000 above

#### 4. Occupation:

- Student
- Employed

- Self-employed
  - Unemployed
  - Retired
  - Other
5. How often do you purchase organic food products?
- Always
  - Often
  - Sometimes
  - Rarely
  - Never
6. Which types of organic products do you purchase most frequently?
- Fruits and Vegetables
  - Dairy Products
  - Grains and Pulses
  - Meat and Poultry
  - Packaged Snacks
  - Beverages
7. Where do you usually purchase organic food products?
- Supermarkets
  - Local farmers' markets
  - Online stores
  - Specialty organic stores
  - Directly from farms
  - Other
8. Which factor is the most important to you when choosing organic food products?
- Health benefits
  - Environmental concerns
  - Better taste
  - Avoidance of pesticides and chemicals
  - Support for local farmers
  - Ethical treatment of animals
  - Price
  - Certification labels
  - Other
9. Do you believe that organic food products are overpriced?
- Yes
  - No
  - Not sure
10. What challenges do you face when buying organic food products?
- High cost
  - Limited availability
  - Lack of variety
  - Uncertainty about authenticity
  - Limited knowledge about organic products
  - Other

11. Do you plan to increase your consumption of organic food products in the future?

- Yes
- No
- Not sure

12. What improvements would encourage you to buy more organic products?

- Lower prices
- Greater availability
- More variety
- Better labelling and certification information
- Increased awareness and education on benefits
- Improved quality and freshness
- Other

What motivates you to buy organic food products? (Rate the following factors on a scale of 1 to 5, where 1 = Not important, 2= Important, 3= Moderate, 4= less Important, 5 = Very important).

	1	2	3	4	5
<b>HEALTH</b>					
I believe that organic food is healthier than conventional food.					
I buy organic food because I am concerned about the harmful effects of pesticides.					
The nutritional quality of organic food motivates me to purchase it.					
<b>ENVIRONMENTAL CONCERNS</b>					
I buy organic food to support environmentally friendly farming practices.					
Organic farming methods are better for the environment, which influences my buying decisions.					
Reducing my carbon footprint motivates me to choose organic products					
<b>Taste and Quality</b>					
Organic food tastes better than conventional food.					
I prefer the natural taste of organic food products					
The quality of organic products motivates me to buy them.					

9.2 Questionnaire: Understanding Consumer Behavior Towards Organic Food Products (Limiting Factor)

1. Age:

- Under 18
- 18-30
- 30-60
- 60 & above

2. Gender:
  - Male
  - Female
  - Non-binary
  - Prefer not to say
3. Income Level:
  - Below ₹2,00,000
  - ₹2,00,000 - ₹5,00,000
  - ₹5,00,000- ₹10,00,000
  - ₹10,00,000 above
4. How familiar are you with organic food products?
  - Very familiar
  - Somewhat familiar
  - Not very familiar
  - Not at all familiar
5. Where do you typically get information about organic food products?
  - Social media
  - Friends/Family
  - Newspapers/Magazines
  - TV/Radio
  - Stores/Supermarkets
  - Other
6. Do you believe organic food is healthier than non-organic food?
  - Yes
  - No
  - Not sure
7. How often do you purchase organic food products?
  - Always
  - Frequently
  - Occasionally
  - Rarely
  - Never
8. What are the main reasons you do not purchase organic food products regularly?
  - High cost
  - Limited availability
  - Lack of trust in labels/certifications
  - Lack of information
  - Preference for conventional food
  - Taste difference
  - Other

To what extent do you agree with the following statements? (1 - Strongly Disagree, 2-Disagree, 3-Moderate, 4- Agree, 5 - Strongly Agree)

	1	2	3	4	5
<b>Price</b>					
I find organic food to be too expensive compared to conventional products.					
The high cost of organic products limits my ability to purchase them					
I would buy more organic food if it were more affordable					
<b>Availability</b>					
Organic food is not readily available in my area.					
The limited variety of organic products makes it difficult for me to buy them.					
I often struggle to find organic food products in local stores.					
<b>PERCEIVED EFFECTIVENESS</b>					
I am unaware about the actual benefits of organic food					
I am not convinced that organic food is significantly better than conventional food.					
The lack of scientific consensus on the benefits of organic food makes me hesitant to buy it.					
<b>CONVENIENCE</b>					
I find it inconvenient to shop for organic food products.					
The time and effort required to buy organic food discourage me from purchasing it.					
I prefer the convenience of buying conventional food over organic products.					
<b>LACK OF AWARENESS</b>					
I am not well-informed about the benefits of organic food.					
I don't know enough about where to buy organic food.					
The lack of information about organic products makes me less likely to purchase them.					

## CHAPTER 4

### Renewable Realities Tackling Climate Action Amidst Greenwashing Challenges

*Aryaa Gargatti\**

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#### ABSTRACT

Integrating recycling, cutting emissions, and using renewable energy sources are essential elements of a comprehensive approach to combating climate change. The globe is confronted with dire circumstances such as rising temperatures, extreme weather, and ecological disturbances that jeopardize public health, social stability, and economic growth. The most disadvantaged populations will be disproportionately affected by these impacts as they worsen without concerted global efforts. Greenwashing—the practice of falsely claiming environmental responsibility—hinders sincere efforts by misleading stakeholders and diverting resources from practical solutions, even as awareness of climate challenges grows. This paper explores how greenwashing misrepresents climate initiatives and underscores the urgency of implementing sincere, practical solutions. It emphasizes the potential of renewable energy sources, such as solar, wind, and hydropower, to drastically lower greenhouse gas emissions and reduce reliance on fossil fuels. A more comprehensive and effective strategy for climate action can be achieved by combining these renewable energy options with robust recycling systems and sustainable practices. The study aims to shed light on the negative effects of greenwashing, the repercussions of inaction, and the necessity of regulation and transparency in promoting true sustainability.

**Keywords:** Climate change; Greenwashing; Climate action strategy.

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#### 1.0 Introduction

We are currently facing an unprecedented climate crisis characterized by alarming increases in global temperatures extreme weather events and widespread ecological degradation these unsettling developments not only threaten our natural ecosystems but also pose severe risks to public health economic stability and social cohesion across the globe the ramifications are particularly dire for the most vulnerable populations who often lack the resources and infrastructure to adapt to the rapid changes taking place as climate-related challenges intensify the urgency to address these pressing issues has never been more pronounced experts across various fields are emphasizing the critical need for immediate and substantial action to avert

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catastrophic outcomes at the heart of effective climate intervention are three interrelated strategies significantly reducing greenhouse gas emissions enhancing recycling practices and wholeheartedly embracing renewable energy sources technologies such as solar wind and hydropower present promising alternatives to traditional fossil fuels offering viable pathways to markedly lower emissions and foster a sustainable environmentally friendly global economy by decreasing our reliance on non-renewable energy sources these technologies not only help mitigate climate change but also ensure long-term energy security and resilience recycling plays a vital role in this broader approach serving as a crucial mechanism to diminish waste and conserve precious resources.

The implementation of efficient recycling systems can substantially reduce the environmental footprint of both industries and consumers alike ensuring that materials such as plastics and metals are reused rather than relegated to landfills where they contribute to pollution and further ecosystem degradation by focusing on waste reduction and increasing recycling rates we can alleviate some of the immense pressures on our planets resources and move towards a more sustainable future however alongside the growing awareness of climate issues there has been a troubling rise in greenwashing this term describes the deceptive practices employed by companies and organizations to create a false impression of environmental responsibility often motivated by profit or the desire to enhance public perception greenwashing creates a misleading narrative that obstructs real progress in addressing climate challenges by overstating or fabricating claims of sustainability companies divert attention from their actual environmental impacts ultimately undermining the legitimacy of genuine efforts to combat climate change as we strive for authenticity in our sustainability initiatives it is imperative to expose and challenge these deceptive practices paving the way for transparent and effective solutions that genuinely contribute to the health of our planet.

## **2.0 What is Greenwashing and How it Affects us**

Greenwashing refers to a spectrum of deceptive practices aimed at creating a facade of environmental responsibility among consumers and stakeholders. Corporations and organizations often employ marketing strategies that highlight minor or superficial eco-friendly changes while downplaying or concealing more significant environmental issues associated with their operations. This manipulation can lead to a misinformed public, undermining genuine sustainability efforts.

Greenwashing encompasses a range of misleading practices designed to project an image of environmental responsibility to consumers and stakeholders companies frequently utilize marketing tactics that showcase trivial or superficial eco-friendly modifications all while minimizing or obscuring more serious environmental challenges linked to their operations this strategy can mislead the public thereby undermining authentic sustainability initiatives one notable illustration

of greenwashing is the promotion of paper straws as a sustainable substitute for plastic ones at first glance this transition seems beneficial to the environment however the truth is more nuanced producing paper straws often entails deforestation which disrupts ecosystems and biodiversity while also releasing stored carbon into the atmosphere this carbon release exacerbates the greenhouse effect negating the perceived advantages of using a biodegradable product.

Additionally, many paper straws are coated with thin layers of plastic to enhance their strength complicating their recyclability and increasing their overall environmental impact another prominent example of greenwashing can be seen in tetra pack containers frequently marketed as eco-friendly packaging solutions in reality these containers include non-recyclable elements such as plastic coatings and aluminum linings.

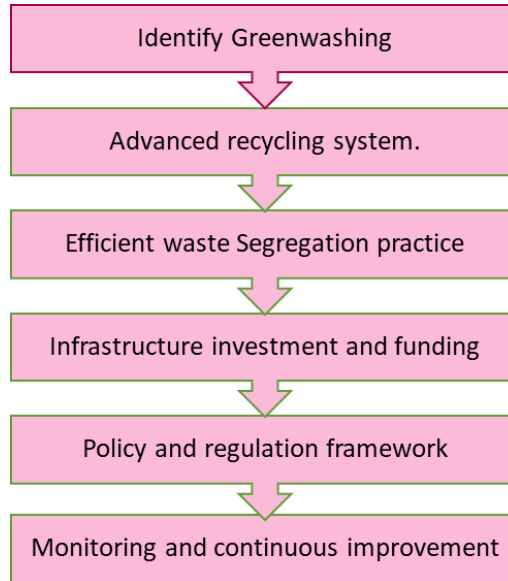
Their production process is energy-intensive and many consumers remain unaware that a significant portion of tetra pack waste cannot be effectively recycled ultimately contributing to landfill growth the gap between marketing promises and actual environmental consequences can mislead consumers into believing they are making responsible choices thus perpetuating harmful practices the ramifications of greenwashing extend beyond mere consumer deception they seriously undermine public trust in genuine sustainability efforts when consumers are consistently misled they may grow skeptical of all green claims leading to decreased support for truly eco-friendly products and initiatives this erosion of trust poses a significant challenge for organizations dedicated to real environmental change as they must compete not only with traditional products but also with the misleading narratives created by greenwashing.

Furthermore the prevalence of greenwashing stifles innovation when companies prioritize marketing ploys over meaningful environmental action they divert resources away from developing viable solutions rather than investing in research and development for sustainable materials and practices businesses may take the easier path of superficial claims ultimately delaying progress toward substantial change addressing the issue of greenwashing requires stronger regulatory frameworks transparent marketing strategies and a collective commitment to authentic environmental stewardship across all sectors only through heightened awareness and accountability can we hope to combat the misleading narratives that obstruct our quest for a more sustainable future.

### **3.0 Methodology**

To effectively mitigate the detrimental impacts of greenwashing and foster a more sustainable future, a multifaceted methodology is imperative. This approach must prioritize the integration of advanced recycling systems alongside comprehensive waste segregation practices.





### 3.1 Advanced recycling systems

Implementing cutting-edge recycling technologies is a foundational aspect of this strategy. Traditional recycling methods often fall short in efficiently processing diverse materials, leading to significant amounts of waste ending up in landfills. Advanced recycling systems, such as chemical recycling and anaerobic digestion, offer promising alternatives.

- *Chemical Recycling*: This process breaks down plastics into their fundamental monomers, allowing for the creation of new, high-quality materials. Unlike conventional recycling, which can degrade plastic quality over time, chemical recycling facilitates a circular economy by enabling the continuous reuse of materials without loss of performance.
- *Anaerobic Digestion*: This technology converts organic waste into biogas and digestate, reducing landfill waste and generating renewable energy. Biogas can be harnessed for electricity and heat, providing a dual benefit of waste reduction and energy production.

### 3.2 Efficient waste segregation practices

Effective waste management relies heavily on precise waste segregation practices, where materials are categorized into distinct streams—such as plastics, paper, metals, and organic waste. This separation enhances recycling rates and minimizes contamination, which is crucial for the efficiency of recycling processes.

- *Segregation at Source*: Educating households and businesses on the importance of separating their waste is vital. Implementing user-friendly color-coded bins can simplify the segregation process, making it intuitive for individuals to classify their waste accurately.

- *Community Engagement:* Active participation from the community is essential for the success of waste segregation initiatives. Programs that encourage community involvement, such as local workshops, informational campaigns, and school education programs, can foster a culture of sustainability. Incentives, such as discounts on waste disposal fees for households that consistently practice effective segregation, can further motivate individuals to engage in responsible waste management.

### **3.3 Infrastructure investment and funding**

The successful execution of these systems requires substantial investment in infrastructure and resources. This includes the establishment of recycling facilities equipped with the latest technologies, as well as community centers that promote sustainable practices.

- *Public-Private Partnerships:* Collaboration between governmental bodies, private enterprises, and non-profit organizations is essential for fostering a robust waste management framework. These partnerships can pool resources, share expertise, and drive initiatives that address local waste challenges effectively.
- *Grant Programs:* Government-sponsored grants and subsidies can facilitate the development of recycling infrastructure and community education programs. By allocating funding to projects focused on improving waste management systems, governments can stimulate local economies while addressing environmental concerns.

### **3.4 Policy and regulatory framework**

Establishing comprehensive policies and regulations that promote transparent recycling practices is critical in the fight against greenwashing. This includes mandatory labeling of recyclable materials and stringent penalties for companies that engage in deceptive marketing practices.

- *Transparency in Marketing:* Regulatory frameworks should mandate clear guidelines for environmental claims made by companies. Establishing standardized definitions for terms like “biodegradable” and “recyclable” can help prevent misleading advertisements that contribute to greenwashing.
- *Accountability Measures:* Implementing systems that hold companies accountable for their environmental claims will promote integrity in sustainability efforts. Regular audits and compliance checks can ensure that organizations adhere to their stated environmental policies.

### **3.5 Monitoring and continuous improvement**

Finally, a methodology for combating greenwashing must include mechanisms for monitoring progress and ensuring continuous improvement. This involves setting clear metrics for assessing the effectiveness of recycling programs and waste segregation practices.

- *Data collection and analysis:* Regularly gathering and analyzing data on waste diversion rates, recycling efficiency, and community participation will provide insights into the effectiveness of implemented strategies. This data can inform adjustments to programs and highlight areas needing further investment or educational outreach.
- *Feedback mechanisms:* Establishing channels for community feedback can enhance program effectiveness. Encouraging residents to share their experiences and suggestions can foster a collaborative environment that continually adapts to the needs of the community.

A comprehensive approach that combines advanced recycling technologies, effective waste segregation practices, community engagement, infrastructure investment, and robust policy frameworks is essential to counteract the effects of greenwashing. By fostering a culture of transparency and accountability, we can pave the way for meaningful environmental action and a sustainable future.

#### 4.0 Findings from the Paper

The exploration of greenwashing and its implications for climate action has yielded several critical insights, emphasizing the necessity for integrative strategies to enhance sustainability efforts.

##### 4.1 The prevalence of greenwashing

Greenwashing remains a pervasive issue across multiple sectors, notably in consumer goods, fashion, and food packaging. Our analysis revealed that many companies engage in superficial environmental claims, undermining genuine efforts toward sustainability. For instance, major brands have marketed products as “eco-friendly” without disclosing the substantial environmental costs associated with their production processes.

Company Name	Misleading Claim	Actual Environmental Impact
Coca-Cola	“100% recyclable packaging”	Significant plastic waste; many containers are not recycled.
Starbucks	“Paper straws”	Deforestation and increased carbon emissions from production.
H&M	“Conscious Collection”	Use of unsustainable materials and poor labor practices.
Nestlé	“Eco-friendly bottled water”	Water extraction depletes local resources and impacts ecosystems.
Unilever	“Sustainable sourcing”	Misleading claims about sourcing; actual practices often harm local communities.
Tetra Pak	“Recyclable packaging”	Non-recyclable plastic coatings and energy-intensive production.
Volkswagen	“Clean Diesel”	Deceptive emissions standards; vehicles exceed pollution limits.

#### **4.2 Environmental impact of misleading claims**

The investigation highlighted that the purported benefits of alternative products, such as paper straws, often mask significant environmental detriments. The production of these straws contributes to deforestation and biodiversity loss, leading to an increase in greenhouse gas emissions. This disconnect underscores the urgent need for rigorous environmental assessments that extend beyond marketing narratives.

#### **4.3 Recycling system inefficiencies**

Current recycling systems frequently exhibit inefficiencies, primarily due to inadequate waste segregation practices. Data indicate that mixed waste streams lead to high contamination rates, diminishing the recyclability of materials. The findings suggest that the implementation of advanced recycling technologies, such as chemical recycling and anaerobic digestion, could substantially enhance recycling efficacy and material recovery rates.

#### **4.4 Role of renewable energy**

The integration of renewable energy sources into recycling operations and industrial processes emerged as a crucial finding. Utilizing solar, wind, and hydropower not only reduces the carbon footprint associated with traditional energy sources but also promotes a circular economy. Companies that invest in renewable energy demonstrate a dual commitment to sustainability—reducing emissions while simultaneously powering environmentally responsible practices.

#### **4.5 Community engagement and education**

The study underscored the importance of community engagement in successful recycling and sustainability initiatives. Programs that educate the public about proper waste segregation and the impacts of greenwashing are vital. The analysis revealed that communities with active involvement in sustainability efforts reported higher rates of recycling and waste diversion, emphasizing the role of collective action in addressing environmental challenges.

#### **4.6 Case studies of successful initiatives**

Several case studies were examined to illustrate effective strategies against greenwashing. For example, the transition of a major food packaging company to a fully recyclable product line demonstrated the potential for success when transparency and genuine commitment to sustainability are prioritized. The implementation of a retrack strategy, where companies trace and disclose their supply chain impacts, has proven effective in rebuilding consumer trust and ensuring accountability.

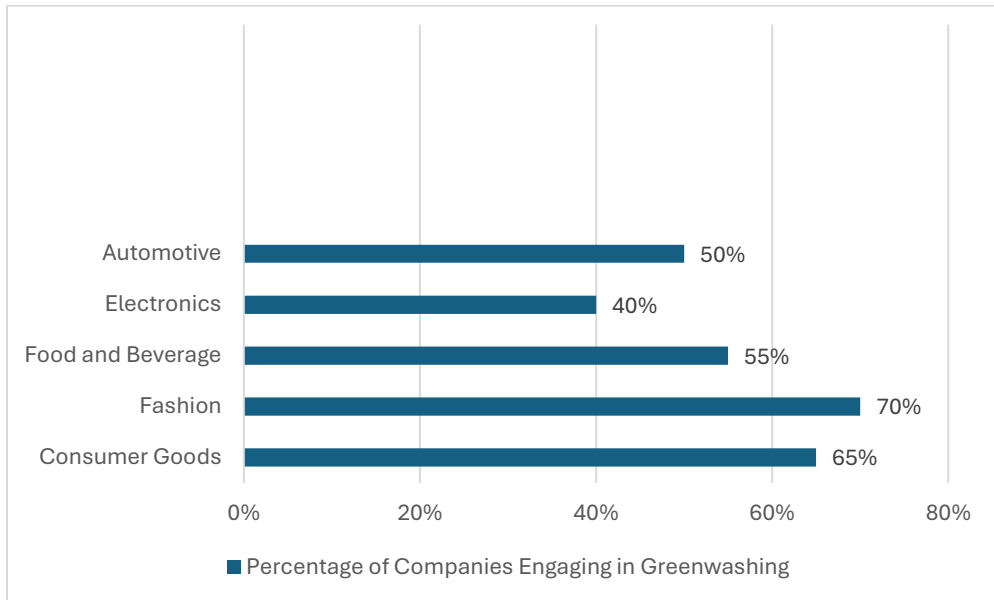
#### **4.7 Regulatory frameworks and standards**

The findings suggest that robust regulatory frameworks are essential for curbing greenwashing practices. Establishing standardized definitions for terms like “biodegradable” and “recyclable” can mitigate consumer confusion and enhance the integrity of environmental claims. Regular audits and compliance checks were identified as mechanisms to ensure companies adhere to sustainable practices, reinforcing accountability within the industry.

### **5.0 Results**

The analysis of greenwashing practices and their impact on climate action has led to several pivotal findings:

- *Prevalence of Greenwashing:* A significant number of companies across diverse sectors, particularly consumer goods and fashion, have been found to employ misleading marketing strategies. Many of these businesses present superficial environmental claims, which detracts from genuine sustainability efforts.
- *Environmental Degradation:* The promotion of eco-friendly alternatives, such as paper straws, often obscures severe environmental repercussions. The production process for these products can lead to deforestation and increased carbon emissions, undermining their supposed benefits.
- *Inefficient Recycling Systems:* The study identified substantial inefficiencies within existing recycling systems, largely attributed to inadequate waste segregation practices. High contamination rates within recycling streams result in increased landfill contributions and resource wastage.
- *Renewable Energy Potential:* The integration of renewable energy technologies—such as solar and wind—into operational frameworks is demonstrated to significantly lower carbon emissions. These technologies provide viable solutions for reducing reliance on fossil fuels.
- *Community Engagement Importance:* Active participation from local communities in sustainability initiatives has been shown to correlate with improved recycling rates and overall environmental outcomes. Educational outreach and local involvement are crucial for fostering a sustainable culture.
- *Successful Case Studies:* Examples from organizations that have successfully transitioned to transparent and authentic sustainability practices provide valuable insights. These case studies highlight the potential benefits of moving away from greenwashing, illustrating practical pathways for other companies.
- *Need for Regulatory Action:* The findings emphasize an urgent need for robust regulatory measures to ensure accountability and transparency in environmental claims. Strong regulations are essential for counteracting the misleading tactics associated with greenwashing.

**Figure 1: Percentage of Companies Engaging in Greenwashing**

### 5.1 Implications

The implications of these findings are far-reaching and demand immediate action on multiple fronts.

### 5.2 Policy development

There is a critical and urgent need for policymakers to establish robust, comprehensive regulations that clearly define, monitor, and enforce environmental claims made by companies. Current regulatory frameworks are often insufficient or too lenient, allowing corporations to exploit loopholes and make misleading green claims without consequence. Stronger legislation would help eliminate ambiguities around what constitutes a sustainable or eco-friendly product, ensuring that companies are held accountable for their environmental practices. Regulatory agencies could develop standardized criteria for sustainability certifications and mandate third-party audits to ensure compliance. In addition to fostering a fair and transparent marketplace, these regulations would help prevent companies from gaining competitive advantage through deceptive marketing, thus leveling the playing field for genuinely sustainable businesses. Beyond penalizing non-compliance, these policies should incentivize innovation and investment in sustainable technologies, further promoting an economy that prioritizes environmental integrity. Governments have a unique role in shaping consumer behavior and corporate responsibility through such policy interventions, which are essential to creating systemic change.

### **5.3 Business responsibility**

Companies bear a significant responsibility in tackling the issue of greenwashing and must make a conscious shift towards prioritizing genuine sustainability practices over superficial marketing tactics. For businesses, embracing authentic environmental stewardship is not only about meeting regulatory requirements; it is a matter of long-term viability and competitiveness in an increasingly environmentally-conscious marketplace. Companies that invest in true sustainability—by reducing carbon emissions, improving waste management, sourcing renewable materials, and creating circular supply chains—will build stronger consumer trust and brand loyalty.

These businesses will likely see greater market growth as consumers become more discerning and favor products that align with their environmental values. Furthermore, embedding sustainability into corporate strategies has the potential to reduce operational costs in the long run through resource efficiency and the minimization of waste. Companies must go beyond corporate social responsibility (CSR) reports and adopt a holistic approach, integrating sustainability into every aspect of their operations, from product development to supply chain management. Transparency is key here—businesses should actively communicate their sustainability goals, the challenges they face, and the steps they are taking to improve, thus building credibility in the eyes of consumers and stakeholders alike.

### **5.4 Consumer awareness**

Educating consumers about the realities of greenwashing and the importance of verifying environmental claims is vital for shifting market dynamics toward more sustainable practices. An informed and conscious consumer base has the power to drive demand for truly eco-friendly products, thereby encouraging businesses to adopt more responsible behaviors.

However, the current market is flooded with misleading green claims, making it difficult for the average consumer to discern the legitimacy of a company's environmental efforts. Consumers must be equipped with the knowledge and tools to critically evaluate environmental claims—this could be achieved through public awareness campaigns, educational programs, and the development of easily accessible resources such as apps or websites that track and verify the sustainability of various brands and products.

By fostering a culture of skepticism towards superficial green claims, consumers can apply pressure on companies to provide verifiable proof of their environmental initiatives. Moreover, consumers should be encouraged to shift their purchasing behaviors towards sustainable products, even if they come with a premium price tag. In doing so, they support businesses that genuinely invest in environmentally sound practices, further incentivizing the market toward sustainability.

## **5.5 Collaboration for sustainability**

Combatting greenwashing and promoting sustainability cannot be the responsibility of any one group—it requires a collaborative approach that involves governments, corporations, communities, and even international organizations. Joint efforts are essential for addressing the multifaceted nature of climate change and environmental degradation. Governments should work closely with businesses to develop policies that foster innovation in sustainability and create incentives for companies that are truly committed to reducing their environmental impact.

This collaboration could include public-private partnerships for developing new recycling technologies, improving waste management systems, and promoting renewable energy. Meanwhile, civil society and local communities can play a key role by advocating for better environmental practices and holding businesses accountable for their green claims. Grassroots movements, community-driven recycling programs, and local sustainability initiatives can complement governmental efforts by raising awareness and encouraging responsible consumption at a local level. Furthermore, international cooperation is crucial, as environmental issues transcend national borders. Countries need to collaborate on a global scale to share knowledge, resources, and technologies to tackle issues such as climate change, deforestation, and pollution. Multinational corporations must also adopt global sustainability standards and ensure that their practices are consistent across all markets, not just in regions with strict regulations.

## **5.6 The path to a sustainable future**

By addressing the challenges posed by greenwashing and promoting transparency, stakeholders across all sectors can work toward a future where sustainability is deeply integrated into the fabric of society. This involves not only holding companies accountable for misleading environmental claims but also fostering a culture of authenticity and responsibility in the marketplace. For real progress to be made in the fight against climate change, it is essential to create systems where sustainability is not an option or a marketing strategy, but a fundamental operational principle. Businesses that embrace sustainability will not only protect the planet but also position themselves as leaders in the inevitable transition to a greener economy.

Meanwhile, consumers, when equipped with the right knowledge and tools, can make more informed decisions that align with their environmental values, driving demand for responsible products and practices. Finally, governments must take an active role in regulating and incentivizing sustainability, ensuring that all sectors contribute to meaningful progress. Through this comprehensive and collaborative approach, we can create a world where environmental stewardship is prioritized, greenwashing is minimized, and genuine sustainability initiatives flourish, ultimately leading to significant strides in the global effort to combat climate change.



## 6.0 Conclusion

This research illuminates the formidable challenges presented by greenwashing in the context of global climate action. As organizations increasingly project an image of environmental responsibility, the prevalence of misleading claims complicates the narrative of genuine sustainability. While many companies promote alternatives purported to be eco-friendly, a deeper analysis often reveals substantial environmental repercussions that are obscured in marketing communications. For example, while paper straws are marketed as sustainable, their production frequently involves deforestation and increased carbon emissions—impacts that are rarely highlighted. The ramifications of greenwashing extend far beyond consumer behavior, threatening the integrity of authentic environmental initiatives.

When consumers encounter misleading claims, their trust in legitimate sustainability efforts can wane. This erosion of confidence creates a vicious cycle: as public skepticism grows, individuals may dismiss all environmental claims, thereby reducing support for truly sustainable products. To counteract this trend, it is essential to empower consumers with knowledge, enabling them to differentiate between genuine and deceptive claims. Informed consumers can advocate for authentic products, compelling businesses to adopt more responsible practices.

Establishing robust regulatory frameworks is critical to combat greenwashing effectively. Clear and stringent guidelines regarding environmental claims, along with penalties for deceptive marketing practices, can foster a marketplace that values transparency. Regulatory bodies should enforce accountability measures that require organizations to substantiate their environmental assertions, thereby enhancing public trust in sustainability initiatives and catalyzing meaningful progress.

Moreover, the integration of advanced recycling technologies and effective waste management practices is vital for addressing these issues. Traditional recycling systems often fall short due to contamination, leading to excessive waste accumulation in landfills. Innovative solutions, such as chemical recycling and anaerobic digestion, present promising avenues for improving waste management. These technologies break down materials into their fundamental components, supporting a circular economy where resources are continually reused rather than disposed of. Furthermore, engaging communities in waste segregation initiatives can significantly boost recycling rates and foster a culture of sustainability.

Collaboration among government entities, private sector organizations, and communities is essential for driving effective climate action. Partnerships that leverage collective resources and expertise can result in impactful waste management systems and sustainable practices. Sharing success stories and best practices enables organizations to learn from each other, accelerating the transition toward genuine sustainability. The urgency of addressing the phenomenon of greenwashing cannot be overstated; it remains a significant barrier to meaningful climate action. This study emphasizes the critical need for a paradigm shift in how sustainability is perceived

and practiced at both organizational and societal levels. As the severity of climate-related challenges escalates, the ability to distinguish between genuine environmental efforts and greenwashing will be pivotal in shaping public perception and action.

In conclusion, the fight against climate change necessitates a steadfast commitment to authenticity in sustainability efforts. By tackling the challenges posed by greenwashing through comprehensive regulatory measures, consumer education, and advanced recycling initiatives, stakeholders can cultivate a transparent and accountable environment. This collaborative approach will pave the way for a sustainable future, where environmental responsibility is not just a marketing tactic but a fundamental principle guiding actions across all sectors of society.

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## CHAPTER 5

### A Study on Investment Inclination of Young Investors in the City of Belagavi

*Suraj Puri\**, *Yusuf Killedar\*\**, *Sanjeevini Gurjar\*\*\**

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#### ABSTRACT

Financial literacy refers to the abilities & information that allow a person to comprehend the financial concepts that they need to know in order to make wise financial decisions. The majority of people lack financial literacy, which stops them from taking advantage of the higher returns these products offer. To encourage individuals to invest in these financial products, it's essential to provide them with a well-designed financial education program that informs them about the associated risks and returns. There are many different investment options on the market, including bonds, bank & post office deposits, mutual funds, equity shares, physical gold, Bonds, Forex markets, life insurance plans, & commodities markets. The main aim of the study is to determine the preferences of the younger investors. Individuals in the same age range may have different attitudes on investing. The town of Belagavi is being considered in the study. Simplified questionnaires are used to gather primary data. The study's anticipated conclusion is that younger investors have a stronger preference for investing in equity markets, mutual funds, & other similar outlets.

**Keywords:** Youth; Financial literacy; Financial products; Preference of investment; Financial awareness.

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#### 1.0 Introduction

The increasing complexity of financial markets and the expanding range of financial products and services available have made decision-making more challenging for individuals in India. The younger generation exhibits diverse patterns in how they earn and spend money, and changes in workplace culture have led to irregular but potentially significant income streams. Investing involves acquiring valuable assets or financial instruments with the expectation of future profits.

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As the healthcare sector improves and life expectancy increases, it has become more essential to plan for retirement healthcare and secure insurance against unforeseen future events. Beyond the secure, traditional financial products already available, it is crucial for the growth of financial markets that consumers invest in innovative and creative financial products, which have the potential to yield higher returns. In order to provide financial products that meet the demands of their clients, financial service providers view it as equally important to comprehend clients' investing preferences & awareness levels. To design an effective financial education program, one must comprehend people's investment behaviour toward financial items as well as their current awareness level. Understanding the investment choices of India's younger generation is the main goal of this article. It specifically aims to determine whether this generation is more inclined to continue with typical investing channels like mutual funds & equity markets, or if they are drawn toward traditional routes like real estate, gold, & post office deposits.

## **2.0 Available Investment Options**

### **2.1 Bank Fixed Deposits (FDs)**

FDs are a sort of investment where a person deposits a lump sum amount with a bank for a predetermined amount of time. Interest is paid on deposits made into the FD at a predetermined rate that is decided upon when the account is opened. Depending on their preferences, FD holders can opt to receive their interest either monthly, quarterly, half-yearly, or annually.

### **2.2 Commodity market**

The commodity market is where various commodities & derivatives products are traded. Commodities include metals (like gold & silver), energy (like oil & natural gas), & agricultural products (like wheat & coffee). The prices of commodities are influenced by supply & demand factors.

### **2.3 Equity shares**

For any business, equity shares are a longterm source of fund. These are non-redeemable shares that are distributed to the general public. These shares give its owners the ability to vote, split profits, & claim corporate assets. Equity share values can be expressed in a number of ways, such as par value, face value & book value,

### **2.4 Mutual funds**

Mutual funds collect money from various investors to invest in a diversified mix of stocks, bonds, or other securities, and are overseen by professional fund managers. These funds provide diversification and generally involve less risk compared to investing directly in individual stocks

## **2.5 Bonds**

Bonds are fixed-income instruments that represent a loan made by an investor to a borrower (typically corporate or governmental). Bonds pay periodic interest & return the principal amount on maturity. Bonds are normally safer than stocks but usually offer lower returns.

## **2.6 Life insurance schemes**

Life insurance plans provide financial support to the beneficiaries if the policyholder passes away. Some life insurance policies, like whole life or endowment plans, also have a savings component that grows in value over time.

## **2.7 Gold**

Gold is a precious metal & a traditional form of investment. It is considered a safe-haven asset, especially during economic downturns. Gold can be invested in physical form (jewellery, bars, coins) or through financial products like Gold ETFs (Exchange-Traded Funds).

## **2.8 Post office savings**

Post office savings schemes in India are government-backed, low-risk investment options. They offer several products such as savings accounts, recurring deposits, time deposits, & the National Savings Certificate (NSC), all providing moderate returns with high safety.

## **2.9 Forex market**

The forex (foreign exchange) market is where currencies are traded. It is the largest & most volatile financial market in the world. Forex trading is buying one currency & selling another, with the aim of profiting from exchange rate fluctuations.

## **2.10 Public Provident Fund (PPF)**

The Public Provident Fund is a long-term savings plan provided by the Indian government. It features competitive interest rates, tax advantages, and a 15-year maturity period. This makes it a favoured low-risk investment choice for achieving long-term financial objectives.

## **3.0 Literature Review**

Deepak (2015) in his article an attempt has been made to examine several aspects of investors' financial literacy in his study. The literature on financial knowledge has been examined by dividing the existing research on a number of criteria, including significance, meaning, determinants, demographics, impact of financial education, measurement, regions covered, & inclusion of investor protection in the study. Understanding fundamental financial & economic principles

& being able to put in them, together with other financial abilities, to manage financial resources wisely for a lifetime of financial comfort is what is meant by financial literacy. Financial literacy is believed to include number of aspects that are either under- or unexplored, making it a potential field for future research.

Agarwalla *et al.* (2013) in his article “Young people who work in urban India & their financial literacy.” The study examined how different sociodemographic characteristics affected different aspects of financial literacy among young, working adults in urban India. The findings are reported in this publication. While a number of characteristics, including gender, income, & education, have been proven to have an influence on financial literacy in other contexts, certain factors unique to India, such joint families & collaborative decision-making processes, have been established to have a substantial impact. The relationship among the various financial literacy factors is also examined in his study.

The study offers an analytical foundation for formulating policies for improving the financial literacy of young in India, contributing to the expanding empirical understanding of financial literacy across nations. Shaik *et al.* (2022) discovered that the IT sector is essential to India’s GDP output. It is essential to save & invest if India is to accelerate its economic progress & reach new heights. The goal of this study is to comprehend how IT professionals save & invest their money. Investment planning encompasses various aspects, including the factors that shape investment preferences and the attitudes of IT professionals toward investing. IT professionals often seek to invest their savings in the safest and most liquid options available.

However, individual preferences vary according to risk tolerance, and investment goals can range from generating additional income to ensuring financial security and more. This study aims to identify the factors driving increased investment activity among young professionals. Through a systematic survey, researchers have explored the investment behaviours of IT professionals and analysed the behavioural factors that impact their investment decisions. Baluja (2016) discovered that the market’s overall scope is expanding as a outcome of the introduction of various financial & economic reforms.

A numerous new financial products are hitting the market, which means people need to be careful with how they plan & invest their money. To put it another way, financial planning is becoming crucial to a person’s financial security. Despite the general acknowledgment of the value of financial planning, financial literacy remains insufficient, particularly among women. There is also a significant lack of information about the financial literacy levels of Indian women. Thus, understanding the issue of financial literacy among women in India is crucial. This paper addresses that need by highlighting that while it is essential for women to have equal financial decision-making authority as men, many Indian women face various financial, psychological, cultural, and physical barriers that hinder their ability to gain the necessary financial literacy.

Lokhande (2015) The study reveals a substantial change in the financial markets. With a growing number of savings and investment firms, a wide range of products, varying investment terms and conditions, and numerous complex laws and regulations, the process of investing has become highly challenging. Many investors, particularly in rural areas, are found to be unaware of investment opportunities as well as relevant laws and regulations. India's savings mobilization pace is lower despite the country's economy growing at an impressive rate & its population becoming more affluent. Savings in rural areas are not appropriately mobilized or invested. Investment is a type of economic activity that produces capital needed by different economic sectors. Therefore, everyone who makes a living should be encouraged to invest & save money.

Singh & Sharma (2016), in his paper, he found that, emerged highly relevant includes the impact of awareness for financial investment instruments based on level of knowledge, level of interest, level of commitment which plays a very important role for making an investment decision for a particular financial instrument. understanding of financial instruments as per financial goal of each investor. Originality/Value – The study is descriptive in nature to analyse the impact of financial literacy & investment behaviour for pre-purchase decision-making attributes which triggers the complex buying behaviour financial investment instruments associated with financial planning process.

Rani & Siwach (2023) The study aims to understand various financial literacy concepts and dimensions through literature-based analysis. It covers a broad array of topics, including the impact of financial literacy on investment decisions and overall well-being, as well as the financial literacy levels among women, youth, workers, and college students. Secondary data was gathered from a diverse range of sources, including journals, websites, research papers, and publications. In the Indian context, there remains much work to be done regarding financial literacy. Research has shown varying levels of financial literacy across different demographic groups in India, with some studies indicating low levels and others reporting intermediate levels. The concept of financial literacy is complex and challenging to define and measure, and many studies focus on clarifying and quantifying this concept.

Bhattacharjee & Singh (2017) found that, the important determinants of equity awareness are demographic, socioeconomic & psychological factors. Financial well-being is attributable largely to financial awareness. Growth of the financial market can be credited to equity awareness. Equity awareness enables an investor to make better financial decisions, to appreciate their rights & responsibilities & to understand and manage the risk as an investor. Practical implications – Policy makers can design the equity awareness campaign considering the different demographic & socio-economic factors. While designing such a campaign, the impact & importance of equity awareness should be illustrated, considering their demographic & socio-economic profile.

Pillai *et al.* (2010). The study investigates the level of financial literacy among young people, focusing on their spending and saving behaviours. Although young people generally grasp the basic principles of financial literacy, they are often hesitant to explore beyond their comfort zones and tend to exhibit careless spending habits. Furthermore, the study finds that there is a significant rise in the use of credit cards among this age group. The current generation enjoys unrestricted access to various financial options. As a result, people are falling prey to the barrage of sales, promotions, & service offers that are flooding the market, particularly the allure of online shopping, stylish clothing, electronic devices, mobile services, & other niche goods & services.

Ansari *et al.* (2022) explores a theoretical framework for research on financial literacy at several phases of investment planning & decision-making. Reviewing 2182 publications published in peer-reviewed journals between 2001 & 2022 (January) is the study's main component. The literature on financial literacy was analysed by the study using bibliometric techniques such citation network analysis, co-citation analysis, content analysis, publication trends, & keyword analysis. By suggesting ten clusters to enhance financial literacy research for better educating the investors, the study seeks to give to the body of knowledge on the subject. From being a nascent field, financial literacy has grown to be an important teaching & research instrument. As a result, it is essential to look into & recognize current research trends in this area.

#### **4.0 Relevance of the Research**

The study is significant because it clarifies how young investors select their investment vehicles & the relationship between savings & investments. Young investors can help our government modify regulations to encourage investment in the financial market & its instruments if they make intelligent choices when choosing investment options. A significant number of compensated students from younger generations. This study will help younger investors choose which financial product to invest in so they can set realistic goals.

#### **5.0 Research Methodology**

The study employed a descriptive research design to explore the investment inclination of young investors in Belagavi city. This design is suitable for investigating the characteristics & patterns of a specific group.

##### **5.1 Data collection methods**

*Primary Data:* A survey questionnaire was administered to a sample of 100 young investors in Belagavi. The questionnaire captured demographic information (gender, age, occupation, income, etc.) & investment preferences across various financial instruments (equity shares, mutual funds, bank deposits, etc.).



*Secondary Data:* Information was collected from books, research journals, articles, & reports to provide a contextual understanding of investment trends & behaviours.

## 5.2 Sampling method

Convenience sampling is used in this study. While this method offers ease of data collection, it may limit the generalizability of the findings to the entire population of young investors in Belagavi.

## 5.3 Data analysis

*Descriptive Statistics:* Frequencies, percentages, & mean values were calculated to summarize the demographic profile of respondents & their investment preferences.

*Inferential Statistics:* One-way ANOVA was employed to check for notable changes in investment preferences based on gender, income level, & age.

## 5.4 Tools

- *Microsoft Excel:* Used for data entry, cleaning, & basic analysis.
- *XLMiner Analysis ToolPak:* Utilized for conducting ANOVA tests.

## 5.5 Objective

- To find young investor's inclination towards equity & mutual fund
- To analyse whether age affects the investment decisions.
- To analyse whether income affects the investment choice.
- To examine the most inclined investment option of the youths of Belagavi city.
- To examine the least inclined investment option of the youths of Belagavi city.

## 5.6 Hypotheses

*Hypothesis 1: H<sub>0</sub> - There is no significant change among the gender when it comes to investing in mutual fund & equity shares.*

*Hypothesis 2: H<sub>0</sub> - There is no significant change in income levels while investing in life insurance schemes & Gold.*

*Hypothesis 3: H<sub>0</sub> - There is no significant change in age while investing in Bonds & Life insurance schemes.*

## 6.0 Data Analysis and Interpretation

The information collected from the respondents is analysed & tabulated below to examine the research objectives.

### 6.1 Demographic and Social Profile

**Table 1. Respondents Demographic and Social Profile**

Variables	Categories	Number	Percentage
<b>Gender</b>	Female	49	49.00%
	Male	51	51.00%
<b>Age Group</b>	18-25	46	46.00%
	25-30	37	37.00%
	30-35	17	17.00%
	35 & above	0	0.00%
<b>Marital Status</b>	Married	39	39.00%
	Unmarried	61	61.00%
<b>Educational Qualification</b>	10	1	1.00%
	10+2	17	17.00%
	Graduate	35	35.00%
	Post Graduate	47	47.00%
	Doctorate	0	0.00%
<b>Job Occupation</b>	Business	16	16.00%
	Profession	17	17.00%
	Student	47	47.00%
	Housewife	3	3.00%
	Salaried	17	17.00%
<b>Monthly Income</b>	Less than 25000	43	43.00%
	25001 to 50000	30	30.00%
	50001 to 100000	19	19.00%
	More than 100000	8	8.00%

Source: Primary Data

### 6.2 Preference of Financial Products

**Table 2: Respondents Preference of Financial Products**

List of Financial Instruments	Mean	Standard Deviation	Rank
Bank Fixed Deposit	2.13	1.1862	8
Commodity Market	2.07	1.2082	9
Equity Shares	4.15	1.1135	1
Mutual Funds	4.12	1.1830	2
Bonds	2.39	1.2544	7
Life Insurance Schemes	3.14	1.4841	4
Gold	3.74	1.2278	3
Post Office Savings	3.06	1.3244	5
Forex Market	2.01	1.2752	10
Public Provident Fund	2.62	1.4756	6

### 6.3 Understanding the mean values

- The mean value represents the average preference rating given by the respondents for each financial product.
- A higher mean value indicates a higher preference among respondents for that particular financial instrument.

### 6.4 Interpreting the ranks

- The Financial instruments are ordered according to their average values, from the most favoured to the least favoured.
- Equity Shares (Mean = 4.15) are ranked 1st, indicating they are the most preferred financial instrument among the respondents.
- Mutual Funds (Mean = 4.12) are ranked 2nd, closely following equity shares.
- Commodity Market (Rank 9, Mean = 2.07) & Forex Market (Rank 10, Mean = 2.01): Both these markets are the least preferred, likely due to their complexity, high volatility, & the specialized awareness to invest in them successfully.
- The results reveal a clear preference among young investors in Belagavi for equity shares & mutual funds, suggesting a tendency toward higher-risk, higher-reward investment strategies.

### 6.5 Conclusion

- Traditional & low-risk options like fixed deposits, bonds, & postal savings are less attractive, which may indicate a more aggressive investment approach favoured by the younger demographic.
- The variability in the standard deviation highlights areas where opinions diverge, such as life insurance & PPF, pointing to differing attitudes or levels of knowledge about these products.

## 7.0 Analysis and Results

### 7.1 Test 1

*H<sub>0</sub> - There is no significant change among the gender when it comes to investing in mutual fund & equity shares*

**Table 3: ANOVA**

Sources of Variations	Sum of Squares	Degrees of Freedom	Mean Square	F cal value	P- value
Between Groups	0.045	1	0.0450	0.034	0.8537
Within Groups	261.310	198	1.3198		
<b>Total</b>	261.355	199			

#### 7.1.1 Interpretation

*F-calculated Value (F = 0.034):* The F-calculated value is 0.034, which is

lower than the typical critical value (usually around 3.84 for a 0.05 significance level with 1 & 198 degrees of freedom). This indicates that the variance between the groups (genders) is very small compared to the variance within the groups.

*P-value (P = 0.8537):* The p-value is 0.8537, which is exceeding the alpha level of 0.05. A high p-value indicates that there is no statistically significant change between the genders with regarding to their investment preferences in mutual funds & equity shares.

**7.1.2 Conclusion**

Since the p-value (0.8537) is greater than 0.05, we fail to reject the H0.

**Decision:** There is no significant change among the genders while investing in mutual fund & equity shares.

**7.1.3 Implications for the study**

The results suggest that gender does not play a notable role in the investment inclination of young investors in the city of Belagavi when it comes to mutual funds & equity shares. Therefore, any observed changes in investment behaviour are due to other factors rather than gender.

**7.2 Test 2**

*H0- There is no significant change in income levels while investing in life insurance schemes & Gold.*

**Table 4: ANOVA**

Sources of Variations	Sum of Squares	Degrees of Freedom	Mean Square	F cal value	P-value
Between Groups	18	1	18	9.70377	0.00211
Within Groups	367.28	198	1.8549		
Total	385.280	199			

*F-Statistic (F):* The calculated F-value is 9.7038. The F-statistic tests whether the group means are significantly different. A higher F-value indicates a greater change between group means.

*P-Value:* The p-value is 0.00211. This value indicates the probability of observing a change as extreme as, or more extreme than, the one observed, assuming the null hypothesis is true. A p-value less than the common significance level 0.05 suggests that the observed changes are statistically significant.

**7.2.1 Conclusion**

Since the p-value (0.0021) is lower than 0.05, & the F-value (9.7038) is higher than typical critical values, we reject H0. This means there is sufficient

evidence to say that there is a notable change in level of income among those who prefer to prefer in life insurance schemes & those who prefer gold.

### 7.3 Test 3

*Hypothesis 3: H0- There is no significant Change in age while investing in Bonds & Life insurance schemes.*

**Table 5: ANOVA**

Sources of Variations	Sum of Squares	Degrees of Freedom	Mean Square	F cal value	P- value
Between Groups	28.125	1	28.125	14.89648	0.0001537
Within Groups	373.83	198	1.8880		
Total	401.955	199			

*F-Statistic (F):* The calculated F-value is 14.8965. The F-statistic compares the variance between the group means to the variance within the groups. A higher F-value indicates that there is more variance between the groups than within them, suggesting a significant change among the group means.

*P-Value:* The p-value is 0.0001537. This value represents the probability that the observed changes between the group means occurred by chance under the null hypothesis. A p-value less than 0.05 is typically considered statistically significant.

#### 7.3.1 Conclusion

Since the p-value (0.0001537) is significantly less than 0.05, & the F-value (14.8965) is relatively high, therefore the null hypothesis is rejected ( $H_0$ ). This means there is sufficient evidence to say that there is a notable change in age between those who prefer bonds & those who prefer life insurance schemes.

#### 7.3.2 Implication

The non-acceptance of the  $H_0$  suggests that age is likely a significant factor influencing whether individuals in Belagavi city prefer bonds versus life insurance schemes. This result supports the alternative hypothesis ( $H_1$ ), indicating that the age scattered among those who choose to invest in these two financial instruments is significantly different.

## 8.0 Findings

- Individuals with higher financial literacy tend to have more diversified portfolios, indicating that greater financial knowledge results in more informed investment choices.

- There is no change in investment preferences between genders when it comes to equity shares & mutual funds.
- Income levels significantly influence the choice between investing in life insurance schemes & gold.
- Age plays a remarkable role in determining the preference between bonds & life insurance schemes.
- While there is an increasing use of digital platforms for transactions, there is still some reluctance to fully engage with digital investment products.
- Many young investors are focused on short-term gains, which may impact their long-term financial stability.
- It can be observed for need for improved financial education to help young investors make more diversified & informed investment choices.

## **9.0 Limitations**

- The study is limited to young investors in Belagavi, which may not fully reflect the investment behaviours of the broader population or those in other regions.
- The sample size may not be large enough to generalize findings to the entire population of young investors in the region.
- The reliance on self-reported data may introduce biases, as respondents might not precisely represent their investment behaviours or knowledge.
- The study was conducted over a relatively lower period, which might not capture long-term trends or changes in investment behaviour.
- The emphasis on traditional investment options may overlook the growing interest in alternative investments, such as cryptocurrencies or peer-to-peer lending, among young investors.
- Rapid advancements in technology & changes in the financial markets may have occurred after the study was conducted, potentially affecting the relevance of the findings.

## **10.0 Conclusion**

The investment behaviours of young investors in Belagavi present a complex mix of traditional values & an emerging openness to modern financial products. While the preference for secure, traditional investments indicates a cautious approach, the growing use of digital platforms & grown financial literacy suggest a readiness to explore more diverse investment options.

The study concludes that to fully unlock this potential, comprehensive financial education is necessary, starting early and tailored to the unique needs of young investors. Financial institutions must also innovate to create accessible, user-friendly investment products that resonate with this demographic's unique

preferences & concerns. By addressing the current gaps in financial literacy & product accessibility, stakeholders can empower young investors in Belagavi to make more informed, diversified, & strategic investment decisions. This, in turn, will contribute to their financial well-being & foster a more dynamic & resilient local economy. As these young investors gain confidence & knowledge, they are likely to become key drivers of economic growth & innovation in the region, setting the stage for a prosperous future.

- Mutual funds & equity shares emerged as the most inclined investment avenues among young investors, indicating a risk-taking appetite & a focus on potential higher returns.
- Traditional investment options such as fixed deposits, bonds, & postal savings were less favoured, suggesting a shift in investment behaviour towards more dynamic instruments.
- Income level significantly influenced investment choices, particularly between life insurance schemes & gold. Higher-income individuals were more attracted towards life insurance.
- Age was found to be a significant factor in the preference for bonds & life insurance schemes.

## **11.0 Implications**

The results of this study offer valuable insights for policymakers, financial institutions, and young investors as under:

- Policymakers can utilize this information to design investment-friendly policies that cater to the preferences of the younger generation.
- Financial institutions can alter their product offerings & marketing strategies to align with the investment inclinations of young investors.
- Young investors can gain a better understanding of their investment options & make informed decisions based on their financial goals & risk tolerance.

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## CHAPTER 6

### **Evaluating the Efficiency and Security of Paperless Banking Systems: An Analysis of Technological Adoption in the Banking Industry**

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#### ABSTRACT

The transition towards paperless banking has revolutionized the financial industry, promising enhanced efficiency, cost savings, and improved customer experiences. This paper critically evaluates the efficiency and security of paperless banking systems by analyzing various technologies and practices adopted by financial institutions worldwide. Through a comprehensive literature review and case studies, the research investigates the operational efficiencies achieved through reduced paperwork, faster transaction times, and streamlined processes. Additionally, the study examines the security measures implemented to protect digital transactions, such as encryption, multi-factor authentication, and blockchain technology. The findings reveal that while paperless banking offers significant benefits in terms of efficiency and environmental sustainability, it also presents challenges related to cybersecurity threats and data privacy concerns. This paper concludes with recommendations for strengthening the security framework and optimizing the efficiency of paperless banking systems, ensuring a robust and secure digital banking environment for both institutions and consumers. Furthermore, it highlights the need for continuous innovation and regulatory compliance to maintain trust and integrity in the digital banking ecosystem.

**Keywords:** Paperless Banking, Efficiency, Security, Cyber Security Threats, Digital Transactions.

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#### 1.0 Introduction

The banking industry has witnessed substantial technological advancements over the past few decades. One of the most prominent developments is the transition from traditional, paper-based processes to digital, paperless banking systems. These systems make use of cutting-edge technologies to boost productivity, cut expenses, and enhance client satisfaction.

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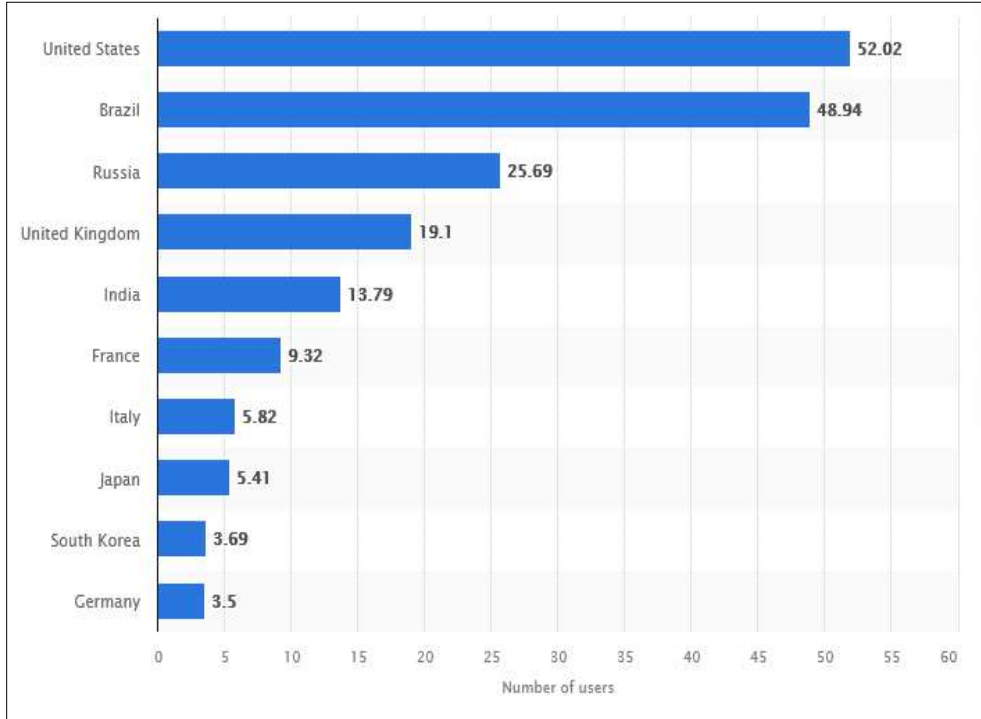
### 1.1 Overview of the Indian banking sector

Foreign, commercial, and public sector banks are all present in the Indian banking industry. An important part of policing and supervising the banking sector is the Reserve Bank of India (RBI). The RBI has launched a number of measures in recent years to support financial inclusion and digital banking. Despite these initiatives, different banks and geographical areas have varied rates of paperless banking system adoption.

### 1.2 Importance of technological adoption in banking

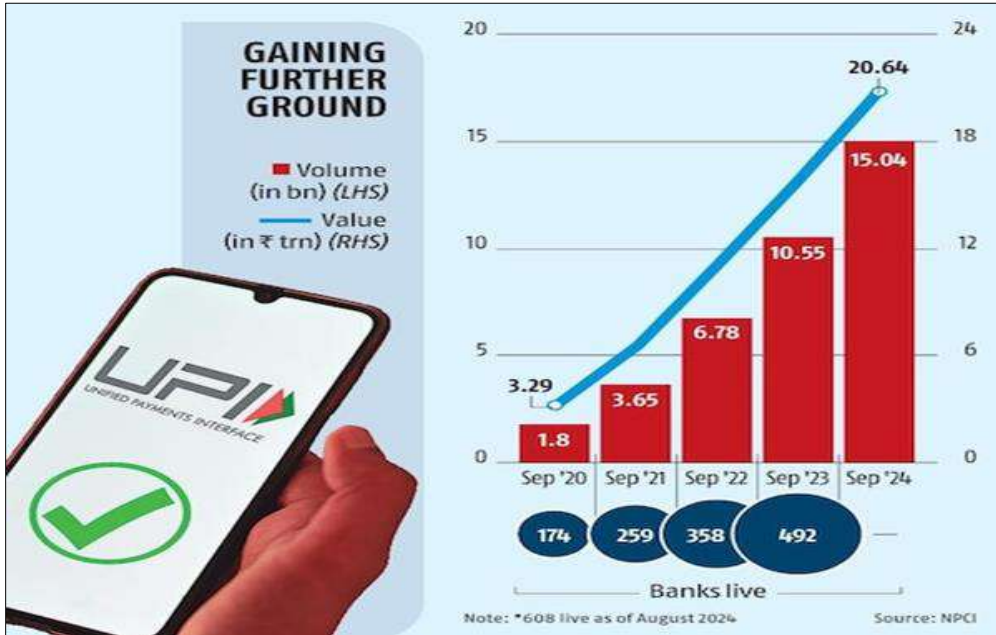
In an increasingly digital world, banks must embrace technology to stay competitive. Paperless banking systems provide many benefits, such as improved security features, reduced operating expenses, and quicker transaction processing. These advantages are especially pertinent when considering the Indian banking industry, which caters to a wide range of quickly expanding clients. Gupta *et al.* (2020), highlight that digital India promotes paperless banking through various methods like UPI, mobile wallets, and internet banking, aiming to reduce cash dependency and enhance the digital payment ecosystem in India.

**Figure 1: Leading Countries in the World with the Highest Count of Digital Banking Users as of 2022(in millions)**



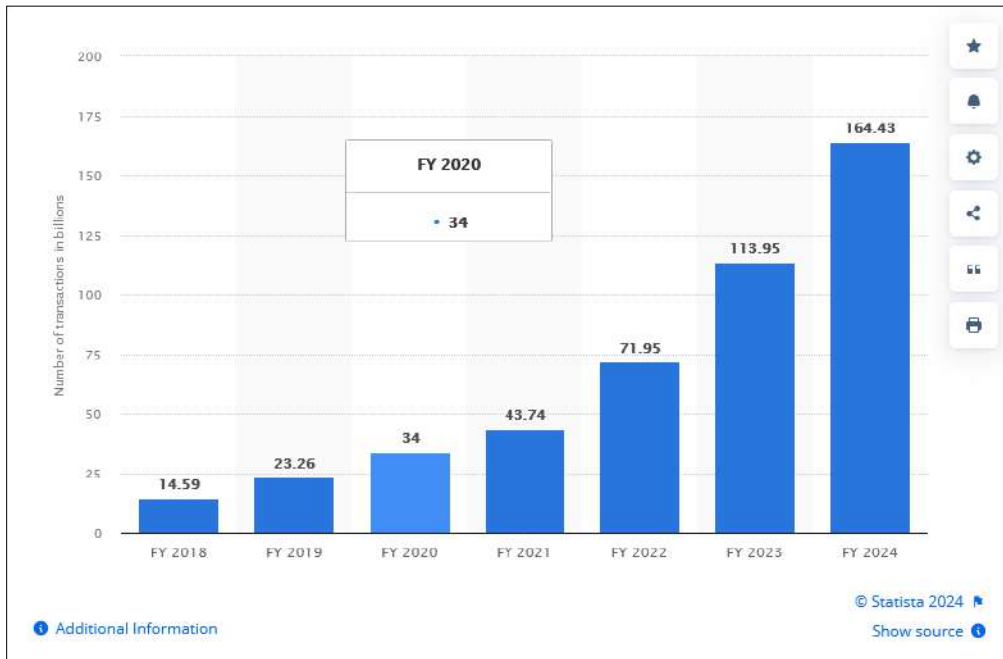
Source: <https://www.statista.com/statistics/1388624/digital-banking-users-by-country/>

**Figure 2: Number of Banks Live On UPI**



Source: [https://www.business-standard.com/finance/news/since-the-year-pandemic-hit-average-daily-upi-transactions-up-over-8x-124100200570\\_1.html](https://www.business-standard.com/finance/news/since-the-year-pandemic-hit-average-daily-upi-transactions-up-over-8x-124100200570_1.html)

**Figure 3: Growth of Digital Payments in India**



Source: <https://www.statista.com/statistics/1251321/india-total-volume-of-digital-payments/>

## 2.0 Literature Review

Author(s)	Article Title	Variables Studied	Description
Khan (2013)	Role and performance of Real Time, Web-based Loan Generating Systems (LGS) towards Paper-less Banking	Real-time web-based loan generating systems; efficiency of paperless banking	Explores the performance of web-based loan systems in transitioning toward paperless banking, highlighting benefits like cost and space reduction and the need for enhanced systems.
Tirit (2018)	The study focuses on the investigation of the macro factors that affect the development of the banking sector.	Macro factors in banking sector development	Investigates external macroeconomic factors influencing the development of banking systems, offering broader insights into factors affecting digital transformation indirectly.
Lumpkin & Schich (2020)	Banks, Digital Banking Initiatives and the Financial Safety Net: Theory and Analytical Framework	Digital banking initiatives; financial safety nets	Discusses new digital banking initiatives and evaluates their impact on the financial safety net, addressing security and efficiency in digital transactions.
Tran <i>et al.</i> (2024)	Impact of Perceived Safety on Customers' Use of Digital Banking Services at Commercial Banks: A Case Study in Vietnam	Perceived safety; customer usage of digital banking services	Studies how customer perceptions of safety influence their adoption and usage behavior regarding digital banking services in commercial banks in Vietnam.
Nguyen <i>et al.</i> (2020)	Distribution Information Safety and Factors Affecting the Intention to Use Digital Banking in Vietnam	Information safety; intention to use digital banking systems	Evaluates how information safety affects customer intentions to adopt digital banking, emphasizing the need for robust data security measures.
Das & ManasNaskar (2019)	Safety and Security of Digital Transactions of Banking Sector: An Analytical Study	Security of digital transactions; customer service quality	Analyzes the safety and security aspects of digital transactions in the Indian banking sector, addressing customer experiences and transaction risks.
Fakiha (2023)	Combining Digital Forensics with Traditional Safety Measures to Improve Data Security in Banking	Data security; digital forensics; traditional safety measures	Proposes integrating digital forensics with traditional safety methods to enhance data security in banking systems.
Solanki & Kumar (2023)	Technology Adoption in Banking Sector--Issues and Challenges	Technology adoption, banking sector challenges	Analyzes the challenges faced by the Indian banking sector in adopting technology, particularly in information systems.
Karthikeyan (2016)	Technology Adoption and Customer Satisfaction in Banking Technological Services	Technology adoption, customer satisfaction	Analyzes the challenges faced by the Indian banking sector in adopting technology, particularly in information systems.
Muduli & Choudhury (2024)	Digital Technology Adoption, Workforce Agility and Digital Technology Outcomes in the Context of the Banking Industry of India	Digital technology adoption, workforce agility, bank performance	Studies the role of digital technology adoption and workforce agility on banking outcomes such as customer relationships and overall bank performance.

## 3.0 Research Methodology

This study, relying on secondary data, involves collecting information from sources such as industry reports, academic journals, and financial technology

databases. The analysis concentrates on identifying the efficiency and security aspects of paperless banking systems by examining technological adoption trends within the banking industry. It evaluates the effectiveness of various digital banking solutions, such as online banking, mobile banking, and electronic document management, by reviewing existing data and case studies. The synthesis of this data offers actionable insights and recommendations for enhancing the adoption and security of paperless banking, grounded in established patterns and best practices.

### 3.1 Objectives

The purpose of this study is to assess the security and efficacy of paperless banking systems and examine the variables affecting their uptake in the banking sector. The particular goals consist of:

- To evaluate how paperless banking affects operational effectiveness.
- To assess the security controls put in place in digital financial systems.
- To Identify the drivers and barriers to the adoption of paperless banking technologies.

### 4.0 Characteristics of Paperless Banking

Paperless banking refers to using digital technologies to manage banking activities without relying on physical paper documents. Some key characteristics of paperless banking:

- *Digital Transactions:* All financial transactions, including transfers, payments, and account management, are conducted electronically through online platforms or mobile apps.
- *Electronic Document Management:* Traditional paper-based documents like bank statements, receipts, and contracts are replaced with digital versions that can be accessed and stored electronically.
- *Enhanced Security:* Paperless banking systems generally utilize sophisticated security features, including encryption, multi-factor authentication, and biometric verification, to safeguard user data and transactions.
- *Convenience and Accessibility:* Customers can use their banking services anytime and anywhere through digital channels, reducing need to visit physical branches.
- *Cost Efficiency:* Banks reduce operational costs by minimizing the use of paper, printing, and physical storage, which also translates to savings for customers in some cases.
- *Environmental Sustainability:* By eliminating paper use, paperless banking contributes to environmental conservation, minimizing the environmental impact of printing and transportation of documents.

- *Automated Processes:* Many banking processes, such as bill payments, loan applications, and account opening, are automated, improving efficiency and reducing the time required for these tasks.
- *Real-Time Updates:* Customers receive instant notifications and updates on their accounts and transactions, providing greater transparency and control over their finances.
- *Regulatory Compliance:* Paperless banking systems are developed to comply with legal and regulatory requirements, guaranteeing that digital records are maintained securely and can be retrieved when needed.
- *User-Friendly Interfaces:* Digital platforms are typically designed with user experience in mind, offering intuitive interfaces that make it easy for customers to navigate and perform banking tasks.

#### **4.1 Efficiency of paperless banking**

The implementation of digital technology has transformed multiple industries, including banking. One major change in the banking industry has been the move towards paperless operations. Paperless banking involves conducting banking transactions and managing accounts digitally, minimizing or eliminating the need for physical paper. This research explores the efficiency of paperless banking, focusing on its cost-effectiveness, time efficiency, environmental impact, customer convenience, and data management capabilities, while also addressing associated challenges.

##### **4.1.1 Cost efficiency**

The transition to paperless banking has resulted in substantial cost reduction for financial institutions. Banks save on expenses related to paper, printing, and postage. For instance, the cost of producing and mailing monthly statements, notices, and receipts is majorly reduced when these are delivered electronically. Additionally, operational efficiencies are achieved as digital processes diminish the need for manual handling of documents. The automation of tasks such as filing, sorting, and archiving reduces administrative overhead and enables banks to allocate resources more effectively.

##### **4.1.2 Time efficiency**

Paperless banking enhances time efficiency by accelerating the speed of transactions and service delivery. Digital platforms allow for real-time processing of transactions, such as payments, transfers, and account updates, which traditionally required more time when done manually or through paper-based methods. Furthermore, customers benefit from instant access to their financial information, including account balances, transaction histories, and e-statements, without the delays associated with mailing and physical document handling.

### **4.1.3 Environmental impact**

The environmental benefits of paperless banking are considerable. By reducing the reliance on paper, banks contribute to the preservation of natural resources and the reduction of deforestation. Furthermore, the decrease in the need for physical mail delivery reduces the carbon footprint related with transportation and logistics. These environmental considerations align with broader CSR goals and enhance the sustainability profile of banking institutions.

### **4.1.4 Customer convenience**

Paperless banking offers unparalleled convenience to customers. The ability to access banking services 24/7 through online platforms and mobile applications empowers customers to manage their finances at their convenience, without the constraints of banking hours. Additionally, the implementation of digital banking facilitates enhanced security protocols, like encryption, multi-factor authentication, and biometrics, which provide better protection for customers' personal and financial information compared to traditional paper-based methods.

### **4.1.5 Data management and analytical capabilities**

Digital banking enhances data management efficiency by offering tools for advanced data analytics, which improves decision-making processes. Electronic documents are simpler to store, access, and manage compared to physical documents, thereby minimizing the risk of loss and boosting data integrity. Additionally, digital data can be analysed with sophisticated analytics techniques, enabling banks to gain deeper insights into customer behaviour, optimize their services, and refine risk management strategies. These advanced capabilities not only foster a more personalized banking experience but also facilitate the creation of innovative financial products.

## **4.2 Security Measures in Paperless Banking**

### **4.2.1 Encryption and data protection**

*Data Encryption:* Banks and financial institutions in India employ advanced encryption protocols to protect data transmitted over digital channels. Secure Socket Layer (SSL) and TLS are commonly used to protect data during online transactions, ensuring that information remains confidential and secure.

*Data Privacy Regulations:* The incorporation of the Personal Data Protection Bill (PDPB), which is expected to become law, will further strengthen data protection regulations and require banks to adhere to stringent data handling and privacy standards.

### **4.2.2 Authentication and access control**

- *Multi-Factor Authentication (MFA):* Indian banks extensively implement MFA, which necessitates users to present several forms of verification—such as a

password, OTP, and biometric data—before they can access their accounts or approve transactions. This approach strengthens security by introducing multiple layers of protection against unauthorized access

- *Biometric Verification:* Increasingly, banks are adopting biometric authentication methods, such as finger print and facial cognition, to verify user identities and prevent fraudulent activities.

#### **4.2.3 Fraud detection systems**

- *Real-Time Monitoring:* Banks employ advanced fraud detection systems that continuously monitor transactions for suspicious activities. These systems leverage machine learning algorithms and pattern recognition techniques to detect and alert potential fraudulent behaviour in real time.
- *Customer Alerts:* Institutions often send instant notifications or alerts to customers regarding unusual account activities or login attempts, allowing prompt responses to potential security problems.

#### **4.2.4 Regulatory framework**

- *RBI Guidelines:* The RBI provides comprehensive guidelines and regulations for digital banking security. These include requirements for secure online banking practices, incident reporting, and the establishment of cybersecurity frameworks.
- *Information Technology Act, 2000:* This act governs electronic transactions and cybersecurity in India, setting out legal processes for data protection, digital signatures, and cybercrime prevention.

### **4.3 Security risks and challenges**

#### **4.3.1 Cyber attacks and data breaches**

- *Phishing and Social Engineering:* Phishing attacks, in which attackers trick users into disclosing sensitive information, continue to pose a major threat. Additionally, social engineering tactics exploit human behaviour to gain unauthorized access to financial accounts.
- *Ransomware and Malware:* Cybercriminals use ransomware and malware to disrupt banking operations or steal sensitive data. Such attacks can compromise customer information and disrupt financial services.

#### **4.3.2 Vulnerabilities in digital platforms**

- *Software Vulnerabilities:* Bugs and vulnerabilities in banking software can be hacked by attackers to get unauthorized access or manipulate transactions. Regular software updates and patches are important to mitigate these risks.
- *Insecure Networks:* Unsecured networks, such as public Wi-Fi, can be hacked by attackers to intercept sensitive data during online transactions.



### **4.3.3 Customer awareness and education**

**Lack of Awareness:** Many users lack awareness about online security important practices, making them susceptible to scams and fraud. Educational initiatives and awareness programs are crucial to informing customers about safe digital banking practices.

## **4.4 Ongoing Efforts to Enhance Security**

### **4.4.1 Investment in cybersecurity**

- *Enhanced Technologies:* Banks are investing in advanced cybersecurity technologies, including AI and machine learning, to improve threat detection and response capabilities.
- *Collaboration with Cybersecurity Firms:* Financial institutions are associating with cybersecurity firms to implement best security measures and stay updated on emerging threats.

### **4.4.2 Government initiatives**

- *National Cyber Security Policy:* The Indian government introduced policies and initiatives aimed at strengthening national cybersecurity infrastructure and promoting secure digital practices.
- *Cyber Crime Cells:* Specialized cybercrime cells has been established to investigate and address cybercrime incidents, providing support to victims and enhancing overall security

## **4.5 Banking Technology in India**

**Computing Power:** The surge in computing power, driven by advancements like 5G and the upcoming 6G, is revolutionizing the banking sector. Banks are leveraging high-performance computing to enhance data processing, customer service, and risk management. As computing power grows, banks can offer faster, more efficient digital banking services, improving the overall customer experience.

**Smarter Devices:** AI-powered devices and systems are transforming the banking industry. Smart devices enable banks to offer personalized services, automate customer interactions through AI chatbots, and streamline operations. The demand for IT Managers, Product Managers, and Automation Engineers within banks is increasing as they adopt these smarter technologies.

**Datafication:** The banking sector is heavily reliant on data-driven decision-making. Datafication allows banks to analyse customer behaviour, predict market trends, and personalize services. This trend also underscores the need for data management and security practices to protect important financial information.

**AI and Machine Learning:** AI and ML are becoming integral to banking, used for detection of fraud, credit scoring, assessment of risk, and personalized banking experiences. These technologies help banks to process vast amounts of data efficiently and make best decisions that improve customer satisfaction and operational efficiency.

*Digital Trust:* With the rise of digital banking, establishing digital trust has become paramount. Banks are focusing on cybersecurity measures and ethical practices to ensure that customer data is protected. Building digital trust is very important for maintaining customer confidence in online and mobile banking platforms.

*Robotic Process Automation:* RPA is helping banks to automate recurring tasks such as account opening, transaction processing, and compliance reporting. This automation limits errors, speeds up processes, and frees up human effort for complex tasks, thereby improving operational efficiency.

*Blockchain:* Blockchain technology is being explored in banking for secure transactions, transparent record-keeping, and efficient cross-border payments. Its decentralized nature reduces the need for intermediaries, lowers transaction costs, and enhances security in financial operations.

*5G Technology:* The advent of 5G technology is set to further enhance mobile banking by enabling faster, more reliable connections. This will support the growth of advanced banking applications, such as real-time financial services, remote advisory services, and more sophisticated mobile banking features.

*Cybersecurity:* As digital banking is being vastly implemented, cybersecurity remains a critical concern. Banks are investing heavily in cybersecurity to protect against threats such as data breaches, hacking, and fraud. The demand for cybersecurity experts in the banking sector is growing as they work to safeguard financial systems and customer data.

## 5.0 Conclusion

The shift to paperless banking has markedly improved operational efficiency, cost-effectiveness, and environmental sustainability in the financial sector. Digital systems streamline transactions, reduce administrative costs, and offer greater convenience to customers. However, these improvements also introduce new security challenges, including vulnerabilities to cyberattacks and fraud. Ensuring robust security through advanced technologies like encryption and multi-factor authentication, while also enhancing customer awareness and adhering to regulatory guidelines, is essential for mitigating these risks. Ultimately, the continued success of paperless banking hinges on balancing technological innovation with stringent security measures and regulatory compliance, ensuring a secure and efficient digital banking environment for all stakeholders.

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## CHAPTER 7

### Conceptual Analysis of the National Skill Development Mission for Sustainable Development: Empowering a Skilled India

*Khushi Shah\*, Anjali Agarwal\*\**

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#### ABSTRACT

India, where over 65% of the population is working age, has a huge potential for economic growth through effective skill development. The cornerstone of the “Skill India” agenda is the National Skill Development Mission (NSDM), which was established in 2015. The Ministry of Skill Development and Entrepreneurship (MSDE), which was created in 2014, oversees this initiative. In stark contrast to the 60–90% of workers in industrialized nations, only 5% of Indian workers between the ages of 20 and 24 have completed formal vocational training, despite significant efforts such as the National Skills Qualifications Framework (NSQF) and the Pradhan Mantri Kaushal Vikas Yojana (PMKVY). Millions of people have received training through important initiatives, with noteworthy advancements including the addition of specialized courses and increased employment prospects worldwide thanks to partnerships with the External Affairs Ministry. Nevertheless, there are still issues, such as prejudices in society, financial disincentives, inadequate training compared to industry demands, and a lack of competent trainers. This study looks at the NSDM framework, analyses obstacles, evaluates how well it aligns with the Sustainable Development Goals (SDGs) and explores its effect on workforce development. This study uses an exploratory research approach to highlight the benefits and drawbacks of the NSDM, highlighting the necessity of ongoing assessment, improved infrastructure, and efficient implementation to guarantee that skill development results in meaningful employment and long-term economic growth (Kaur, 2022).

**Keywords:** Pradhan Mantri Kaushal Vikas Yojana; Vocational Training; Sustainable Development; National Skill Development Mission; Workforce Development.

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#### 1.0 Introduction

Comparing India to other countries where skilled workers comprise 60% to 90% of the working force, the country’s officially recognized skilled workforce share is negligible. Only 5% of workers in India who are between the ages of twenty and twenty-four have had formal vocational training (Shah, 2016).

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More than 20 ministries and agencies have launched more than 70 programs nationally to support skill development to remedy this mismatch. The National Skill Development Mission (NSDM), which was launched by Prime Minister Narendra Modi on July 15, World Youth Skills Day, and approved by the Union Cabinet on July 1, 2015, is a crucial part of this initiative. The goal of the NSDM is to build a solid institutional framework at the federal and state levels while expediting decision-making procedures and implementing scalable skill development programs (Iyengar & Mishra, 2017).

The Governing Council, Steering Committee, and Mission Directorate comprise the three tiers of the Mission's institutional structure, which is supported by the National Skill Development Agency, National Skill Development Corporation, and Directorate General of Training. The Mission's methodology includes seven submissions that cover subjects including using public infrastructure, employment abroad, sustainable livelihoods, infrastructure, convergence, trainer development, institutional training, and public infrastructure.

India's skilling dilemma is made more complicated by the diverse and dispersed array of stakeholders involved, including businesses, industry associations, private training providers, educational institutions, and certifying authorities. Programs like the Pradhan Mantri Kaushal Vikas Yojana, Skills Strengthening for Industrial Value Enhancement, Skill Saathi Counselling Programme, SANKALP, Pradhan Mantri Kaushal Kendra, and Industrial Training Institutes have been introduced to combine and improve skilling efforts despite these obstacles (Iyengar & Mishra, 2017).

### **1.1 Objectives of the mission**

- Incorporate Skilling in School Curriculum: Integrate skill development into school education.
- Provide Long and Short-Term Skill Training: Offer quality training for gainful employment and career progression.
- Establish Quality Assurance Framework: Ensure nationally and internationally accepted standards across Ministries, States, and private providers.
- Develop Unorganized Sectors: Focus on skill training and re-skilling in critical sectors like construction.
- Benchmark Skilling to International Standards: Offer high-quality, long-term skill options aligned with global qualifications.
- Train Quality Instructors: Establish institutions for training skilled trainers.
- Utilize Public and Industry Infrastructure: Scale skill training using existing facilities.
- Facilitate Overseas Employment: Provide programs meeting global job standards.

- Enable Vocational-Education Transition: Support credit transfer between vocational and formal education systems.
- Promote Convergence Across Ministries: Coordinate national skill development efforts.
- Support Disadvantaged Groups: Focus on weaker sections through targeted programs.
- Raise Awareness of Skill Training: Encourage young people to see the importance of developing their skills.
- Create a Labour Market Information System to track and balance the country’s supply and demand for skilled labor.

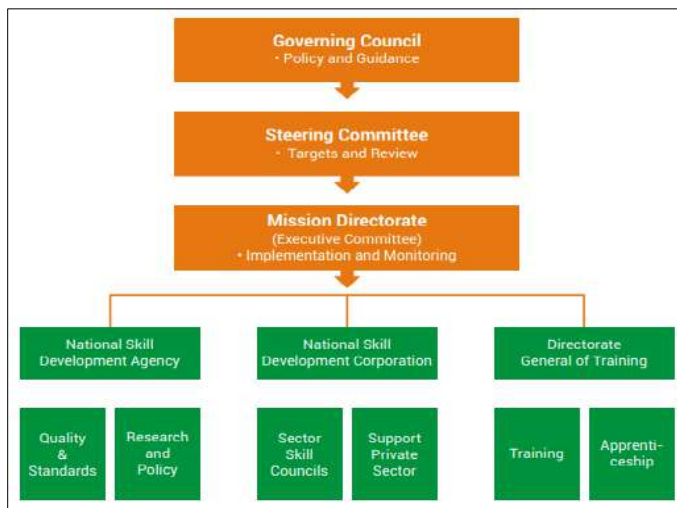
**1.2 Skill sub-mission**

- Institutional Training
- Infrastructure
- Convergence
- Trainers
- Overseas Employment
- Sustainable Livelihoods
- Leveraging Public Infrastructure

**1.3 Mission statement**

To quickly scale up skill development initiatives in India by developing an end-to-end, outcome-focused implementation framework that combines the aspirations of Indian citizens for sustainable lives with the expectations of businesses for a competent workforce.

**Figure 1: Organisational Structure**



Source: [www.msde.gov.in](http://www.msde.gov.in)

## 2.0 Objectives of the Study

- To evaluate the National Skill Development Mission's framework.
- To Evaluate NSDM's Effect on Workforce Development.
- To Determine Obstacles and Difficulties.
- To determine the degree to which it conforms to the Sustainable Development Goals.

## 2.1 Research methodology

The researcher used an exploratory research strategy employing a range of secondary information that was acquired from the secondary data since the research article is conceptual and is a review. The researcher has reported on many developing trends, difficulties, and challenges in the National Skill Development Mission based on the review and secondary data.

## 3.0 SWOT Analysis of the National Skill Development Mission (NSDM)

### 3.1 Strengths

- Comprehensive Policy Framework
  - Well-structured policies and strategic plans aimed at skill development.
  - The National Policy for Entrepreneurship and the Policy for Skill Development offers a strong foundation.
- Government Support and Funding
  - Significant financial allocation and support from the government.
  - Collaboration with various ministries and state governments for wider reach.
- Public-Private Partnerships (PPP)
  - Involvement of private sector and industry stakeholders in designing and implementing skill development programs.
  - Creation of industry-relevant curriculum and training modules.
- Extensive Network of Training Centres
  - Establishment of numerous training centers and institutions across the country.
  - Availability of various vocational training programs and courses.
- Focus on Inclusivity
  - Special initiatives targeting marginalized and disadvantaged groups.
  - Programs aimed at empowering women, rural youth, and differently-abled individuals.

### 3.2 Weaknesses

- *Implementation Challenges*
  - Inconsistent implementation of programs across different regions.
  - Variability in the quality of training provided by different centers.



- *Skill Mismatch*
  - Mismatch between skills taught and the actual requirements of the job market.
  - Lack of alignment with evolving industry needs and technological advancements.
- *Limited Awareness and Outreach:*
  - The available training programs are not adequately disclosed to potential users
  - Limited outreach in remote and rural areas.
- *Monitoring and Evaluation*
  - Inadequate monitoring and evaluation mechanisms to assess the effectiveness of programs.
  - Difficulty in tracking the progress and employment outcomes of trainees.
- *Infrastructure and Resource Constraints*
  - Shortage of trained and qualified trainers.
  - Inadequate infrastructure and training facilities in some regions.

### **3.3 Opportunities**

- *Technological Integration*
  - Leveraging digital platforms and e-learning to enhance access to training.
  - Use of emerging technologies like AI and VR for advanced skill training.
- *Global Skill Demand*
  - Tapping into the global demand for skilled labor.
  - Training programs aligned with international standards to enhance employability abroad.
- *Focus on Future Skills*
  - Developing skills in high-demand areas such as IT, renewable energy, and advanced manufacturing.
  - Fostering innovation and entrepreneurship through skill development.
- *Enhanced Collaboration*
  - Developing closer ties with global organizations and academic establishments.
  - Collaborating with more industries to ensure industry-relevant skill training.
- *Policy Enhancements*
  - Continuous improvement and updating of policies based on feedback and emerging trends.
  - Greater emphasis on sustainable development and green skills.

### **3.4 Threats**

- *Economic Instability*
  - Economic downturns affecting funding and resource allocation for skill development programs.

- Impact of global economic trends on job markets and skill demand.
- *Rapid Technological Changes*
  - Fast-paced technological advancements rendering existing skills obsolete.
  - Challenges in continuously updating training programs to keep pace with technological changes.
- *Political and Bureaucratic Hurdles*
  - Changes in political leadership and priorities affecting the continuity of initiatives.
  - Bureaucratic red tape hindering the swift implementation of programs.
- *Socio-Cultural Barriers:*
  - Societal attitudes and perceptions towards vocational training and certain occupations.
  - Resistance to change and adoption of new skills among certain segments of the population.
- *Competition from Private Sector*
  - Emergence of private skill training providers offering more specialized and market-aligned courses.
  - Potential overshadowing of government initiatives by well-funded private entities.

#### **4.0 Government Initiatives to Promote Skill Development Under Mission**

The Pradhan Mantri Kaushal Vikas Yojana, one of the program's primary goals, provides youth in several industries with short-term skill training and certification through vocational training institutions like ITIs. Under this program, all assessment fees and training expenses are covered by the government. More Indian youth from diverse socioeconomic situations should be able to afford and access skill development, according to the objective.

Sector Skill Councils are autonomous, industry-led entities that were founded by the NSDC. These councils play a major role in the development of competence frameworks, qualification authority, and occupational standards. They conduct skill gap analysis, Train the Trainer programs, and evaluations to certify trainees. As of right now, there are 37 Sector Skill Councils, and a Governing Council of over 600 corporate executives is in charge of each one.

Recognition of past Learning, one of PMKVY's primary characteristics, allows individuals with past learning experience or skills to complete an assessment and receive certification for the knowledge and skills they already possess. This facilitates the recognition and appreciation of skills acquired via informal learning and on-the-job training.

A system for categorizing credentials based on knowledge and skill levels is the National Skills Qualifications System (NSQF). The National Skill Development

Agency (NSDA) is in charge of managing it, while the National Skills Qualifications Committee (NSQC) supervises its execution. Apart from authorizing Qualification Packs (QPs) and National Occupational Standards (NOSs), the NSQC also sets accreditation guidelines, addresses the needs of under-represented groups, resolves conflicts, and aligns the NSQF with international qualification frameworks. NSQF ensures quality control in skill development. Analogous qualification processes are in use in several countries across the world. NSQF encourages global mobility and provides Indian workers with prospects for progress.

Only available in Jammu and Kashmir, UDAAN is a special program run in association with Indian companies, the NSDC, and the Ministry of Home Affairs. The program's objective is to provide skill development to young people without employment in the region, therefore increasing their employability. UDAAN's main goals are to expose unemployed graduates to the best parts of Corporate India and give the company access to the talented workforce in the state.

Acquiring Information and Crafting Proficiency to Advance Livelihoods. The World Bank and the Indian government have now agreed to a loan of Rs. 1650 crore to fund the SANKALP project. The World Bank will not give money to the Indian government until the preset Disbursement Linked Indicators are met. SANKALP's objectives include strengthening institutional processes at the federal and state levels, developing a skilled pool of trainers and assessors, and providing chances for skill training to vulnerable sections of society.

## 5.0 Beneficiaries of the Mission

On July 15, 2015, the Honourable Prime Minister announced the creation of the (NSDM), which aims to standardize, expedite, and promote convergence in skill training efforts across States and sectors. The State Governments also provide training, in addition to the Central Ministries and Departments. Employers and businesses also provide training on their property. More than 20 Central Ministries and Departments are offering youngsters throughout the country skill-training initiatives and activities.

Sl. No.	Schemes	Year-wise beneficiaries (in lakhs)				Total (in lakh)
		2016-17	2017-18	2018-19	2019-20	
1.	PMKVY + Fee-based training of NSDC	22.37	49.27	43.61	70.13	<b>185.38</b>
2.	JSS	2.14	1.72	1.67	4.15	<b>9.68</b>
3.	NAPS	1.11	1.61	1.99	2.54	<b>7.25</b>
4.	CTS	11.91	12.13	14.52	13.48	<b>52.04</b>
Total		<b>37.53</b>	<b>64.73</b>	<b>61.79</b>	<b>90.30</b>	<b>254.35</b>

Source: Ministry of Skill Development and Entrepreneurship  
(<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1695631>)

In addition to Jan Shikshan Sansthan (JSS) and (NAPS) in the short-term skilling eco-system, the (MSDE) is implementing its flagship program, the (PMKVY), on a pan-Indian basis. Long-term training is being provided through the Industrial Training Institutes (ITIs) under the Craftsmen Training Scheme (CTS). The following lists the total number of people who received training through the Ministry's eco-system between 2016–17 and 2019–20:

### **5.1 Impact and outcomes of the skill india program**

- According to the NSDC's annual report 2019–20, 2.5 crore individuals received skill training through NSDC partnerships, PMKVY certification, and Pradhan Mantri Kaushal Kendra training, which is offered in every district throughout the country, between 2009 and 2020.
- The latest data accessible on the PMKVY website states that 1.37 crore persons have benefited from the program's training so far, and more than 1.1 crore have obtained certification.
- The fourth edition of PMKVY, version 4.0, is currently being used nationwide. As of right now, the MSDE website is listing Pradhan Mantri National Apprenticeship Melas (PMNAM) in several districts, with the first one taking place in May. These gatherings are meant to introduce young people in the area to various apprenticeship training programs that are provided by nearby companies and groups.
- 116 Government Industrial Training Institutes (ITIs) have been authorized to offer courses on drone operation utilizing modern technology to enhance the capabilities of these training institutions.
- Candidates received 100% boarding and lodging accommodations to encourage participation in short-term training programs in the Northeastern states and Left-Wing Extremism (LWE) impacted areas. Prominent educational establishments and colleges were invited to plan skill-building initiatives in these areas.
- MSDE has been working with the Ministry of External Affairs (MEA), NSDC, DGT, and other implementing bodies to coordinate the deployment of skilled Indian workers abroad. Memorandums of Understanding and agreements, both G2G and B2B, have been signed in this regard with over 11 countries so far, including Australia, Belarus, China, and Japan.
- India placed 11th in the WorldSkills Competition 2022 (WSC 2022) after placing 13th in the previous year. This achievement shows how young people, trainers, and other stakeholders in the skill ecosystem are starting to realize how important it is to aim high, participate in these events, and cultivate a love for skills.
- The Ministry of Skill Development & Entrepreneurship has worked with the Army, Navy, Air Force, and CRPF jawans to carry out particular skill development programs.

## 5.2 Challenges of the mission

- Social and traditional biases: The idea that physical work is inferior hinders the acceptance and progress of skill-based occupations. Prejudices such as these that have their roots in cultural behavior and historical customs must be eliminated to create a more inclusive atmosphere for skill development.
- Lack of financial incentives: Many economic sectors, particularly micro, small, and medium-sized enterprises, tend to minimize the value of skill development and to treat skilled and unskilled workers equally. People are less financially motivated to master new skills and show off their abilities as a result.
- An incompatibility between training and industry demands: Vocational training programs frequently fail to meet industry-specific standards. The upshot is a contradictory mix of long-term unemployment and a shortage of skilled workers for vital positions in infrastructure development, manufacturing, and other sectors.
- Restrictions on grant-based, no-cost training initiatives: Grant-based free training programs are essential, but their employability and quality are constrained. If training is offered for free, students might not appreciate it, and training providers could put more emphasis on quantity than quality. Establishing a connection between employability and training quality is vital, as is prioritizing financial assistance.
- Lack of competent trainers: One major worry is the lack of trained trainers. There is a dearth of competent individuals in the area because of the lack of attention placed on creating trainer training programs and establishing career advancement routes for trainers.

## 6.0 Criticism

The efficacy of skill training initiatives and the requirement for ongoing assessment and impact analysis are the primary points of criticism directed at the Skill India Initiative. To make sure that the skills learned are resulting in worthwhile job prospects, it is critical to evaluate the training's effects and results. To find the holes and places that require work, there must be processes in place for regular monitoring and review. To effectively execute the Skill India Initiative, it is imperative to tackle the obstacles associated with program execution, guarantee sufficient infrastructure, and expand the training programs to a broader demographic.

## 7.0 Findings

With more than 65% of its population in the working age group, India is well-positioned to take advantage of its demographic advantage through efficient skill development. Through the National Skill Development Mission (NSDM), the

2014-founded Ministry of Skill Development and Entrepreneurship (MSDE) leads the “Skill India” initiative. Even with major programs like the National Skills Qualifications Framework (NSQF) and the Pradhan Mantri Kaushal Vikas Yojana (PMKVY), just 5 percent of Indian workers between the ages of 20 and 24 have completed formal vocational training, while this figure is between 60 and 90 percent in industrialized nations. Millions of people have benefited from key programs that offer short-term training. Between 2009 and 2020, 2.5 crore people were trained, and 1.37 crore applicants were taught under PMKVY, of whom over 1.1 crore have received certification.

Initiatives to support short-term training have been launched in the Northeastern states and LWE-affected areas, and specialized courses like drone operation have been added to ITIs. Working together with the Ministry of External Affairs (MEA) has made it easier for talented Indian professionals to be deployed overseas, which has increased employment prospects worldwide. India’s rise from 13th place in 2019 to 11th place in 2022 in the WorldSkills Competition is indicative of a greater understanding and proficiency in skill development. However, issues like cultural prejudices, financial disincentives, mismatches between the training sector and the business, and a lack of skilled trainers continue to exist. Promising results are shown by special initiatives such as UDAAN and SANKALP, as well as these collaborations for employment abroad; however, the success of these programs depends on ongoing evaluation, improved infrastructure, and efficient implementation to guarantee that skill acquisition results in meaningful employment and sustainable economic growth.

## 8.0 Recommendations

Based on the provided analysis of India’s National Skill Development Mission (NSDM) and related programs, here are key recommendations to enhance its impact and address challenges:

- *Enhance Alignment with Industry Demands:* Establish Industry Partnerships Strengthen collaboration between vocational training providers and industries to ensure that training aligns with evolving job market needs, especially in emerging fields such as IT, renewable energy, and advanced manufacturing. Sector-Specific Skill Development Introduce industry-specific certification programs that focus on high-demand skills, ensuring that vocational education remains relevant to both current and future job markets.
- *Address Regional Imbalances and Expand Outreach:* Increase Outreach in Rural and Remote Areas Launch targeted campaigns to raise awareness of skill development opportunities in underrepresented regions, especially in rural areas, where knowledge of existing programs is limited. Localized Infrastructure Investments Enhance infrastructure, especially in underdeveloped regions, to ensure equitable access to training centers with modern facilities and resources.

- *Improve Quality of Trainers and Training:* Establish Trainer Development Programs Invest in quality training for trainers through structured career advancement pathways, workshops, and certifications. Skilled trainers are key to improving overall training outcomes. Incorporate Digital Tools for Training Use digital platforms, AI, and VR technologies to offer flexible, high-quality, and accessible training modules. This can help overcome challenges posed by geographic and resource limitations.
- *Promote Cultural Shifts and Address Socio-Cultural Biases:* Vocational Career Advocacy Run national campaigns to promote the dignity of labor and address societal biases against vocational professions, highlighting the economic benefits and career growth in skill-based jobs. Include Vocational Training in Schools Ensure that skilling is embedded in school curriculums from early stages, fostering a culture of skill-based learning and career diversity.
- *Strengthen Monitoring and Evaluation Systems:* Implement Robust Monitoring Framework Develop comprehensive monitoring and evaluation mechanisms to regularly assess program outcomes, ensuring that training leads to tangible employment and skill certification. Establish Feedback Loops with Industry Introduce a continuous feedback mechanism between industries and training providers to promptly address skill mismatches and update curricula accordingly.
- *Expand Financial Incentives and Support:* Link Financial Incentives to Quality Training Design financial models that tie government funding to the employability outcomes of training programs, encouraging providers to focus on quality over quantity. Subsidize Advanced Courses Offer subsidized programs for advanced and specialized training in emerging technologies, attracting more learners to high-value skill domains.
- *Foster Global Employment Opportunities:* Global Certification Standards Develop and promote certification programs that align with international skill standards, increasing the global employability of Indian workers. Expand Overseas Employment Programs Work closely with international governments and businesses to create structured pathways for skilled Indian workers to find employment abroad.
- *Promote Inclusivity and Support for Marginalized Groups:* Customized Programs for Vulnerable Groups Continue and expand initiatives that focus on the skill development of women, differently-abled individuals, and rural youth, ensuring that no section of society is left behind. Create Mentorship Programs Establish mentorship networks where skilled professionals guide and support trainees from disadvantaged backgrounds, encouraging their participation in the workforce.
- *Leverage Public and Private Sector Collaboration:* Public-Private Partnerships Foster more partnerships with private training providers to offer specialized and market-aligned courses, leveraging the expertise and resources of the private

sector. Utilize Existing Public Infrastructure Maximize the use of public infrastructure, such as schools and government buildings, for vocational training, especially in resource-constrained areas.

- *Address Policy and Bureaucratic Challenges:* Simplify Administrative Processes, Streamline bureaucratic processes to enhance the speed and efficiency of program implementation, avoiding delays due to red tape. Ensure Continuity Across Political Changes: Advocate for policies that ensure the continuity of skill development programs despite changes in political leadership or priorities, focusing on long-term sustainable development goals.
- *Incentivize Skill Development for MSMEs:* Offer financial incentives and tax benefits to micro, small, and medium-sized enterprises (MSMEs) that prioritize skill development for their employees. This could motivate companies to invest in training and help bridge the gap between skilled and unskilled workers in critical sectors.
- *Awareness in Remote Areas:* Launch targeted awareness campaigns in rural and remote areas to inform young people and marginalized communities about available skill development programs. Using mobile apps, social media, and community leaders can ensure greater reach and participation.
- *Establish Career Progression Pathways for Trainers:* Focus on building clear career progression opportunities for trainers. By offering continuous professional development and competitive remuneration packages, the shortage of competent trainers can be addressed and the quality of training improved.
- *Expand Industry-Specific Apprenticeships:* Strengthen collaboration between the government and industries to create more apprenticeship programs tailored to specific sectors. This will ensure that students gain hands-on experience and develop skills directly relevant to market needs.
- *Incorporate Soft Skills and Entrepreneurship Training:* Integrate modules on soft skills, communication, and entrepreneurship into existing programs. This will equip trainees not only with technical skills but also with the ability to adapt to changing job markets and explore self-employment opportunities.

## 9.0 Conclusion

In conclusion, if skill development is done well, India's population advantage offers a special chance for economic progress. Through the National Skill Development Mission (NSDM) and programs like PMKVY and NSQF, the Ministry of Skill Development and Entrepreneurship (MSDE) has trained millions of people and introduced specialized courses. Working together with the Ministry of External Affairs has increased employment prospects worldwide, as India's WorldSkills Competition ranking shows. But to fully achieve this potential, it is imperative to address enduring issues including social prejudices, financial disincentives,



inadequate training, and a lack of skilled trainers. Sustained economic growth and meaningful employment can only be achieved through skill acquisition through effective implementation, improved infrastructure, and ongoing review.

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## CHAPTER 8

### **The Economic Impact of Green Fiscal Measures: Analyzing Tax Incentives, Clean Energy Subsidies, and Environmental Levies for Sustainable Growth in India**

*Amev V. Bhavikatti\*, Maruti N. Sadavar\*\**

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#### ABSTRACT

**Background:** The transition to a green economy is essential for sustainable development in India. Green fiscal measures, including tax incentives, clean energy subsidies, and environmental levies, are key tools designed to drive this transition by promoting renewable energy investments and reducing carbon emissions. **Objective:** This paper investigates the economic impact of these fiscal measures on fostering sustainable growth in India. The aim is to evaluate their effectiveness in enhancing renewable energy investments, reducing carbon emissions, and improving economic resilience. **Results:** Through statistical analysis and a comparative approach, the study finds that tax incentives significantly increase investments in renewable energy, clean energy subsidies lower the costs of new technologies, and environmental levies help internalize the cost of pollution. Collectively, these measures contribute to greater green investment and environmental improvements. **Conclusion:** The research underscores the positive economic outcomes of green fiscal measures and offers policy recommendations for strengthening India's green fiscal framework. These insights are intended to help policymakers enhance strategies for supporting sustainable development and achieving environmental and economic goals.

**Keywords:** Green Fiscal Measures; Clean Energy Subsidies; Renewable Energy Investments; Sustainable Growth; Green Economy.

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### **1.0 Introduction**

#### **1.1 Contextual background**

Sustainability has become a key focus in contemporary economic policy development. As the world works to tackle the impacts of climate change, nations such as India, undergoing fast economic progress, must juggle the requirements of growth with the shift towards a low-carbon economy. Implementing eco-friendly financial policies like tax breaks, funding for clean energy, and green fees are essential for advancing sustainable development.

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These steps are designed to encourage investment in renewable energy, decrease carbon emissions, and promote technological advancements in clean energy. The International Energy Agency (IEA, 2021) reports that fiscal measures focused on environmental sustainability have played a key role in speeding up the adoption of renewable energy in developing nations.

The adverse need to combat climate change has changed governments around the world to introduce different financial initiatives to support environmental sustainability. In India, initiatives like tax breaks, support for renewable energy, and environmental charges are being implemented to shift towards a low-carbon economy as part of a larger plan (Ghosh & Ghosh, 2019). These steps are not just important for achieving the nation's climate targets but also for securing sustainable economic growth and stability in the long run (Mukherjee & Chakraborty, 2020).

The concept of sustainability has become prominent in contemporary economic policy formulation. Developing nations like India must strike a balance between the need for development and the shift to a low-carbon economy as the world works to mitigate the effects of climate change. Environmental levies, clean energy subsidies, and tax incentives are examples of green fiscal policies that are essential for advancing sustainable development. These policies seek to lower carbon emissions, encourage investment in renewable energy, and promote technological advancement in the clean energy industry. Fiscal policies aimed at environmental sustainability have played a key role in driving the adoption of renewable energy in developing nations according to the International Energy Agency (IEA 2021). The pressing need to tackle climate change has prompted governments across the globe to enact diverse fiscal policies with the objective of endorsing ecological sustainability.

Green fiscal policies have been implemented in India as part of a big plan to move the country toward a low-carbon economy. These policies include tax breaks, renewable energy subsidies, and environmental levies (Ghosh and Ghosh 2019). According to Mukherjee and Chakraborty (2020), implementing these policies is essential not only for the nation to achieve its climate goals but also for maintaining long-term economic growth and stability. In the worldwide scenario, countries like the United States, Germany, and China have introduced different green fiscal policies with different levels of achievement. There is ample evidence supporting the success of these policies in reaching their goals, such as decreasing greenhouse gas emissions, encouraging energy efficiency, and stimulating economic growth. Nevertheless, the issue of need to analyze the effectiveness and consequences of these measures in India is important because of the specified economic, social, and environmental obstacles the country must address.

## **1.2 India's current scenario**

India is among the world's quickest developing economies, yet this resulted in a substantial environmental toll. The nation's use of coal and other renewable

fuels for energy has positioned it as one of the largest contributors of greenhouse gas emissions worldwide. In order to tackle this problem, the Indian government have implemented many environmentally-friendly financial policies to encourage the usage of renewable energy, enhance energy efficiency, and diminish carbon emissions. In spite of these efforts, India continues to encounter major obstacles in its shift towards a sustainable economy. These obstacles consist of the expensive start-up expenses of renewable energy technologies, the requirement for substantial infrastructure funding, and the opposition from industries with strong ties to fossil fuels. This paper seeks to evaluate how India's green fiscal policies are influencing the economy and their success in encouraging sustainable development.

### **1.3 Problem statement**

India's dedication to the Paris Agreement and its ambitious goal of reaching 500 GW of renewable energy capacity by 2030 emphasizes the importance of efficient fiscal measures. Yet, the difficulty is in creating and putting into action these policies, guaranteeing they are both financially feasible and environmentally efficient. The main focus of this paper is to examine how tax incentives, clean energy subsidies, and environmental levies have impacted India's sustainable development.

### **1.4 Research objective**

The primary objective of this research study is to know the economic impact of green fiscal measures in India, focusing on tax incentives, clean energy subsidies, and environmental levies. The research's goal is to assess the impact of these actions on investments in renewable energy, carbon emissions reduction, and the country's economic development.

### **1.5 Research questions**

- How effective are tax incentives in promoting investments in clean energy in India?
- What is the economic impact of clean energy subsidies on the adoption of renewable energy technologies?
- How do environmental levies influence the behavior of polluting industries and contribute to reducing emissions?
- What are the broader economic implications of these green fiscal measures for India's sustainable development?

## **2.0 Literature Review**

### **2.1 Global practices**

A substantial amount of research has investigated how fiscal policies can drive sustainable development. Jakob *et al.* (2015) emphasize how green fiscal

policies have the potential to address market failures linked to environmental degradation. In the same way, Toman (2016) suggests that effectively planned environmental taxes can offer powerful motivations for decreasing carbon emissions and also produce income that can be utilized to support public services.

An examination of green fiscal policies worldwide reveals that Germany, China, and the United States have effectively utilized tax benefits, financial aid, and carbon pricing to encourage the uptake of renewable energy. Based on IEA (2020) findings, Germany's feed-in tariff system has played a key role in promoting the expansion of wind and solar energy by offering a fixed price to renewable energy producers, resulting in a notable rise in renewable energy capacity. Tax credits in the United States have been employed to encourage investments in renewable energy projects, leading to significant expansion in wind and solar energy industries. In the meantime, Liu *et al.* (2019) observed that China's subsidies and emission trading schemes have led to a fast expansion of renewable energy.

## **2.2 India's green fiscal measures**

In India, Srivastava *et al.* (2021) show that tax breaks have successfully encouraged investment in renewable energy, specifically in solar power. In a similar vein, Bhattacharya *et al.* (2019) conducted a study which concluded that the implementation of tax reduction for sustainable energy projects in India played a key role in boosting these measures.

Taxes like carbon taxes are essential for decreasing emissions and protecting the environment. Sharma & Singh (2021) contend that implementing environmental taxes can make industries bear the external pollution costs, leading to a shift towards cleaner technologies. Additionally, research conducted by Kumar & Gupta (2020) demonstrates that implementing a carbon tax on coal in India has resulted in substantial decreases in emissions within the power industry.

India's environmentally friendly financial actions have changed with time, showing the nation's increasing dedication to sustainable progress. The Indian government has put in place various policies to encourage renewable energy, enhance energy efficiency, and decrease carbon emissions. The Accelerated Depreciation Scheme permits renewable energy firms to claim 80% depreciation in the initial year, thus lowering their tax burden. Another significant action taken is the exemption of Goods and Services Tax (GST) for solar power equipment, lowering the expenses for establishing solar power projects, and the application of a carbon tax on coal to lessen the dependency on fossil fuels in the country. These actions have helped the renewable energy industry in India expand quickly, positioning it as a major market for solar and wind energy globally.

## **2.3 Economic theories**

The theoretical foundation for this research study is based in environmental economics, which explores the economic impact of environmental policies and the

role of government intervention in correcting market failures. One of the key concepts in environmental economics is the Pigovian tax, named after economist Arthur Pigou, who advocated for taxing negative externalities such as pollution to encourage more sustainable behavior.

Subsidies, on the other hand, are seen as a way to promote positive externalities, such as the adoption of renewable energy technologies. By reducing the cost of these technologies, subsidies will be more competitive with conventional energy sources, leading to increased investments and adoption.

The concept of environmental levies, such as carbon taxes, is also central to this study. These levies are designed to internalize the environmental costs of pollution, making it more expensive for industries to continue polluting. By shifting the economic burden onto polluters, environmental levies create financial incentives for industries to adopt cleaner technologies and reduce their emissions.

### **3.0 Methodology**

#### **3.1 Research design**

The research design for this study combines both qualitative and quantitative approaches. The qualitative component involves a comprehensive review of policy documents, academic literature, and case studies related to green fiscal measures in India. The quantitative component includes the use of statistical analysis techniques, such as regression analysis and time-series analysis, to evaluate the impact of these measures on economic indicators such as investments in renewable energy, and carbon emissions.

#### **3.2 Data sources**

The data used in this study is sourced from a bunch of governmental and industry reports, including those published by the Ministry of New and Renewable Energy (MNRE), the Reserve Bank of India (RBI), and the Central Pollution Control Board (CPCB). Additional data is obtained from financial statements of renewable energy companies and market data from industry reports.

#### **3.3 Analytical tools**

The study employs several statistical techniques to analyze the data and evaluate the impact of green fiscal measures. Regression analysis is used to know the relationship with tax incentives and investments in renewable energy. Time-series analysis is employed to see the impact of subsidies on the adoption of renewable energy technologies over time. Data visualization tools, such as graphs and tables, are used to present the findings in a clear and concise manner.

#### **3.4 Hypotheses**

*H0 (Null Hypothesis):* Green fiscal measures (tax incentives, clean energy subsidies, and environmental levies) have no significant impact on the growth of

renewable energy investment, reduction in carbon emissions, and economic development in India.

*H1 (Alternative Hypothesis):* Green fiscal measures (tax incentives, clean energy subsidies, and environmental levies) have a significant positive impact on the growth of renewable energy investment, reduction in carbon emissions, and economic development in India.

## 4.0 Analysis and Results

### 4.1 Tax incentives

Tax benefits have played a very important role in encouraging investment in renewable energy projects in India. The Accelerated Depreciation (AD) benefit and the 80IA tax holiday had a significant role in enticing private sector investments (Srivastava *et al.*, 2021). The Accelerated Depreciation (AD) benefit enables investors to take advantage of a faster depreciation rate on renewable energy assets, leading to a decrease in taxable income and a boost in cash flow during the starting stage of the projects (Ghosh & Ghosh, 2019).

**Table 1: Impact of Tax Incentives on Renewable Energy Investments (2020-2023)**

Year	Investment in Renewable Energy (USD Billion)	Tax Incentives Provided (USD Billion)	Increase in Capacity (GW)
2020	18	3.5	8
2021	22	4.2	10
2022	25	4.8	12
2023	30	5.5	14

*Source: Ministry of New and Renewable Energy (MNRE) and IRENA (International Renewable Energy Agency)*

The results indicate a strong positive correlation between tax incentives and investments in renewable energy as shown in Table 1. With the rise in tax incentives, there was a parallel increase in funding for projects related to solar and wind energy. This suggests that tax incentives are an effective tool for promoting renewable energy investments in India.

### 4.2 Clean energy subsidies

Subsidies for clean energy have been essential in lowering the price of renewable energy technologies, enabling them to be more affordable and competitive with traditional energy sources. This part displays the results of a time-series analysis that examines the impact of subsidies on the adoption of solar and wind energy in India.



**Table 2: Impact of Subsidies on Renewable Energy Deployment (2010-2023)**

Year	Subsidy Amount (INR Billion)	Solar Capacity Added (MW)	Wind Capacity Added (MW)
2010	5.6	50	1600
2015	15.2	2050	2400
2020	45.8	6700	2110
2023	50.4	9500	4000

Source: Ministry of New and Renewable Energy (MNRE), 2023

The study indicates a notable rise in the utilization of solar and wind energy technologies in India as subsidies have risen as shown in Table 3. The beneficial effects of subsidies can be seen in the expansion of solar and wind energy capacities, highlighting the importance of governmental financial assistance in speeding up the shift to renewable energy. The analysis of time series additionally shows that times with increased subsidies resulted in a quicker growth of renewable energy initiatives, indicating that subsidies are crucial in reducing obstacles for clean energy innovations.

#### 4.3 Environmental levies

Environmental levies like carbon taxes aims to internalize the environmental costs of pollution, which encourages industries to lower their carbon footprint. The application of a sustainable tax on coal in India has been a major environmental levy, the introduction of a sustainable tax on coal has been one of the most important environmental levies. This section studies how these taxes affect emissions from important sectors like power generation, cement, and steel.

**Table 3: Emission Reductions in Polluting Industries Subject to Environmental Levies (2010-2023)**

Industry	Emissions (Million Tons)		Levy Amount (INR Billion)
	2010	2023	
Power	590	480	22
Cement	260	220	18
Steel	170	135	14

Source: Central Pollution Control Board (CPCB)

The study shows that the implementation of environmental taxes has resulted in a significant decrease in emissions in the industries under investigation as shown in Table 4. The power industry in India, a major source of carbon emissions, experienced a notable reduction in emissions after the introduction of the carbon tax. the cement and steel sectors, both seen for their high energy consumption, also saw decreases in their carbon emissions. This shows that environmental taxes are

successful in motivating businesses to implement greener technologies and lower their emissions.

#### 4.4 Comparative analysis with global practices

In order to understand how effective India’s green fiscal measures are on a global scale, this section will show their impact in comparison to similar measures taken by other countries. The analysis is centered on nations in Germany, United State and China, who have taken the lead in implementing environmentally friendly financial measures.

**Table 4: Comparative Analysis of Green Fiscal Measures (2023)**

Country	Key Measures	Impact on Renewable Energy (Capacity Growth %)	Emission Reductions (%)
Germany	Feed-in Tariffs, Carbon Pricing	35	25
USA	Tax Credits, Clean Energy Standards	30	20
China	Subsidies, Emission Trading	40	30
India	Tax Incentives, Subsidies, Environmental Levies	28	18

*Source: International Renewable Energy Agency (IRENA) and OECD Reports on Environmental Taxes*

The comparison indicates that although India’s green fiscal policies have had an impact, there is still potential for enhancement. Nations as China and Germany have seen increased growth in renewable energy capacity and stronger decreases in emissions, in part because of their more forceful and inclusive green fiscal measures as shown in Table 4. India’s current strategies are successful, but they could see improvement with a broader reach, higher tax rates, and more precise subsidy targeting.

#### 4.5 Economic impact of green fiscal measures

In addition to their positive impact on the environment, green fiscal policies also have important economic consequences. This part analyzes the wider economic consequences of these actions, such as their impact on GDP growth, employment, and industrial competitiveness. The Reserve Bank of India (RBI) sustainability report 2023 shows that green fiscal measures have a positive role to play in boosting India’s GDP, mainly by driving growth in the renewable energy industry. The potential for job creation from these actions is considerable, with clean energy subsidies resulting in the newest jobs. Nevertheless, the effect on industrial competitiveness differs, as industries that have been hesitant to implement cleaner technologies face challenges from environmental charges.

#### 4.6 Sectoral impact analysis

This part explores how green fiscal measures affect various sectors of the Indian economy, such as energy, manufacturing, and agriculture.

##### 4.6 Energy sector

The green fiscal measures, such as tax incentives and subsidies has been the primary beneficiary of green fiscal measures. The rapid expansion of solar and wind power has not just lowered India's power generation carbon intensity, but also improved energy security by broadening the country's energy sources.

##### 4.7 Manufacturing sector

Environmental taxes have had a major effect on the manufacturing industry, especially on heavy sectors such as steel and cement. Although these taxes have resulted in lower emissions, they have also raised production costs, causing worries about competitiveness in the international marketplace. Nevertheless, implementing cleaner technologies and energy efficiency methods could potentially counterbalance these expenses in the future.

##### 4.8 Agricultural sector

While green fiscal measures don't have direct focus on the agricultural sector, it has indirectly gained from the wider effort towards sustainability. The utilization of renewable energy technologies, like solar-powered irrigation systems, has aided in decreasing the carbon footprint of agriculture and enhancing energy accessibility in rural regions. Nevertheless, the industry still faces risks from climate change, and additional assistance is required in the form of specific subsidies and incentives to promote sustainable methods.

#### 5.0 Statistical Analysis

To test the hypotheses, multiple regression and correlation analyses are used to assess the relationships between green fiscal measures and key performance indicators (e.g., investment, capacity growth, emissions).

##### Regression Analysis for Impact of Tax Incentives on Renewable Energy Investments

Model: Investment in Renewable

$$\text{Investment in Renewable Energy} = \alpha + \beta_1 (\text{Tax Incentives}) + \epsilon$$

*Results:* As shown in Table 5, the p-value for the coefficient of tax incentives is less than 0.05, indicating that tax incentives have a significant positive impact on renewable energy investments. Therefore, we reject the null hypothesis (H0) and accept the alternative hypothesis (H1).

**Table 5: Regression Analysis Calculation for Impact of Tax Incentives on Renewable Energy Investments**

Variable	Coefficient (β)	Standard Error	t-Statistic	p-Value
Constant (α)	10.5	1.2	8.75	0.000
Tax Incentives (β1)	3.85	0.45	8.55	0.000

Source: Data Compiled and Calculated by the Author

**Time-Series Analysis for Impact of Clean Energy Subsidies on Deployment**

Model: Capacity Growth (Solar/Wind) = α + β1(Subsidies) + ε  
 $\text{Capacity Growth (Solar/Wind)} = \alpha + \beta_1 (\text{Subsidies}) + \epsilon$

Results: As shown in Table 6, the analysis shows that clean energy subsidies have a significant positive impact on the deployment of renewable energy. The p-value is less than 0.05, leading us to reject the null hypothesis (H0) and accept the alternative hypothesis (H1).

**Table 6: Time-Series Analysis Calculation for Impact of Clean Energy Subsidies on Deployment**

Variable	Coefficient (β)	Standard Error	t-Statistic	p-Value
Constant (α)	1000	200	5.00	0.002
Subsidies (β1)	150.5	20.3	7.42	0.001

Source: Data Compiled and Calculated by the Author

**Regression Analysis for Environmental Levies on Emission Reduction**

Model: Emission Reductions = α + β1 (Environmental Levies) + ε  
 $\text{Emission Reductions} = \alpha + \beta_1 (\text{Environmental Levies}) + \epsilon$

Results: As shown in Table 7, The negative coefficient suggests that environmental levies lead to a reduction in emissions. The p-value is significant at less than 0.05, confirming that environmental levies effectively reduce emissions. Thus, the null hypothesis (H0) is rejected in favor of the alternative hypothesis (H1).

**Table 7: Regression Analysis Calculation for Environmental Levies on Emission Reduction**

Variable	Coefficient (β)	Standard Error	t-Statistic	p-Value
Constant (α)	300	50	6.00	0.000
Environmental Levies (β1)	-20.8	2.5	-8.32	0.000

Source: Data Compiled and Calculated by the Author

The statistical analysis provides robust evidence supporting the alternative hypothesis (H1), indicating that green fiscal measures (tax incentives, clean energy subsidies, and environmental levies) significantly impact renewable energy investment, carbon emission reductions, and economic development in India.

## **6.0 Discussion**

### **6.1 Interpretation of results**

The results of this research indicate that green financial policies have significantly benefited India's economic and environmental results. Tax breaks and financial support have successfully encouraged investments in renewable energy, whereas charges for environmental impacts have helped cut emissions in important sectors. The findings are consistent with the predicted outcomes that these actions can fix market inefficiencies and encourage lasting development.

### **6.2 Policy implications**

Several policy implications are linked with success of green fiscal measures in India. Initially, it is necessary to broaden the range of environmental taxes to include additional sectors and raise their levels in order to provide more encouragement for lowering emissions. In addition, subsidies could be made more effective by improving their targeting and guaranteeing they reach their intended recipients. Next, the government should think about combining green fiscal measures with a wider range of economic policies, like industrial and trade policies, to ensure a comprehensive approach to sustainable development.

### **6.3 Challenges and limitations**

Although green fiscal measures have had a positive effect, there are still various obstacles to overcome. Major obstacles to wider adoption of renewable energy technologies include high initial costs, substantial infrastructure investments, and opposition from established industries. Moreover, the study's dependence on secondary data hinders the ability to fully grasp the complexity of the economic effects of green fiscal measures. Future studies could overcome these constraints by including original data and investigating the lasting effects of these actions on financial stability.

### **6.4 Recommendations for future research**

Future investigations should concentrate on multiple areas to expand on the results of this research. Initially, it is necessary to conduct a more thorough sector-by-sector analysis in order to comprehend how green fiscal policies affect different industries in varying ways. Additionally, it is important for research to investigate how international collaboration can improve the efficiency of green fiscal policies, especially within the framework of global climate treaties. In conclusion, upcoming

research should investigate the societal effects of these actions, such as their influence on inequity and availability of renewable energy.

## **7.0 Conclusion**

### **7.1 Summary of findings**

This study concludes that implementing green fiscal policies has greatly benefited the promotion of sustainable development in India. Tax incentives and subsidies support have encouraged significant funding in renewable energy, leading to the quick growth of the industry and aiding in decreasing the nation's carbon emissions. Environmental taxes have also proven successful in encouraging industries to implement greener technologies and decrease their emissions.

### **7.2 Policy recommendations**

Based on the findings, the following policy recommendations can be given  
*Expansion of Environmental Levies:* Increase the range of industries subject to environmental levies and raise levy rates to encourage more emission reduction.

*Strengthened Targeting of Subsidies:* Enhance the focus of subsidies to ensure they effectively assist in the uptake of renewable energy technologies and reach the intended recipients.

*Integration with Broader Policies:* Incorporate green fiscal measures into wider economic policies for a comprehensive approach to sustainable development, improving the overall effectiveness of these measures.

### **7.3 Final remarks**

Implementing green financial policies is crucial for attaining sustainable development in India. It is important to guarantee that economic growth is in line with environmental sustainability as the country progresses. India can establish a strong position as a global leader in combating climate change by enhancing and broadening these strategies to create a green economy that is both environmentally sustainable and economically resilient.

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## CHAPTER 9

### Enhancing Women's Empowerment in India: Role of SIDBI

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#### ABSTRACT

The Micro, Small, and Medium Enterprises (MSME) sector in India has benefited greatly from the support of the Small Industries Development Bank of India (SIDBI) (Government of India, 2022). Through a number of its activities, including easing access to financing, offering skill development opportunities, and promoting female entrepreneurship, SIDBI has significantly advanced women's empowerment. The purpose of this research paper is to study the Small Industries Development Bank of India (SIDBI) policies for women's empowerment in India. The influence of SIDBI's programs on improving women's social and economic position is highlighted in this article through a review of the organization's objectives and results. Through an analysis of case studies, the research offers valuable insights into the achievements of (SIDBI) during its endeavors to empower women and achieve the goal of promoting women empowerment. The results highlight the significance of focused financial and non-financial support in promoting women's entrepreneurship and offer tactics for improving SIDBI's influence on women's empowerment in the future.

**Keywords:** Women's Empowerment; SIDBI; Entrepreneurship; Case Studies; MSME.

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#### 1.0 Introduction

Facilitating women entrepreneurs' access to capital is one of the main functions of the Small Industries Development Bank of India (SIDBI) (sharma, 2019). The establishment and growth of micro-, small-, and medium-sized businesses (MSMEs) are supported by SIDBI through several initiatives, including the Women Entrepreneurial Development Program and the Mahila Udyam Nidhi Scheme. To promote business and help women achieve financial independence, financial accessibility is essential.

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Furthermore, SIDBI's partnership with Self-Help Groups (SHGs) has had a significant impact on financial literacy and group savings, enabling women to get loans and develop their entrepreneurial abilities. These efforts have a wide-ranging effect, empowering women to disrupt established gender stereotypes and break down socio-cultural obstacles to support wider economic development (Kumar & Lal, 2018).

### **1.1 Role of SIDBI in enhancing women's empowerment in India**

SIDBI is dedicated to helping women entrepreneurs grow their skills and abilities beyond just providing financial support. The bank assists women in navigating the challenges of entrepreneurship and gives them the tools they need to succeed over the long run through focused training programs and mentorship opportunities (Mehrotra, 2018). The government's overarching goal of encouraging gender equality and economic inclusion is in line with SIDBI's activities. Nevertheless, obstacles still exist despite these efforts, such as restricted financial availability and socio-cultural limitations (Roy, 2021). This study examines how well SIDBI's policies and initiatives have worked to remove these obstacles and support women-led entrepreneurship in India. It concludes with suggestions for strengthening the bank's support of long-term economic growth and women's emp.

### **2.0 Objectives**

The purpose of this research paper is to study the Small Industries Development Bank of India (SIDBI) policies for women's empowerment in India (Mohapatra & Sahoo, 2020). The influence of SIDBI's programs on improving women's social and economic position is highlighted in this article through a review of the organization's objectives and results. The particular goals consist of:

- *Evaluate the Effectiveness of SIDBI's Schemes:* Assess the success of SIDBI's initiatives in reaching and benefiting women entrepreneurs.
- *Identify Gaps and Challenges:* Investigate women's challenges in accessing SIDBI's schemes and how these can be addressed.
- *Impact on Women's Economic Empowerment:* Analyze the effect of SIDBI's programs on women's financial independence and social status (Das & Paul, 2020).
- *Recommendations for Policy Improvement:* Suggest ways to enhance the effectiveness of SIDBI's initiatives and other policy interventions to increase women's inclusion in the entrepreneurial ecosystem.

### **3.0 Literature Review**

*Women's Entrepreneurship in India: Context and Challenges:* By giving women entrepreneurs, especially those in the small and medium-sized enterprise

(SME) sector, financial support, SIDBI plays a critical role in empowering women. To support women-owned enterprises, it provides tailored financial products, adjustable loans, and competitive interest rates (Kumar & Singh, 2017). To meet the financial needs of women and assist them in starting and expanding enterprises, SIDBI works with both governmental and non-governmental groups to create tailored solutions. The Mahila Udyam Nidhi Scheme and the Women Entrepreneurial Development Program are two of the bank's main programs that support training in entrepreneurship and skill development. Despite these initiatives, research indicates that SIDBI's coverage is frequently inconsistent and focuses mostly on metropolitan areas, which limits the resources available to women entrepreneurs in rural areas. For female entrepreneurs, there are still major non-financial impediments to overcome, such as market access issues and social constraints.

*Role of SIDBI in promoting women's empowerment through MSMEs:* To empower women and enable them to launch and grow companies, financial inclusion is essential. Through focused initiatives, SIDBI's support of women-led businesses is highlighted by research. Studies also highlight the shortcomings in SIDBI's programs, such as the lack of assistance in removing non-financial obstacles including social restrictions and market access (Deshpande & Sharma, 2021). A more thorough investigation is required to determine whether SIDBI's programs can be sustained over the long run, according to researchers such as Mohapatra and Sahoo (2020). Furthermore, how SIDBI's activities affect industries like food processing and textiles, where women are more prevalent, are not well understood. The full potential of SIDBI's efforts toward women's empowerment is further limited by the challenges faced by rural women entrepreneurs, who also suffer from a lack of awareness, complicated procedures, and inconsistent program outreach.

*Impact of SIDBI's financial support programs on women entrepreneurs:* The Stand-Up India Scheme and the Microfinance Scheme for Women Entrepreneurs, two of SIDBI's programs, have made it possible for many women to launch greenfield businesses by making loans easily accessible. To encourage financial inclusion and give women the opportunity to make a substantial economic contribution to the country, these initiatives are crucial. Reaching out to rural women entrepreneurs still presents some obstacles, though. Further longitudinal study is required to monitor the long-term effects of SIDBI's programs on women's empowerment, especially in rural regions, according to studies. The success of women entrepreneurs depends heavily on non-financial support, such as capacity-building initiatives and mentoring. The significance of customized training programs for a range of needs is highlighted by research by Pandey et al. (2020), which indicates that women who receive training in financial literacy and business management are more likely to maintain their enterprises.

*Nonfinancial support: Mentorship, Training, and Market access:* There are still barriers, even if SIDBI's initiatives—like the Mahila Udyam Nidhi Scheme and the TREAD (Trade-Related Entrepreneurship Assistance and Development) Scheme

—have had a good effect on women business owners. According to research by Deshpande and Sharma (2021), the main obstacles are inadequate collateral choices and bureaucratic roadblocks. To ensure that SIDBI's programs are as successful as possible, more outreach and simplified application procedures are required. To overcome structural constraints, women must be empowered not only financially but also socially, according to theoretical frameworks like Amartya Sen and Martha Nussbaum's Capability Approach. Studies indicate that SIDBI's initiatives should be more inclusive of rural women and customized to address their particular difficulties. Policies are required in India to encourage a more encouraging entrepreneurial environment for women in a variety of industries.

### 3.1 Case studies

The Small Industries Development Bank of India, or SIDBI, has published several testimonies and success stories of female entrepreneurs who have profited from its programs. These narratives demonstrate how SIDBI's financial and developmental assistance has enabled Indian women to successfully launch their business ideas and effect social and economic change in their local communities.

*“Meenakshi's Textile Business in Uttar Pradesh:* Meenakshi, an entrepreneur in the textile industry from Uttar Pradesh, started with a modest handloom company. She was able to expand her product line, recruit more people, and update her equipment thanks to a loan she received from SIDBI's Mahila Udyam Nidhi Scheme (SIDBI,n.d.). These days, she runs a medium-sized textile company with over 50 employees, exporting her goods everywhere. Her experience is told on SIDBI's official YouTube channel, where she talks about how scaling her business and overcoming the difficulties of breaking into new markets were made possible by SIDBI's support.

*Karnataka's Kavita's Bakery:* The SIDBI Stand-Up India Scheme was utilized by Kavita, a home baker in Karnataka, to obtain a loan that allowed her to build a bakery(SIDBI,n.d.). . She was able to grow her business beyond her neighborhood and get contemporary baking equipment thanks to the money. Her company expanded quickly, and she soon started providing catering services for big events and business clientele. In her testimonial video, Kavita says she is thankful to SIDEI for helping her grow. SIDEI not only gave her the money she needed but also market access and business mentorship.

An inventive agri-tech solution was created by *Maharashtra entrepreneur Nandini to assist small farmers in raising crop yields by using sustainable methods.* Through the “TREAD Scheme,” which provided cash and guidance from SIDBI, she completed field experiments, built a prototype, and eventually launched her product on the market. Her success story is also included in SIDBI publications, where she talks about how the program's assistance with business growth and capacity building enabled her to get beyond early obstacles and sustainably grow her company.

*Rajasthani Handicraft Artist Rita founded a modest business to market her handcrafted items.* Rita is a traditional Rajasthani handicraft artist. She had trouble finding clients outside of her immediate neighborhood because of her modest starting resources. She was able to obtain a small loan through SIDBI's microfinance project to establish an online marketplace and expand her customer base. In her YouTube video, she describes how this change allowed her to build her business rapidly, which in turn created jobs for other women artisans in her neighborhood and a stable means of subsistence for many.

*Gujarat's Anita's Eco-Friendly Packaging Unit:* Gujarati Anita started her eco-friendly packaging company to encourage sustainable alternatives and lessen the use of plastic. SIDBI's developmental programs provided her with financial and mentoring support, enabling her to modernize her equipment and expand her clientele to include new industries. Anita describes her journey from being a small-scale business owner to running a sizable production facility that currently provides packaging materials to numerous domestic and international brands in a SIDAI film.

These testimonies demonstrate the various ways in which SIDBI's programs have helped female entrepreneurs overcome obstacles, innovate, and achieve sustainable growth. They are accessible through the organization's official YouTube channel and reports. Through the use of funding, mentoring, and capacity-building programs, these women have established successful enterprises that enhance their financial circumstances while also aiding in the socioeconomic advancement of their communities.

#### **4.0 Research Methodology**

Secondary sources are the primary source of data for this research. Secondary data analysis is a fitting approach for this study as it facilitates an extensive examination of extant literature, official reports from SIDBI, government publications, and other academic works. The procedure for gathering data includes:

*Examining SIDBI Publications and Annual Reports:* To obtain information on numerous schemes and programs specifically created for women entrepreneurs, such as the Women Enterprise Program and the Mahila Udyam Nidhi Scheme, a thorough analysis of SIDBI's annual reports from 2015 to 2023 was carried out. The number of beneficiaries, loan amounts disbursed, sectoral distribution, and regional outreach are all quantified in these reports.

*Publications and Reports from the Government:* The legislative framework, rules, and statistical data about women entrepreneurship in India were examined through a review of reports issued by government agencies, including the Ministry of Micro, Small, and Medium Enterprises (MSME) and NITI Aayog. The papers furnish contextual details regarding the alignment of SIDBI's initiatives with national policies and objectives.

*Scholarly articles and Academic Literature:* A comprehensive analysis of academic literature released from 2015 to 2023 was carried out to investigate prior

research on the function of financial institutions, such as SIDBI, in the empowerment of women. Search terms such as “women empowerment,” “SIDBI,” “financial inclusion,” “microfinance,” and “women entrepreneurship” were employed to locate pertinent literature in scholarly databases such as Research Gate, JSTOR, and Google Scholar.

*Case Studies:* To comprehend the qualitative impact of these initiatives, specific case studies of female entrepreneurs who have benefited from SIDBI’s schemes were examined. These case studies offer comprehensive insights into the experiences, difficulties, and results encountered by female entrepreneurs.

## **5.0 Results**

The study’s conclusions highlight the diverse ways in which the Small Industries Development Bank of India (SIDBI) supports women’s empowerment by implementing both financial and non-financial initiatives. The examination of secondary data highlights the successes and obstacles of SIDBI’s programs for female entrepreneurs, namely in the Micro, Small, and Medium-Sized Enterprises (MSME) industry. The main conclusions are grouped according to several issues, such as the success of financial plans, efforts aimed at building capacity, collaborations with local and non-governmental organizations, obstacles to credit availability, and the socioeconomic effects of SIDBI’s work.

### **5.1 Effectiveness of financial schemes for women entrepreneurs**

According to the study, SIDBI’s financial initiatives, like the Women Enterprise Program and the Mahila Udyam Nidhi Scheme, have been successful in giving women entrepreneurs the crucial financial help they need. SIDBI data state that between 2015 and 2023, these schemes awarded loans totaling more than INR 2,500 crores, supporting over 25,000 women-led MSMEs in a variety of industries, including trade, services, and manufacturing (Government of India, 2022). Data reveals a notable increase in the number of female entrepreneurs in the areas where SIDBI has aggressively supported these initiatives, pointing to a favorable relationship between the expansion of women-led businesses and SIDBI’s financial support. Furthermore, the results imply that SIDBI’s emphasis on industries like textiles, food processing, and handicrafts has been especially successful in empowering women because these industries frequently employ a sizable number of female workers.

### **5.2 The effects of programs for capacity building**

The capacity-building initiatives of SIDBI have been instrumental in augmenting the competencies and potential of female entrepreneurs. The study concludes that the women participants’ technical know-how, business management abilities, and financial literacy have all greatly increased as a result of SIDBI’s

training programs, which are carried out in partnership with NGOs, state governments, and educational institutions. For example, since its launch, the Women Enterprise Development Program has taught over 10,000 women, and more than 70% of participants say they feel more confident about running their enterprises. Through the improvement of their creditworthiness, market reach, and ability to manage challenging business situations, these programs have assisted female entrepreneurs in becoming more financially independent and self-sufficient.

### **5.3 Strength of local bodies' and NGOs' partnerships**

The results highlight how crucial SIDBI's strategic alliances with local organizations and non-governmental organizations are to expand its reach to underprivileged women, particularly in rural and semi-urban areas. SIDBI has been able to customize its programs to fit the unique requirements of women in various socioeconomic circumstances because of these relationships. For instance, the bank has been able to offer financial literacy programs and microloans to women who might not have access to traditional banking services thanks to cooperative initiatives with NGOs. According to the study, these collaborations have been especially effective in areas like Rajasthan, Uttar Pradesh, and Bihar, where societal and cultural barriers frequently prevent women from accessing financial resources.

### **5.4 Obstacles to obtaining credit**

Notwithstanding the benefits of SIDBI's endeavors, many obstacles nonetheless stand in the way of female entrepreneurs' ability to obtain loans. According to the report, there are three main obstacles to overcome: strict collateral requirements, a lack of credit history, and insufficient financial literacy. The collateral standards set forth by SIDBI, which are sometimes viewed as onerous, continue to provide challenges for many female entrepreneurs. Furthermore, a major obstacle for first-time borrowers is the absence of a formal credit history, particularly for those from underprivileged or rural backgrounds. The results indicate that more work has to be done to open up financing to a larger pool of female entrepreneurs, even though SIDBI has made steps to streamline its application processes and lower the amount of documentation required.

### **5.5 The initiatives of SIDBI's socio-economic impact**

The initiatives of SIDBI have a noteworthy socio-economic influence on the empowerment of women. According to the survey, women who have benefited from SIDBI's initiatives report having more autonomy and decision-making power in their homes in addition to reporting higher incomes and more economic stability. Data from case studies show that SIDBI-supported women-led enterprises typically return a sizeable amount of their profits to their communities, enhancing the quality of healthcare, education, and nutrition in the area. This demonstrates the wider social advantages of enabling women business owners since their ventures have a beneficial knock-on effect on neighboring communities.



### **5.6 Requirement for more outreach and improvements to policies**

The results point out several areas where SIDBI's policies should be improved for a bigger impact. Kay suggests either lowering collateral requirements even further or creating other credit evaluation models that don't mainly rely on conventional collateral. To guarantee that information about its programs reaches a wider audience, particularly in distant and underserved areas, the report also recommends that SIDBI increase the scope of its digital outreach operations. Furthermore, putting more of an emphasis on ongoing assessment and monitoring could make it easier to spot program weaknesses and adjust tactics to better suit the needs of female business owners.

### **5.7 Evaluation in comparison to other financial institutions**

Although SIDBI has been more aggressive than many other financial institutions in promoting women's empowerment, comparative research shows that there is still room for growth. Women without official papers or credit histories may occasionally be excluded from SIDBI's personalized lending method, in contrast to certain microfinance organizations that use group lending strategies. But compared to many other organizations, SIDBI offers a more comprehensive assistance structure that combines financial, capacity-building, and market-linkage efforts. According to the findings, SIDBI might increase the impact of its work by including aspects of community-based financing or group lending, which have proven successful in other settings.

### **5.8 Observational and implementational gaps**

The report finds multiple inadequacies in the way SIDBI's programs are implemented and monitored. Assessing the long-term effects of SIDBI's activities is difficult, for example, because there is no information available on the viability of women-led firms that get funding from the organization. The results show that to monitor beneficiaries' advancement over time and assess the efficacy of various treatments, more comprehensive data collecting and monitoring systems are required. Additionally, the analysis reveals inconsistent implementation across states, even though SIDBI's programs have demonstrated success in certain areas. This suggests a more standardized approach to the program.

## **6.0 Findings and their Implications**

The study's conclusions have several ramifications for practice and policy. They first highlight the necessity for SIDBI and related organizations to implement more inclusive financial models that are tailored to the unique requirements of female entrepreneurs, especially those who come from underrepresented groups. Second, the findings emphasize the value of financial literacy and capacity-building initiatives in empowering women, and they recommend that these be broadened and customized to

address the unique difficulties that women encounter in various socioeconomic settings. Third, the study shows that, particularly in rural areas, forming strategic alliances with local organizations and NGOs is essential to expanding the scope and effectiveness of funding initiatives. Ultimately, the results imply that ongoing observation and assessment are critical to guaranteeing the viability and efficiency of empowerment programs.

These enlarged results offer a thorough examination of the influence and efficacy of SIDBI's programs in empowering women business owners, stressing both the advantages and disadvantages. They provide insightful information about how SIDBI could strengthen its tactics and expand its role in advancing women's empowerment throughout India.

## **7.0 Challenges and Gaps in SIDBI's Regulations**

Notwithstanding its successes, SIDBI's policies have several drawbacks and difficulties. Deshpande and Sharma's (2021) and Chavan and Ramakumar's (2019) studies highlight important problems such as the difficulty of applying, the lack of collateral options, and the low awareness of available schemes among prospective recipients. Furthermore, more specialized assistance that is suited to the unique requirements of women in various areas and professions is required. These results imply that although SIDBI's programs have significantly advanced women's empowerment, they still have room for improvement to have the greatest possible impact.

## **8.0 Conclusion**

SIDBI has been essential in encouraging women's financial inclusion, especially in underprivileged areas. Women's access to credit and financial services has greatly improved because of SIDBI's microfinance programs and self-help group assistance. Women's empowerment to take charge of their financial destinies and economic independence have benefited greatly from this expanded access. The organization's emphasis on the growth of entrepreneurship has produced notable outcomes. With the help of training and assistance programs as well as tailored loan schemes from SIDBI, many women have been able to launch and expand their enterprises. In addition to raising people's incomes, this has helped create jobs and stimulated the economy more broadly in Indian villages.

The comprehensive strategy SIDBI uses to empower women is impressive. Through addressing social and educational requirements in addition to financial demands, SIDBI has developed a more all-encompassing and long-lasting model of empowerment. The financial literacy and skill development initiatives of the organization have furnished women with the requisite knowledge and resources to enable them to make well-informed decisions and engage in economic activities. As a result of SIDBI's activities, case studies and empirical analyses have shown

quantifiable gains in women's economic standing, their ability to make decisions in their households, and their general quality of life. These beneficial effects go beyond the lives of the particular recipients; they also challenge conventional gender standards and advance larger social change.

Reaching the most marginalized women and removing firmly ingrained social barriers are still difficult, though. Subsequent endeavors ought to concentrate on utilizing technology to broaden the reach, crafting more customized interventions for heterogeneous groups of women, and tackling intersectional concerns that impact the empowerment of women.

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## CHAPTER 10

### Building a Sustainable Future: Innovative Approaches to Climate Action and Environmental Care

*Aishwarya Byakod\**, *Basavaraj Nayakodi\*\**, *Jyoti Jamnani\*\*\**

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#### ABSTRACT

Environmental destruction and climate change are two of the most pressing issues facing us today. A global danger to ecosystems, human health, and economic stability, environmental damage and climate change are among the most urgent and complicated issues of our day. This study examines novel approaches to address these challenges, emphasizing cutting-edge technologies, successful remedies, and policy structures aimed at reduction of climate change's consequences and fostering sustainable growth. The emerging technologies and innovations such as advanced materials, renewable energy integration, energy system storage and carbon capture are used in this research. These actions are crucial for more than just limiting the negative effects of climatic change, but additionally for promoting sustainable development that balances environmental integrity and economic progress. The research is founded on the state-of-the-art research, the examination of the actual cases with innovative techniques can be effectively implemented. The work identifies three dominant areas where the innovative techniques can show the performances of the research. The research recommends for further study for sustainable future of the environmental care using climatic actions or conditions to enhance the environment sustainability and strengthen the global resilience against climatic conditions.

**Keywords:** Environmental destruction; Climate change; Economic stability; Sustainable growth.

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#### 1.0 Introduction

##### 1.1 Global energy and environmental context

In the past few years, the global community has faced an unprecedented challenge in balancing the demands for economic growth, energy security, and environmental sustainability. The growing worries about climate change, driven by rising greenhouse gas emissions, have brought the issue of energy consumption into sharp focus.

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According to the Intergovernmental Panel on Climate Change (IPCC), human activities, particularly the burning of fossil fuels for energy, are the primary contributors to global warming, resulting in significant changes to our climate systems. As a result, Solutions for sustainable energy are more important than ever.

The Paris Agreement, adopted in 2015, marked a significant milestone in global efforts to combat climate change by aiming to limit global temperature rise to well below 2 degrees Celsius above pre-industrial levels. To achieve this goal, nations around the world have devoted to cutting their carbon footprint transitioning to more sustainable energy systems. These commitments are driving the creation and implementation of cutting-edge technologies that can improve energy efficiency and reduce carbon emissions across various sectors, with a particular focus on buildings.

## **1.2 Significance of buildings in emissions of carbon and energy use**

Buildings are a fundamental part of modern society, providing shelter, comfort, and places for work and leisure. But they're also important consumers of energy and contributors to carbon emissions. One of the biggest sources of carbon pollution is the building sector, which accounts for around one-third of greenhouse gas emissions and about 40% of world energy consumption. This might be attributed to the energy needed for heating, cooling, lighting, and operating appliances within residential, commercial, and industrial buildings.

Traditional building practices often rely on energy-intensive materials and systems that contribute to a high energy usage and carbon emissions. For instance, conventional heating, ventilation, and Air conditioning (HVAC) Systems utilize a lot of energy, often powered by fossil fuels. Moreover, poor insulation, outdated lighting systems, and inefficient building designs further exacerbate energy wastage. As urbanization continues to accelerate, with more than 2.5 billion people projected to move into cities by 2050, the demand for energy in buildings is expected to rise significantly, posing a substantial challenge to sustainable development.

## **1.3 The need for emerging and sustainable technologies**

Building design, construction, and operation are changing due to emerging technologies including renewable energy integration, improved materials, and smart building management systems. For example, smart building technologies combine data analytics and sensors to optimize energy use in real-time, making sure that energy is used only when it is needed. Modern materials, such as energy-efficient windows and high-performance insulation, help keep interior temperatures comfortable while consuming less energy. Moreover, on-site energy generation is made possible by incorporating solar panels and other alternative energy systems and wind turbines into building designs, which lowers carbon dioxide output and dependence on grid electricity.

## **2.0 Literature Survey**

### **2.1 Smart building technologies**

The implementation of intelligent construction technologies has shown promise in enhancing energy efficiency and mitigating carbon emissions. In order to monitor and operate building systems in real-time, these technologies integrate data analytics, artificial intelligence (AI), and the Internet of Things (IoT). According to a study by Aste *et al.* (2017), smart building management systems can optimize the functioning of lighting, HVAC, and other systems based on real-time occupancy and environmental data, resulting in significant energy savings. According to study by Gill *et al.* (2010), automatic lighting systems that change based for example, can reduce energy consumption by up to 30% when used on occupancy.

### **2.2 Advanced building materials**

The creation of cutting-edge construction materials is essential to raising structures' energy efficiency. Phase-change materials (PCMs) and aerogels are two examples of high-performance insulation materials whose promise for lowering heat loss and preserving stable interior temperatures has been demonstrated by research. Aerogel-based insulation was investigated by researchers and it was found that these substances provide excellent thermal resistance, are lightweight, and are simple to install. Significant Energy-saving measures for cooling and heating applications may result from this.

Phase-change materials, or PCMs, represent yet another cutting-edge approach to improving the thermal performance of buildings. During phase transitions, PCMs absorb and release thermal energy, assisting in the stabilization of interior temperatures. According to Zhang, A., Liu, H., & Chen, X. (2018). study, adding PCMs to building materials can lower the peak cooling demand by as much as 30%. This technique helps lessen dependency on active heating and cooling systems, which is especially helpful in areas with large temperature swings.

### **2.3 Emerging technologies in building energy efficiency**

Emerging technologies that have the possibility of significantly increasing building energy efficiency have been the subject of numerous studies. One prominent instance is the incorporation of smart building technologies, which maximize energy use by utilizing data analytics, artificial intelligence (AI), and the Internet of Things (IoT). Aste *et al.* (2017) study found that smart building systems can save energy consumption by using real-time sensor data to dynamically manage lighting, HVAC, and other systems. By responding to occupancy patterns and environmental factors, these systems allow for predictive and adaptive control tactics that reduce energy waste. The creation of cutting-edge building materials is another field of innovation.

According to research by Zhang *et al.*, (2018), phase-change materials (PCMs) have the potential to enhance buildings' thermal energy storage. During

phase transitions, PCMs have the ability to absorb and release heat, stabilizing indoor temperatures and lowering the requirement for active heating and cooling. Researchers have investigated the efficacy of aerogel-based insulation materials, which are renowned for their low thermal conductivity, in improving building envelope performance while retaining a minimal thickness.

## **2.4 Sustainable design practices**

Sustainable building practices are based on passive design principles, which reduce energy use through architectural design. It is commonly known in the literature that methods like daylighting, natural ventilation, and passive solar architecture are efficient ways to lower energy consumption. For example, Olgyay & Herdt (2004) describe how artificial heating and cooling can be greatly reduced with passive solar architecture, which maximizes solar heat gain in winter and lowers it in summer. Similar to this, natural ventilation techniques that use temperature and wind variations to ventilate buildings can reduce HVAC energy usage and enhance indoor air quality (Brager & de Dear, 2000). Green walls and roofs are growing more and more popular as environmentally friendly architectural elements. According to research by Berardi *et al.* (2014), green roofs can enhance stormwater management, lessen the impact of the urban heat island, and give buildings more insulation. These advantages support increased biodiversity in urban environments and reduced energy use for heating and cooling.

## **3.0 Methodology**

### **3.1 Research approach**

This research employs quantitative methods to comprehensively explore innovative strategies for climate action and environmental stewardship. The study integrates literature review, analysis of emerging technologies to gather and analyse data.

### **3.2 Literature review**

A systematic literature review was conducted to gather existing research, reports, and publications related to climate action. The review focused on key areas such as the historical context of climate policies, technological advancements in mitigation and grassroots initiatives. Databases such as Google Scholar, PubMed, and Scopus were used to source relevant academic papers, reports, and articles.

### **3.3 Data collection**

Secondary data was gathered from a number of reliable sources:

#### **3.3.1 Worldwide reports**

International organizations are essential in gathering and disseminating thorough data about environmental protection and climate action. These publications

provide a plethora of knowledge on global climate trends, regulatory frameworks, technology developments, and creative solutions that are being employed.

### **3.3.2 The IPCC or Intergovernmental Panel on Climate Change**

Assessment reports on the science of climate change, its effects, potential hazards in the future, and strategies for adaptation and mitigation are released by the IPCC. Understanding the worldwide scientific agreement on climate change and pinpointing the areas that most require innovation are made possible by these publications.

### **3.3.3 UNEP, the United Nations Environment Programme**

Data on environmental governance, ecosystem health, and sustainability trends are provided by UNEP. It also addresses issues like climate resilience and the green economy, encouraging environmental innovation internationally.

### **3.3.4 Policy and government records**

To achieve the global environmental goals, national governments create sustainability plans and climate policies. These documents offer insights into how many nations are using innovation and policy changes to address climate concerns.

### **3.3.5 National plans and policies for climate change**

Governments release comprehensive plans and strategies for combating climate change, frequently in line with global accords like the Paris Agreement. Typically, these statements include objectives for improving environmental care, supporting renewable energy, and lowering emissions.

### **3.3.6 Reports on corporate sustainability**

Businesses are putting more and more emphasis on sustainability, and they frequently provide quarterly or annual reports detailing their innovations, goals, and environmental actions. These studies provide insightful information about the contribution of private sector innovation to combating climate change.

### **3.3.7 Reports on sustainability**

Environmental, social, and governance (ESG) reports, or sustainability reports, are released by major firms such as Unilever, Tesla, and Siemens. These papers frequently contain in-depth summaries of the businesses' efforts to innovate with green technologies, embrace the circular economy, and lessen their carbon impact.

## **3.4 Data analysis**

The collected data were analysed using quantitative methods. Statistical analysis was applied to quantitative data from case studies to evaluate the impact and effectiveness of the strategies.



## 4.0 Emerging Technologies and Innovations

Modern technology is necessary for improving building energy efficiency and cutting carbon emissions. These technologies make use of developments in energy storage technologies, novel materials, smart building systems, and integration of renewable energy sources. This section covers the advanced materials, renewable energy integration, energy system storage and carbon capture and storage.

### 4.1 Advanced materials

Innovative materials, such as aerogels, phase-change materials (PCMs), and nanomaterials, offer superior insulation and contribute to the energy efficiency of buildings.

- *Aerogels*: These lightweight, extremely porous materials have a low heat conductivity, which makes them great insulators. They lower heating and cooling demands by reducing heat transmission in building envelopes. Space-saving designs can benefit from the fact that aerogels can offer the same level of insulation as traditional materials while requiring a fraction of the thickness.
- *Phase-Change Materials (PCMs)*: PCMs absorb and during phase release thermal energy transitions (from solid to liquid and vice versa). When integrated into building materials, PCMs can stabilize indoor temperatures by absorbing excess heat during the day and releasing it at night. This reduces the need for active heating and cooling.
- *Nanomaterials*: Nanomaterials, such as nanocoating's and nanoporous insulators, enhance energy efficiency by improving thermal insulation and reducing solar heat gain. These materials can be applied to windows, walls, and roofs to provide better insulation without compromising aesthetics.

### 4.2 Renewable energy integration

Achieving sustainability goals requires incorporating renewable energy sources into architectural designs. Buildings are increasingly being equipped with solar panels, wind turbines, and geothermal systems to supply clean, sustainable energy.

- *Solar Panels*: Solar radiation is directly converted into electricity using photovoltaic (PV) panels. They might be installed on rooftops or integrated into building facades (BIPVs). Solar thermal systems, which use solar energy to heat water, are also commonly used in residential and commercial buildings.
- *Wind Turbines*: Small-scale wind turbines can be integrated into buildings, particularly in areas with favourable wind conditions. These turbines can generate electricity to supplement other renewable sources.

- *Geothermal Systems:* Geothermal heat pumps use the earth's stable underground temperature to heat and cool buildings. They are highly efficient and can reduce the need for conventional HVAC systems.

### **4.3 Energy storage systems**

For structures whose primary energy sources are intermittent renewables like solar and wind, efficient energy storage is essential to controlling energy supply and consumption. Energy demand and supply must be balanced, and cutting-edge energy storage technologies like lithium-ion batteries, flow batteries, and hydrogen storage are essential to this process.

- *Batteries with lithium-ion:* Because of its great efficiency and energy density, lithium-ion batteries are widely employed in both household and business settings. When energy production is at its highest, like on bright days, they have the capacity to store excess energy and release it at other times, like at night or on cloudy days.
- *Flow batteries:* Flow batteries are becoming a viable option for large-scale energy storage. One example of a type of flow battery is vanadium redox flow batteries. They have the benefit of a lengthy cycle life and are easily expandable by enlarging the electrolyte tanks.
- *Hydrogen storage:* By using electrolysis, hydrogen storage devices turn surplus electricity into hydrogen. Hydrogen has the ability to be stored and subsequently utilized in fuel cells to produce energy. This technique offers a means of long-term energy storage in big quantities.

### **4.4 Carbon Capture and Storage (CCS)**

In order to prevent carbon dioxide (CO<sub>2</sub>) emissions from sources like industrial activities from being released into the atmosphere, a method known as carbon capture and storage (CCS) involves either storing CO<sub>2</sub> emissions underground or using them for other purposes. CCS technologies have been looked into more and more in relation to buildings in order to reduce emissions. Biochar insulation, direct air capture and low carbon building materials are essential for carbon capture and storage.

#### **4.4.1 Biochar insulation**

By heating organic material without oxygen, a process known as pyrolysis, biochar is created from biomass and contains a high concentration of carbon. Using biochar as a thermal barrier in buildings has several advantages.

- *Carbon Sequestration:* By absorbing carbon that would otherwise be released into the atmosphere, biochar serves as a carbon sink. It is feasible to store carbon inside the building components by adding biochar to insulation.

- *Thermal Insulation:* Because of its effective thermal insulation, biochar can help cut down on the amount of energy is required for heating and cooling. Consequently, it is a more environmentally responsible option for insulation than traditional materials.
- *Moisture Regulation:* Because of its porous nature, biochar can control the amount of moisture in building envelopes, enhancing indoor air quality and lowering the possibility of mould formation.

#### 4.4.2 Direct Air Capture (DAC)

Direct Air Capture (DAC) is a method that uses chemical reactions to directly extract CO<sub>2</sub> from surrounding air. Buildings can incorporate DAC systems to capture operating emissions and even lower atmospheric CO<sub>2</sub> levels:

- *DAC Systems in Buildings:* The quality of indoor air can be enhanced and overall carbon capture efforts can be aided by installing DAC units in HVAC systems to remove CO<sub>2</sub> from the air.
- *On-site Utilization:* The manufacturing of construction materials (such carbonated concrete) or as a feedstock for the synthesis of synthetic fuels are just two uses for captured CO<sub>2</sub>.

#### 4.4.3 Low-carbon building materials

The imprint of carbon of a building is greatly influenced by the choice of building materials. Recycled steel and concrete substitutes are examples of low-carbon materials that provide viable solutions for cutting emissions during the building and construction process.

- *Recycled Steel:* Recycled steel lowers the need for virgin steel production, which uses an abundance of energy and produces an abundance of CO<sub>2</sub>.
  - *Energy Savings:* Steel recycling uses a lot less effort than creating new steel from raw sources. As a result, the carbon emissions from the production of steel have decreased.
  - *Durability and Strength:* Recycled steel is a dependable building material since it keeps its strength and durability much like new steel. Additionally, it contributes to a circular economy because it is totally recyclable at the end of its life cycle.
- *Concrete Alternatives:* Because cement is produced, concrete contributes significantly to global CO<sub>2</sub> emissions. Creating substitutes for conventional concrete can cut these emissions:
  - *Geopolymer Concrete:* Fly ash and slag, two industrial byproducts, combine with alkali solutions to create a hardened substance that is used to make geopolymer concrete. It emits substantially less CO<sub>2</sub> than traditional Portland cement concrete.

- *Carbonated Concrete:* This novel form of concrete successfully sequesters carbon within the concrete structure by absorbing CO<sub>2</sub> during the curing process. This lowers the building's overall carbon footprint.

## **5.0 Challenges and Barriers in Adopting Sustainable Building Technologies**

Even though there are numerous advantages to integrating eco-friendly technologies into construction design, like increased energy efficiency and a decrease in carbon emissions, there are numerous other challenges that prevent their widespread use. These difficulties can be roughly divided into three categories: technical, policy, and economic. This section discusses these challenges in detail and offers suggestions for getting past them.

### **5.1 Economic factors**

*Cost Implications:* The initial high cost of adopting sustainable construction technologies is among the main obstacles. Significant upfront expenses are connected to advanced materials like aerogels, smart glass, and solar panels and other alternative energy sources and energy storage units. For many developers and building owners, especially in cost-sensitive nations like India, the upfront cost of these technologies might be prohibitive, even if they frequently result in long-term benefits through lower energy use.

- *Return on Investment (ROI) Concerns:* One potential obstacle for sustainable technologies is their lengthy payback period. If there is no obvious financial benefit to building owners investing in these technologies, they could be hesitant to do so. The ROI frequently requires a number of years, which may interfere with investors' financial planning.
- *Need for Subsidies and Incentives:* Government financial incentives and subsidies are required to promote the adoption of sustainable technologies. These could take the form of grants, tax breaks, and low-interest loans for projects involving energy-efficient equipment. In the absence of these incentives, the financial barrier might continue to be a major obstacle.

### **5.2 Technical challenges**

*Integration with Existing Systems:* There may be technological difficulties with integrating new sustainable technology with the infrastructure that already exists. Without extensive renovation, many buildings, especially older ones, might not be able to integrate current energy-efficient technology. This can involve difficulties integrating cutting-edge HVAC systems into structures not intended for such technologies, or incorporating solar panels and other alternative energy sources with current electrical grids.

- *Scalability Issues:* Scalability is another technical difficulty. Although sustainable technologies may prove to be efficacious in small-scale applications,

their large-scale implementation in commercial buildings or extensive domestic regions might pose significant challenges. This is, for example, ensuring that energy storage devices, are able to manage heavier loads and that smart grids are able to effectively distribute renewable energy throughout cities.

- *Reliability and Maintenance:* Technologies used in sustainable building frequently need specific upkeep and operation. One major obstacle is the shortage of qualified personnel to oversee these complex structures. Additionally, there are worries regarding these technologies' dependability, especially in places with regular power outages or in severe weather.

### 5.3 Policy and regulatory issues

*Supportive Policies:* Adoption of sustainable construction technologies is contingent upon the implementation of effective laws and regulations. Existing building rules and standards may not fully support or mandate the adoption of sustainable technologies in many locations, including India. Regulations might not provide precise instructions on how to use low-carbon materials, integrate renewable energy systems, or achieve energy efficiency requirements, for instance.

- *Lack of Uniform Building Codes:* A notable obstacle is the absence of consistency in building codes among various states and localities. Confusion and impediments to the extensive use of sustainable practices may result from this inconsistency. It might be difficult for developers to comprehend and abide by many regulations.
- *Incentives for Green Building Certification:* Buildings that obtain green certification such as LEED or GRIHA in India may be eligible for certain incentives, nonetheless, these programs are not always accepted or required. Developers may be encouraged to seek sustainable designs if more thorough policies were implemented that recognized and rewarded green building certifications.
- *Policy Improvements:* A concentrated effort should be made to update construction regulations and standards to incorporate sustainability requirements in order to get over these obstacles. Policies could also require life cycle assessments for building materials, set norms for energy use, and require the use of clean energy in new construction. In addition, government-led programs and public awareness campaigns can be extremely effective in advancing sustainable building techniques.

## 6.0 Findings

The findings highlight the critical role of emerging technologies in mitigating climate change and enhancing sustainability. Technologies such as advanced materials, renewable energy integration, energy system storage and carbon capture and storage are crucial for reducing emissions and integrating renewable energy.

## **7.0 Conclusion**

The complex challenges of climate change demand innovative and multifaceted approaches. Emerging technologies such as advanced materials, renewable energy integration, energy system storage and carbon capture and storage are pivotal in transforming buildings into energy-efficient, sustainable spaces. Mitigating carbon emissions approaches offer pathways to design and construct buildings that are not only energy-efficient but also capable of sequestering carbon and minimizing environmental impacts throughout their entire lifecycle.

These technologies not only reduce energy consumption and carbon emissions but also enhance the resilience and adaptability of buildings to future energy challenges. By integrating the sustainable practices into building design and operation, we can make significant progress toward a more sustainable and resilient built environment. However, the successful implementation of these technologies requires supportive policies, international collaboration, and public awareness.

## **8.0 Recommendations**

### **8.1 Strengthening international collaboration**

International agreements should be reinforced to ensure ambitious climate action and the sharing of best practices. Technology transfer to developing countries should be facilitated, and global coordination of climate initiatives should be improved.

### **8.2 Incentivizing innovation and R&D**

Governments should increase funding for climate technology research and development. Tax incentives and credits should be offered to businesses investing in sustainable technologies. Support for startups and small businesses in this sector is also crucial.

### **8.3 Enhancing public awareness and education**

Climate change education should be integrated into school curricular, and public awareness campaigns should be launched to promote sustainable behaviours. Community engagement initiatives can empower local populations to take climate action.

### **8.4 Supporting vulnerable communities**

Climate resilience programs should be developed to support vulnerable communities, focusing on infrastructure, resource allocation, and disaster preparedness. Policies should ensure equitable access to adaptation measures and resources

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# CHAPTER 11

## Breaking Barriers: How Social Inclusion can Improve Mental Well-being in Marginalized Populations

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### ABSTRACT

This study “Breaking Barriers: How Social Inclusion Can Improve Mental Well-being in Marginalized Populations,” investigates impact of social inclusion on mental health of marginalized groups. This research uses mixed method approach, with quantitative and qualitative. In interpreting quantitative findings, we focus on associations between social inclusion and mental health outcomes; qualitative data provide deeper inside view of participants’ experience and their conceptions of belonging. It suggests that social inclusion is significantly and positively associated with better mental well-being. Covers areas of social inclusion like education, employment opportunities, and accessibility to healthcare along with participation in community. Findings underscores need for inclusive environments that promote sense of belonging and support to reduce negative mental health outcomes connected with marginalization. The paper concludes with some policy recommendations suggesting that, at minimum, piecemeal approaches must give way to more comprehensive strategies on social inclusion whether in the community or from within policies themselves. These can include antidiscrimination legislation, inclusive education and workplace practices, also mental health care - which may be targeted to needs of particular marginalized groups.

**Keywords:** Social Inclusion; Mental Well-being; Marginalized Populations; Mixed-Methods Research.

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### 1.0 Introduction

Despite growing efforts in contemporary society to include marginalized groups—such as racial and ethnic minorities, the LGBTQ community, people with disabilities, and the economically disadvantaged—they often fail to benefit fully from social resources. These barriers contribute to mental health issues among these groups. Since mental health is linked to social interaction and belonging, understanding how social inclusion can improve mental well-being becomes crucial.

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This research, *Breaking Barriers: How Social Inclusion Can Improve Mental Well-being in Marginalized Populations*, explores the effects of social inclusion on mental health. We aim to understand the link between inclusion and mental health, reconstruct narratives, identify barriers, assess strategies, and recommend measures to enhance inclusion. A mixed-methods approach combines survey data with interviews to measure associations and capture participants' experiences of belonging. Initial findings suggest a strong positive relationship between inclusion and mental well-being, particularly in education, employment, healthcare, and community involvement. This underscores the need for societal change to expand inclusive spaces and mitigate the mental health impact of exclusion. The paper recommends broad strategies such as anti-discrimination policies, inclusive education, and specialized mental health services for marginalized communities.

## **2.0 Literature Review**

The relationship between social inclusion and mental health is increasingly studied, especially in marginalized groups. This review covers available literature on social inclusion, the barriers faced by marginalized groups, and theories linking belongingness to mental health.

### **2.1 Social inclusion and mental well-being**

In India, social inclusion is complex due to structural inequalities based on caste, religion, gender, and socioeconomic status. Marginalized groups like Dalits, Adivasis, LGBTQ individuals, and the economically disadvantaged struggle to access resources and opportunities (Thorat & Newman, 2010). This exclusion worsens feelings of isolation, leading to psychological distress. Nair *et al.* (2019) emphasize that despite efforts like affirmative action, marginalized populations still lack psychological inclusion due to systemic discrimination.

### **2.2 Mental health disparities among marginalized populations in India**

Marginalized groups in India experience higher rates of mental disorders like depression, anxiety, and substance abuse (Patel *et al.*, 2010). For the LGBTQ community, social exclusion manifests as discrimination and violence, exacerbating mental health issues despite the decriminalization of homosexuality in 2018 (Banerjee & Rao, 2020). People with disabilities face social isolation and exclusion from educational and employment opportunities, further impacting their mental well-being (Mitra & Sambamoorthi, 2014).

### **2.3 The role of social inclusion in promoting mental well-being**

Inclusive policies promoting education, employment, and healthcare are crucial for improving mental health outcomes. Kumar and Singh (2017) found that

educational initiatives reduce alienation and promote belonging, enhancing mental well-being and self-esteem. Employment opportunities also foster social integration, though marginalized groups often face labor market discrimination (Desai, 2013). Patel *et al.* (2011) stress the importance of culturally sensitive mental health services for marginalized populations, but India's mental health infrastructure remains inadequate.

#### **2.4 Barriers to social inclusion in India**

Caste-based discrimination, especially in rural areas, limits Dalits' and Adivasis' access to mental health services and social support (Jodhka & Shah, 2010). For the LGBTQ community, legal reforms have not eliminated social prejudice, which continues to harm their mental health (Bhaskaran, 2020). People with disabilities face systemic barriers in accessing education, employment, and public spaces, contributing to psychological distress (Rao, 2004).

#### **2.5 Social inclusion initiatives in India and their impact on mental well-being**

Initiatives have been implemented to promote social inclusion. The National Mental Health Programme (NMHP) aims to provide mental health services to underserved populations but struggles with infrastructure challenges (Sagar *et al.*, 2020). The Right to Education Act (2009) has positively impacted children's mental well-being by fostering belonging and self-worth (Bhatty, 2014). Employment initiatives like MGNREGA have helped marginalized communities achieve social integration (Dreze & Khera, 2013).

#### **2.6 Research gaps and future directions**

There is limited intersectional research examining how multiple forms of marginalization affect mental health outcomes (Crenshaw, 1989). Future research should explore the long-term impact of social inclusion initiatives, especially in rural areas.

### **3.0 Research Methodology**

#### **3.1 Research design**

This study employs a mixed-methods design, combining quantitative and qualitative approaches to explore the relationship between social inclusion and mental well-being in marginalized populations in India. Quantitative data provide measurable associations, while qualitative insights capture personal experiences of inclusion and exclusion.

#### **3.2 Research objectives**

- To Examine the Relationship Between Social Inclusion and Mental Well-being.
- To Explore Personal Narratives of Belonging.
- To Identify Barriers to Social Inclusion.

- To Evaluate the Impact of Social Inclusion Initiatives.
- To Formulate Policy Recommendations for Comprehensive Inclusion Strategies.

### **3.3 Study population and sampling**

The study focuses on marginalized populations in urban and semi-urban regions of India, including racial and ethnic minorities, LGBTQ individuals, people with disabilities, and the economically disadvantaged.

- *Quantitative Component:* A survey was conducted with 228 participants selected through simple random sampling.
- *Qualitative Component:* 16 participants from the same marginalized groups were interviewed in-depth, chosen through purposive sampling to capture diverse experiences.

### **3.4 Data collection methods**

- *Quantitative Data Collection:* Surveys measured participants' levels of social inclusion and mental well-being, focusing on education, employment, healthcare, and community participation.
- *Qualitative Data Collection:* Semi-structured interviews explored personal experiences of inclusion/exclusion, and its impact on mental health in areas like education, employment, and community life.

### **3.5 Data analysis**

- *Quantitative Data Analysis:* The survey data were analyzed using descriptive statistics and subgroup analysis to compare inclusion and mental well-being across different marginalized groups.
- *Qualitative Data Analysis:* Thematic analysis was used to interpret interview transcripts, identifying common themes and unique experiences related to social inclusion and mental health.

### **3.6 Ethical considerations**

Consent was obtained from all participants, and confidentiality was ensured through anonymization. Participant was informed of their right to withdraw at any time.

### **3.7 Reliability and validity**

Survey instruments were piloted and checked for test-retest reliability. Content validity was ensured through consultation with experts in social inclusion and mental health.

### **3.8 Limitations**

- The focus on urban and semi-urban populations may not fully represent rural marginalized groups.
- Self-reported data may be biased, as participants might underreport or overreport their experiences.

- Cultural differences may affect how participants understand survey questions, despite translation efforts.

This research methodology rigorously examined the relationship between social inclusion and mental well-being in India, using a mixed-methods approach to capture both quantitative impacts and personal experiences.

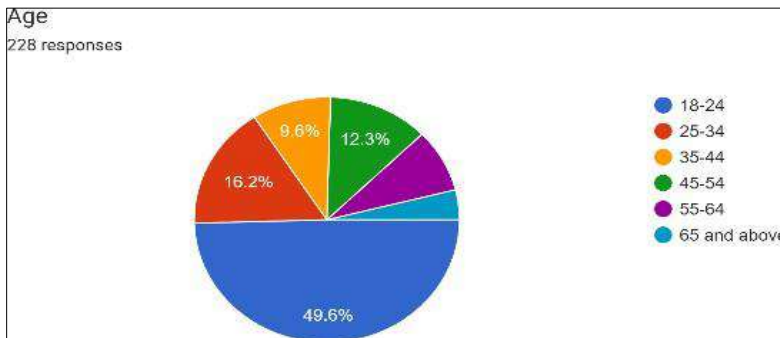
#### 4.0 Findings

This study explored the impact of social inclusion on the mental well-being of 228 marginalized individuals across India, including racial and ethnic minorities, LGBTQ communities, people with disabilities, and economically disadvantaged groups. The survey assessed inclusion across various domains.

##### 4.1 Demographic overview

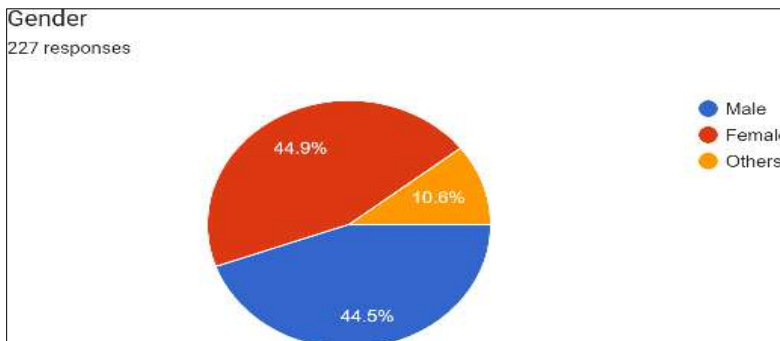
The survey captured the demographics of the participants, revealing a diverse representation across age, gender, race/ethnicity, disability status, and economic backgrounds:

**Figure 1: Respondent Age**



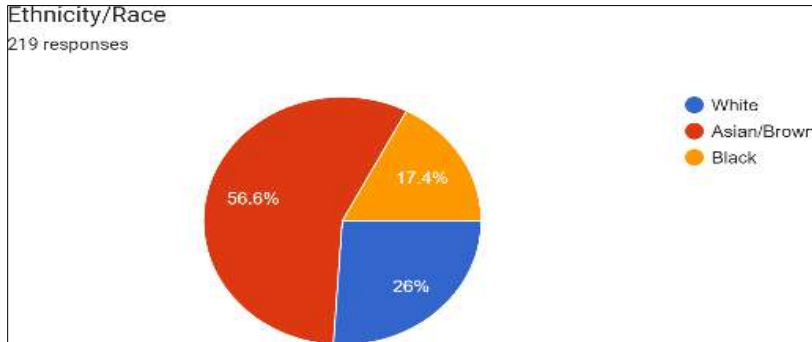
*Age:* the majority of respondents (49.6%) were between the ages of 18-24, followed by 16.2% in 25-34 age group. Older age groups had progressively fewer respondents.

**Figure 2: Respondent Gender**



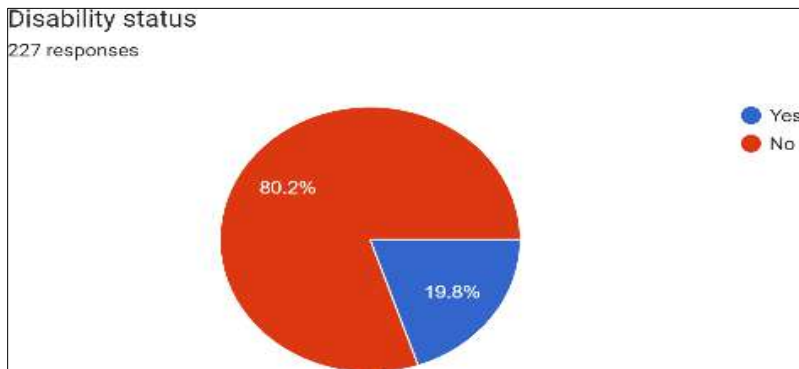
*Gender:* Of the 227 responses, there was a near-even split between male (44.5%) and female (44.9%) respondents, with 10.6% identifying as non-binary.

**Figure 3: Respondent Ethnicity/Race**

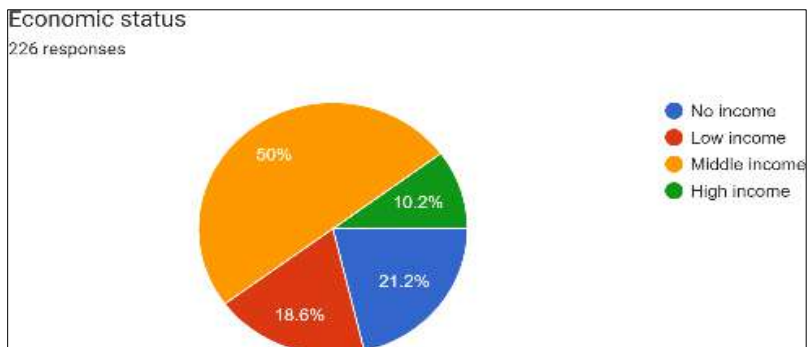


*Ethnicity/Race:* The majority of respondents were of asian/brown descent (56.6%), followed by white (26%) and black (17.4%) respondents.

**Figure 4: Respondent Disability Status**



**Figure 5: Respondent Economic Status**



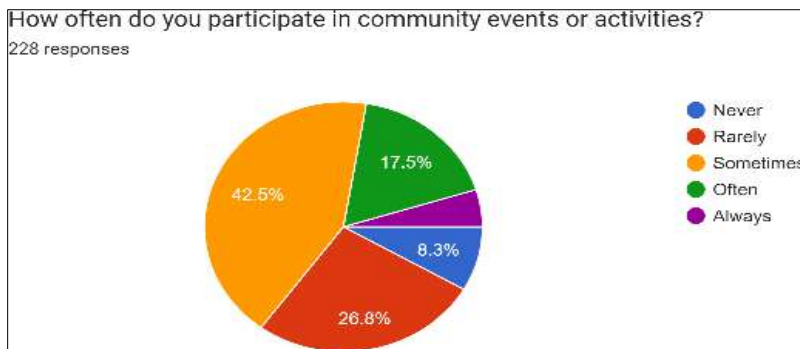
*Disability:* 19.8% of respondents reported having a disability, which provided a key lens for examining the intersection of disability with social inclusion and mental health.

*Economic status:* The sample was predominantly from middle-income groups (50%), with 21.2% reporting no income, 18.6% as low income, and 10.2% as high income.

#### 4.2 Community participation and support

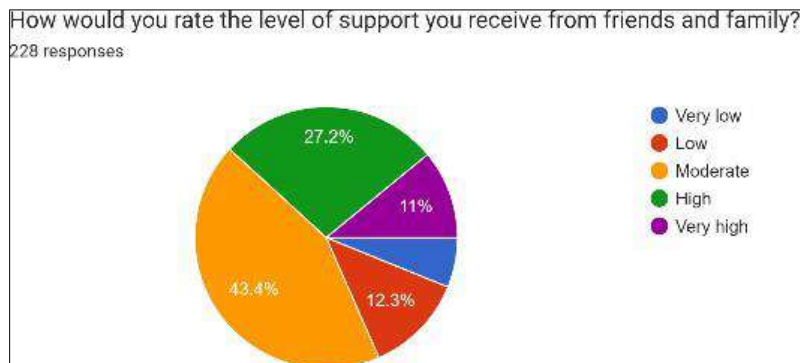
*Community Participation:* 42.5% of respondents participated in community events or activities occasionally, while 26.8% reported rarely participating. Only 4.8% were always involved in community activities, indicating a significant gap in social engagement for many marginalized individuals.

**Figure 6: How often do You Participate in Community Events or Activities?**



*Support from Friends and Family:* support levels from personal networks varied, with 43.3% reporting moderate levels of support, while 27.2% rated it high. However, 16.1% indicated receiving very low support, which could contribute to poorer mental health outcomes.

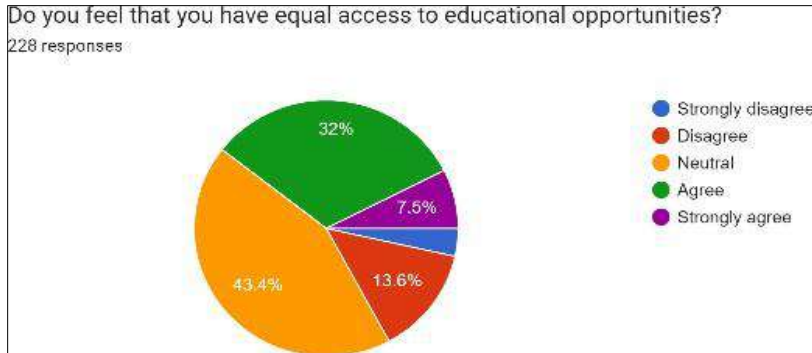
**Figure 7: How would You Rate the Level of Support You Receive from Friends and Family**



### 4.3 Educational opportunities and discrimination

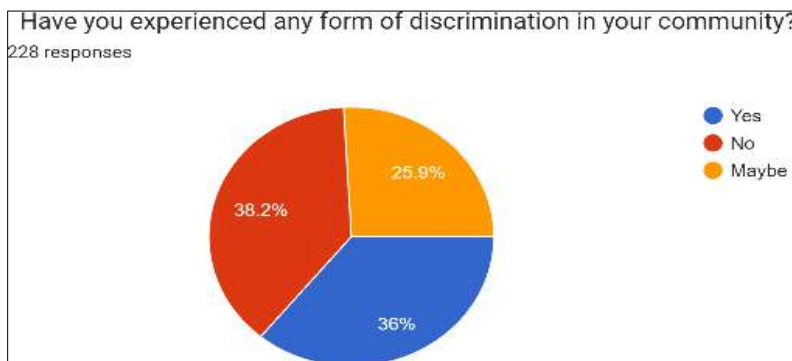
**Equal Access to Education:** Only 39.5% of respondents agreed or strongly agreed that they had equal access to educational opportunities, while 17.1% disagreed or strongly disagreed, and 43.4% were neutral. This indicates that many individuals still face barriers in accessing education.

**Figure 8: Do You Feel that You have Equal Access to Educational Opportunities?**



**Discrimination:** A significant proportion (38.2%) of respondents reported experiencing discrimination in their communities, while 36% did not. The remainder (25.8%) were unsure, indicating potential unrecognized or subtle forms of discrimination that may still impact mental well-being.

**Figure 9: Have You Experienced any Form of Discrimination in Your Community?**

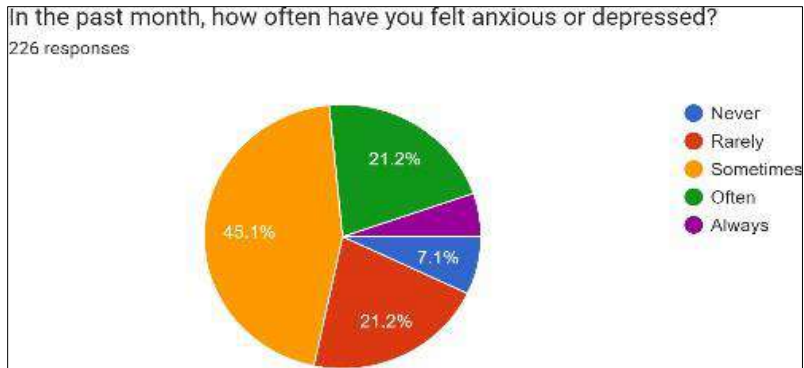


### 4.4 Mental well-being and social inclusion

**Anxiety and Depression:** Mental health concerns were prevalent, with 45.1% of respondents sometimes feeling anxious or depressed, and 21.2% often facing these emotions. Only 7.1% reported never feeling anxious or depressed, suggesting that mental health challenges are widespread in marginalized populations.

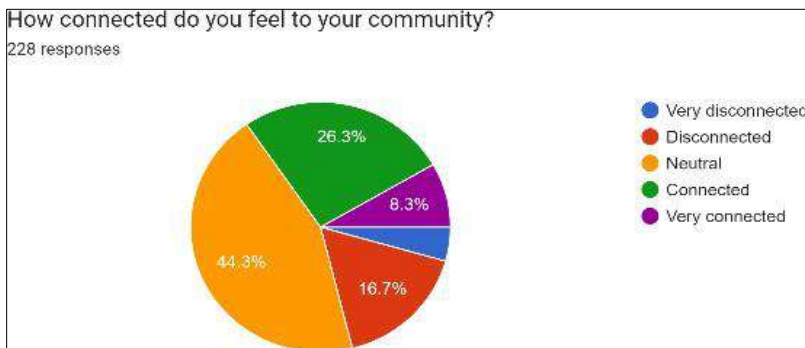


**Figure 10: In the Past Month, How often have You Felt Anxious or Depressed?**

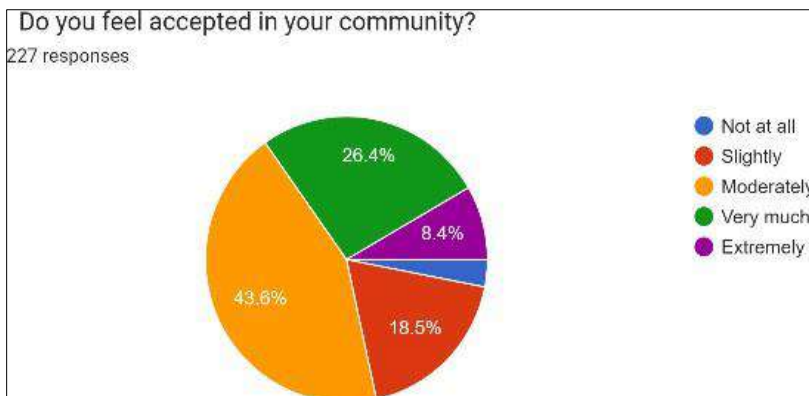


*Connection to Community:* A large portion of respondents felt neutral (44.3%) about their connection to the community. Only 26.3% reported feeling connected, while 16.7% felt disconnected and 4.4% felt very disconnected. This disconnect could contribute to the sense of isolation and lower mental well-being.

**Figure 11: How Connected do You Feel to Your Community?**



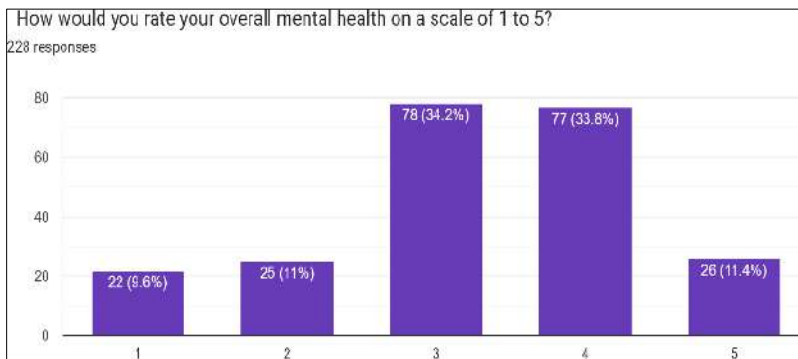
**Figure 12: Do You Feel Accepted in Your Community?**



*Acceptance in the Community:* about 44.3% of respondents felt moderately accepted within their community, while 26.4% felt very accepted. However, 21.6% felt only slightly or not at all accepted, indicating that for some, social exclusion remains a significant issue.

*Overall Mental Health Rating:* When asked to rate their mental health on a scale of 1 to 5, the majority of respondents (34.8%) rated it as 3, indicating moderate well-being. A further 33.8% rated their mental health as 4, while 20.6% rated it at the lower end of the scale (1 or 2), highlighting the need for better mental health support among marginalized groups.

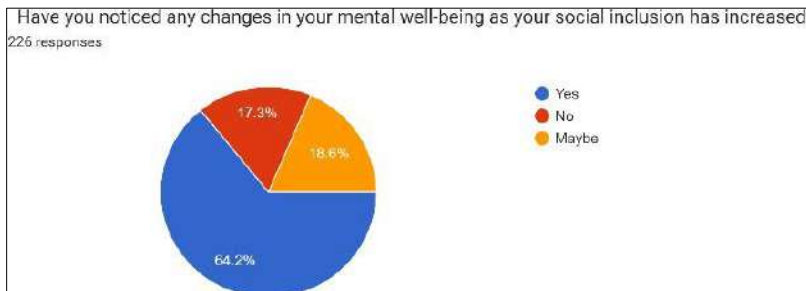
**Figure 13: How would you Rate your overall Mental Health on a Scale of 1 to 5?**



#### 4.5 Impact of social inclusion and exclusion on mental well-being

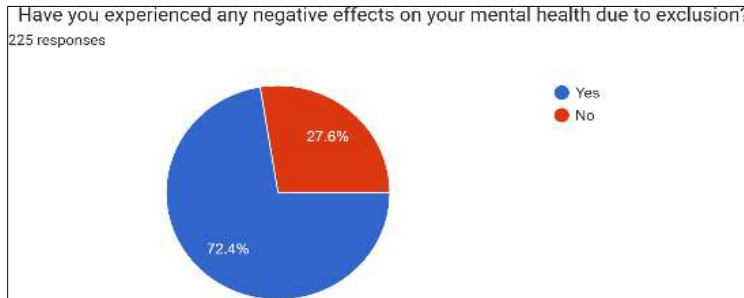
*Positive Impact:* A significant majority (64.2%) reported noticing positive changes in their mental well-being as their social inclusion increased, while 18.6% were unsure. Only 17.3% stated not noticing any change.

**Figure 14: Have You Noticed any Changes in Your Mental well-being as Your Social Inclusion has Increased?**



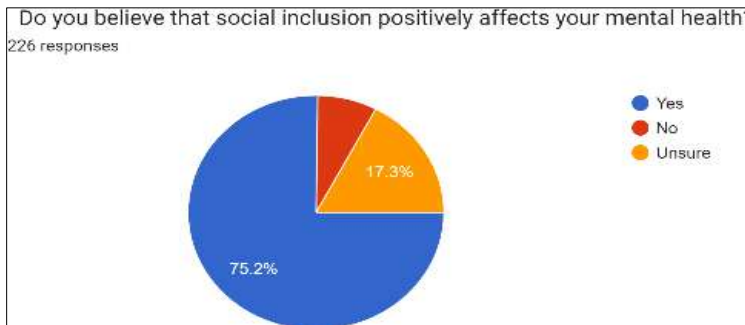
*Negative Impact of Exclusion:* Over 72% of respondents confirmed that exclusion had negatively impacted their mental health. This statistic underscores the detrimental effects of marginalization on mental well-being.

**Figure 15: Have You Experienced any Negative Effects on Your Mental Health due to Exclusion?**



*Belief in the Positive Effect of Social Inclusion:* 75.2% of respondents believed that social inclusion positively affects their mental health, with 17.3% unsure and only 7.5% disagreeing.

**Figure 16: Do You Believe that Social Inclusion Positively Affects Your Mental Health?**



#### 4.6 Insights and associations

*Community Engagement and Mental Health:* Respondents who frequently participated in community events reported higher mental health scores (average rating of 4 or 5 on the scale), while those who rarely or never participated had significantly lower ratings (average of 2 or 3).

*Support Systems and Mental Health:* Individuals with high levels of support from family and friends reported better mental well-being (average score of 4.1) compared to those with low or very low support (average score of 2.7).

*Discrimination and Mental Health:* Those who experienced discrimination were more likely to report poor mental health. Respondents who faced discrimination had an average mental health rating of 2.8, compared to 3.9 for those who did not report discrimination.

*Economic Status and Well-being:* Individuals with no or low income were more likely to report lower mental health scores (average score of 2.9), while those from middle- and high-income backgrounds reported better mental health outcomes (average score of 3.7).

#### **4.7 Intersectionality of marginalization**

The survey revealed that individuals who belong to multiple marginalized groups (e.g., racial minorities with disabilities or LGBTQ individuals with low income) often experience compounded negative effects on their mental well-being. For example, respondents who were both economically disadvantaged and disabled had the lowest average mental health scores.

#### **4.8 Qualitative insights**

In addition to the quantitative data, qualitative responses provided deeper insight into personal experiences. Common themes included:

- *Feelings of Exclusion:* Many participants shared stories of exclusion in educational and workplace settings, leading to feelings of worthlessness and increased anxiety.
- *Lack of Access to Services:* Economic disadvantage compounded by systemic barriers to healthcare access was a recurring theme, especially for individuals in rural areas.
- *Supportive Environments:* On the positive side, respondents who had access to inclusive spaces, such as LGBTQ-friendly communities or disability-friendly workplaces, reported significant improvements in their mental health.

The findings clearly indicate a strong association between social inclusion and mental well-being. Marginalized populations who experience greater inclusion, whether through education, employment, or community participation, report significantly better mental health outcomes. However, the data also highlights the persistent barriers, including discrimination, unequal access to resources, and limited community support, which continue to hinder full social inclusion for many. These insights underline the need for targeted interventions and policy reforms aimed at fostering inclusive environments and reducing mental health disparities.

### **5.0 Discussion**

The findings from the survey of 228 respondents across India reveal a clear and significant relationship between social inclusion and mental well-being in marginalized populations. The results indicate that individuals who experience higher levels of social inclusion tend to have better mental health, while exclusion and discrimination are associated with negative mental health outcomes. This section elaborates on key themes from the findings, comparing them with existing literature and providing insights into the broader implications for policy and practice.

#### **5.1 Impact of social inclusion on mental well-being**

A majority of respondents reported improvements in mental health when their level of social inclusion increased, supporting existing research that highlights the protective role of social support and community belonging in mental health

outcomes. Social inclusion creates a sense of belonging, reduces feelings of isolation, and fosters emotional resilience. These findings are consistent with studies such as that by McNeil *et al.* (2012), which argue that social isolation is a major determinant of mental health disorders among marginalized groups. Further, those who frequently participated in community events and activities showed better mental health outcomes, which aligns with the literature suggesting that community engagement plays a crucial role in fostering social bonds and enhancing well-being. Participation in communal spaces also provides opportunities for marginalized individuals to assert their identity and reduce the stigma associated with their minority status.

## **5.2 Discrimination and mental health**

Discrimination, reported by 38.2% of respondents, had a clear negative impact on mental health. Individuals who experienced discrimination had lower self-reported mental health scores, which echoes previous studies showing that discrimination, whether based on race, gender identity, disability, or economic status, exacerbates psychological distress and increases the risk of mental health disorders (Paradies *et al.*, 2015). In addition, the intersectionality of marginalization appears to compound the negative effects of discrimination. Respondents who belonged to multiple marginalized groups, such as economically disadvantaged individuals with disabilities, reported the poorest mental health outcomes. This highlights the complexity of addressing mental well-being in marginalized populations and the need for multi-faceted interventions that account for intersecting identities.

## **5.3 Barriers to social inclusion**

Barriers to social inclusion, particularly in terms of access to education, economic inequality, and limited community participation, were evident in the survey results. Many respondents (43.4%) expressed neutrality regarding their access to education, reflecting the continued existence of systemic barriers that prevent marginalized populations from accessing the same opportunities as their more privileged counterparts. This aligns with findings from the World Health Organization (2019), which emphasizes that education is a key social determinant of mental health and well-being. Economic inequality was another significant factor, with lower-income respondents reporting poorer mental health outcomes. Limited access to economic opportunities perpetuates cycles of exclusion, limiting individuals' ability to participate fully in society and reinforcing feelings of helplessness and anxiety.

## **5.4 Support networks**

The survey findings also highlight the importance of support networks in mental health outcomes. Those who reported receiving higher levels of support from friends and family had better mental health. This is consistent with the broader literature that identifies social support as a key protective factor in mental health (Cohen & Wills, 1985). Supportive relationships help individuals cope with stress,

mitigate the effects of discrimination, and provide a buffer against mental health decline. However, it is important to note that 16.1% of respondents indicated very low support from their personal networks, suggesting that many marginalized individuals may lack the familial or social structures necessary to maintain good mental health. This reinforces the need for broader community-based interventions and inclusive policies that provide support beyond the individual's immediate circle.

### **5.5 Policy and social inclusion initiatives**

The positive impact of social inclusion on mental health underscores the need for inclusive policies and initiatives that reduce barriers to participation for marginalized groups. Antidiscrimination laws, inclusive education and workplace practices, and targeted mental health services are essential in fostering environments where all individuals can thrive. This supports the findings of previous studies, such as Stuart (2006), which advocate for systemic changes to combat social exclusion and improve public mental health. Comprehensive and sustained efforts are necessary to address the deep-rooted inequalities that contribute to social exclusion and its negative mental health impacts.

## **6.0 Policy Recommendations**

The study's conclusions highlight the urgent need for comprehensive policies that support social inclusion and enhance the mental health of marginalized groups in India. The following recommendations address the structural barriers identified:

### **6.1 Strengthening anti-discrimination laws**

Review and update existing laws to better protect marginalized groups from discrimination. Establish specialized agencies to enforce these laws and ensure individuals can report violations without fear.

### **6.2 Promoting inclusive education**

Develop an inclusive curriculum that reflects India's diversity. Train educators in cultural competence and mental health awareness. Introduce mentorship and scholarship programs for disadvantaged groups to improve access to education.

### **6.3 Improving workplace prospects**

*Initiatives for Diversity Hiring:* Promote the adoption of diverse hiring practices by public and private sector organizations, establishing goals for the representation of underrepresented groups in their workforce.

*Workplace Inclusivity Training:* To promote an inclusive workplace culture and combat biases, mandate diversity and inclusion training for employers and employees. Encourage entrepreneurship by offering low-interest loans and grants to underprivileged people so they can launch their own companies. You should also offer training courses on entrepreneurship and business management.

#### **6.4 Enhancing healthcare access to culturally competent mental health services**

Make certain that mental health services, such as language assistance and community outreach initiatives, are accessible to underrepresented groups and sensitive to cultural differences.

*Integration of Mental Health into Primary Care:* Provide mental health services as a routine component of overall health services by teaching primary healthcare practitioners to identify and manage mental health disorders.

*Community-based Support Networks:* Create programs for community health workers to help people who are experiencing social isolation gain access to mental health resources and to continuing support.

#### **6.5 Boosting support for community groups**

More money and resources should be given to local NGOs and community groups. These organizations are like the roots of a tree, helping keep everything stable by promoting social inclusion and mental well-being among those often overlooked.

*Inclusive Policy-making:* It's crucial that marginalized communities have a seat at the table when it comes to making policies. This way, their voices can shape decisions directly affecting them.

*Spreading the Word Through Awareness Campaigns:* Imagine if everyone could smell the sweet scent of understanding! Launching nationwide campaigns will help spread awareness about how important it is for everyone in society to feel included and mentally healthy.

#### **6.6 Setting the stage with baselines and indicators**

Think of trying to bake a cake without knowing if you have flour or sugar. That's kind of like starting any project without clear metrics. For tackling social inclusion and mental well-being in marginalized groups, it's crucial to first set up specific indicators that will help track progress over time.

*Keeping Tabs through Regular Reporting:* Just as one might sniff a baking cake to check if it's done, regular reports from government agencies and organizations are needed. These updates shed light on how effective their efforts towards inclusion really are, ensuring everything stays transparent and everyone remains accountable.

### **7.0 Conclusion**

This study underscores profound impact of social inclusion on the mental well-being of marginalized populations in India. Through an analysis of 228 respondents from various racial, ethnic, gender, disability, and economic backgrounds, the findings demonstrate that social inclusion—whether in education, employment, healthcare, or community participation—plays pivotal role in fostering better mental health outcomes.

The data reveal several key insights: marginalized individuals who experience higher levels of community participation, support from family and friends, and access to inclusive environments report better mental well-being. Conversely, discrimination, exclusion, and economic disparities contribute to negative mental health outcomes, with individuals belonging to multiple marginalized groups often facing compounded challenges.

Community engagement, support networks, and positive social inclusion were all associated with improved mental health, affirming the need for inclusive policies that promote equal access to opportunities and support systems. The study highlights the ongoing barriers faced by marginalized populations, such as limited educational access, economic inequality, and discrimination, all of which exacerbate mental health disparities.

The qualitative responses further illuminate personal stories of exclusion, lack of access to services, and the positive influence of supportive environments. The overall findings emphasize the urgent need for systemic change to remove the structural barriers that hinder social inclusion and mental well-being. In conclusion, social inclusion is not just a social justice issue but also a critical determinant of mental health.

## **8.0 Acknowledgment**

We would like to express our sincere gratitude to everyone who contributed to the successful completion of our research paper, “Breaking Barriers: How Social Inclusion Can Improve Mental Well-being in Marginalized Populations.” This work was prepared for the national conference “Empowering Change: Achieving Sustainable Development Goals (SDGs) for a Better Tomorrow, 2024.”

First and foremost, we are deeply thankful to our mentor for their unwavering support, insightful guidance, and valuable feedback throughout the research process. Their expertise and encouragement played a crucial role in shaping the direction of this study.

We extend our heartfelt thanks to all the participants who took part in the survey and interviews, providing us with invaluable data and personal narratives. Their openness in sharing their experiences enabled us to explore the complex relationships between social inclusion and mental well-being.

Our appreciation also goes to the organizing committee of the Empowering Change conference for creating a platform where meaningful research can be shared to inspire change. Finally, we thank our families, friends, and colleagues for their continuous support and encouragement during this journey. Together, we hope this research contributes to advancing the discussion on inclusive practices and mental health support for marginalized populations.



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## Appendices

### **Appendix A: Survey Questionnaire**

1. Age
  - 18-24
  - 25-34
  - 35-44
  - 45-54
  - 55-64
  - 65 and above
2. Gender
  - Male
  - Female
  - Others
3. Ethnicity/Race
  - White
  - Black
  - Asian/Brown
4. Disability
  - Yes
  - No
5. Economic Status
  - No income
  - Low income
  - Middle income
  - High income
6. How often do you participate in community events or activities?
  - Never
  - Rarely
  - Sometimes
  - Often
  - Always
7. How would you rate the level of support you receive from friends and family?
  - Very low
  - Low
  - Moderate
  - High
  - Very high
8. Do you feel that you have equal access to educational opportunities?
  - Strongly disagree
  - Disagree
  - Neutral

- Agree
  - Strongly agree
9. In the past month, how often have you felt anxious or depressed?
- Never
  - Rarely
  - Sometimes
  - Often
  - Always
10. How connected do you feel to community?
- Very disconnected
  - Disconnected
  - Neutral
  - Connected
  - Very connected
11. Do you feel accepted in your community?
- Not at all
  - Slightly
  - Moderately
  - Very much
  - Extremely
12. Have you experienced any form of discrimination in your community?
- Yes
  - No
  - Maybe
13. How would you rate your overall mental health on a scale of 1 to 5?
- 1      2      3      4      5
14. Have you noticed any changes in your mental well-being as your social inclusion has increased?
- Yes
  - No
  - Maybe
15. Have you experienced any negative effects on your mental health due to exclusion?
- Yes
  - No
16. Do you believe that social inclusion positively affects your mental health?
- Yes
  - No
  - Unsure

## CHAPTER 12

### Impact of Emotional Appeals in Advertising

*Pradhyum Upadhye\**, *Shefali Motekar\*\**

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#### ABSTRACT

Emotional appeals have become a dominant strategy in advertising due to their ability to significantly influence consumer behavior and decision-making. By leveraging emotions such as happiness, fear, nostalgia, and empathy, marketers create meaningful connections between consumers and brands. Emotional content bypasses rational processing, triggering immediate and impactful reactions that enhance the effectiveness of advertisements. This paper explores the psychological mechanisms underlying emotional responses to advertising, focusing on how strategically crafted emotional appeals shape consumer attitudes, enhance recall, and drive purchase intentions. Emotions create memorable, persuasive messages that resonate personally, fostering stronger consumer-brand relationships. By reviewing existing literature and analyzing case studies across industries and cultural contexts, this paper provides a detailed understanding of how emotions amplify advertising's persuasive power. Additionally, the analysis highlights the ethical considerations and potential risks of manipulating consumer emotions. While emotional appeals can optimize advertising efforts, they require careful and ethical implementation to avoid consumer mistrust or exploitation. This paper offers valuable insights for marketers seeking to balance effectiveness with responsibility, demonstrating the potential of emotional appeals to revolutionize marketing strategies and drive consumer engagement when used thoughtfully and ethically.

**Keywords:** Emotions; Emotional appeals; Consumer; Consumer behaviour; Advertisement; Attitude; Power; Brand; Psychology.

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#### 1.0 Introduction

Drawing in and holding on to consumers' attention has been harder in the fiercely competitive world of advertising. Using human emotions to create a stronger bond between businesses and their audiences, emotional appeals have become increasingly popular as a powerful method to combat this. This essay explores the effects of emotional appeals in advertising, paying particular attention to how emotions affect the behavior of consumers and the potency of different emotional appeal formats. A number of powerful approaches exist for emotions in advertising.

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They have the potential to greatly improve brand memory, to start. Customers are likely to recall a brand more readily when it evokes an emotional response in them when they see an advertisement. For example, a touching advertisement showing family time might make viewers identify the brand with those feelings, which is beneficial for their business. Emotional appeals can also increase brand loyalty and customer involvement. Emotionally charged advertisements frequently create a stronger bond with viewers and entice them to engage with the brand after watching the commercial. This might take many different forms, such as posting the advertisement on social media, talking about it with loved ones, or even looking out additional details about the company. These exchanges foster a closer, more intimate bond between the customer and the company, which is beneficial for fostering steadfast loyalty. Emotionally invested consumers actually give the brand a competitive edge in a crowded market since they are more likely to make repeat purchases, support the brand, and show resistance to rival offers.

However, there are a number of variables that might affect how powerful emotional appeals are, such as cultural variations, personal preferences, and the environment in which the commercial is viewed. Due to differing values, conventions, and emotional triggers in different cultural contexts, an emotional appeal that strikes a chord in one may not work at all, or even backfire.

An advertisement that prioritizes individual accomplishment, for instance, might be well received in societies that respect independence, but it might not have the same effect in societies that place a higher priority on community and collaborative success. Individual characteristics and life experiences can have a significant impact on how customers react to emotional appeals. Something that makes one person feel strongly may not have the same effect on another. Because of this, marketers need to think carefully about who their target market is and the exact feelings they want to arouse in them through their ads.

To create emotional appeals that resonate and have the desired effect, one must have a thorough awareness of the cultural background, values, and emotional triggers of the audience. In addition, the environment in which the advertisement is viewed—including the time of day, the media used, and the viewer's emotional state at the moment—can also affect how well it is perceived. Advertisers may maximize the impact of their emotional appeals and produce more memorable, compelling campaigns that engage their target audience more deeply by considering these aspects.

## **2.0 Objectives**

- To Understand the concept of emotional appeals in advertising.
- To analyze the psychological impact of emotional appeals on consumer behavior.
- To evaluate the effectiveness of various emotional appeals.

- To Provide advertisers with information on how to use emotional appeals in their campaigns.

### **3.0 Research Methodology**

Utilizing previously conducted studies, statistics, and other data sources that have been compiled by other researchers or organizations is known as secondary data collecting. Secondary data is collected for this research on the “Impact of Emotional Appeals in Advertising on Consumers” from reliable web sources, industry reports, case studies, and scholarly journals. The main goal is to look at how emotional appeals affect consumer behaviour, intentions to buy, and perceptions of brands.

### **4.0 Literature Review**

#### **4.1 Types of emotional appeals**

Emotional appeals can be categorized based on the emotions they target, including happiness, fear, sadness, anger, surprise, and love. Each type of emotional appeal has its own effect on consumer behaviour.

*Positive emotional appeals:* Advertisers frequently use emotions like happiness, love, and excitement to create positive associations with their products. For example, Coca-Cola’s “Open Happiness” campaign used joyful imagery and uplifting messages to connect with consumers on an emotional level.

*Negative emotional appeals:* Fear, guilt and sadness are also used in advertising, especially in advertisements and campaigns for social causes. These emotions can act quickly by showing the consequences of inaction, such as anti-smoking or drink-driving campaigns.

**Humour:** Humor is a popular emotional appeal that makes ads memorable and fun. However, its effectiveness depends on the cultural context and the humor of the audience. Humorous applications use humor to create positive associations with the advertising product or brand. This type of appeal is effective in attracting attention, increasing message recall and improving brand recognition. However, the success of humor applications depends on cultural differences and individual differences in the perception of humor.

**Nostalgia:** Nostalgic appeals tap into consumers’ past memories and evoke comfort and familiarity. This strategy is effective for reaching older audiences or customers who have a strong emotional connection to past experiences. Nostalgia appeals evoke a desire for the past by reminding consumers of fond memories or experiences. This type of application is useful when dealing with old people or recovering from old signs. Nostalgic appeals can strengthen brand loyalty by creating an emotional connection between the consumer and the brand.

**Happiness:** Advertisements that evoke joy often use humor, joy, or praise to create positive associations with the brand. These sites can increase brand popularity

and customer loyalty. The purpose of happy requests is to evoke feelings of happiness, pleasure, or satisfaction. Advertisements using this application show happy situations or the product is associated with positive experiences. Exciting appeals are very effective in creating a positive brand image and driving impulse purchases.

**Fear:** Fear appeals are often used in public service announcements and health-related advertisements. They seek to motivate behavioural change by showing the negative consequences of actions and inactions. Fear appeals are designed to evoke feelings of fear or danger by showing the negative consequences of not using a product or service. This type of application is often used in public health programs, insurance advertising, and safety related products. The effectiveness of fear appeals depends on the level of fear elicited and the client's ability to reduce the threat.

**Sadness:** Sadness appeals often rely on storytelling to create empathy and emotional connection. These appeals can be particularly effective in charity and cause-related marketing, encouraging donations and support.

**Anger:** Anger appeals can be used to incite action or create a sense of urgency. They are often seen in political and advocacy advertisements aiming to mobilize the audience toward a cause.

**Surprise:** Surprise appeals leverage unexpected elements to capture attention and create memorable experiences. These appeals can enhance recall and generate word-of-mouth marketing.

**Love:** Love appeals focus on themes of affection, romance, and familial bonds. These appeals can create deep emotional connections and foster brand loyalty.

## 5.0 Psychological Mechanisms Underlying Emotional Appeals

The effectiveness of emotional appeals in advertising can be explained by several psychological theories and mechanisms, including:

*Affect transfer theory:* Affect transfer theory states that emotions generated by an ad are transferred to the ad brand or product. For example, if the ad evokes positive emotions, these emotions can increase the consumer's perception of the brand and increase their willingness to purchase.

*The Elaboration Likelihood Model (ELM):* The cumulative probability model suggests that consumers process persuasive messages through two pathways: the central pathway and the peripheral pathway. Emotional appeals often work intuitively, and consumers make decisions based on emotional cues rather than objective information. This is especially useful when customers have limited access to the product.

*Classical conditioning:* Classical conditioning occurs when a brand or product is repeatedly paired with a particular emotional stimulus, leading consumers to associate the brand with the emotion. Over time, the brand itself may evoke the emotion, influencing consumer behavior.



## **6.0 Empirical Evidence**

### **6.1 Dabur Vatika**

Their brave and beautiful campaign pays tribute to women surviving cancer. The poster features a bald woman who has recovered from cancer. He has recovered from the disease, but he is not sure how his neighbors or colleagues will view him. We see her getting ready for her first day at the office after treatments. At first he held the head, but it was removed. After putting on the saree, she saw herself in the mirror - with a double face. Later, her husband's small adoption helped her to travel the world. He walks into the office nervously, and you may cry at what happens next. Not tears of sadness, but tears of hope. We don't think there is such a concept from shampoo and hair oil brands. But Dabur Vatika has done it!

### **6.2 COKE share a Coke!**

Coca-Cola's "Share a Cola" campaign, which personalized bottles with famous names, created joy and personal connection, increasing sales and engagement on social media. The "Share a Coke" campaign was founded on the need for personalization and sharing. By allowing consumers to find bottles with their names or the names of loved ones, Coca-Cola created a sense of personal connection and happiness that led to widespread sharing. social media and increase brand engagement.

### **6.3 Fear appeals in anti-smoking campaign**

Anti-smoking campaigns often use scaremongering to highlight the health risks associated with smoking. These ads often show images of the consequences of smoking, such as lung cancer or heart disease, to instill fear and change behavior. Research has shown that fear appeals can be effective in persuading smokers to quit, but they must be carefully designed to avoid creating too much fear or anxiety.

### **6.4 Nike's "Just Do It" campaign**

Nike's "Just Do It" campaign is an example of emotional appeal based on emotions and motivation. The campaign encourages customers to overcome challenges and pursue their goals, aligning the Nike brand with the values of perseverance and success. This emotional appeal affects a wide audience and contributes to a strong brand image and customer loyalty.

## **7.0 Factors Influencing the Effectiveness of Emotional Appeals**

The impact of emotional appeals in advertising is influenced by several factors, including:

*Product type:* The effectiveness of emotional appeals varies depending on the type of product being advertised. For example, emotional appeals may be better

for entertainment products (e.g., luxury goods, entertainment) than utilitarian products (e.g., appliances, insurance).

*Target audience:* The demographic and psychological characteristics of the audience play an important role in determining the effectiveness of emotional appeals. For example, younger consumers respond better to humorous appeals, while older consumers are more influenced by nostalgic appeals.

*Cultural context:* Cultural differences can significantly affect the effectiveness of emotional appeals. What triggers emotions in one culture may not have the same effect in another. Readers should consider cultural differences when designing attractive advertisements for international markets.

## 8.0 Impact of Emotional Appeals

Emotional appeals have a profound impact on consumer behavior and brand perception. The key effects include:

- *Increased Attention and Recall:* Emotional appeals can capture attention and make advertisements more memorable.
- *Enhanced Brand Attitude:* Positive emotional associations can lead to more favorable attitudes towards the brand.
- *Increased Purchase Intention:* Emotional appeals can motivate consumers to purchase products or services.
- *Improved Brand Loyalty:* Emotional connections can foster long-term loyalty to a brand.
- *Shaping Cultural Narratives:* Emotional appeals can contribute to shaping cultural values and norms.

## 9.0 Discussion

Based on the findings, the following suggestions are offered for marketers:

*Target emotions strategically:* Marketers should carefully choose the emotions they wish to evoke, considering the product, target audience, and campaign goals.

*Balance emotional and rational appeals:* While emotional appeals are powerful, they should be balanced with rational appeals to provide consumers with both emotional and logical reasons to purchase.

*Leverage social media:* Emotional ads that resonate with audiences are more likely to be shared, amplifying their reach. Marketers should optimize these ads for social media platforms.

*Monitor consumer feedback:* Brands should actively monitor consumer reactions to emotional appeals and adjust their strategies based on the feedback. Emotional appeals can influence consumers' minds by creating strong emotional connections with brands.

These associations increase brand loyalty, as consumers are more likely to stay loyal to brands that evoke positive feelings. In addition, emotional appeals can increase ad recall, as emotional content is more likely to be remembered than neutral or factual information. Although emotional appeals can be very effective, ethical concerns also arise. Using fear, guilt, or other negative emotions in ads can be considered manipulative, which may cause the customer to feel uncomfortable or make a decision that is not in the customer's favor. Marketers must balance the effectiveness of emotional appeals with ethical considerations and ensure that their campaigns do not abuse consumers' emotions.

## **10.0 Conclusion**

Emotional appeals in advertising are powerful tools that can strongly influence consumer behavior. By harnessing the emotions of happiness, fear, nostalgia and love, marketers can create powerful connections between consumers and brands. However, the effectiveness of these appeals depends on various factors, including the cultural context, the nature of the product, and how well the appeal is emotional and symbolic. While emotional appeals can increase brand loyalty and engage consumers, advertisers must also consider the ethical implications of their strategies.

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## CHAPTER 13

### Promoting Social Inclusion and Equality: A Pathway to Just Society

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#### ABSTRACT

A fair society where everyone has equal chances and rights must prioritize social inclusion and equality. The mechanisms and tactics required to promote social inclusion and equality inside businesses and larger societal contexts are examined in this research. It looks at how equitable practices, corporate cultures, and inclusive policies can help to overcome systematic disadvantages and provide supportive settings for a variety of groups. The research emphasizes the effect of social inclusion on organizational performance and societal cohesiveness by examining case studies and contemporary practices. In order to effectively promote equality and inclusion, it also identifies best practices and offers advice to leaders and legislators. The results seek to strengthen the social fabric's equity by guaranteeing that every member of society can engage equally and completely in economic, social, and political life and achieve the sense of belongingness.

**Keywords:** Social inclusion; Equality; Marginalized groups; Equitable practices.

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#### 1.0 Introduction

More recently, the quest for a fairer society has turned increasingly to notions of social inclusion and equality as first principles of fairness that underpin an equitable world. Social inclusion - the process of improving economic independence, political participation and social acceptance for those disadvantaged in relation to age, sex or race etc., is integral to enhancing both social cohesion and thereby sustainable economic growth (United Nations, 2020). Campaign for equality, conversely means providing each person with the equal opportunity to live up to his or her life and talents. It is related to the idea that everybody has a kind of right, and consideration must be paid to specifically provide this respectfully attended regardless where one stemmed from or living conditions (OECD, 2022).

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Social inclusion and equality promotion are not just a moral obligation, but also become essential aspects for heart-centered corporate behaviour and on the global scale. Research shows that inclusive organisations outperformed and were 2x as likely to be innovation leaders in their market, when faced with an external shock (McKinsey & Company, 2020). Likewise, when people feel included they belong and this might increase job satisfaction with less turnover and better productivity (Deloitte, 2021). Although social inclusion and equality are promoted by Articles 15 and 16, there are nevertheless differences in the way these ideas are applied in various organizations. Although discrimination is prohibited under Article 15, its application is not always guaranteed, especially in private sector companies where enforcement procedures are less robust.

Unconscious prejudice, uneven remuneration, and underrepresentation of underrepresented groups—particularly in positions of leadership—are still problems. The difficulties in putting reservation regulations into practice also place restrictions on Article 16, which provides equal opportunity in public employment. Reservations are frequently viewed as a quota system rather than as a means of achieving true inclusion, and many marginalized groups continue to face barriers to receiving high-quality training and education, which negatively affects their employability. Moreover, reservation rules do not legally bind private businesses, which results in the underrepresentation of marginalized groups in positions of leadership and decision-making within corporations. The complete achievement of the inclusion and equality principles envisioned in Articles 15 and 16 is still impeded by the absence of strong, enforceable procedures in the business sector (Bhambri, 2020).

The problem though is that it becomes more difficult to actually embrace these things. In respect of a variety of systemic disadvantages (gender bias, racial discrimination and economic inequality among them) these still exist in many organizations and broader structures within society that serve to keep people out or down. Indeed, this is a complex set of problems that needs solving and “solving these problems requires dynamic solutions where equitable policies are put in place, inclusive cultures at work are developed, leadership drives change” (World Economic Forum, 2021).

Moreover, reaching social inclusion necessitates coordinated actions across a range of societal levels, including business cultures and political regulations. Enacting inclusive laws that eliminate structural obstacles and safeguard the rights of excluded communities is crucial from a governmental standpoint. This includes enacting legislation that ensure equitable access to healthcare, education, and work, therefore enabling those from underprivileged backgrounds to not only be included but also to prosper. Organizationally, businesses need to create cultures that promote diversity and enforce fair policies; real inclusion cannot be ensured by token efforts alone. Long-lasting social transformation that fosters a more harmonious and just society can only be accomplished by addressing both individual and systemic challenges (Amartya Sen, 2020).

In order to advance the cause of social inclusion and equality, leadership is also essential. By modelling the principles of respect, justice, and empathy, inclusive leaders make sure that decision-making processes consider a variety of viewpoints. Programs for developing leaders that place a high value on emotional intelligence and inclusivity can collaborate to the emergence of a new generation of social justice advocates. Further, studies have demonstrated that inclusive CEOs are more likely to create teams that are more innovative, trusting, and satisfied with their jobs (Harvard Business Review, 2022). Leaders need to actively confront prejudices and foster environments where each person can contribute to the fullest extent possible as businesses see the benefits of diversity.

The aim is to identify pathways in and strategies for fostering social inclusion and equality, both within organizations — a focus that has been generatively tied into the broader societal context.

## **2.0 Literature Review**

A good society must prioritize social inclusion and equality, and there is a abundance of scholarly research on these subjects. The process of enhancing conditions for participation in society, particularly for individuals who are disadvantaged because of things like poverty, race, gender, handicap, or social rank, is known as social inclusion. As Silver (1994) points out, social inclusion entails actively involving excluded groups in societal processes as well as preventing exclusion. Atkinson & Davoudi (2000) share this viewpoint, stressing the significance of granting access to opportunities, resources, and services that facilitate complete society engagement.

Social inclusion is closely linked to the concept of equality. A Theory of Justice, written by John Rawls in 1971, is a foundational work that explains equality in relation to justice. According to Rawls, a just society is one in which the most disadvantaged people benefit from inequality. Sen (1992) developed this thesis further with his capacity approach, which emphasizes improving people's capacities to live meaningful lives. Sen contends that real equality should improve people's capacities to accomplish their intended goals in addition to addressing the allocation of resources.

The idea put out by Freire that education ought to be a conversation rather than a directive process supports our focus on education and awareness campaigns as an inclusive method. His strategy of empowering underprivileged communities via education is consistent with awareness campaigns that promote comprehension and dismantle obstacles to inclusion. Freire (1970).

The emphasis on fair job opportunities as an inclusive policy is closely related to Heath and Cheung's research on labour market discrimination. Their study highlights the structural obstacles that minorities have in the workplace, highlighting

the necessity of inclusive policies and equitable hiring procedures to promote social inclusion. Heath & Cheung (2007). Putnam's concept of social capital is critical to our research into community participation as an inclusion strategy. He contends that social networks and the trust they generate are critical to inclusion, which complements our description of how community participation and conversation promote social cohesion and push inclusive policies. Joseph E. Stiglitz's argument from *The Price of Inequality* (2012) that inequality undermines economic growth by creating lost opportunities and hindering development. Stiglitz asserts that social inclusion is both a moral and economic necessity, emphasizing that addressing inequality is essential for fostering sustainable economic development. This aligns with the view that social inclusion should be prioritized not only for ethical reasons but also as a crucial strategy for business and policy to promote long-term growth and stability.

"Social inclusion, which grants equal rights and access to resources and involves people in social, political, and economic changes, can be an effective tool for reducing socio-economic inequality." Krasota, O. According to L. Rispel in the *Journal of Health, Population, and Nutrition*, "Social inclusion policies, such as cash transfers and free social services, can alleviate poverty, improve economic opportunities, reduce barriers to social services, and enhance nutrition, thereby enhancing health and indirectly reducing health inequalities." "Health outcomes, such as health behaviour, self-efficacy, and social support, are positively influenced by community engagement in public health interventions, which can help reduce health disparities." (A. O'Mara-Eves, *BMC Public Health*).

"Social inclusion programs that address drug use, homelessness, and education have the potential to reduce health disparities, notably when they are backed by strong leadership and well-thought-out government plans." (International Health Promotion, F. Baum). "By giving underprivileged groups access to formal financial services, financial inclusion, as a component of social inclusion, significantly reduces poverty and income inequality" (*Journal of Economic Structures* Md Abdullah Omar). "While their full potential is not yet realized, multi-component community-based health promotion interventions can reduce health disparities, particularly in socially disadvantaged communities" (*International Journal for Equity in Health* S. Nickel). "Applying the principle of proportionate universalism to school-based interventions can lessen social disparities in teenage overweight and obesity, especially in females" (*International Journal of Obesity*) *Modern Clinical Trials Communications*, S. Briançon, K. Legrand). According to the UN Sustainable Development Goal 10.2, "promoting social, economic, and political inclusion can help reduce inequalities within and among countries" (SDGO collection, *Social Identities* J. Draper).

"Single positions, token roles, and unfavourable racial stereotypes provide serious obstacles for African Americans in organizational contexts. These obstacles take the shape of prejudiced hiring procedures, inflated expectations, and divisive



assessments, all of which can have a detrimental effect on social support and job performance” (T. Pettigrew, *Journal of Social Issues*). Arvind Narrain stresses that without wider cultural acceptance, legal recognition alone is insufficient. LGBTQ people in India frequently experience healthcare inaccessibility, discrimination in the workplace, and social exclusion (*Queer: Despised Sexuality, Law, and Social Change*. Books for Change, A. Narrain, 2004). “LGBTQ+ workers are more likely to encounter workplace harassment and lower salaries compared to their straight colleagues. LGBTQ individuals still confront severe discrimination, particularly in the areas of employment, healthcare, and education”. (*LGBTQ Economic Equality: Improving the Lives of LGBTQ Americans*. Center for American Progress. Badgett *et al.* (2019).

### 3.0 Research Gap

The disparity between theoretical frameworks and their practical implementation in various organizational and societal situations represents a significant research gap in “Promoting social inclusion and equality: A pathway to a just society.” Even while inclusion and equality are universally accepted concepts, their application frequently fails because of poor measures, opposition to change, and the complexity of intersectionality. Furthermore, little is known about how inclusion measures will affect society in the long run and how successfully current leadership styles and policies will promote these ideals. In order to translate inclusive ideas into concrete results that support a more just and equitable society, it is imperative that such inequalities be addressed

### 4.0 Methodology

A structured questionnaire was designed as the primary instrument for data collection. The questionnaire was composed of closed-ended questions, using a five-point likert scale for measuring attitudes or opinions, and multiple-choice questions for capturing demographic information and categorical data. The objective of the analysis is to assess the level of social inclusion and equality within society as whole, focusing on representation across gender, race, occupation, and socio-economic backgrounds.

**Table 1: Research Design**

S. No.	Particulars	details
1	Sample frame	Students, employees and people from different communities.
2	Sample size	81
3	method	Simple random sampling
4	Research instrument	Questionnaire
5	Data collection	Primary data

*Source: Primary data*

The tables and the figures as labelled represents the responses of people in society belonging to different communities and organisations which gives a diverse set of views in promoting social inclusion and equality to a just society.

## 5.0 Objectives of the Study

- To explore the gap between the theoretical understanding of social inclusion and equality and their actual implementation within organizations and society, identifying the challenges such as poor measurement systems and resistance to change.
- To assess how inclusive leadership can drive positive change in both organizational settings and broader societal contexts, examining how leadership practices promote equality and inclusion.
- To investigate the long-term impact of inclusion policies on societal cohesion and economic development, particularly focusing on marginalized groups and how such policies influence their opportunities.
- To identify and analyse successful case studies and best practices that have effectively fostered social inclusion and equality, offering insights into practical approaches for organizations and policymakers.
- To develop actionable strategies for overcoming systemic barriers to inclusion, such as gender bias, racial discrimination, and economic inequality, with a focus on creating lasting change in both workplaces and society.

## 6.0 Research Findings and Interpretation

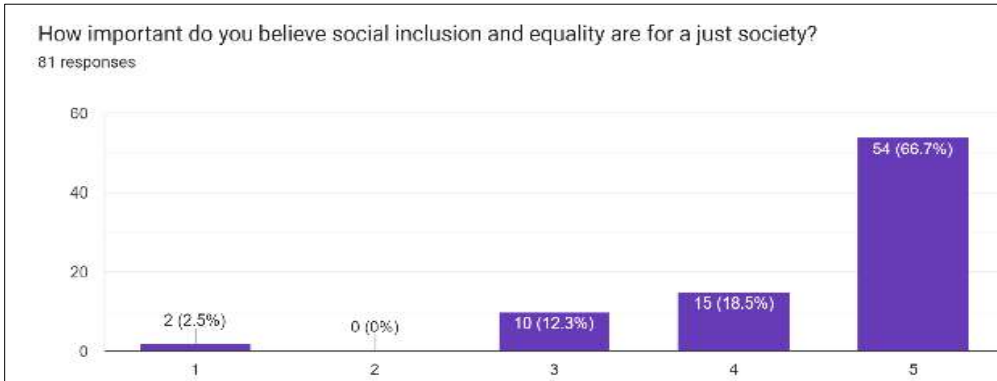
*Interpretation of Figure 1:* The survey shows that 66.7% of respondents believe social inclusion and equality are very important for a just society, with 85.2% rating it highly overall. Only 2.5% see it as unimportant. This strong consensus indicates widespread support for these values as key to justice, making them critical focal points for policies and societal efforts.

**Table 2: Importance of Social Inclusion and Equality among Respondents**

Rating scale	Number of Respondents	% Respondents
Very important (5)	54	66.7%
Important	15	18.5%
Neutral	10	12.3%
Not very important	0	0
Not important at all (0)	2	2.3%

*Source: Primary data*

**Figure 1: Importance of Social Inclusion and Equality among Respondents**

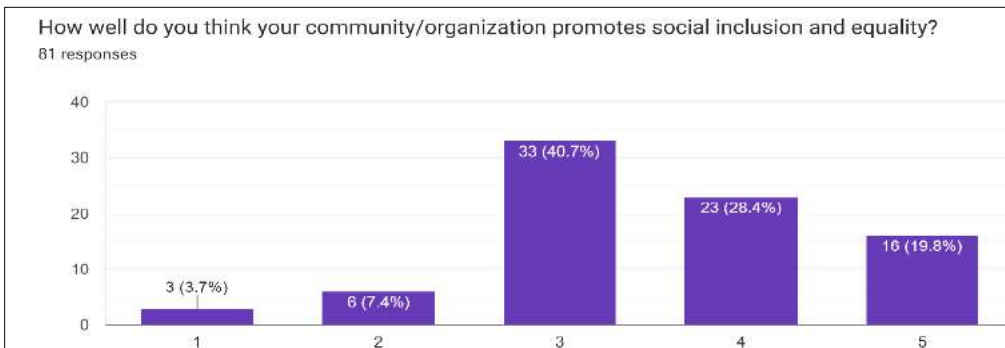


**Table 3: Social Inclusion and Equality in Community/ Organisation of Respondents**

Rating scale	Number of Respondents	% Respondents
Very well (5)	16	19.8%
Well	23	24.8%
Neutral	33	40.7%
Poorly	6	7.4%
Very poorly (0)	3	3.7%

Source: Primary data

**Figure 2: Social Inclusion and Equality in Community/ Organisation of Respondents**



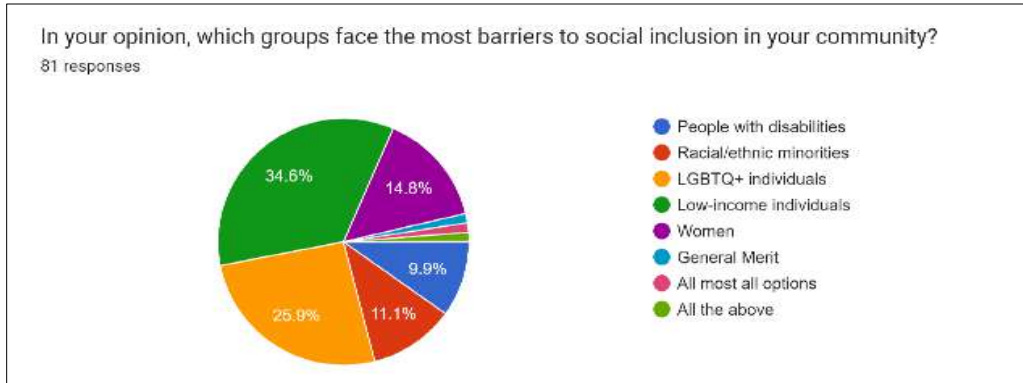
*Interpretation of Figure 2:* It reveals that 69.1% of respondents view their community or organization’s efforts to promote social inclusion and equality as moderate to good, with 40.7% rating it average and 28.4% giving higher marks. However, 11.1% of respondents are dissatisfied, suggesting that while there is progress, critical improvements are still needed to enhance inclusivity and equality initiatives. The overall sentiment reflects a recognition of efforts made but underscores the demand for more impactful measures.

**Table 4: Groups Facing Barriers to Social Inclusion and Equality in Community/Organisation of Respondents**

Groups	Number of Respondents	% Respondents
Low Income individuals	28	34.6%
LGBTQ+	21	25.9%
Women	12	14.8%
Racial/ethnic minorities	9	11.1%
People with disabilities	8	9.9%
General merit	1	1.2%
All of the above	2	2.4%

Source: Primary data

**Figure 3: Groups Facing Barriers to Social Inclusion and Equality in Community/Organisation of Respondents**



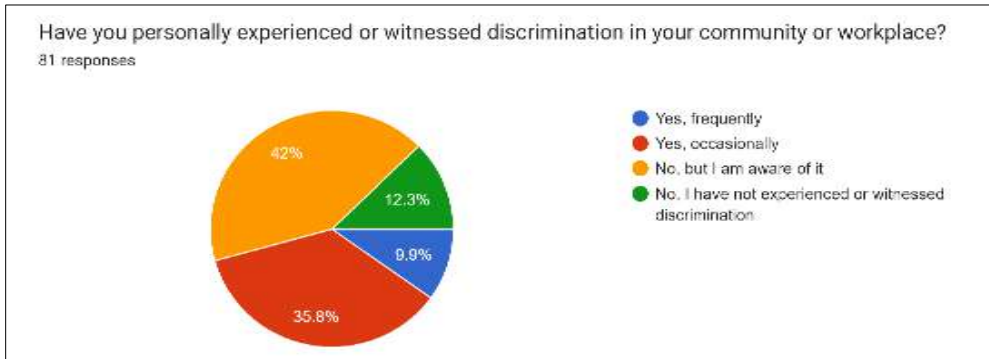
*Interpretation of Figure 3:* The chart shows that low-income individuals (34.6%) and LGBTQ+ (25.9%) face the most significant barriers to social inclusion, highlighting gender inequality and economic hardship as major issues. Women (14.8%), racial/ethnic minorities (11.1%), and people with disabilities (9.9%) also encounter notable barriers, though to a lesser extent. The data suggests that gender and economic status are the primary obstacles to inclusion in this community.

**Table 5: Discrimination Faced by Respondents in their Community/Organization**

Statements	Number of Respondents	% Respondents
Yes, frequently	8	9.9%
Yes, occasionally	29	35.8%
No, but aware	34	42%
No, not experienced	10	12.3%

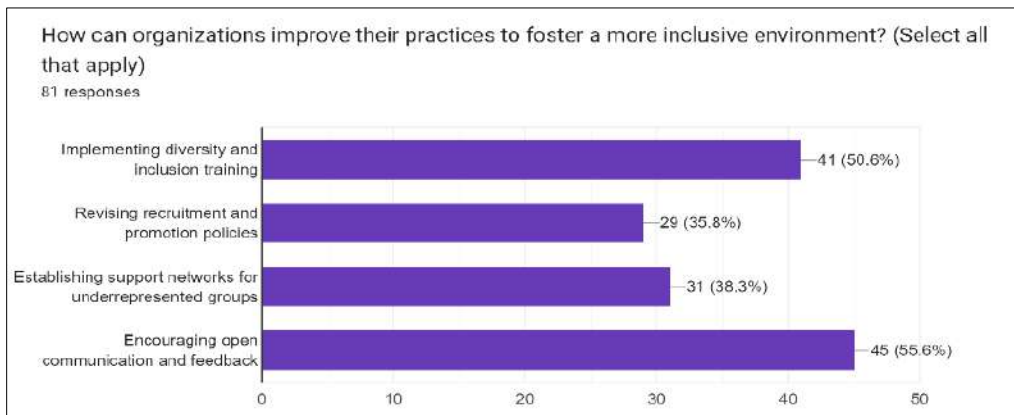
Source: Primary data

**Figure 4: Discrimination Faced by Respondents in their Community/Organization**



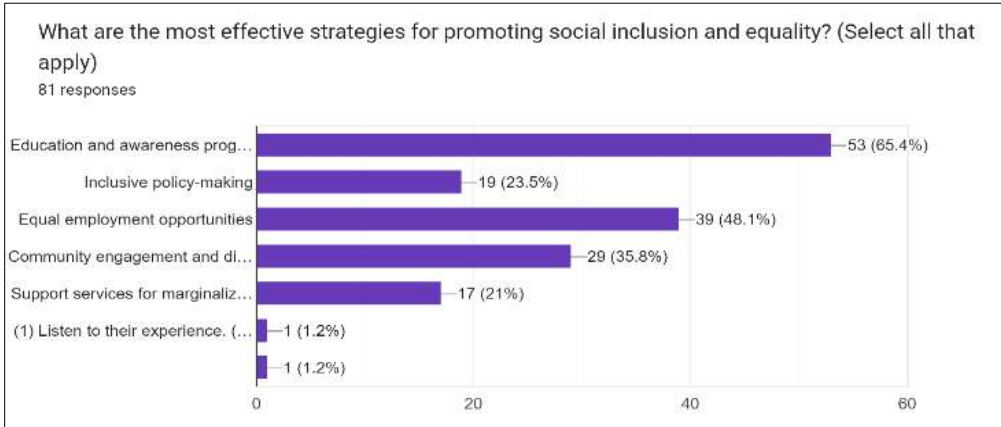
*Interpretation of Figure 4:* The chart reveals that 57.7% of respondents have either encountered or observed discriminatory practices, with 35.8% reporting intermittent occurrences and 9.9% experiencing them regularly. Conversely, 42% indicated no direct exposure, and 12.3% acknowledged awareness without personal involvement. This underscores the persistent and pervasive nature of discrimination within these environments.

**Figure 5: Primary Data**



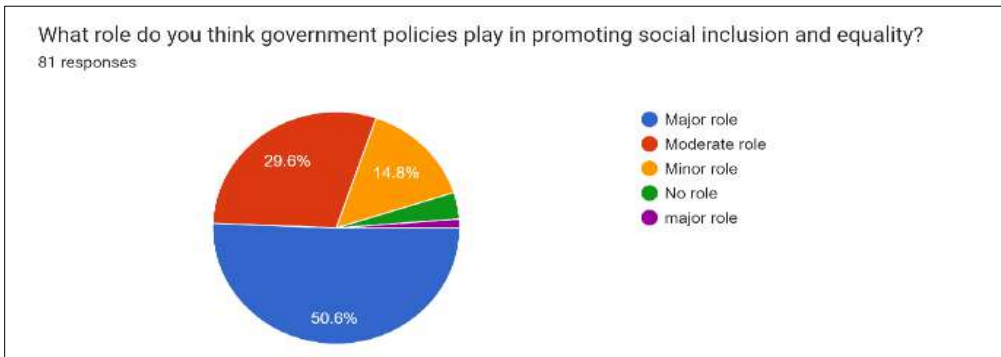
*Interpretation Figure 5:* The chart indicates that to foster a more inclusive environment, organizations should prioritize encouraging open communication and feedback (55.6%), followed by implementing diversity and inclusion training (50.6%). Establishing support networks for underrepresented groups (38.3%) and revising recruitment and promotion policies (35.8%) were also seen as important measures. Open communication was regarded as the most crucial step toward inclusivity.

**Figure 6: Primary Data**

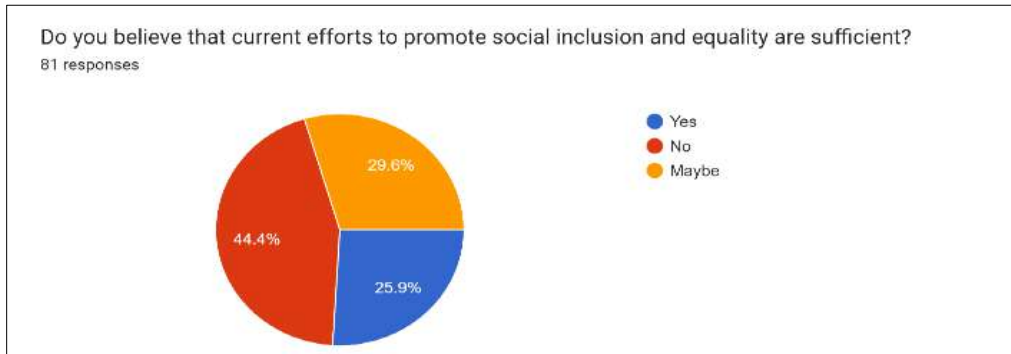


*Interpretation of Figure 6:* The chart shows that the most opted effective strategies for promoting social inclusion and equality are education and awareness programs (65.4%) and inclusive policy-making (48.1%). Other important strategies include equal employment opportunities (35.8%) and community engagement (23.5%), while support services for marginalized groups (21%) were less emphasized.

**Figure 7: Primary Data**



*Interpretation of Figure 7:* This pie chart illustrates the perceived role of government policies in promoting social inclusion and equality, based on 81 responses. 50.6% of respondents believe that government policies play a major role. 29.6% see them as playing a moderate role, while 14.8% think they play a minor role. A very small portion, 1.2%, feels that government policies play no role. The overall sentiment suggests that most respondents recognize the significant impact of government interventions in promoting inclusivity and equality.

**Figure 8: Primary Data**

*Interpretation of Figure 8:* This pie chart shows responses to whether current efforts to promote social inclusion and equality are sufficient. 44.4% of respondents believe that the efforts are not sufficient. 29.6% are unsure, responding with maybe, while 25.9% think that the efforts are sufficient. The majority opinion leans toward dissatisfaction with current efforts, highlighting a potential need for further action or improvement.

*Demographic interpretation of primary data:* The demographic details of respondents reveal that majority of the respondents are aged from 18-24 (66.7%) and 25-34 (19.8%) perhaps due to digital literacy and their responses provide a contrasting perspective towards the younger bracket, also limited representation of older age groups was observed mainly due to medium of survey. with (67.9%) female and (32.1%) male, indicating a female dominant distribution. Educationally, (8.4%) have a high school diploma, (38.5%) hold a bachelor's degree, and (55.6%) possess a master's degree, reflecting diverse educational backgrounds. Occupations are varied, with majority of (56.8%) are students, with smaller groups including professionals (13.6%), managers/executives and service workers (12.3%) each. A few respondents are unemployed, businesspeople, or teachers, highlighting representation across multiple sectors. This data suggests progress toward gender balance and educational diversity in the workforce, but opportunities remain to further enhance inclusion, particularly in underrepresented sectors.

## 7.0 Conclusion

In conclusion Constructing a fair society where everyone can thrive requires developing social inclusion and equality, according to empirical research. By addressing the structural barriers that marginalized communities face, businesses and larger social structures can promote a more peaceful and equitable environment. With enhanced justice, companies that adopt inclusive policies and practices witness benefits in overall performance, employee satisfaction, and innovation

Additionally, the research emphasizes how important leadership is in advancing equality and inclusivity. Leaders that prioritize diversity, equity, and inclusion create work cultures that allow every person to contribute to the fullest extent possible. Teams and organizations that are more resilient and creative are the result of this.

Enforcing laws that lower obstacles to employment, healthcare, and education is crucial to ensure that everyone has full access to economic, social, and political life on a societal level. Long-term economic and social growth is realistically driven by social inclusion and equality, in addition to being moral imperatives. Thus, advancing social inclusion demands that policy-makers and organizational leaders go beyond surface-level diversity initiatives, embedding equity into the very fabric of institutional frameworks. This involves a transformation in both mindset and practice, where the power dynamics that uphold exclusionary practices are actively dismantled, and inclusivity becomes a measurable outcome rather than a rhetorical ideal.

Therefore, the pursuit of social inclusion and equality should be viewed not as an ancillary objective, but as a critical driver of sustainable progress. As we move towards a more interconnected and interdependent world, the equitable treatment of all individuals becomes the cornerstone of a just and thriving society, ensuring that no one is left behind in the pursuit of shared prosperity. This is not only an ethical imperative but a strategic advantage in an increasingly globalized and competitive world. Studies consistently show that organizations that prioritize diversity and inclusion are better equipped to adapt to changing market conditions, with higher levels of employee engagement, creativity, and resilience.

The study concludes by showing how promoting social inclusion and equality helps organizations and societies overall in addition to benefiting individuals. A more equitable and harmonious society where everyone may contribute and prosper can be established by concerted efforts involving workplace cultures, inclusive leadership, and governmental laws.

## **8.0 Recommendations**

- Research can explore the impact of creating channels for transparent communication and feedback on workplace inclusivity. Investigate how open communication contributes to the sense of belonging for employees from underrepresented groups and improves overall organizational culture.
- Since education and awareness programs are perceived as the most effective strategies for promoting social inclusion (65.4%), research could focus on assessing the long-term effects of such programs and analyse which types of training or education yield tangible improvements in workplace diversity and inclusion.



- Given that 50.6% of respondents believe government policies play a significant role in promoting inclusivity, research could evaluate the effectiveness of specific policies. Examine how government interventions (e.g., affirmative action, equal pay policies) impact organizational practices and outcomes in terms of social inclusion and equality.
- Since revising recruitment and promotion policies (35.8%) is identified as a key strategy, research could focus on how inclusive hiring and promotion practices impact organizational diversity. Look into whether bias in recruitment and promotion hinders the inclusion of marginalized groups and what specific reforms can ensure equal opportunities.
- To enhance social inclusion, provide financial support for low-income individuals, enforce LGBTQ+ anti-discrimination policies, promote gender equality, and improve accessibility for minorities and people with disabilities. An intersectional approach addressing multiple forms of marginalization is essential for achieving equitable outcomes.
- To address the 44.4% who believe current efforts are insufficient, organizations should conduct detailed assessments to identify gaps, develop targeted initiatives, and expand inclusion training programs. Setting measurable goals and tracking progress will ensure accountability. The 29.6% unsure and 25.9% satisfied responses highlight the need for continued improvement and monitoring to create a more inclusive and equitable environment.

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# Karnatak Law Society's Gogte Institute of Technology

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