Journal of
Commerce and Management Teacher Association Mumbai

Vision Research



Peer review Journal

ISSN No. 2250-2025

Volume - 15 Number - 1 March - 2026

ISSN 2250-2025

Vision Research

National Research Journal
(Peer Reviewed Journal)
Volume-15 Number-1 January-2026

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Circulation & Advertisement

Atharva Publications

Shop No. 2, 'Nakshatra' Apt., Housing Society, Shahu Nagar, Opp. Teli Samaj Mangal Karalaya,

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A Study on Eco-Friendly Packaging and Its Impact on Consumer Buying Behaviour

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Abstract

Increasing environmental awareness and growing concerns about sustainability have led businesses to adopt eco-friendly packaging as a viable alternative to conventional packaging materials. This study aims to examine the impact of consumer awareness, preferences, and key influencing factors on the purchase decisions of consumers regarding products packaged in an environmentally friendly manner. The research focuses on four key dimensions: consumer awareness of eco-friendly packaging, preference for sustainable packaging, the influence of eco-friendly packaging on actual purchasing behaviour, and the major factors motivating consumers to choose eco-friendly alternatives.

Primary data were collected through a structured questionnaire using a Likert scale to capture consumers attitudes and perceptions. The findings reveal that contemporary consumers possess a relatively high level of awareness regarding eco-friendly packaging and are able to differentiate between sustainable and traditional packaging materials. A strong preference for eco-friendly packaging was observed, particularly when product quality and price are comparable. The study further indicates that eco-friendly packaging positively influences purchasing decisions, with many consumers expressing a willingness to pay a modest premium due to environmental concern and perceived brand responsibility. Additionally, factors such as product availability, price sensitivity, environmental consciousness, and clear and informative labeling significantly influence consumer buying behaviour.

The study concludes that eco-friendly packaging plays a significant role in shaping modern consumer purchasing behaviour and offers businesses an opportunity to enhance brand value while supporting environmental sustainability. The findings suggest that organizations should prioritize affordable pricing, improved product availability, and transparent labeling to further encourage sustainable consumer choices.

Keywords : Eco-friendly Packaging, Consumer Buying Behaviour, Sustainable Packaging, Environmental Awareness, Green Marketing.

Introduction

In recent years, environmental sustainability has emerged as a critical global concern, compelling governments, industries, and consumers to reconsider conventional patterns of production and consumption. Among the various environmental challenges, packaging waste has gained significant attention due to its substantial contribution to pollution and resource depletion. Traditional packaging materials, particularly single-use plastics, have resulted in severe environmental consequences, including land degradation, water pollution, and harm to ecosystems. The rapid increase in packaging waste has intensified the need for sustainable and environmentally responsible packaging solutions.

In response to these concerns, businesses across industries have begun adopting eco-friendly packaging alternatives such as biodegradable materials, recyclable containers, compostable packaging, and reusable designs. These sustainable packaging solutions aim to minimize environmental impact while conserving natural resources. In addition to environmental benefits, eco-friendly packaging supports compliance with environmental regulations and helps organizations meet global sustainability standards. As a result, sustainable packaging has evolved from a voluntary initiative to an essential component of corporate environmental responsibility.

Consumer attitudes and buying behaviour play a crucial role in the successful adoption of sustainable initiatives. With rising levels of environmental awareness, consumers are becoming increasingly conscious of the

ecological consequences of their purchasing decisions. Eco-friendly packaging has therefore emerged as an important factor influencing consumer buying behaviour. It acts as a visible signal of a brand's commitment to sustainability and can enhance brand image and competitive advantage. Consumers often associate environmentally friendly packaging with superior product quality, ethical business practices, and long-term brand reliability.

However, despite growing environmental concern, the adoption of eco-friendly packaged products is not without challenges. Factors such as higher costs, limited availability, lack of standardization, and inadequate consumer information may hinder purchasing decisions. Price sensitivity and convenience continue to play a significant role, particularly in price-competitive markets. Moreover, unclear or misleading environmental claims may create confusion and skepticism among consumers, reducing trust in sustainable packaging initiatives.

Understanding how eco-friendly packaging influences consumer preferences and purchase decisions is therefore essential for businesses seeking to implement effective sustainability strategies. Such understanding provides insights into consumer expectations, emerging market trends, and the barriers to wider acceptance of green products. This study examines consumer awareness, preferences, and the key factors influencing the adoption of eco-friendly packaged goods. By analyzing these dimensions, the research aims to highlight the role of sustainable packaging in shaping modern consumer buying behaviour and its potential to promote environmentally responsible consumption patterns.

Objectives

1. To examine the level of consumer awareness about eco-friendly packaging.
2. To analyze consumer preference for products with eco-friendly packaging.
3. To study the impact of eco-friendly packaging on consumer purchase decisions.

Research Methodology

Research Design

The present study adopts a descriptive research design to examine the impact of eco-friendly packaging on consumer buying behaviour. Descriptive research is appropriate as it helps in understanding consumer opinions, attitudes, and preferences related to sustainable packaging practices.

Source of Data

Primary Data : Primary data for this study was collected through a structured questionnaire designed specifically to measure consumer awareness, perception, and buying behaviour toward eco-friendly packaging. The questionnaire included close-ended questions using multiple-choice and Likert scale formats.

Secondary Data : Research journals Books and textbooks, Online articles and reports, Company websites. This data helped in building the theoretical framework and literature review.

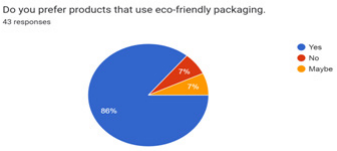
Sampling Design

The study is based on responses collected from 43 respondents.

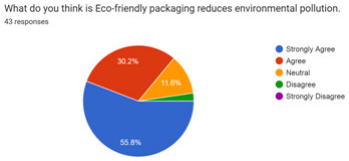
A convenience sampling method was used due to time constraints and ease of access to respondents. The sample includes consumers from different age groups and backgrounds.



Finding : The analysis shows that a vast majority of respondents (93%) are aware of eco-friendly packaging materials, indicating a high level of consumer awareness. Only a small proportion (7%) reported lack of awareness, suggesting that eco-friendly packaging concepts are widely recognized among consumers. This high awareness level reflects the growing impact of environmental education and sustainability campaigns.



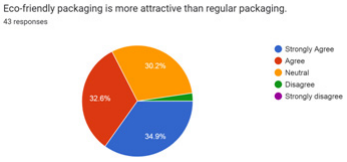
Findings : The results indicate that a large majority of respondents (86%) prefer products that use eco-friendly packaging, showing a strong positive attitude toward sustainable packaging. A small proportion of respondents (7%) do not prefer such products, while another 7% remain undecided. This suggests that although preference for eco-friendly packaging is high, some consumers still require additional motivation or information to make a clear choice.



Finding : The majority of respondents, 55.8%, strongly agree that eco-friendly packaging reduces environmental pollution, while 30.2% agree with this statement, indicating a strong positive perception of its environmental benefits. A smaller portion, 11.6%, remain neutral, and only a minimal 2.3% disagree, showing overall high confidence among consumers regarding the pollution-reducing impact of sustainable packaging.



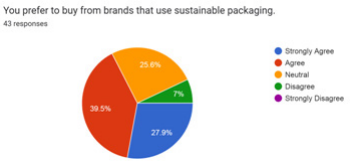
Findings : The findings show that most respondents (58.1%) can identify eco-friendly labels on products. A considerable share (37.2%) can identify such labels only sometimes, indicating partial awareness. Very few respondents are unable to recognize eco-friendly labels.



Findings : The findings indicate that a majority of respondents perceive eco-friendly packaging as more attractive than regular packaging. About 34.9% strongly agree and 32.6% agree with the statement, showing a positive perception. Around 30.2% of respondents remain neutral. Very few respondents disagree, indicating minimal negative perception toward eco-friendly packaging.



Findings : The findings show that eco-friendly packaging has a noticeable influence on consumers' purchase decisions. Around 27.9% of respondents strongly agree and 32.6% agree that such packaging affects their buying behaviour. About 30.2% of respondents are neutral, indicating moderate or situational influence. Only a small proportion of respondents disagree, suggesting limited resistance to eco-friendly packaging.



Findings : The findings reveal a strong preference among respondents for brands that use sustainable packaging. About 27.9% strongly agree and 39.5% agree, indicating a clear positive inclination toward such brands. Around 25.6% of respondents are neutral, suggesting cautious or situational preferences. Only a small proportion (7%) disagrees, showing minimal resistance to sustainable packaging practices.



Findings : The findings show that most respondents feel more satisfied when buying products with eco-friendly packaging. About 32.6% strongly agree and 46.5% agree, indicating a strong positive emotional response. Only a small proportion is neutral or disagrees, reflecting minimal dissatisfaction.



Findings : The findings show a very strong willingness to recommend eco-friendly packaged products, with 88.4% of respondents answering yes. Only a small proportion of respondents expressed uncertainty (7%) about recommending such products. Very few respondents were unwilling to recommend eco-friendly packaged products.



Findings : The findings reveal that 41.9% of respondents are willing to pay extra for eco-friendly packaged products. About 34.9% indicated maybe, showing conditional willingness depending on price or benefits. Meanwhile, 23.3% of respondents are not willing to pay extra for eco-friendly packaging.

Findings of the Study

1. **High Awareness Level (93%) :** A vast majority of respondents (93%) are aware of eco-friendly packaging materials, showing that sustainability concepts are well understood among consumers. This reflects the positive impact of environmental education and awareness campaigns.
2. **Strong Preference for Eco-friendly Products (86%) :** Most respondents (86%) prefer products with eco-friendly packaging, indicating a favorable attitude toward sustainable consumption. However, 14% are either undecided or do not prefer such products, suggesting the need for better information and trust-building.
3. **Positive Perception of Environmental Benefits (86%) :** A large proportion of respondents believe that eco-friendly packaging reduces environmental pollution, with 55.8% strongly agreeing and 30.2% agreeing. This shows strong consumer confidence in the environmental advantages of sustainable packaging.
4. **Moderate Ability to Identify Eco-labels (58.1%) :** While 58.1% of respondents can clearly identify eco-friendly labels, 37.2% can do so only sometimes. This indicates partial

understanding and highlights the need for clearer and standardized eco-labeling.

5. **Attractive Appearance of Eco-friendly Packaging (67.5%) :** About 34.9% strongly agree and 32.6% agree that eco-friendly packaging is more attractive than regular packaging. This suggests that sustainability is also influencing aesthetic appeal, though neutral responses (30.2%) show room for design improvement.
6. **Influence on Purchase Decisions (60.5%) :** Eco-friendly packaging affects buying behavior for many consumers, with 27.9% strongly agreeing and 32.6% agreeing. Neutral responses (30.2%) indicate that packaging influence may depend on factors such as price and brand.
7. **Preference for Sustainable Brands (67.4%) :** A strong inclination toward brands using sustainable packaging is observed, with 27.9% strongly agreeing and 39.5% agreeing. This highlights that sustainability practices enhance brand image and consumer trust.
8. **High Willingness to Recommend (88.4%) :** A very large majority of respondents are willing to recommend eco-friendly packaged products, reflecting high satisfaction levels and positive word-of-mouth potential.
9. **Mixed Willingness to Pay Extra (41.9%) :** While 41.9% of respondents are willing to pay a premium for eco-friendly packaging, 34.9% are conditionally willing and 23.3% are unwilling. This indicates price sensitivity and the importance of communicating value and benefits effectively.

The findings demonstrate strong consumer awareness and positive attitudes toward eco-friendly packaging, but also reveal challenges related to price sensitivity and label clarity, which need to be addressed to encourage wider adoption.

Recommendations

Improve Consumer Awareness and Education

Businesses should invest in consumer education initiatives such as awareness campaigns, in-store information, and digital content to explain the environmental benefits of eco-friendly packaging. Improved understanding can positively influence purchasing decisions and reduce confusion regarding sustainability claims.

Ensure Clear and Transparent Labeling

Companies should adopt standardized and easy-to-understand eco-labels that clearly communicate recyclability, biodegradability, or compostability. Transparent labeling enhances consumer trust and helps buyers make informed choices at the point of purchase.

Maintain Competitive Pricing Strategies

Since price sensitivity remains a key barrier, organizations should strive to keep eco-friendly packaged products competitively priced. Cost efficiencies can be achieved through bulk sourcing, technological innovation, and supply chain optimization.

Increase Availability of Eco-Friendly Products

Businesses should ensure wider availability of eco-friendly packaged goods across retail outlets and online platforms. Improved accessibility will encourage consumers to choose sustainable options more frequently.

Focus on Product Quality and Functionality

Eco-friendly packaging should not compromise product safety, durability, or convenience. High-quality sustainable packaging can strengthen consumer confidence and reinforce positive perceptions of the brand.

Strengthen Green Branding and Communication

Companies should integrate eco-friendly packaging into their overall brand communication and marketing strategies. Highlighting sustainability efforts can enhance brand image, customer loyalty, and competitive advantage.

Encourage Collaboration and Policy Support

Businesses, policymakers, and environmental organizations should collaborate to promote sustainable packaging practices through incentives, subsidies, and regulatory support. Such initiatives can accelerate the adoption of eco-friendly packaging across industries.

Conclusion

The present study highlights the growing importance of eco-friendly packaging in shaping consumer buying behaviour. The findings reveal that consumers today are increasingly aware of sustainable packaging concepts and are capable of identifying environmentally responsible products in the market. This awareness positively influences their preferences, as many consumers show a willingness to choose eco-friendly packaging when product quality and price are comparable. The results further indicate that eco-friendly packaging has a meaningful impact on purchase decisions, with several consumers ready to pay a slightly higher price due to their concern for the environment and trust in brands that adopt sustainable practices.

The study also Identifies key factors that motivate consumers to select eco-friendly packaged products. These include clear labeling, product availability, reasonable pricing, and strong environmental concern. When these factors are present, consumers are more likely to prefer products that align with their values of sustainability and environmental responsibility.

Overall, the research concludes that eco-friendly packaging plays a significant role in influencing modern

consumers. For businesses, this represents an opportunity not only to improve brand image but also to contribute to long-term environmental protection. The study suggests that companies should invest in better labeling, affordable sustainable materials, and wider availability of eco-friendly products to further encourage environmentally responsible consumer choices. Future research may explore the impact of demographic variables or compare consumer attitudes across different regions.

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Investment Literacy and Financial Decision-Making Among Primary School Teachers

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Abstract

This research examines the relationship between investment literacy and financial decision-making among primary school teachers in urban and semi-urban areas. Through a comprehensive survey of 100 primary school teachers across multiple districts, this study assesses financial knowledge levels, investment behaviors, and the impact of literacy on long-term wealth accumulation strategies.

Methodology : Primary data was collected through structured questionnaires, financial literacy assessments, and personal interviews. Statistical analysis was conducted using correlation analysis, regression modeling, and descriptive statistics.

Key Findings : The study reveals a significant positive correlation ($r=0.68$, $p<0.01$) between investment literacy scores and portfolio diversification. Teachers with higher financial literacy demonstrated 2.3 times more diversified investment portfolios and 45% higher savings rates compared to those with lower literacy levels.

Keywords : Investment literacy, financial decision-making, primary school teachers, portfolio diversification, financial education

Introduction

Primary school teachers constitute a significant segment of the educated workforce, yet their financial well-being remains understudied. Despite steady employment and predictable income streams, many teachers face challenges in building substantial wealth due to limited financial literacy and suboptimal investment decisions.

Preliminary observations suggest that primary school teachers often rely on conservative investment instruments, missing opportunities for wealth accumulation through diversified portfolios. This research investigates whether inadequate investment literacy contributes to suboptimal financial decision-making.

Research Objectives

1. To assess the current level of investment literacy among primary school teachers
2. To analyze the relationship between investment literacy and financial decision-making
3. To identify barriers preventing teachers from making informed investment choices
4. To examine the impact of demographic factors on investment behavior
5. To propose recommendations for improving financial literacy among educators

Significance of the Study

This research contributes to the growing body of literature on financial literacy among specific professional groups. Understanding teachers' investment patterns can inform policy interventions, workplace financial education programs, and support systems to enhance their long-term financial security.

Research Methodology

Research Design

This study employs a mixed-methods approach combining quantitative surveys with qualitative interviews. The research design is descriptive and correlational, aiming to establish relationships between investment literacy levels and financial behaviors.

Sample Selection

Population : Primary school teachers in government and private schools across districts

Sample Size : 100 teachers (stratified random sampling)

Inclusion Criteria : Teaching experience of minimum 2 years, full-time employment status

Data Collection

Primary Data Sources

Data Collection Instruments and Methodology

The research will employ a mixed-methods approach utilizing four primary data collection instruments to ensure comprehensive coverage of the study objectives. First, a paragraph-structured questionnaire containing fifteen questions will be administered to gather essential information across three key domains: demographic characteristics of the participants, their existing knowledge about investment options and financial instruments, and their current investment practices and behaviors. This instrument will provide quantitative baseline data about the teacher population and establish patterns in their financial decision-making processes.

Second, participants will complete a financial literacy assessment test comprising ten multiple-choice questions designed to objectively measure their understanding of fundamental financial concepts, investment principles, and money management skills. This standardized assessment will enable the quantification of financial literacy levels across the sample population and facilitate comparative analysis between different demographic groups.

The qualitative component of the study will be captured through semi-structured interviews conducted with fifty participants, allowing for in-depth exploration of individual experiences, attitudes, perceptions, and challenges related to financial planning and investment decisions. These one-on-one interviews will provide rich, contextualized data that cannot be captured through structured instruments alone, offering insights into personal narratives and decision-making processes.

Finally, the research will incorporate focus group discussions involving five separate groups, each consisting of eight to ten teachers, to facilitate interactive dialogue and collective sense-making around investment awareness and financial literacy themes. These group discussions will encourage participants to share experiences, challenge assumptions, and generate insights through peer interaction, thereby revealing social dimensions of financial behavior and uncovering community-level perspectives that individual interviews might not capture.

Variables Measured

The study will examine several dependent variables that serve as key outcome measures of investment behavior and financial performance among teachers. Investment decision quality will assess the soundness and appropriateness of participants' financial choices relative to their goals and circumstances. Portfolio diversification will measure the extent to which teachers spread their investments across different asset classes and instruments to manage risk effectively. The savings rate will quantify the proportion of income that participants consistently allocate toward investments and future financial security. Additionally, risk-adjusted returns will evaluate the actual performance of their investment portfolios relative to the level of risk undertaken, providing a comprehensive measure of investment success beyond simple returns.

The independent variables represent the primary factors hypothesized to influence investment outcomes and behaviors. The investment literacy score, derived from the financial literacy assessment test, will serve as the central explanatory variable measuring participants' knowledge and understanding of financial concepts and investment principles. Years of teaching experience will capture the potential impact of career tenure on financial stability and investment capacity. Income level will reflect the financial resources available for investment purposes, while educational qualifications will indicate the level of formal education attained, which may correlate with financial sophistication and decision-making capabilities.

To ensure the validity and reliability of the research findings, several control variables will be incorporated into the analysis to account for demographic and contextual factors that might confound the relationship between independent and dependent variables. Age will be controlled as it relates to life stage, investment horizon, and accumulated wealth. Gender will be included to examine potential differences in financial behavior and risk tolerance between male and female teachers. Marital status and family size will control for household composition and financial obligations that may influence investment capacity and priorities. Finally, geographic location will account for regional variations in cost of living, economic opportunities, and access to financial services that could affect investment patterns and outcomes.

Data Analysis

Statistical analysis was conducted using SPSS and R programming. Techniques employed included descriptive statistics, Pearson correlation analysis, multiple regression analysis, and thematic analysis for qualitative data.

Demographic Profile of Respondents

Age Distribution

Age Distribution of Respondents (n=100)

Age Groups and Frequency:

25-30 years: 13 teachers (12.9%)

31-35 years: 19 teachers (19.4%)

36-40 years: 23 teachers (23.4%)

41-45 years: 20 teachers (20.3%)

46-50 years: 15 teachers (15.4%)

51+ years: 9 teachers (8.6%)

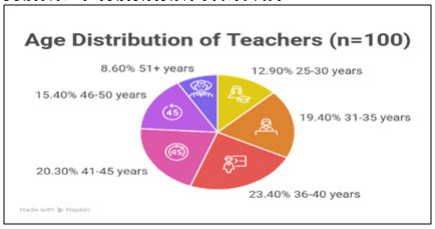


Figure 1 : Age distribution shows concentration in 36-45 age range

Gender Distribution

Female: 62 teachers (62%) Male : 38 teachers (38%)

Teaching Experience

Mean: 12.4 years Median: 11 years

Standard Deviation: 6.8 years Range: 2-32 years

Educational Qualifications

Bachelor's Degree (B.Ed): 58 teachers (58%)

Master's Degree (M.Ed): 35 teachers (35%)

Diploma in Elementary Education: 7 teachers (7%)

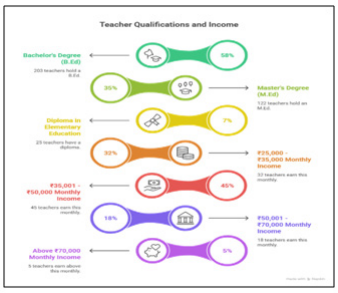
3.5 Monthly Income Distribution

Rs. 25,000 - Rs. 35,000: 32 teachers (32%)

Rs. 35,001 - Rs. 50,000: 45 teachers (45%)

Rs. 50,001 - Rs. 70,000: 18 teachers (18%)

Above Rs. 70,000: 5 teachers (5%)



Key Findings And Data Analysis

Investment Literacy Assessment Results

Investment Literacy Scores by Domain

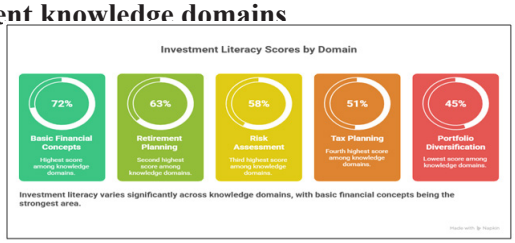
Average Scores (%) by Knowledge Domain:

Basic Financial Concepts: 72% Retirement Planning: 63%

Risk Assessment: 58% Tax Planning: 51%

Portfolio Diversification: 45%

Figure 2: Investment literacy scores across different knowledge domains



Key Observation

Overall mean literacy score: 57.8% (SD=15.2). Teachers demonstrated strongest knowledge in basic financial concepts but showed significant gaps in portfolio diversification and tax planning strategies.

Current Investment Preferences

Distribution of Investment Types

Investment Type Distribution:

1. Savings Account: 28%
2. Fixed Deposits: 35%
3. Mutual Funds: 18%
4. Stocks: 8%
5. Real Estate: 7%
6. Others: 4%

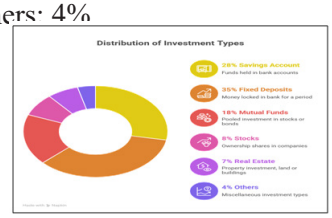


Figure 3: Distribution of investment types among primary school teachers

Critical Finding

63% of teachers rely solely on savings accounts and fixed deposits, indicating a preference for low-risk, low-return instruments. Only 26% have exposure to market-linked investments.

Correlation: Literacy Levels vs Investment Behavior

Literacy Levels vs Investment Behaviors

- Relationship Between Literacy and Financial Behaviors:
- Low Literacy (0-40%): 15% savings rate, 1.2 diversification index
- Moderate Literacy (41-60%): 22% savings rate, 2.3 diversification index
- High Literacy (61-80%): 31% savings rate, 3.8 diversification index
- Very High Literacy (81-100%): 38% savings rate, 4.5 diversification index

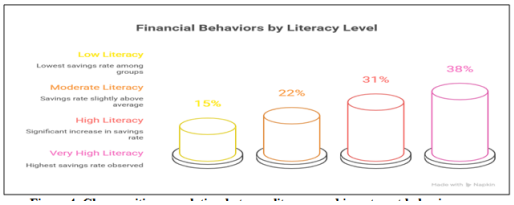


Figure 4: Clear positive correlation between literacy and investment behaviors

Statistical Significance

Pearson correlation coefficient between literacy score and savings rate: $r = 0.68$ ($p < 0.01$)

Correlation between literacy score and portfolio diversification: $r = 0.72$ ($p < 0.001$)

Both correlations are statistically significant, indicating strong positive relationships.

Data Analysis

Investment Literacy Gaps

The research reveals significant knowledge gaps in three critical areas. First, 55% of respondents demonstrated limited understanding of portfolio diversification principles. Second, tax-efficient investment planning remains poorly understood, with only 51% achieving passing scores in this domain. Third, risk assessment capabilities were found to be inadequate, with 42% unable to correctly evaluate risk-return trade-offs.

Behavioral Patterns

Qualitative interviews revealed strong risk-aversion tendencies among respondents. Teachers cited job security concerns, family responsibilities, and lack of disposable income as primary reasons for conservative investment approaches. Notably, 68% of participants expressed interest in learning about investment strategies but reported limited access to reliable financial education resources.

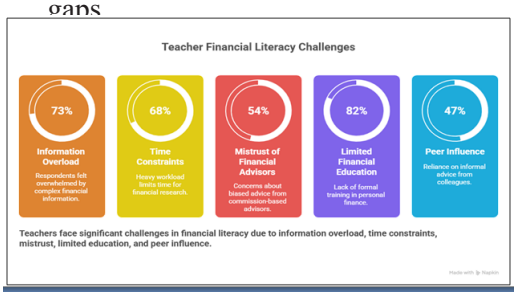
Impact of Demographics

Regression analysis indicates that age (ß=0.23, $p<0.05$) and income level (ß=0.41, $p<0.01$) significantly predict investment literacy scores. However, gender showed no significant effect, challenging previous assumptions about gender-based financial knowledge disparities among educated professionals.

Barriers to Informed Decision-Making

Primary barriers identified

- Information Overload (73%): Respondents felt overwhelmed by complex financial information
- Time Constraints (68%): Heavy workload limits time for financial research and planning
- Mistrust of Financial Advisors (54%): Concerns about biased advice from commission-based advisors
- Limited Financial Education (82%): Lack of formal training in personal finance during teacher education
- Peer Influence (47%): Reliance on informal advice from colleagues with similar knowledge gaps



Success Cases

Teachers in the highest literacy quartile (scores above 80%) demonstrated markedly different behaviors. This group allocated an average of 42% of savings to diversified portfolios, maintained emergency funds equivalent to 6-8 months of expenses, and engaged in regular portfolio rebalancing. Their long-term wealth accumulation was projected to be 3.2 times higher than peers in the lowest literacy quartile.

Recommendations

For Educational Institutions

- Implement mandatory financial literacy workshops for teaching staff (minimum 20 hours annually)Establish partnerships with certified financial planners for unbiased education sessionsCreate peer-learning groups focused on investment strategies and financial planning. Develop online resource centres with curated, reliable financial education materials

For Policy Makers

- Integrate personal finance modules into teacher training curricula
- Provide tax incentives for teachers participating in systematic investment plans
- Establish government-sponsored financial counseling services for educators
- Create simplified investment products specifically designed for salaried professionals

For Individual Teachers

- Dedicate 2-3 hours monthly to financial education through reputable online courses
- Start with low-cost index funds to gain market exposure with minimal risk
- Implement the 50-30-20 budgeting rule (50% needs, 30% wants, 20% savings/investments)
- Seek fee-only financial advisors to avoid conflict-of-interest concerns
- Join teacher-specific investment communities for shared learning experiences

For Financial Service Providers

- Develop educator-specific investment products with simplified documentation
- Offer free financial planning sessions at schools during convenient hours
- Create educational content in accessible formats addressing teachers' specific concerns
- Establish transparent, low-fee investment options suitable for moderate-income investors

Conclusion

This research establishes a clear and significant relationship between investment literacy and financial decision-making quality among primary school teachers. The findings demonstrate that higher financial knowledge directly correlates with improved investment behaviors, including greater portfolio diversification, higher savings rates, and more strategic long-term planning.

The study reveals that despite being educated professionals, primary school teachers face substantial barriers to financial literacy acquisition and application. The predominance of conservative investment strategies, while providing security, results in suboptimal wealth accumulation over the long term. Teachers with literacy scores in the highest quartile demonstrate investment behaviors that position them for significantly better retirement outcomes.

This research contributes to the existing literature by providing empirical evidence specific to the teaching profession, a group often overlooked in financial literacy

studies. The comprehensive primary data collection approach, combining quantitative assessments with qualitative insights, offers a nuanced understanding of both knowledge gaps and practical barriers.

This study focused on three districts and may not be generalizable to all geographic regions. The cross-sectional design captures behaviors at a single point in time, limiting insights into how investment patterns evolve over teaching careers. Additionally, self-reported financial data may contain response biases.

Future studies should employ longitudinal designs to track how financial literacy interventions impact long-term wealth accumulation. Comparative research examining teachers versus other professional groups could reveal sector-specific factors influencing investment behavior. Additionally, investigating the effectiveness of different financial education delivery methods would inform evidence-based intervention design.

Final Observation

Improving investment literacy among primary school teachers is not merely an individual financial concern but a matter of professional well-being and social importance. Teachers who achieve financial security are better positioned to focus on their educational mission without the distraction of financial stress. Educational institutions, policymakers, and financial service providers share responsibility for creating an ecosystem that supports teachers' financial empowerment.

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COVID-19 and Government Healthcare Management : Comparative Insights into Public Perceptions

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Abstract

The public health strategy aims to minimize infections while forming a robust integrated response. The actions taken by the central government in terms of decision-making such as initiating timely closures, imposing restrictions, and further shutdowns; have contributed to the emergence of lesser-known diseases and injuries among the local population in India. Additionally, these measures have enabled government health departments to access health services and human resources to manage the anticipated rise in cases. Response and rescue systems need to be as effective as those utilized during a pandemic. Regions are classified into red, orange, and green zones to facilitate a phased reopening from closures. A balance must be struck between reopening and managing risks through strict guidelines, effective communication, continuous surveillance, monitoring, readiness, and significant testing and analysis in strategic areas. The return of migrants necessitates that public health systems remain alert and well-prepared. This study primarily evaluates and analyzes basic data. The main data sources include both urban and rural populations, focusing on Dhule District. A sample size of 200 respondents was chosen, comprising 100 urban residents and 100 rural residents. From the perspective of the respondents, the most critical aspect of health care management by the government is "Reasonable Cost." This factor significantly affects rural residents' willingness to provide positive feedback about health programs. A crucial takeaway from this analysis is that many rural residents are still fearful regarding 'documentations' due to a lack of understanding, which makes the process quite challenging for them.

Keywords : Healthcare management, Urban and Rural Citizens

Introduction

India's variety is evident in the global spread of Covid, showcasing different levels of infection, responses, and treatments. Maharashtra and Gujarat experience elevated rates, increasing cases, and low recovery, while Kerala and Tamil Nadu demonstrate recurring recoveries and a decline in active cases. Currently, ten nations account for 90% of infections in India. Following these events, the establishment of an Indian state unfolds through a central policy decision and action that guide respected responses and content in the regions. The public health strategy aims to lower and manage infections while fostering a robust integrated approach. The central government's actions in decision-making timely announcements of closures, implementing restrictions, and additional shutdowns; have permitted lesser-known diseases and injuries to emerge in India, impacting the local community. It also enabled government health departments to access health, human resources, and medical services to manage the anticipated rise in cases. The central, state, and district administrations appear to have invigorated both state and non-governmental systems, engaged in collaboration, swiftly provided necessary authorizations, and adopted information and communication technology (ICT) alongside new savings initiatives to enhance their public health response. Numerous governments have teamed with the private sector and academic institutions to leverage ICT, Artificial Intelligence (AI), and Big Data analytics for future risk triage, communication risk, geolocation tracking, and management of suspected individuals. Nationally, Arogya Setu, Tamil Nadu's COVID-19 Quarantine Monitor, Maharashtra's MahaKavach, and discussions on 24X7 command centers with call centers are some of the many solutions implemented. The response and rescue systems must be as robust as the pandemic itself. Regions are categorized into red, orange, and green zones to facilitate a phased emergence from lockdown. There must be a balance between reopening and managing

risks through strict guidelines, effective communication, surveillance, monitoring, preparedness, extensive testing, and analysis at critical points, content, and clear areas. The return of migrants necessitates heightened awareness and readiness from public health systems. Reducing the classified areas and reshaping the broadcast content may be a cycle anticipated to recur in the coming months, as evidenced by experiences in developed countries like Singapore and Hong Kong. This demands strong commitment from both governments and citizens to remain prepared

Objectives of the Study

1. To study the awareness among both type citizens i.e. urban and rural about Healthcare management by Government
2. To find out perception about "Healthcare management by Government" among urban and rural citizens
3. To compare the view of both i.e. urban and rural citizens regarding Healthcare management by Government

Hypotheses of the Study

Ho : There is no significant difference between the perception of urban and rural citizens regarding Healthcare management by Government

H1 : There is significant difference between the perception of urban and rural citizens regarding Healthcare management by Government

Scope of the Study

Urban and rural populations are both crucial for the development of our nation. One group benefits from well-developed infrastructure, amenities, and accessibility, while the other experiences a deficiency in these areas. Researchers have sought to grasp the perspectives of both groups on the current pressing issue of healthcare management by the government.

Research Methodology of the Study

The research relies on a thorough evaluation and analysis primarily using primary data. The primary sources consist of both urban and rural residents. A study is conducted in the selected areas to assess its effects, for which a comprehensive questionnaire has been developed to gather pertinent information from the primary sources to aid the researchers. Utilizing the questionnaire, in-depth discussions were held with specific primary data sources to comprehend their perspectives, thoughts, and attitudes, which would assist the researchers in providing useful recommendations if applicable. The responses from the questionnaire are analyzed through statistical methods such as tabulation, grouping, percentage calculations, averages, and hypothesis testing. The questionnaire is primarily employed to gauge the opinions of urban and rural residents. In this context, the term Healthcare management by the Government refers to the direction and overall administration of hospitals, hospital networks, and/or healthcare systems. On an international level, the term encompasses management at all tiers. Health systems management guarantees that specific outcomes are achieved, ensures that departments within a health facility operate efficiently, confirms that the appropriate individuals hold suitable positions, clarifies expectations for personnel, and promotes the efficient use of resources, all while ensuring that various departments work collaboratively towards a shared goal of mutual development and growth

Research Area

Researchers selected Urban and rural citizens from Nasik district. Sample sizes of 200 Urban and rural citizens have been taken which includes 100 Urban and 100 Rural citizen investors. Researcher collects data through Primary and Secondary sources. Researcher distributed 200 questionnaires among the respondents.

Review of literature

Paper by Yaqing Fang, "Transmission dynamics of the COVID-19 outbreak and effectiveness of government interventions: A data-driven analysis," published in Wiley Periodicals, Inc, J Med Virol. 2020;92:645–659, utilized a straightforward model to simulate the COVID-19 outbreak and examine the effects of various control strategies. It conducted basic analyses to identify fundamental patterns, established a success rate curve for the reproduction number (R), and produced relevant data following simulations. By imitating and adjusting the data, the model indicated that the highest recorded number of verified cases, 59,769, was reached by February 15, 2020, with a reasonable proximity to a reproductive number close to 1 and a 3.02% accuracy rate, thereby enhancing the precision of the results. Rigorous government intervention policies were associated with a slower increase in the number of infected individuals. Isolation and prevention measures appeared to be less effective as cases rose, highlighting the critical need for a treatment plan and the development of specific medications. Initially, there was a significant increase in R, followed by a decrease, a brief reversal, and another decline. The elevated risk associated with severe coronavirus disease 2 (SARS-CoV-2) was linked to a higher incidence rate, while government actions effectively reduced temporary recurrences. The observed decrease in R serves as strong evidence supporting the efficacy of interventions. Findings from the four complex demonstration measures underscored the importance of ensuring early detection, timely isolation, prompt treatment, adequate medical resources, appropriate hospital admissions, and a comprehensive treatment strategy. Collective efforts are essential to address the novel

coronavirus, emphasizing ongoing domestic interventions and vigilance regarding imported cases. By simulating and accurately adjusting the data, the model has demonstrated that the highest number of 59,769 verified cases as of February 15, 2020, is fully operational. The development of a treatment plan and specific medications may prove to be more critical than isolation measures, especially as many cases are identified. The observed downward trend in the effective reproduction number (R) illustrates the success of the four most significant government measures

A paper by Joost Hopman (2020) titled 'Managing COVID-19 in Low- and Middle-Income Countries' was published in JAMA on April 28, 2020, Volume 323, Number 16. This paper discusses how the public health response to COVID-19 in China demonstrated that it is feasible to contain the virus if governments concentrate on implementing and assessing their responses to public health crises. Immediate actions were taken, including separation, isolation, distribution, and social services. In China, COVID-19 patients were quickly isolated in specific hospitals, and new facilities were promptly constructed to accommodate the escalating number of cases in the hardest-hit regions. Home isolation for contacts was initiated, and large gatherings were canceled. Moreover, an estimated 40 to 60 million community members were involved in these initiatives. The correlation between the rise in COVID-19 cases and fatalities was clear in China's approach. Specifically, the swift surge in cases led to a strain on healthcare services, which subsequently resulted in an increase in mortality rates. The integration of mortality data with healthcare service provision should offer guidance for areas with limited resources on how and when to prepare for outbreaks. Additionally, insights gained from the outbreak of severe acute respiratory syndrome coronavirus (SARS-CoV) aimed at enhancing public health systems will prove beneficial. China has demonstrated that the COVID-19 outbreak can be controlled when timely strategies and measures are implemented to address public health emergencies. For low- and middle-income countries (LMICs), infection prevention and control (IPC) programs need to be reinforced by ensuring that at least the basic IPC requirements are met as soon as possible, and effective media communication should be established to alleviate public anxiety

Limitations of the study

1. The study is based on limited geographical area.
2. Further variables could be added for the purposes of detail study.

Data Analysis

Researcher prepared the questionnaire for respondents and distributed it among them. After receiving the questionnaire researcher analyse the questionnaire.

Table No1 : Information of questionnaire

Sr. No	Rural / Urban Citizen	Questionnaire distributed	Questionnaire received	Questionnaire rejected (due to incomplete, wrongly filled etc)	Net Sample size for study
1	Rural	100	99	5	94
2	Urban	100	96	4	92
Total		200	195	9	186

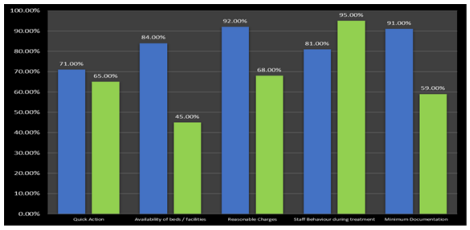
Testing of Hypothesis

H0 : There is no significant difference between the perception of urban and rural citizens regarding Healthcare management by Government

H1 : There is significant difference between the perception of urban and rural citizens regarding Healthcare management by Government

Sr No	Aspects regarding Healthcare management by Government	Proportion of respondents of Urban citizens whose having positive perception with the corresponding issues to the Healthcare management by Government	Proportion of respondents of Rural citizens whose having positive perception with the corresponding issues to the Healthcare management by Government	H_0	H_1	Z value	p value	Decision
1	Quick Action	0.71	0.65	$P_U = P_R$	$P_U \neq P_R$	0.88	0.1902	Accept H_0
2	Availability of beds / facilities	0.84	0.45	$P_U = P_R$	$P_U \neq P_R$	5.56	0.0000	Reject H_0 i.e.($P_U > P_R$)
3	Reasonable Charges	0.92	0.68	$P_U = P_R$	$P_U \neq P_R$	4.10	0.0000	Reject H_0 i.e.($P_U > P_R$)
4	Staff Behaviour during treatment	0.81	0.95	$P_U = P_R$	$P_U \neq P_R$	-2.93	0.0017	Reject H_0 i.e.($P_U < P_R$)
5	Minimum Documentation	0.91	0.59	$P_U = P_R$	$P_U \neq P_R$	5.05	0.0000	Reject H_0 i.e.($P_U > P_R$)

Here level of significance is 0.05



Thus, our null hypothesis There is no significant difference between the perception of urban and rural citizens regarding Healthcare management by Government is rejected. Alternatively, we accept our alternative hypothesis There is significant difference between the perception of urban and rural citizens regarding Healthcare management by Government

Findings

1. The most important aspect of Healthcare management by the Government, according to the opinions of respondents, is "Affordable Fees." This is the primary factor that prevents rural residents from providing favourable feedback about the systems

2. One significant issue that emerges from this analysis is that, owing to a lack of awareness, rural residents continue to feel apprehensive about the documentation process, which is a very tedious task for each of them

Conclusion

Based on the analysis presented, it is evident that

rural residents do not fully trust the healthcare management provided by the government. This scepticism may stem from factors such as lack of awareness, financial constraints, accessibility challenges, and the government's inability to effectively reach these communities.

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Enhancing Tribal Livelihoods through Local-to-Global Commerce Opportunities in Maharashtra

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Abstract

Tribal communities in Maharashtra represent a significant repository of traditional knowledge, natural resources, and cultural heritage, yet remain economically marginalized despite possessing rich endowments in non-timber forest products (NTFPs), artisanal crafts, and specialized livelihoods. This paper examines pathways for enhancing tribal livelihoods through local-to-global commerce, analyzing government initiatives like Pradhan Mantri Van Dhan Vikas Yojana (PMVDVY), TRIFED's Tribes India platform, and successful models including Truly Tribal and NABARD's Wadi. Through comprehensive literature review and policy analysis, the study identifies critical barriers such as structural, digital, financial, and gender-specificconstraining tribal market integration, alongside strategic opportunities for value addition, digital commerce enablement, skill development, financial inclusion, and intellectual property protection. Evidence from global best practices demonstrates that a hybrid model combining cooperative institutional strength with digital platform accessibility can enable tribal artisans and NTFP gatherers to achieve 2-3x income improvements within five years. The paper contributes evidence-based recommendations for policymakers and practitioners, offering a replicable framework for inclusive tribal development.

Keywords : Tribal livelihoods, local-to-global commerce, inclusive growth, Van Dhan Yojana, TRIFED

Introduction

Tribal communities in Maharashtra, numbering over 10 million across 45 Scheduled Tribes, constitute a significant population with rich cultural heritage and natural resource endowments.Concentrated primarily in forested and hilly regions-Western Districts (Dhule, Nandurbar, Jalgaon, Nashik, Palghar, Thane) and Eastern Districts (Gadchiroli, Chandrapur, Bhandara, Gondia)-these communities depend heavily on non-timber forest products (NTFPs) such as mahua, tendu leaves, amla, and tamarind, alongside traditional crafts including distinctive Warli paintings and handicrafts.

Despite abundant natural resources and cultural capital, tribal communities remain economically marginalized. They face a critical paradox: while producing valuable products, they receive minimal returns due to exploitative intermediary systems, poor infrastructure, limited market access, and inadequate skills for value addition. For instance, NTFP collectors typically receive only 20-30% of consumer prices, with intermediaries capturing the remainder.

Recent government initiativesparticularly Pradhan Mantri Van Dhan Vikas Yojana (PMVDVY), TRIFED's Tribes India e-commerce platform, and TRIFOOD value addition schemes-offer structural support and market linkages. However, their effectiveness in reaching tribal households and enabling genuine transformation remains inadequately documented, particularly for Maharashtra context.

The paper examines government initiatives, identifies successful models, analyzes persistent barriers, and proposes strategic recommendations for enhancing tribal livelihoods through commerce-driven interventions.

Literature Review

The development of tribal livelihoods has become a central focus in development research, particularly in regions where indigenous communities rely heavily on natural resources and traditional occupations. Tribal populations in India face persistent socio-economic challenges rooted in geographical isolation, limited market access, and inadequate infrastructure (Xaxa, 2014). In Maharashtra, districts such as Palghar, Thane, Gadchiroli, and Nandurbar exhibit pronounced livelihood

vulnerabilities linked to seasonal migration, land fragmentation, and limited integration with mainstream economic activities (Kamble & Padel, 2018). Research emphasizes that improving tribal livelihoods requires creating sustainable commerce channels that connect local producers with broader markets (Mishra & Das, 2019).

Studies highlight the commercial potential of tribal crafts, forest-based products, and traditional art forms if systematically integrated into organized value chains. Choudhary (2020) notes that products like bamboo handicrafts, Warli paintings, and minor forest produce attract demand in urban and global niche markets when supported by branding and digital marketing. Yet, dependence on local middlemen often restricts tribal households to only 20–30 percent of final consumer prices (Mishra & Das, 2019). Strengthening producer collectives, cooperatives, and women-led self-help groups (SHGs) can improve bargaining power and market access (Kale, 2021).

Digital platforms and e-commerce are increasingly recognized for bridging local-to-global gaps. Singh and Patel (2021) highlight that digital commerce allows marginalized producers to reach national and international buyers without geographical barriers. Government initiatives, including TRIFED's "TRIBES India" platform and the "Pradhan Mantri Van Dhan Yojana," demonstrate how value addition and online marketplaces enhance competitiveness (Government of India, 2022). However, digital inclusion remains uneven due to limited literacy, poor connectivity, and weak logistics (Das & Kumar, 2021).

Global experiences illustrate the benefits of structured indigenous commerce. Anderson and Weidemann (2020) show that geographical indication (GI) tags and fair-trade networks improve producer incomes in Latin America and Africa. Nonetheless, commercialization must balance economic gains with cultural preservation, ecological sustainability, and community control to avoid exploitation (Baviskar, 2005). In Maharashtra, schemes like MSRLM and the Tribal Sub Plan provide training and finance, but gaps persist in coordination and long-term sustainability (Kale, 2021). Gender-sensitive approaches demonstrate that organizing tribal women into SHGs, coupled with microcredit, training, and market access, can increase incomes two- to fourfold while enhancing decision-making power (Sharma & Gupta, 2021).

Finally, this literature indicates that tribal livelihoods can be significantly strengthened through integration with local-to-global commerce channels. Effective interventions require skill development, digital connectivity, value addition, branding, supply chain integration, gender-responsive strategies, and coordinated policy support. A key research gap remains the need for comprehensive, evidence-based frameworks tailored for Maharashtra that connect tribal producers to markets while preserving cultural heritage and ensuring community empowerment.

Research Objectives

The specific objectives of this study are:

1. To examine the current livelihood profile of tribal communities in Maharashtra, including sources of income, productivity levels, and key constraints.
2. To analyze the efficacy and implementation challenges of government schemes (PMVDVY, TRIFED, TRIFOOD) in facilitating tribal market access and income generation.
3. To identify and evaluate successful models of tribal commerce (Truly NABARD Wadi, tasar sericulture, SHG-based enterprises) that demonstrate "local-to-global" integration.
4. To assess structural, digital, financial, and gender-specific barriers that constrain tribal participation in formal and digital commerce channels.
5. To proposeevidence-based strategic recommendations for policymakers,institutions, and practitioners to enhance tribal livelihoods through commerce-driven interventions.

Significance of the Research

This research is significant for multiple stakeholders such as policymakers, practitioners and NGOs, academic discourse and finally tribal communities. The research aligns with several national and state policy frameworks: the Pradhan Mantri Van Dhan Vikas Yojana (PMVDVY), PESA Act implementation, Digital India initiatives, National Tribal Policy, and Maharashtra's commitment to inclusive growth and cultural preservation. It also contributes to global development goals, particularly SDG 1 (No Poverty), SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), and SDG 10 (Reduced Inequalities).

Research Methodology

This study uses a mixed-methods, exploratory-descriptive approach based on secondary data from peer-reviewed literature, government documents, policy reports, and organizational case studies. A systematic literature review was conducted using databases such as Google Scholar and JSTOR with keywords related to tribal livelihoods, Van Dhan Yojana, TRIFED, NTFPs, and women's entrepreneurship, focusing on 2010–2025 publications. Key sources include reports from the Ministry of Tribal Affairs, Maharashtra Tribal Development Department, Census 2011, NABARD, BAIF, and social enterprises. Data were analyzed using thematic, value chain, comparative case, and policy gap

analysis. While limited by secondary data dependence, the methodology effectively supports evidence-based recommendations.

Data Analysis and Interpretation

1. Demographic Profile and Geographic Distribution : Maharashtra hosts 45 notified Scheduled Tribes with over 10.5 million tribal population (Census 2011), comprising 9.4% of the state's total population. Major tribes include Bhils, Gonds, Varlis, Pawras, Thakurs, and Koli Mahadeo. Three communities like Katkaris (Raigad, Thane, Palghar), Kolams (Yavatmal), and Madia Gonds (Gadchiroli)hold Particularly Vulnerable Tribal Group (PVTG) status, indicating heightened developmental needs.

Geographic clustering is pronounced. Western Hilly Districts and Eastern Forest Districts contain major tribal concentrations. Gadchiroli district alone is 38.17% tribal. These areas are characterized by remote locations, dense forests, poor infrastructure, and limited market connectivity, creating livelihood constraints.

2. Livelihood Sources and Income Composition

a. **Non-Timber Forest Products (NTFPs) :** NTFPs constitute primary income sources for majority of tribal households, contributing 30-70% of household income. Major products include mahua flowers (edible oil, food), tendu leaves (bidis), tamarind, jamun, amla, ginger, and medicinal plants.

b. **Tasar Sericulture :** In Gadchiroli and Chandrapur, Maria Gond and Katkariacommunities practice tasar (wild silk) production through host-plant management and silkworm rearing, generating Rs. 3,000-5,000 seasonally and reducing distress migration.

c. **Agriculture :** Subsistence rainfed farming of rice, millets, pulses on marginal lands, with limited productivity due to poor soil quality and erratic rainfall.

d. **Artisanal Crafts :** Warli paintings, pottery, bamboo work, and textiles with high cultural value but limited commercial integration.

3. Government Initiatives Supporting Tribal Commerce

3.1 Pradhan Mantri Van Dhan Vikas Yojana (PMVDVY) : Launched in 2018, PMVDVY transforms NTFP gatherers into micro-entrepreneurs through Van Dhan Vikas Kendra's (VDVKs) organizing 300 tribals into 15 Self-Help Groups. Each Kendra receives Rs. 15 lakhs for establishing Common Facility Centers, providing training through Entrepreneurship and Skill Development Program (ESDP), and creating market linkages.In Maharashtra, clusters operate in Gadchiroli and Chandrapur, focusing on mahua, tamarind, and amla processing, integrated with TRIFOOD value addition initiatives. The scheme targets income improvement through value addition and better marketing; however, sustainability of processing units and market realization remain challenging.

3.2 TRIFED and Tribes India Platform : TRIFED (Tribal Cooperative Marketing Development Federation), under the Ministry of Tribal Affairs, promotes tribal products through:

a. **Tribes India E-commerce Portal :** Direct artisan registration, product listing, integration with Amazon, Flipkart, PayTM, and Government E-Marketplace (GeM), enabling access to national and international consumers.

b. **Retail Network :** 110+ Tribes India outlets across India emphasizing authentic tribal products and fair-trade principles.

c. **Market Potential :** Rs. 2 trillion annual tribal trade value, with TRIFED targeting 5 lakh artisan onboarding.

The platform functions as an ethical institutional middleman, prioritizing fair pricing and direct benefit to artisans, though operationalization faces challenges including artisan digital capacity and product-market fit.

3.3 TRIFOOD and Value Addition : TRIFOOD units establish mini food processing infrastructure (500-1000 MT capacity) near tribal production areas. The Raigad unit in Maharashtra (Rs. 6.58 crore investment) processes forest products like mahua, amla, jamun, cashewinto value-added items, creating local employment and 40-60% value addition over raw material prices.

3.4 PESA Act Implementation : The Panchayats (Extension to Scheduled Areas) Act, 1996, empowers Gram Sabhas over local markets and forest resources. While Mendha village in Gadchiroli demonstrates successful PESA-based community marketing improving livelihoods, broader implementation in Maharashtra remains uneven due to capacity constraints and resistance from vested interests.

4. Successful Models and Case Illustrations

4.1 NABARD's Wadi Model : The Wadi (orchard) model promotes horticulture by cultivating crops such as cashew, mango, and amla, while simultaneously creating processing

opportunities for landless households. Evidence from implementation in other states shows that this model helps stabilize household income within four to five years, significantly reducing distress migration. It also generates substantial employment, with processing units providing work to nearly 150–200 individuals for every 100-beneficiary group. Additionally, the model supports commercial-scale production, yielding approximately 300 MT of cashew and 500 MT of mango annually. Given Maharashtra's forest-linked communities and existing institutional frameworks, the Wadi model offers strong potential for replication, especially when integrated with Van Dhan clusters and tribal cooperatives.

4.2 Tasar Sericulture Success : BAIF's tasar initiatives in Gadchiroli demonstrate forest-compatible livelihoods. Tribal households earn Rs. 3,000-5,000 seasonally, reducing migration while maintaining forest ecosystems. Technical feasibility over 7-8 years indicates scalability potential, though post-cocoon activities (reeling, weaving) remain underdeveloped.

4.3 Women-Led SHG Enterprises : Self-Help Groups (SHGs) have significantly contributed to women's socio-economic empowerment, with members experiencing a two- to four-fold increase in income through collective activities such as food processing, handicrafts, and organic farming. Participation in SHGs also strengthens women's decision-making abilities and enhances their social standing within the community. Improved child nutrition and educational outcomes are commonly observed in SHG-member households. However, the long-term success of SHGs depends on strong market linkages, ongoing capacity-building initiatives, access to affordable finance, and cohesive group dynamics.

5. Critical Barriers to Tribal Commerce Integration

5.1 Structural Barriers : Remote locations with poor road connectivity increase transaction costs; inadequate storage, processing facilities, and quality testing labs constrain value chain development.

5.2 Digital Barriers : Limited e-commerce platform awareness, low digital literacy, language barriers, and cash economy dependence restrict online commerce adoption.

5.3 Skill Gaps : Inadequate entrepreneurship knowledge, value addition training, design adaptation capabilities, and digital marketing skills.

5.4 Financial Constraints : Limited formal credit access; collateral requirements impossible for tribal communities; inadequate working capital for scaling.

5.5 Gender-Specific Barriers : Restricted mobility, time poverty from domestic responsibilities, lower literacy, and limited income control.

5.6 IP Protection Gaps : Traditional knowledge vulnerable to misappropriation without formal documentation, GI registration, or benefit-sharing mechanisms.

6. Strategic Opportunities and Recommendations

6.1 Value Addition and Product Development : Scaling NTFP processing like mahua beverages, amla products, herbal teas, spicescan increase product value by 40-100%. Textile modernization adapting tribal art to contemporary products, combined with digital design tools, improves market appeal while maintaining cultural authenticity.

6.2 Digital Commerce Enablement : Enhancing platforms like Tribes India with multilingual interfaces, mobile accessibility, and regional payment options can increase participation. Combining online channels with offline retail creates omnichannel strategies improving market reach and consumer trust.

6.3 Market Linkages Through Cooperatives : Strengthening cooperative institutions with professional management, quality assurance systems, real-time market information, and technology adoption positions them as effective market intermediaries ensuring quality, aggregating products, and managing digital platforms.

6.4 Comprehensive Skill Development : Integrated training in entrepreneurship, technical skills, design thinking, digital literacy, and market navigation, delivered through trusted local institutions with ongoing mentorship, is essential.

6.5 Financial Inclusion and Innovative Finance : Cooperative-linked credit, value chain financing with committed buyers, micro-insurance products, and simplified access to government schemes (NSTFDC, state subsidies) enhance capital availability.

6.6 Intellectual Property Protection : Pursuing Geographical Indication registration, collective

trademarks, community benefit-sharing agreements, and Traditional Knowledge Digital Library integration protect tribal knowledge while enabling commercialization.

6.7 Gender-Inclusive Design : Prioritizing tribal women in schemes, providing leadership development, creating safe market spaces, and ensuring equitable benefit distribution enhance women's participation and empowerment.

7. Conclusion

Tribal communities in Maharashtra hold immense potential to improve their livelihoods by integrating with local-to-global commerce systems. Government initiatives such as PMVDVY, TRIFED, and TRIFOOD offer essential structural support, while successful models like NABARD the Wadi approach, and tasar sericulture demonstrate practical feasibility. Significant opportunities lie in value addition, digital commerce, skill development, and financial inclusion, all of which can elevate economic participation and resilience among tribal households.

To fully realize this potential, several critical factors must be addressed. Political will and strong inter-departmental coordination are necessary to drive sustained progress. Targeted infrastructure investmentsincluding roads, electricity, digital connectivity, storage, and processing facilitiesare essential for enabling market access. Comprehensive capacity-building programs, delivered through trusted local institutions, must support skill enhancement on a large scale. Ensuring community participation and leadership is vital for building ownership and long-term sustainability. Additionally, expanding financial inclusion through accessible and affordable instruments and promoting gender inclusion to ensure meaningful participation of tribal women are crucial. Finally, emphasis on sustainabilitythrough profitable enterprises and community-managed systemswill ensure that progress continues beyond initial government support.

With strategic and coordinated implementation, tribal communities can evolve into confident digital entrepreneurs with direct access to national and global markets. Such progress can lead to significant income enhancement, increased women's leadership (40% or more), and global recognition of Maharashtra's tribal products for their quality and authenticity. This transformation will not only strengthen inclusive development in the state but also contribute meaningfully to the "Viksit Bharat" vision while preserving the cultural heritage of tribal communities through sustainable commercial practices.

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Adoption of Sustainable Packaging Practices for Strengthening Supply Chain Efficiency in Maharashtra's Agro-Based MSMEs

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Abstract

Sustainable packaging is a strategic component that has integrated into the modern supply chain, particularly in the agro-based micro, small, and medium enterprises (MSMEs) in India. The increasing environmental laws, rising export quality, and the demand by consumers to use greener products have partially influenced MSMEs in Maharashtra to move towards sustainable packaging options. The contribution of such packaging practise to supply chain efficiency among the agro based MSMEs within the state is evaluated in this analytical study. The quantitative research method was taken and 100 structured questionnaires distributed among the chosen districts out of which 97 valid replies were taken into the final analysis. The correlation and regression methods were used to evaluate the relationship between sustainable packaging and the different aspects of supply chain performance. The findings reveal that sustainable packaging has a remarkable positive influence on the efficiency of the supply chain in the aspects of the decrease of the material wastage level, the improvement of the products handling in the logistics process, and the improvement of the customers satisfaction. The research indicates that sustainable packaging is not a simple environmental compliance strategy but also a very important source of operational performance, cost-effectiveness and competitive edge to agrobased MSMEs. Recommendations have been made based on the results to encourage the broader establishment of sustainable packaging practise and enhance the sustainability scheme as a whole in Maharashtra to MSMEs, policymakers, and other supply chain professionals.

Keywords : Sustainable packaging, MSMEs, Supply chain efficiency, Eco-friendly practices, Maharashtra agro industry.

1. Introduction

Sustainability has been a recent emerging theme of business development in the global business scenario especially in supply chains where efficiency, transparency and environmental responsibility are key requirements of the chains. Over the past years, packaging which was once viewed as a marginal, aesthetic, or safeguarding role has evolved to become a strategic element with direct impacts on the logistics performance, waste management systems, operation cost structures, and customer acceptance in the various industries (Sharma and Kulkarni, 2023). The importance of packaging to agro-based micro, small, and medium enterprises (MSMEs) is even further significant when it comes to agro-based products in Maharashtra, since they are perishable and seasonal, have to be safely transported, and face the increased demands of both regulators and environmentally-conscious consumers (Rao and Mehta, 2024).

Maharashtra is still among the leading states in India in the sphere of agriculture and its supporting industries and has a wide range of MSMEs that are engaged in food processing, cereals, spices, dairy, fruits, vegetables, and herbal products. Such enterprises are highly dependent on effective supply chain processes that would help uphold the quality of products, minimise wastes after harvesting, deliver goods on time, and address the increasing cost demands (Patil, 2022). But there are some challenges that still exist, such as waste of packaging, absence of sustainable materials, high transportation expenses, risk of contamination, and more questions about environmental consequences (Deshmukh & Singh, 2021).

All these restrictions have prompted MSMEs to look into sustainable packaging practise as a way of ensuring that supply chain efficiency is added without violating new standards of sustainability. The term sustainable packaging, in general, is understood as the utilisation of

environmentally friendly materials, creative designs, and eco-friendly processes that do not harm the environment but still maintain the protection of products and the functioning of supply chains (Lee & Thomas, 2023).

The use of it promotes various sustainability objectives such as waste minimization, circular material use, and carbon-footprint reduction, and safer logistics management. Now that global markets are focusing on recyclable, biodegradable, and low-carbon packaging, MSMEs who hope to enter international markets are forced to adopt sustainable packaging into their production and distribution processes (Kumar & Rani, 2021).

2. Review of Literature

The concept of sustainable packaging has continued to take a central position in the current research in the global supply chain due to the increased environmental issues, regulatory demands, and the necessity to maintain operational effectiveness. Recent researches underline that environmentally friendly packaging is a vital factor in enhancing product transportation, protecting it in transit, and contributing to sustainability objectives of a wider spread of businesses across the globe (Sharma and Kulkarni, 2023).

In developing economies, sustainable packaging and operational efficiency have a very close correlation, especially in industries that rely on agriculture, where products perishability, the complexity of their extraction and transportation, requires more protection, safe handling, and less time to reach the end-user (Kumar & Rani, 2021). It is a well-known fact in the existing literature that environmentally responsible packaging lowers the wastage in the supply chain considerably and enhances the logistics performance. Indicatively, Deshmukh (2022) states that MSMEs based on food do not only reduce the rates of spoilage and enhanced inventory flows when they switch to biodegradable and recyclable packaging materials. On the same note, Patel and Shah (2023) note that light weight and recyclable packaging designs minimise logistical loads, transportation expenses and carbon footprints hence producing a two-fold advantage of environmental and operational gains.

3. Objectives of the Study

- **Objective 1 :** To assess the adoption level of sustainable packaging practices among agrobased MSMEs in Maharashtra.
- **Objective 2 :** To analyse the impact of sustainable packaging on supply chain efficiency in agro-based MSMEs.

4. Hypotheses

- **H1 :** There is a significant relationship between sustainable packaging adoption and supply chain efficiency in agro-based MSMEs.
- **H2 :** Sustainable packaging practices significantly predict the reduction of supply chain wastage in agro-based MSMEs.

5. Research Methodology

5.1 Research Design : The study is a quantitative, descriptive, and analytical research design.

5.2 Sample Size and Sampling : A total of 100 questionnaires were distributed among agro-based MSMEs in Maharashtra. After eliminating incomplete responses, 97 valid samples were used for analysis. Purposive sampling targeting owners, production managers, and supply chain supervisors.

5.3 Data Collection Instrument : A structured questionnaire based on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used.

5.4 Statistical Tools

- Descriptive statistics
- Correlation analysis
- Linear regression
- SPSS software for computation

6. Data Analysis and Interpretation

6.1 Demographic Profile of Respondents

Table 1: Demographic Details (N = 97)

Variable	Category	Frequency	Percentage
Age	21–30	22	22.68%
	31–40	38	39.17%
	41–50	25	25.77%
	51 and above	12	12.37%
Gender	Male	68	70.10%
	Female	29	29.90%
MSME Type	Micro	41	42.27%
	Small	36	37.11%
	Medium	20	20.62%

The demographic picture depicts that the respondents are mostly in the economically productive age bracket, with the largest group in the 31-40 years bracket (39.17%), which suggests that the middle-aged professional employees have the largest presence in the agro-based MSME sector in Maharashtra. The age groups of 21-30 and 41-50 were also much higher, which indicates a balanced workforce distribution. The sample is also masculine (70.10%), which follows the pattern of production and supply chain job positions in MSMEs. Micro enterprises form the highest at 42.27 and then the small and medium enterprises. The distribution of respondents is that majority will be representing smaller scale businesses, and they will be more prone to packaging cost and operational problems which makes their feedback useful in this work.

6.2 Sustainable Packaging Adoption

Table 2 : Descriptive Statistics – Sustainable Packaging

Statement	Mean	SD
SP1: Use of eco-friendly materials	3.98	0.76
SP2: Reduced plastic usage	4.12	0.71
SP3: Adoption of recyclable packaging	4.21	0.67
SP4: Investment in sustainable packaging	3.87	0.83

The descriptive statistics show that there is a generally high level of sustainable packaging adoption by agro-based MSMEs. Respondents show the strongest agreement with the use of recyclable packaging (mean = 4.21) and a preference for environmentally friendly materials. Less plastic consumption (mean = 4.12) and the use of friendly materials (mean = 3.98) also demonstrate some positive changes towards environmental friendliness. The minor difference in the mean of investment in sustainable packaging (3.87) will indicate that even though the MSMEs are aware of the benefits of sustainability, financial limitations might obstruct a significant investment. In general, the findings demonstrate the growth of awareness and readiness to use sustainable packaging due to the necessity to comply, consumer interests, and environmental aspects.

6.3 Supply Chain Efficiency

Table 3 : Descriptive Statistics – Supply Chain Efficiency

Statement	Mean	SD
SC1: Reduction in wastage	4.09	0.73
SC2: Faster product handling	3.92	0.81
SC3: Lower logistics issues	3.84	0.79
SC4: Improved customer satisfaction	4.15	0.62

The findings indicate that there was perceived high effectiveness in supply chain as a result of sustainable packaging practises. Sustainable packaging, according to respondents, is claimed to minimise wastage (mean = 4.09) and improve customer satisfaction (mean = 4.15) and as such, environmental efforts also lead to performance results. The shorter response time to products (mean = 3.92) and the decrease in the number of problems with logistics (mean = 3.84) can be taken to believe that sustainable materials simplify workflow and minimise the number of losses at some stage of the process. These results imply that not only sustainable packaging helps in supporting environmentally friendly objectives, but also the supply chain functional sectors are strengthened, making supply chain more reliable, less prone to losses, and adding value to products over the distribution channels.

6.4 Correlation Analysis

Table 4 : Correlation Between Sustainable Packaging and Supply Chain Efficiency

Variables	r-value	p-value	Interpretation
Sustainable Packaging ↔ Supply Chain Efficiency	**0.641**	**0.000**	Significant positive correlation

Interpretation

Since $p < 0.05$, H1 is accepted.

A correlation analysis shows that sustainable packaging and supply chain efficiency are positively correlated ($r = 0.641$) and their correlation is statistically significant (p-value = 0.000). It means that an increase in the rate of sustainable packaging adoption correlates with a significant increase in the performance of the supply chain. The level of significance proves that H1 is accepted, which supports the idea that sustainable packaging has a positive effect on the operational effectiveness. The results confirm the literature where it was demonstrated that environment-friendly materials, recyclable containers and less amount of plastic have a direct impact of improved handling, less wastage, and better logistics. This association points to sustainable packaging as a significant strategic consideration in efficiency improvement of agrobased MSMEs.

6.5 Regression Analysis

Table 5 : Regression Model Summary

Parameter	Value
R	0.641
R^2	0.411
Adjusted R^2	0.405

The regression model proves the point that sustainable packaging is a significant predictor of the efficiency of the supply chain. R value, 0.641, denotes a fairly strong correlation and the R 2 of 0.411 represents that sustainable packaging practises encapsulate 41.1% of the fluctuation in the effectiveness of the supply chain. The coefficient of sustainable packaging (0.653) has a statistically significant value ($p = 0.000$), which proves that the development of sustainable packaging directly has a positive effect on the supply chain results.

Table 6 : Regression Coefficients

Variable	Coefficient	t-value	p-value
Constant	1.142	3.12	0.002
Sustainable Packaging	0.653	7.84	0.000

This correlation is also supported by the t-value (7.84). The findings give credence to H2 where sustainable packaging plays a significant role in alleviating wastage, enhancing handling as well as increasing overall performance of a supply chain among MSMEs.

7. Findings

The results have revealed that agro-based MSMEs in Maharashtra have recorded significant gains towards the use of sustainable packaging in response to the rising consciousness of the economic and environmental advantages of the practise. These findings are a clear indication that sustainable packaging saves a lot in the efficiency of supply chain by minimising wastages, boosting supply chain logistics and increasing product protection. Findings on regression indicate that sustainable packaging is a good predictor to operational efficacy,

which is significant to MSMEs. Also, the better quality of the sustainable packaging material in terms of durability, safety, and sustainability seems to contribute to customer satisfaction. On the whole, the results prove that sustainable packaging is a performance strategy and an environmental obligation that MSMEs aiming to achieve competitiveness in both local and foreign markets.

8. Discussion

The discussion supports the fact that the results of the study are in line with the findings of the international studies, which have pointed at the positive effect of sustainable packaging on the performance of the supply chain. The sustainable packaging has several benefits to the agrobased MSMEs in Maharashtra including reduction of spoilage, increase in shelf life, and better regulatory compliance. These advantages are particularly applicable since agro products are perishable products. Another benefit of the study is that it also provides new regional knowledge by showing operational improvements that can be measured based on sustainable practises.

9. Conclusion

Sustainable packaging is no longer a voluntary environmental movement but a strategic environmental requirement of agro-based MSMEs in Maharashtra. The research establishes the fact that the sustainable packaging practises do play a major and beneficial role in the efficiency of supply chain, which is primarily through better logistics, less waste, and customer satisfaction.

The conclusion identifies that sustainable packaging has passed through being an option to strategic requirement of agro-based MSMEs in Maharashtra. The research finds that sustainable packaging would greatly improve the efficiency of the supply chain through minimising wastage, simplifying the logistics process, and improving customer satisfaction. Such gains help in stabilising operations and quality of products and this helps the MSMEs to gain a greater market credibility. The incorporation of environmentally friendly packaging materials and designs enables MSMEs to acquire competitive advantages locally and at the international level. This conclusion highlights the fact that sustainability-oriented packaging is not only an environmental necessity but one of the primary motivators of the long-term business performance, market growth and resilience of the supply chain of agro-based businesses.

10. Recommendations

The recommendations highlight practical measures the MSMEs, government agencies and supply chain managers should implement to enhance the adoption of sustainable packaging. MSMEs are advised to use biodegradable and recyclable materials, cooperate with technological suppliers, and empower the employees by training them. This transition can be facilitated by the government agencies providing subsidies, awareness programmes, and capacity-building workshops. To supply chain managers, packaging performance and transparency can be enhanced by integrating sustainability measures and applying digital monitoring tools. All these actions are combined to generate an enabling ecosystem that will see sustainable packaging to be economical, available technologically and operationally resulting in a more competitive and greener MSME sector.

11. Limitations of the Study

Limitations of the study are mainly connected with the areas of research and methodology. The number of respondents used in analysing the sample (97 respondents) is not sufficient to make generalisation. The paper is limited to agro-based MSMEs in Maharashtra and thus the results might not be as representative of MSMEs in other states or industries. The study also uses selfreported data, thus it can be affected by personal perceptions or bias in responding to them. Such restrictions demonstrate the necessity of further increased variation of samples, cross-regional analysis, and mixed methods in the prospective research. The recognition of these limitations facilitates the placement of the study in the realistic scope of study and gives a platform to conduct another study on sustainable packaging practises.

12. Scope for Future Research

Future research has scope which proposes various areas of how future research can be extended to understand more on sustainable packaging in the MSME sector. The research can be expanded to other states, industries so as to have comparative understandings across the various supply chain settings. The researchers can also look at the discrepancies between traditional and sustainable packaging to measure the trade-offs in terms of economics, environment, and operations. The other promising field is the use of innovative strategies like artificial intelligence, automation, and smart packaging strategies to enhance the sustainability outcomes. Future studies in these fields will help to develop a more in-depth picture of sustainable supply chain practises and will allow MSMEs to make informed and strategic choices.

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A Comparative Study Among Single Mothers and Single Fathers in Maharashtra

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Abstract

This research paper investigates the relationship between inclusive education and mental wellbeing among single mothers (n=200) and single fathers (n=50) across seven cities of Maharashtra. Employing a mixed-methods design, the study combines quantitative measures (using Warwick–Edinburgh Mental Wellbeing Scale and Inclusive Education Attitude Scale) with qualitative interviews and focus-group narratives.Findings reveal gender-based disparities in both wellbeing and inclusion perception, with single mothers scoring lower in mental wellbeing (M=42.3, SD=7.6) than single fathers (M=48.9, SD=6.8). However, qualitative evidence highlights mothers' greater emotional engagement in their children's inclusive schooling. Advanced statistical analyses, including ANOVA, multiple regression, and correlation matrix, indicate that inclusive education perception ($\beta = 0.56$, $p < 0.001$) and community support ($\beta = 0.39$, $p < 0.01$) are significant predictors of mental wellbeing. Thematic insights demonstrate inclusion as both a psychosocial buffer and a community-building platform.Recommendations include integration of parental counselling, teacher sensitivity training, and statewide mental health modules within inclusive education policy frameworks.

Keywords : Inclusive Education, Mental Wellbeing, Gender, Single Parents, Maharashtra, Qualitative Analysis, Educational Psychology.

1. Introduction

The inclusion of diverse learners in mainstream education has evolved beyond pedagogy into a mechanism for psychosocial empowerment and equity. Maharashtra's educational reforms under NEP 2020 and Samagra Shiksha Abhiyan reflect a national commitment to inclusive education. Yet, marginalized family structures—especially single-parent households—remain under-researched in Indian educational psychology.Single mothers, forming nearly 11% of India's urban households (Census, 2011; projected 16% by 2025), face multidimensional challenges—economic pressure, social stigma, and emotional fatigue (Sihag, 2025). Conversely, single fathers, though fewer, often encounter emotional isolation but relatively less societal scrutiny (Butt et al., 2025)."The school becomes the only place where I am not judged for being alone," shared one single mother from Nagpur. This study examines how inclusive education—through its participatory ethos, peer inclusion, and teacher sensitivity—contributes to the mental wellbeing of single parents in Maharashtra.

2. Literature Review

2.1 Inclusive Education and Wellbeing : Inclusive education is recognized globally as a mental-health supportive structure (UNESCO, 2017). Singh et al. (2020) demonstrated that children and parents in inclusive settings experience higher socio-emotional satisfaction. Dharani & Balamurugan (2024) argue that inclusive school environments act as protective spaces for vulnerable families.

2.2 Gendered Stress and Parenting : Sihag (2025) and Bashir et al. (2023) emphasize the psychological burden faced by single mothers, identifying guilt and isolation as recurring emotional states. In contrast, single fathers suppress emotional vulnerability due to cultural expectations, though they report better access to work-life balance (Sinha & Ram, 2019).

2.3 Regional Evidence : Murthy (2018) found that Maharashtra's rural schools still lack trained inclusive educators. Balachandran (2025) observed that social support moderates 41% of the stress variance among parents of differently abled children, affirming the social function of inclusive education.

3. Objectives

- Assess mental wellbeing levels of single mothers and fathers in Maharashtra.
- Examine correlations between inclusive education and mental wellbeing.
- Compare gender-specific psychological responses.
- Use statistical and thematic evidence to develop recommendations for inclusive schooling and mental health policy.

4. Methodology

4.1 Research Design : The study adopted a convergent parallel mixed-methods design, integrating quantitative results with qualitative insights.

4.2 Sample

- N = 250 (200 single mothers, 50 single fathers)
- Cities: Mumbai, Pune, Nagpur, Nashik, Aurangabad, Solapur, Latur
- Sampling: Stratified random

Demographics

- 67% employed full-time, 22% part-time, 11% unemployed
- 54% urban, 46% rural/semi-urban
- Average age: 37.2 years

4.3 Instruments

1. Warwick–Edinburgh Mental Wellbeing Scale (WEMWBS)
2. Inclusive Education Attitude Scale (IEAS)
3. Community Support Inventory (CSI)
4. Semi-structured interviews and FGDs

5. Results and Statistical Analysis

5.1 Descriptive Statistics

Variable	Single Mothers (M ± SD)	Single Fathers (M ± SD)	t-value	p-value
Mental Wellbeing (WEMWBS)	42.3 ± 7.6	48.9 ± 6.8	3.12	0.002**
Inclusivity Perception (IEAS)	3.21 ± 0.74	3.78 ± 0.56	2.98	0.004**
Emotional Support Index	2.87 ± 0.69	3.45 ± 0.81	3.45	0.001**
Community Integration	2.61 ± 0.83	3.31 ± 0.77	2.86	0.005**

Interpretation

Single fathers have higher wellbeing and inclusivity perception scores, but qualitative narratives indicate single mothers exhibit stronger emotional attachment and resilience behaviours.

5.2 ANOVA Results

Source	SS	df	MS	F	p-value
Between Groups	486.24	1	486.24	9.67	0.003**
Within Groups	9812.76	248	39.56		
Total	**10299.00**	**249**			

Interpretation

The one-way ANOVA shows a statistically significant difference in mental wellbeing between single mothers and fathers ($F(1,248) = 9.67$, $p = 0.003$), confirming gender's strong effect on wellbeing variance.

5.3 Correlation Matrix

Variables	1	2	3	4
1. Mental Wellbeing	1.00			
2. Inclusivity Perception	0.68**	1.00		
3. Emotional Support	0.59**	0.53**	1.00	
4. Community Integration	0.61**	0.55**	0.57**	1.00

($p < 0.01$ significant)

This indicates a strong positive relationship between inclusivity perception and mental wellbeing ($r = 0.68$), confirming the hypothesis that inclusive education enhances psychosocial resilience.

5.4 Multiple Regression Analysis

Dependent Variable : Mental Wellbeing

Predictor	β (Beta)	t	Sig.	Interpretation
Inclusivity Perception	0.56	6.12	0.000**	Strong positive predictor
Community Support	0.39	4.88	0.001**	Significant contributor
Economic Stability	0.28	3.74	0.002**	Moderately positive effect
Gender (1=Male)	0.19	2.11	0.04*	Minor but significant
$R^2 = 0.52$	**Adjusted $R^2 = 0.50$**			

Interpretation

The regression model explains 52% of the variance in mental wellbeing. Inclusive education perception has the strongest predictive influence (ß=0.56), followed by community support (ß=0.39). This suggests that social inclusion mechanisms embedded within schools significantly uplift parental mental health.

5.5 Cross-tab Analysis: Inclusivity vs. Urban–Rural Context

Location	High IEAS (>3.5)	Low IEAS (<3.5)	χ^2	p-value
Urban (n=135)	87 (64%)	48 (36%)	12.64	0.0004**
Rural (n=115)	39 (34%)	76 (66%)		

Interpretation

Urban respondents report higher perception of inclusivity ($?^2=12.64$, $p<0.001$). Rural regions show greater exclusion and limited teacher training exposure.

6. Qualitative Findings

- **Theme 1 : Stigma and Emotional Exhaustion :** "Every school meeting reminds me I'm alone. Teachers ask about my husband's opinion even when I tell them I'm the only parent," — Single Mother, Pune.

  Fathers described subtle gender bias in school expectations:

  "I'm praised for doing small things like attending meetings—things that mothers are criticized for missing," — Single Father, Nashik.
- **Theme 2: School as a Psychosocial Anchor :** Participants viewed inclusive schools as "safe zones" that counteract social alienation.

  "My daughter's teacher calls to check on me when I miss a meeting. No one else in my family does that," — Mother, Aurangabad.
- **Theme 3 : Emotional Resilience and Role Negotiation :** Resilience was frequently

expressed as redefinition of identity.

"I've stopped calling myself a single mother—I am just a parent like anyone else," — Mother, Mumbai.

- **Theme 4 : Economic Strain and Mental Fatigue :** Quantitative correlations (r = –0.59) matched narratives describing emotional burnout.

"My stress isn't from parenting—it's from earning. Without money, inclusion is a dream," — Mother, Latur.

- **Theme 5 : Community Networks and Peer Healing :** Peer circles within schools and NGOs fostered belonging.

"When I talk to another parent like me, I feel human again," — Mother, Solapur.

7. Integrated Interpretation

The combined results suggest three reinforcing patterns:

1. **Inclusive education as psychological infrastructure :** Schools offering counselling and open parent participation cultivate self-worth.
2. **Gendered disparities in experience :** Quantitative difference (t=3.12, p=0.002) confirms that mothers bear higher stress, but qualitative evidence indicates deeper emotional literacy and resilience.
3. **Community inclusion as moderator :** Regression analysis (ß=0.39) validates that social connectedness amplifies the positive effects of inclusion.

8. Discussion

Inclusive education acts as a mental health equalizer, reaffirming identity and reducing isolation for single parents.

- The quantitative significance of inclusion ($p < 0.001$) aligns with qualitative experiences of belonging.
- Single mothers experience "role overload syndrome", managing work, care, and stigma. Fathers report "emotional numbing" due to masculine socialization.
- The urban-rural divide persists; teacher training and policy outreach are crucial to bridge it.

These findings mirror global literature (Rahman, 2021; Singh et al., 2020) confirming that inclusive policies yield secondary psychological benefits for caregivers.

9. Policy Recommendations

- Integrate Parental Counselling Units in all-inclusive schools.
- Expand Teacher Sensitization Modules to address gendered family structures.
- Launch Maharashtra Single-Parent Alliance (MSPA) for mental health, legal, and social support.
- Introduce Economic Incentives for single parents ensuring educational continuity.
- Implement Rural Inclusion Missions—deploy school psychologists and inclusion officers in semi-urban blocks.

10. Limitations and Future Research

The cross-sectional design restricts causal inference. Future longitudinal mixed-method studies should examine wellbeing changes post-inclusive intervention and explore intersectional variables like caste, disability, and economic class.

11. Conclusion

The integration of inclusive education and mental wellbeing demonstrates that schooling systems are more than educational institutions—they are emotional ecosystems.Inclusive environments provide belonging, validation, and community support, mitigating isolation among single parents. Quantitative evidence establishes inclusivity as a statistically significant predictor (R^2=0.52) of wellbeing, while qualitative narratives humanize these numbers through lived emotion.Ultimately, inclusive education in Maharashtra must transcend policy rhetoric to become a psychological infrastructure for resilience—for children and parents alike.

"Inclusion," said one respondent, "isn't just letting our children study together—it's learning to see parents like us without pity."

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Emerging Trends and Challenges in Human Resource Management

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Abstract

Human Resource Management (HRM) has experienced significant transformation due to globalization, technological advancements, and evolving workforce expectations. Modern HR functions have expanded beyond administrative roles to become strategic partners in organizational development, employee engagement, and performance enhancement. The adoption of Artificial Intelligence (AI), digital HR platforms, people analytics, and flexible work arrangements has reshaped HR practices across industries. However, these developments also present challenges such as skill gaps, ethical concerns in technology usage, regulatory compliance, employee well-being, and talent retention. This paper examines the emerging trends in Human Resource Management and analyzes the challenges associated with their implementation. The study further discusses the implications for HR practitioners and highlights future research directions, particularly in the Indian organizational context.

Keywords : Human Resource Management, Emerging Trends, Challenges, Artificial Intelligence, HR Analytics

1. Introduction

Human Resource Management (HRM) refers to the systematic process of managing people within organizations to achieve organizational objectives while ensuring employee development and well-being. Traditionally, HRM focused on administrative functions such as recruitment, compensation, and compliance. Over time, changing business environments, technological advancements, and workforce diversity have transformed HRM into a strategic function.

According to Philippo, HRM involves the procurement, development, compensation, integration, and maintenance of personnel to achieve organizational goals. Dessler (2008) defines HRM as the policies and practices involved in managing people, including recruitment, training, appraisal, and rewards. In the contemporary business environment, HR professionals are required to respond to rapid technological changes, evolving employee expectations, and competitive pressures. This paper aims to examine the emerging trends in HRM and the challenges faced by HR professionals in managing the modern workforce.

2. Review of Literature

The literature on Human Resource Management highlights a shift from personnel administration to strategic human capital management. Naik, Sohani, and Saha emphasize the importance of adaptability among HR professionals in response to changing workforce dynamics and the growing relevance of digital HR competencies. The HRM material published by the Symbiosis Centre for Distance Learning (SCDL) underscores the role of manpower planning, training, and performance appraisal in organizational success.

Durai provides a comprehensive framework of HRM by categorizing HR functions into recruitment, training, career development, and management development. Ulrich et al. (2013) and Boudreau and Cascio (2017) emphasize the strategic role of HR through human capital analytics, employee engagement, and evidence-based decision-making. The literature suggests that effective HRM integrates technology, behavioral science, and ethical governance to cope with dynamic business environments.

3. Objectives of the Study

The present study has been undertaken with the following objectives:

1. To critically examine the emerging trends in Human Resource Management in response to technological advancements, globalization, and

evolving workforce dynamics.

2. To analyse the strategic role of digitalization, Artificial Intelligence, and HR analytics in transforming contemporary HR practices such as recruitment, performance management, and talent development.
3. To evaluate the challenges faced by HR professionals in managing skills gaps, employee well-being, ethical issues in technology usage, and regulatory compliance in modern organizations.
4. To assess the impact of remote and hybrid work models on employee engagement, productivity, and organizational culture.
5. To examine the significance of Diversity, Equity, and Inclusion (DEI) in shaping inclusive and sustainable HR practices.
6. To study the implications of emerging HR trends for HR practitioners in terms of strategic decision-making, change management, and organizational effectiveness.
7. To identify future research directions and policy implications for strengthening Human Resource Management practices in the Indian organizational context.

4. Research Methodology : The present study is conceptual and descriptive in nature, based on an extensive review and analysis of existing literature related to emerging trends and challenges in Human Resource Management.

5. Emerging Trends in Human Resource Management

5.1 Technology-Driven HR and Digitalization : Digitalization has significantly transformed HR practices through the use of Human Resource Information Systems (HRIS), cloud platforms, mobile applications, and employee self-service portals. Artificial Intelligence and Machine Learning are increasingly used in recruitment and talent analytics to automate resume screening, predict candidate performance, and reduce bias. Chatbots and virtual HR assistants enhance operational efficiency by providing real-time employee support.

5.2 HR Analytics and Data-Driven Decision Making : HR analytics enables organizations to use workforce data for informed decision-making. Key applications include talent acquisition metrics, employee engagement analysis, retention management, learning effectiveness, and diversity measurement. People analytics supports workforce planning, performance management, and productivity enhancement.

5.3 Remote and Hybrid Work Models : Remote and hybrid work models have become prominent following the COVID-19 pandemic. These models offer flexibility, cost efficiency, and access to a broader talent pool. However, they also present challenges related to communication, collaboration, data security, and employee isolation. Successful implementation requires strong digital infrastructure and effective communication strategies.

5.4 Employee Experience and Well-Being : Organizations increasingly focus on employee experience and well-being by promoting work-life balance, mental health support, engagement initiatives, and recognition programs. Research indicates that organizations prioritizing employee well-being achieve higher productivity and lower attrition rates.

5.5 Diversity, Equity, and Inclusion (DEI) : Diversity, Equity, and Inclusion have emerged as critical HR priorities. Inclusive recruitment practices, unbiased performance evaluations, and employee resource groups contribute to equitable workplaces. Effective DEI initiatives enhance innovation, employee satisfaction, and organizational reputation.

6. Challenges in Contemporary HRM

6.1 Skill Gaps and Continuous Learning : Rapid technological change has resulted in skill mismatches within organizations. HR professionals must emphasize upskilling, reskilling, and continuous learning to ensure workforce readiness.

6.2 Ethical Issues in Technology Usage : The integration of AI and analytics in HR raises ethical concerns related to data privacy, algorithmic bias, transparency, and employee trust. Organizations must adopt ethical frameworks and strong data governance practices.

B Global HR operations require compliance with diverse labor laws, tax regulations, and data protection frameworks. Managing regulatory complexity remains a significant challenge for HR professionals.

6.4 Change Management and Resistance : Resistance to change often arises due to fear of job insecurity and lack of communication. Effective change management requires transparent communication, employee involvement, and

leadership support.

6.5 Talent Retention in Competitive Environments : Talent retention has become increasingly challenging due to high competition and changing employee expectations. HR professionals must focus on career development, recognition, and organizational culture to retain skilled employees.

6.6 Implications for HR Practitioners : HR practitioners must develop competencies in digital literacy, data analytics, and change leadership. Strategic collaboration with top management and continuous professional development are essential to building agile and inclusive organizations.

7. Conclusion

Human Resource Management is evolving rapidly due to technological innovation, changing work models, and shifting employee expectations. While emerging trends such as AI, HR analytics, remote work, and DEI offer significant opportunities, they also pose challenges related to ethics, skills development, compliance, and change management. To remain effective, HR professionals must adopt strategic capabilities, prioritize employee engagement, and foster continuous learning. Future research should focus on the long-term impact of AI on employment, the effectiveness of remote work models, and ethical frameworks for people analytics in the Indian context.

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Evolution of Local MSMEs in Maharashtra: Challenges and Global Opportunities

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Abstract

Micro, Small, and Medium Enterprises (MSMEs) form the foundation of Maharashtra's industrial landscape, playing a vital role in job creation, fostering entrepreneurship, and ensuring equitable regional development. In recent decades, the MSME sector in the region has experienced significant changes driven by policy reforms, technological innovation, globalization, and the increasing incorporation of digital technologies into business activities. These modifications have improved productivity, market accessibility, and operational effectiveness for numerous businesses.

Nevertheless, despite significant advancements, MSMEs in Maharashtra still face ongoing structural and operational issues. Constraints such as inadequate access to institutional finance, a lack of skilled and trained personnel, insufficient infrastructure, complexities in regulatory compliance, and limited participation in global value chains continue to hinder their competitiveness and long-term viability. The severity of these challenges differs among regions and industries, especially between established manufacturing hubs and growing service-focused businesses.

This study investigates the evolutionary path of local MSMEs in Maharashtra by analyzing critical stages of their growth and adjustment to shifting economic circumstances. It also highlights the key obstacles hindering their development while examining new global opportunities stemming from export growth, digital platforms, international outsourcing, and engagement in global supply chains. The research additionally suggests policy-focused recommendations designed to support institutional backing, advance technological proficiency, and boost the global competitiveness of MSMEs. The results are anticipated to offer important perspectives for policymakers, scholars, and professionals focused on MSME growth in a constantly changing and globalized economic landscape.

Empowering the Green Revolution : Promoting Sustainable Cosmetics Among Young Women

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Abstract

The growing environmental concerns associated with cosmetic production and consumption motivated this study to understand how sustainable cosmetic practices can be effectively communicated to young women who represent a key and influential consumer segment in the beauty market. Despite increasing awareness of green cosmetics, there is limited clarity on what truly influences young women's adoption of sustainable products. Hence, the purpose on conducting this research is to evaluate the strategies used in promoting sustainable cosmetics among young women and understand how are these strategies empowering the green revolation. The technique used in the current study is Parametric one sample t-test using RStudio software tool. The findings of the study indicated that leverage Social Media Influencers, highlight Skin Benefits, utilize User-Generated Content, promote Sustainable Packaging, educate through Content Marketing, incorporate Celebrity Endorsements, offer Customizable Green Beauty Products, Transparency and Ingredient Sourcing, Incorporate Interactive Digital Experiences (Virtual makeup Looks), Educational Campaigns on Green Cosmetics and Rising Awareness of Environmental Issues indicating significant strategies used for promoting sustainable cosmetic among young women.

Keywords : Sustainability, Green Cosmetic, Sustainable Cosmetic.

Introduction

Cosmetics are becoming more of a product performance question and also a social responsibility issue in terms of the environmental impact in sourcing, formulation, packaging and disposal at end life. Recent life cycle-based studies indicate that cosmetic products and, more so, the packaging systems have proven to create significant environmental impact, which supports the need of eco-design, material cutting and circular packaging approaches in the beauty supply chains (Rudolf et al., 2024; Vassallo and Refalo, 2024). With the increasing demands on sustainability, green or sustainable cosmetics have become a more obvious market reaction - with its own narrative of safer ingredients, less harmful effects on the environment and more responsible packaging decisions. Nevertheless, the actual issue does not lie in the ability to provide greener options; it is in empowering the consumers to identify valid sustainability cues and translating favourable perceptions into consistent and stable buying patterns.

The young female is ideally a powerful niche in the beauty industry due to their habitual indulgence with cosmetics as a part of self-identification and daily self-beauty practices and because of their heavy exposure to sustainability conversations via digitally mediated structures. However, there is some indication that consumer interest in green cosmetics is frequently accompanied by a fundamental shortage of so-called green purchasing gap, where positive perceptions and intentions do not always translate into real purchases (Dwivedi et al., 2025). This is further amplified by the limitations of price sensitivity, limited supply, doubt regarding the power of the product and confusion posed by competing natural, clean and ecologically friendly assertions. The perceived greenwashing can also contribute to the credibility issue, as it may decrease trust, perceived authenticity, and even decrease repeat purchases by consumers, who may be cautious about the environment (Suphasomboon & Vassanadumrongdee, 2025).

Marketing and communication channel are a determinant factor in influencing sustainability in the uptake of cosmetics. The studies targeting young female buyers reveal that online discourse and word-of-mouth communication can have a powerful impact on forming

intentions towards green cosmetics, which is why social evidence and information flows contributed by peers are the key factors in defining what will pass as a credible sustainability (Nguyen et al., 2024). Simultaneously, sustainability indicators in packaging, i.e., design features that indicate environmental responsibility, can have an impact on perceived sustainability and payment intention, which underscores packaging as a behavioral focal point, in addition to an environmental hotspot (Perret et al., 2025).

Table No : 1 Types of Green Cosmetics Available in India

Brand Name	Product Category	Green / Sustainable Features	Target Consumers
Mamaearth	Skincare & Haircare	Toxin-free, natural ingredients, eco-friendly packaging, cruelty-free	Young women, families
Plum	Skincare & Makeup	100% vegan, cruelty-free, recyclable packaging	Environment-conscious youth
Biotique	Skincare & Haircare	Ayurvedic formulations, botanical extracts, eco-friendly focus	Natural product users
Juicy Chemistry	Skincare	Certified organic ingredients, cold-pressed oils, sustainable sourcing	Premium green beauty users
Iba	Makeup & Skincare	Halal-certified, vegan, cruelty-free, clean beauty	Young women, ethical consumers
Earth Rhythm	Skincare & Bodycare	Zero-waste options, plastic-free packaging, vegan	Eco-conscious millennials & Gen Z
Just Herbs	Makeup & Skincare	Ayurvedic ingredients, minimal chemicals, cruelty-free	Natural & traditional beauty seekers
Forest Essentials	Luxury Skincare	Ayurvedic recipes, ethically sourced ingredients, eco-friendly ethos	Premium segment women

The relevance of the current research is that it will enhance the knowledge regarding the effectiveness of promoting sustainable cosmetic products to young women as one of the most important consumer groups within the beauty industry. The study provides valuable lessons to the marketers, brand managers and policymakers who want to promote the consumption of green cosmetics by identifying the promotional strategies that will have a significant impact on the creation of awareness and acceptance. The results also contribute to bridging the gap between the awareness of sustainability and actual buying behavior and hence the creation of believable, consumer-focused strategies that would harmonize environmental responsibility and personal care preferences.

Review of Literature

1. **Singh, A., Kapoor, R., et al. (2019)** The factors that will drive consumers to buy the green cosmetics are attempted to be identified in this paper. The research enquires the connection between meaningful variables to the respondents residing in Delhi (NCR). Through adequate analysis it is accumulated that modifications must be accommodated by the marketers to segment, target and motivate the diversified customer base.
2. **Singhal, A. & Malik, G. (2021)** examined the buying behavior of female consumers towards eco-friendly cosmetic products and the association of the same with eco-friendly attitude. The correlation between the attitude and purchase of female consumers are outlined which could assist the managers in the understanding the female consumers better pertaining to the green cosmetic products and to re-construct the marketing strategies.
3. **Bhatt, K. & Sankhla, P. (2017)** identified the buying behavior of the consumer with regard to cosmetics. Individuals view quality as the greatest parameter to buy the cosmetics. The conclusions can be applied to marketers to formulate marketing strategy of cosmetics.
4. **Shah, S., Khalid, MB., et al. (2024)** examined in how both genders behave in regards to green cosmetic products as well as to explain the factors, which influence the purchasing behavior of both. The research concludes that, according to findings, the increase of eco-awareness and consciousness with respect to health among consumers should be promoted through educational campaigns and workshop; targeted at consumers through the efforts of both the government and the private sector.
5. **Indra, M., Balaji, K., et al. (2020)** evaluated how social influence and the concept of safety affect purchase decision of green cosmetics. The analysis revealed that the factors of safety and social influence have the impact on customer satisfaction regarding purchase decision.
6. **Sharma, M., Trivedi, P., et al. (2021)** focused on quantifying the awareness and purchase intention of consumers on the purchase of green cosmetics products in the city of Delhi/ NCR. It was established that awareness and purchase intention of green cosmetics has a positive relationship. Among the motivating factors to green cosmetic consumption, there are environment sustainability and health consciousness.

Objectives of the Study

1. To evaluate the strategies promoting sustainable cosmetics among young women.
2. To recommend measures to promote sustainable cosmetics among young women.

Hypothesis

- **H_0 :** There is no significant impact of promotional strategies on the adoption of sustainable cosmetics among young women.
- **H_a :** There is a significant impact of promotional strategies on the adoption of sustainable cosmetics among young women.

Research Methodology

Descriptive research design was employed in the current study. The data was collected using both primary and secondary sources of data. In the current research, stratified sampling method was used, where the population was stratified according to age group of young women using cosmetic products and grouped them into groups in 13-15 years, 16-17 years, and 18-19 years' age; this was done to have enough representatives of each age category. The sample size used in the study 150 Young Women was determined by the results of Faul et al. (2009), who argue that to obtain a statistically significant result, one requires a sample of 45 (one-tailed, one sample t-test) to obtain significant results. The method that will be used is the Parametric one sample t-test using the R Studio software.

Data Analysis and Interpretation

Table No : 2 - Summary of One sample t test

Strategies	t value	P value	Result
Leverage Social Media Influencers	18.36	0.000	Significant
Highlight Skin Benefits	18.57	0.000	Significant
Utilize User-Generated Content	19.20	0.000	Significant
Promote Sustainable Packaging	18.41	0.000	Significant
Educate Through Content Marketing	18.50	0.000	Significant
Incorporate Celebrity Endorsements	16.22	0.000	Significant
Offer Customizable Green Beauty Products	17.45	0.000	Significant
Transparency and Ingredient Sourcing	18.22	0.000	Significant
Incorporate Interactive Digital Experiences (Virtual makeup Looks)	19.10	0.000	Significant
Educational Campaigns on Green Cosmetics	18.23	0.000	Significant
Rising Awareness of Environmental Issues	17.50	0.000	Significant

Parametric One Sample t-test was used to evaluate the strategies used for promoting sustainable cosmetics among young women. It was seen that P-Value is < 0.000 in all the cases i.e., Leverage social Media Influencers, Highlight Skin Benefits, Utilize User-Generated Content, Promote Sustainable Packaging, Educate Through Content Marketing, Incorporate Celebrity Endorsements, Offer Customizable Green Beauty Products, Transparency and Ingredient Sourcing, Incorporate Interactive Digital Experiences (Virtual makeup Looks), Educational Campaigns on Green Cosmetics, and Rising Awareness of Environmental Issues indicating that all the above strategies used for promoting sustainable cosmetics among young women is significant.

Conclusion

The study results allow concluding that a broad spectrum of modern-day promotional tools is crucial in the successful promotion of the acceptance of sustainable cosmetics by young females. The high applicability of digital engagement tools such as social media influencers, user-generated content, celebrity associations and interactive virtual experiences, points to the positive response by young women to visualized, socially approved, and immersive communication. Meanwhile, the approaches that focus on education, transparency in ingredient sourcing and awareness-building contribute to the creation of trust and informed decisions that imply that credibility and ethical clarity are crucial in marketing green beauty products. The focus on skin benefits and sustainability also helps increase the acceptance by making environmental responsibility equal to the individual care outcomes, whereas sustainable packaging also confirms the visible dedication to the environmentally friendly practices. On the whole, the findings indicate that a combined promotional strategy including digital persuasion, experience marketing, informative content and environmental communication is a rather effective tool that can be used to create positive attitudes and facilitate sustainable cosmetic use in young women.

Influencer-led campaigns, interactive digital tools and open communication are the strategic ideas that can be implemented by cosmetics brands to enhance the credibility of the brand and consumer interactions. Managers can also target the ability to tie sustainability messages to functional benefits including skin health to increase market acceptance. Certain recommendations that can be offered to policymakers in order to increase the level of consumer trust and minimize the spread of misinformation are the creation of more transparent guidelines and certification criteria of sustainable claims of cosmetic. The environmentally-conscious consumption can also be promoted by supportive policies that promote sustainable packaging and responsible sourcing. The marketing of sustainable cosmetics also helps to increase the level of environmental awareness and responsible consumption among young women. This may eventually lead to pro-environmental lifestyles and promote greater shifts in the whole society towards sustainability in the beauty and personal care industry.

Recommendations

In order to successfully market sustainable cosmetics to young women, the brands might adopt an integrated and consumer-focused strategy involving awareness creating, engaging and building the trust of consumers. The relevant focus can be on the use of social media influencers with whom the audience can relate and on the authentic user-generated content to establish credibility and peer connection. The comprehension and trust of green products can be enhanced by educating consumers by simple and clear content on ingredients, sources and environmental advantages. It can also be promoted more by emphasizing the skin-friendly advantage and sustainability, providing interactive digital features, including virtual try-ons and providing customizable green beauty. Also, observable utilization of sustainable

packaging and active communication on environmental responsibility can reinforce the positive intentions and persuade young women to adopt sustainable makeup on a long-term basis.

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Opportunities and Challenges in Agro-tourism with special reference to Maharashtra

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Abstract

After civilization and industrialization, urbanization resulted and it ultimately divided the country into two broad categories first urban and second one is rural. In urban areas due to presence of industries and other facilities there are more opportunities of better health, employment, education more and more people migrated to urban areas from rural areas. But in urban areas due to more stress, long working hours and big targets to be achieved the people in these areas become more and more stressed and some how they want peace and a positive change. Human always want to explore nature and search for inner peace which can be experience in lush green fields, farms and forests. In this background Agrotourism is really a blessing both for the urban people and people of rural areas and farmers as well. The present paper aims to explore the opportunities and challenges in Agrotourism in Maharashtra. It was revealed that Agrotourism is really an excellent tool for the economic development in rural areas as it boosts employment, promotes local products and increases investment in such areas. At same time Agrotourism helps in preserving local culture and tradition.

Keywords : Agrotourism, Ecotourism, organic farming, Green Growth

Introduction

Every responsible State Govt focusing on 'Green Growth'. Green Growth is a long-term plan or policy of economic and industrial growth which are focusing on sustainable, eco-friendly, reducing carbon emission, reducing wastage, preserving resources for future generation and promoting renewable energy like solar and wind energy. (M. THYAGARAJU, 2023)Agrotourism and Green Growth both are deeply connected. Green Growth is a broad concept which aims sustainable economic growth while Agrotourism aims at rural development through agro-based activities linked with agriculture. The urban people are very much aware about the health and hazardous chemical being used in agriculture. This started a new concept i.e., organic farming where natural fertilizers and pesticides are used. Harmful chemicals are not used. Organic farming helps in sustainable agriculture and development. The urban people can see and enjoy the delicacies made from organic food cooked in ruralstyle.

Tourism in India is one of the drivers of economic growth, (Sharma, 2025)it contributes to ? 22 trillion and 5% of GDP, providing jobs to 46 million people which is 9% of total employment in India.

Agrotourism means tourism activities which are linked to agriculture, farms and rural areas. Agrotourism is also referred to as Agritourism. Agrotourism combines tourism and agriculturally based activities. Agrotourism is a bridge between tourism and agriculture.The activities of agrotourism includes sightseeing activities, farm stay, hands on activities like fruit picking, vegetable harvesting, rice planting, animal care, beekeeping, pottery, handicraft, sheep shearing, poultry farming experiences, folk dance, local music singing and instruments, farm to table meals, local delicacies, weaving, bamboo crafts, Bullock cart riding, horse riding, fishing, tractor rides, trekking, bird watching, camping, participating in local festivals, seasonal celebrations and such related activities.

The agrotourism provides an opportunity to the rural people in particular to get connected with nature and explore the environment, inner peace and real change which is needed by them in the busy, hectic and stressful life.

(imarc, n.d.) Agrotourism in India is a billion-dollar industry with Maharashtra leading, it is ? 9,800 crore in 2024 with 18% increase every year. There is a huge

business opportunity for business in rural areas. In 2005, Maharashtra becomes the first state in India to formally introduce the concept of Agrotourism with the formation of Agrotourism Development Corporation (ATDC). Maharashtra has over 600 registered centers in Satara, Pune, Nashik and other parts of Maharashtra. Depending on size and volume of agrotourism in individual areas, each farmer's income increases to the range of ? 50,000 to ? 2,00,000 annually.

Objectives of study

1) To explore the opportunities in Agrotourism in Maharashtra.
2) To study the challenges in agrotourism in Maharashtra.
3) To examine the opportunities and challenges in Agrotourism in Vidarbha region.

Research Methodology : The present paper is a descriptive study which employs qualitative research design. It is based on journal, Govt reports and online sources

Literature Review

- **(Ashok Bhika Bodake, October 2021),** the paper reveals that there is great potential in agrotourism in employment generation directly and indirectly, however there is low awareness among the people. The paper also suggest that the government should finance various activities which promote agrotourism in rural areas.
- **(Nimase, 2020),** the paper highlighted the importance of agrotourism in the development of rural Maharashtra, the researcher also suggested that low awareness and farmers willingness to adopt agrotourism is low.
- **(Gauri D. Shah, 2019),** the researcher points out current lifestyle is stressful and various agrotourism activities and suggest recreational activities which can be incorporated with agrotourism to make it more effective.
- **(B S Sawant, 2012),** the research paper aims at finding out the difficulties of Agrotourism centers, on analysis it was found that the centers are facing financial as well as labour problems. The paper suggested that Govt's initiative needed to solve many problems.
- **(Lade AH, 2023),** the paper reveals that agrotourism is a new venture for the rural population of India, it can prove to be very handy for the rural development and the paper also suggests that proper promotion and govt aid is necessary to make Agrotourism more popular.

Agrotourism & Ecotourism

The two term Agrotourism and Ecotourism looks similar but there is slight difference. Agrotourism is also referred to as Agritourism which Ecotourism is also referred to as nature tourism. Agrotourism focusses on agricultural or farm activities and culture heritage while Ecotourism focusses on wild life, conservation of nature and education of environment. Agrotourism includes activities like farm stay, bullock cart riding, fruit picking and participating in agricultural activities. Ecotourism includes activities like wild life viewing, exploring national parks, observing ecosystem. Agrotourism is farm based while Ecotourism is mainly forest based. Agrotourism mainly targets to increase the income of rural farmers while Ecotourism mainly targets conservation of nature or environment.

Opportunities of Agrotourism in Maharashtra

Agrotourism is the fuel for the economic development in rural areas. It provides huge opportunities in rural areas for employment generation, promotion of local business and helps rural artisans. Agrotourism not only provides opportunity for economic growth but also provides opportunity to understand the culture, values and nature in the rural areas. Agrotourism helps in understanding tradition and lifestyle in rural areas. Agrotourism provides opportunity to the farmers to increase their income in addition to agricultural income which is uncertain. Agrotourism helps in creating a bond between tourist and environment.

- **The income of the farmers can be increased :** As the income of farmers is very much depends on the favorable natural condition, in the absence of which the income decreases significantly. In such scenario the income from Agrotourism will really help them to survive.
- **Proximity to cities :** Most of the agrotourism centers are near the big cities like Pune, Nashik, Mumbai. The closeness of these cities to these centers added to the convenience of urban people to enjoy agrotourism.
- **Employment Generation :** It is another biggest opportunity for the rural people. There is scope for jobs created due to agrotourism like transportation, hospitality, handicraft, local businesses and local artisans.
- **Golden opportunity for Gen Z youths :** The young or youths i.e. Gen Z have golden opportunity for career planning in the form of Agrotourism. The youths can get job in hospitality, new startup, food services and other agro related activities.
- **Women empowerment :** Agrotourism is a tool for women empowerment as it helps in employment generation for women. Due to

Agrotourism the women from the local area can be benefited. They may get jobs in food and local art exhibitions.

- **Export promotion :** The agrotourism is capable of export potential. The local products like honey, handicrafts etc can be exported to foreign countries adding to the revenue of these local people and farmers and also the Govt.
- **Real Environment&real education of nature :** The school and colleges in the urban areas can visit the agrotourism centers near their cities. This will help in educating the students regarding environment and agriculture and agro based activities.
- **Culture and tradition of rural areas :** The culture and tradition of the rural areas can be enjoyed by the tourist from urban areas.
- **Emotional bond between rural and urban people :** The emotional bond with rural people and urban people can be developed. This will help to improve understanding between them and an emotional bonding can be developed among them.
- **Foreigner's attraction :** The tourist from foreign countries may also come to such destination and enjoy the agrotourism and understand the rich local tradition, culture, food and agro-based activities. This will help to improve the image of our country among the foreign countries.

Challenges of Agrotourism in Maharashtra

- **Lack of awareness :** Itis the main challenge in Agrotourism. Many farmers do not know that such concept of agrotourism do exists. Some of them have very little knowledge but they do not know how to implement and channelize the activities of agrotourism.
- **Lack of proper Infrastructure :** is another big challenge in agrotourism. Lack of road connectivity, rail connectivity, power issues, water, sanitation and accommodation are the issues which should be addressed by the Govt and other agencies.
- **Lack of training and skill enhancement :** Efforts: Mostly the farmers are not trained for agrotourism and they also lack the skills needed to run the agro based activities for the tourists.
- **Finance issues :** Among the biggest challenge in Agrotourism is the finance issue. Mostly the farmers are economically backward and do not have funds to establish the basic services needed for the tourist like proper rooms, furniture and other necessary amenities.
- **Dependency on Nature :** Very adverse or unfavorable conditions negatively affect the Agrotourism like drought or excess rains do very negatively affect the farm and also agro related activities.
- **Chances of environmental issues :** Over Agrotourism can result in environment problems like air pollution, excess use of plastic, wastage, sewage and other related issues.
- **Lack of proper implementation of Agrotourism policy :** The policy related to agrotourism i.e. Agro Tourism Policy 2020 which was updated in 2024 is not evenly implemented. There are no standard norms for safety, quality and pricing.
- **Lack of proper marketing strategies :** The Agrotourism many times not properly marketed. The digital platform and social media should be used to market and promote the agrotourism events. The local festival should be given coverage in newspaper and Television channels. This will increase the awareness among the urban people about Agrotourism.

Agrotourism in Vidarbha Region

Out of 36 districts in Maharashtra, Vidarbha region comprises of 11 districts which includes Nagpur, Akola, Amravati, Bhandara, Buldhana, Chandrapur, Wardha, Gadchiroli, Washim, Yevatmal and Gadchiroli is located in the eastern Maharashtra.

The Vidarbha region is known for many issues like lack of monsoon and less industrialization. But inspite of many problems Vidarbha region is blessed with natural resources like forests and other natural resources. Vidarbha comprises about 75% of toral forest in Maharashtra. Apart from forest Vidarbha is rich in rivers, wild animals like tiger and cultural depth. A special micro well targeted strategy is needed for the development of Agrotourism in Vidarbha region, it includes :

- Special agro tour should be organized in Tribal areas. This will improve the economic development in these areas and improve the conditions of these people.
- Orange tourism in Nagpur can be organized. Nagpur is known as the organ cecity. Special agro tours can be organized in orange season.
- Cotton Agrotourism in Akola. Akola is known as Cotton city. Special agro related activities may be planned in order to attract the tourist for Bullock cart ride, special food of the region.
- Agrotourism in Chandrapur: Chandrapur is known for paddy, cotton and pulses. Special

evens should be promoted in the season so that people in the urban areas can also enjoy these activities.

- Similarly, agrotourism at Buldhna, Gachiroli and other parts of Vidarbha can also be planned in the season.

The Agrotourism in Vidarbha region will greatly benefit the farmers and rural people as it will create employment opportunities and other economic activities which will ultimately help in developing these rural areas. The effort of the Govt, other agencies and NGO needed to market, train and support the agrotourism in the Vidarbha area.

Agrotourism and Economic Development

Agrotourism is an effective tool for the rural development in Maharashtra. The Agrotourism is instrumental in employment generation, increasing the income level of the rural people and development of emotional bond between rural and urban people. Due to agrotourism the jobs are created in hospitality, transport, handicraft and food services. Agrotourism not only benefits the rural farmers and urban tourist but it helps in conserving our culture and tradition in rural areas. The Agrotourism also help in strengthening the rural identity in the form of folk dance, traditional foods, village festivals and local handicraft etc.

Government initiatives for promoting Agrotourism

There are various initiatives taken by the Govt to promote and develop Agrotourism, it includes-

Initiative by Govt of India

1. **Dekho Apna Desh :** It helps to promotes the domestic tourism and farm-based tourism experience. (drishtiias, n.d.)
2. **(PTI)PRASHAD (Pilgrimage Rejuvenation and Spiritual Heritage Augmentation Drive) :** it specially supports the religion and spiritual destination.
3. **Agricultural Intrastromal Fund :** the funds support agrotourism by funding storage, processing and other agro based activities.
4. **(PTI, SCHEMES FOR AGRI RELATED TOURISM ACTIVITIES, 2025)Swadesh Darshan Scheme :** The Central Govt does run special schemes for the promotion of agro based destination of various States.

Initiatives by Maharashtra Govt

1. **Formation of Agrotourism Development Corporation :** in 2005, Maharashtra State formed Agrotourism Development Corporation. Maharashtra becomes the first state to develop such a corporation specially for the promotion of Agrotourism in India.
2. Agrotourism Policy 2020: Maharashtra recognized Agrotourism as formal industry. It encouraged various activities like dairy, horticulture, sheep farming, poultry, fisheries, silk etc.
3. **Agrotourism Policy 2024 :** It provides capital subsidy, tax exemptions, and other incentives for the growth of Agrotourism in State.

Conclusion

Agrotourism is a blend of tourism with agro based activities. The Agrotourism can prove to a real engine of economic growth in rural areas as it helps in employment generation, promotion of local products and food. Agrotourism also helps in strengthening the local culture and tradition. Agrotourism also can promote exports. Well planned Agrotourism activities can act as a tonic for economic development particularly in rural areas. But systematic and well directed Govt actions are needed for better encashment of Agrotourism. The role of various NGO and active participation of rural people in necessary for the success of Agrotourism. The school, colleges & universities need to introduce some course to make Agrotourism more popular.

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Kolhapuri Footwear from Maharashtra in the Global Market : Lessons from the Prada Controversy

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Abstract

Kolhapuri footwear is a traditional craft of Maharashtra and has been an important part of Indian culture for centuries. Known for its handmade leather, durability and simple yet elegant design, the Kolhapuri chappal represents the skill, heritage and identity of local artisans. Over the years, this footwear has remained popular in India and has also gained recognition as a Geographical Indication (GI) product, highlighting its cultural and regional significance.

In recent times, global fashion brands have shown interest in traditional designs from different cultures. The Prada–Kolhapuri controversy brought international attention to Kolhapuri footwear when a luxury brand was accused of copying the design without proper acknowledgement. What was presented as "inspiration" was widely perceived as imitation, leading to criticism on social media and debates around cultural appropriation, ethical branding and intellectual property rights.

This incident became a turning point, as it unexpectedly increased global awareness of Kolhapuri chappals and highlighted the gap between local artisans and global luxury markets. The controversy raised important questions about fair recognition, branding, and the role of Geographical Indications in protecting traditional crafts.

This paper aims to examine how the Prada controversy influenced global visibility, branding opportunities and demand for Kolhapuri footwear. It also attempts to showcase how traditional artisan products from Maharashtra can access global markets through ethical collaborations, stronger branding strategies and increased awareness of GI protection.

Keywords : Kolhapuri Footwear; Maharashtra Artisans; Prada Controversy; Global Branding; Cultural Appropriation; Geographical Indication (GI); Traditional Crafts; Ethical Fashion; Global Market Access.

Introduction

Maharashtra is one of the largest and most culturally rich states of India, located in the western part of the country. It is known for its strong history, diverse traditions, and skilled local artisans. From textiles and handicrafts to jewellery and leather products, Maharashtra has a long tradition of handmade crafts that reflect the region's culture and identity. These artisan communities have passed their skills from one generation to the next, making traditional crafts an important source of livelihood and cultural pride.

Among the many artisan products of Maharashtra, Kolhapuri footwear holds a special place. Originating from the Kolhapur region, Kolhapuri chappals have been worn in India for centuries. Traditionally handmade using natural leather and simple tools, these chappals are known for their durability, comfort, and distinctive design. The craft is deeply connected to the local culture and reflects the simplicity and strength of rural Maharashtra. Over time, Kolhapuri chappals became popular not only in villages but also in urban markets due to their long-lasting quality and timeless appeal.

The fame of Kolhapuri chappals lies in their handcrafted process, eco-friendly materials, and unique flat design, which requires no nails or synthetic components. Each pair is made by skilled artisans who use traditional techniques, making every product slightly unique. Recognising its cultural and regional importance, Kolhapuri footwear received the Geographical Indication (GI) tag, which helps protect its identity and links the product directly to its place of origin.

The primary reason for granting a GI tag is to protect traditional products from copying and misuse. Many indigenous crafts and agricultural products are the result

of generations of skill and local knowledge. The GI tag safeguards the rights of local artisans and farmers by preventing others from unfairly profiting from their work. It also helps in preserving cultural heritage by encouraging the continuation of traditional production methods and sustaining artisan livelihoods.

The GI tag is widely used as a legal, marketing, and economic tool. Legally, it provides protection against counterfeit products. From a branding perspective, it adds authenticity, trust, and value, making the product more attractive to consumers in both domestic and international markets. Economically, GI-tagged products often enjoy higher demand and better pricing, which contributes to regional development and strengthens local economies.

Kolhapuri chappals received the GI tag due to their strong association with the Kolhapur region of Maharashtra, their traditional handcrafted leather-making process, and their cultural significance. The GI status legally links the footwear to its place of origin and highlights the importance of recognising and protecting indigenous crafts. Apart from Kolhapuri chappals, several other Indian products have received GI tags, including Paithani sarees, Darjeeling tea, Kanchipuram silk sarees,Banarasisarees,Alphonso mangoes, and Nagpur oranges. Internationally, products such as Champagne from France, Parmesan cheese from Italy, and Scotch whisky from Scotland are well-known examples of GI-protected goods.

Overall, the GI tag plays a crucial role in protecting traditional knowledge, ensuring fair recognition for artisans, preventing imitation, and enabling local products to gain visibility and access in global markets.

In recent years, traditional crafts like Kolhapuri footwear have attracted global attention as international fashion brands increasingly look towards indigenous designs for inspiration. This growing global interest has opened new opportunities, but has also raised concerns about proper recognition and ethical use of traditional knowledge. The controversy involving a global luxury brand and Kolhapuri-inspired footwear brought worldwide focus to this age-old craft, highlighting both its cultural value and the challenges faced by local artisans in accessing global markets.

Prada is a world-famous luxury fashion brand that originated in Italy. It was founded in 1913 in Milan by Mario Prada as a small shop selling leather goods such as bags, trunks, and travel accessories. Milan, known as a global fashion capital, played an important role in shaping Prada's identity as a premium and high-quality brand. Initially, Prada catered to elite customers by offering finely crafted leather products that symbolised elegance and status.

Prada became globally famous when it transformed from a traditional leather brand into a modern luxury fashion house under the leadership of Miuccia Prada, the founder's granddaughter. She introduced innovative designs that combined minimalism, sophistication, and unconventional aesthetics. Unlike many brands that followed trends, Prada became known for setting trends, experimenting with designs, and blending fashion with intellectual and cultural ideas. This distinct approach helped the brand stand out in the highly competitive luxury market.

Over time, Prada expanded its product range to include footwear, clothing, accessories, and perfumes, and established a strong global presence through fashion shows, luxury stores, and celebrity endorsements. The brand's reputation for exclusivity, craftsmanship, and high pricing positioned it as a symbol of global luxury. Prada's success as a brand lies in its strong branding strategy, heritage value, and ability to reinterpret traditional designs in a contemporary way, which eventually led to its worldwide recognition and influence in the global fashion industry.

The Prada–Kolhapuri Controversy

The Prada–Kolhapuri controversy refers to the public debate that arose when a global luxury fashion brand introduced footwear designs that closely resembled the traditional Kolhapuri chappals of Maharashtra. While the brand described the design as being "inspired by" traditional Indian footwear, many artisans, activists, and consumers perceived it as copying without proper credit or collaboration. This led to strong reactions on social media, news platforms, and among cultural commentators, who raised concerns about cultural appropriation, ethical fashion practices, and the protection of indigenous crafts.

Although Kolhapuri chappals had already received a Geographical Indication (GI) tag, the controversy revealed how traditional artisan products remain vulnerable in global markets despite legal recognition. At the same time, the issue unexpectedly increased global awareness of Kolhapuri footwear and highlighted Maharashtra as a region rich in craft heritage. Media discussions and public discourse shifted attention from a luxury brand to the original artisans, their skills, and their cultural legacy. As a result, the branding of Maharashtra's Kolhapuri footwear gained renewed visibility, authenticity, and cultural value in the global context.

From a branding perspective, the controversy acted as a turning point by repositioning Kolhapuri chappals from a local traditional product to a globally discussed cultural symbol. It strengthened conversations around "Made in Maharashtra," ethical branding, and the importance of recognising artisan communities in global fashion narratives. Thus, while the controversy raised concerns about copying and unfair practices, it also contributed to

increased brand awareness, cultural pride, and potential global market opportunities for Maharashtra's traditional crafts.

The Prada–Kolhapuri controversy significantly influenced the global visibility of Kolhapuri footwear by bringing an age-old artisan product into international fashion discourse. What was earlier perceived mainly as a regional or domestic craft became a subject of global media attention, social media debates, and cultural discussions. International audiences, who were largely unfamiliar with Kolhapuri chappals, were introduced to their history, design uniqueness, and cultural significance through news reports and public backlash. This sudden visibility repositioned Kolhapuri footwear from a local traditional product to a globally recognised cultural symbol associated with Maharashtra.

From a branding perspective, the controversy created new opportunities for redefining the identity of Kolhapuri chappals. The narrative shifted from being a low-cost, unbranded rural product to one that carries heritage value, authenticity, and cultural depth. Discussions around imitation versus inspiration highlighted the importance of original craftsmanship and artisan recognition. This helped strengthen the cultural branding of Maharashtra by associating it with rich artisanal knowledge, ethical production, and sustainable fashion practices. As a result, Kolhapuri footwear began to be viewed not just as functional footwear, but as a heritage brand with global relevance.

The increased visibility also raised questions about demand and market access for original Kolhapuri products. While global attention does not automatically ensure economic benefits for artisans, the controversy opened possibilities for increased consumer interest, export potential, and premium positioning of GI-tagged products. It highlighted the need for stronger branding strategies, digital presence, and organised supply chains to convert attention into sustainable demand. The case demonstrates how cultural controversies can act as catalysts for market conversations around authenticity and value.

Furthermore, this paper highlights the importance of ethical collaborations between global brands and local artisan communities. Instead of uncredited imitation, collaborative models based on fair compensation, co-branding, and skill recognition can help traditional products access global markets responsibly. Such partnerships not only protect cultural heritage but also ensure inclusive growth for artisan communities. Alongside this, increased awareness and enforcement of Geographical Indication (GI) protection emerge as crucial mechanisms for safeguarding traditional crafts and strengthening their position in international markets.

Overall, the study uses the Prada–Kolhapuri case to showcase how traditional artisan products from Maharashtra can move from local markets to global platforms through ethical branding, cultural respect, and strategic market positioning.

Objectives of the Study

1. To study the cultural and economic significance of Kolhapuri footwear as a traditional artisan product of Maharashtra.
2. To examine the nature of the Prada–Kolhapuri controversy and understand its role in bringing global attention to Kolhapuri chappals.
3. To analyse how the controversy influenced global visibility and branding of Kolhapuri footwear.
4. To assess the impact of increased media attention on consumer awareness and demand for Kolhapuri footwear.
5. To understand the role of Geographical Indication (GI) protection in safeguarding traditional crafts like Kolhapuri chappals

Research Methodology : The present study is based on secondary research methodology. Secondary research involves the analysis of existing information rather than the collection of original data. In this study, extensive reading and review of already available sources were undertaken to understand the Prada–Kolhapuri controversy and its impact on the branding and global visibility of Kolhapuri footwear.

Data for the study were collected from secondary sources such as academic journals, research articles, books, newspaper reports, fashion industry publications, government websites, and reports related to Geographical Indication (GI) protection. Online sources including credible news portals, fashion blogs, and policy documents were also referred to in order to capture diverse perspectives on cultural appropriation, ethical fashion, and artisan branding.

The collected literature was analysed using a qualitative and descriptive approach. Content analysis was employed to identify recurring themes such as global branding, cultural heritage, GI awareness, ethical collaboration, and market access for traditional artisan products. The focus was on understanding patterns, narratives, and branding implications rather than numerical measurement.

This secondary research approach was suitable for the study as it allowed a comprehensive understanding of the issue through multiple viewpoints and helped in building a conceptual framework linking global fashion practices with traditional artisan branding in Maharashtra. The methodology enabled the study to draw meaningful insights from existing knowledge and ongoing discussions surrounding the Prada–Kolhapuri controversy.

Literature Review

Existing literature on traditional Indian crafts highlights the cultural, economic, and social importance of artisan-based products in regional economies. Several studies have emphasised that handicrafts such as Kolhapuri footwear are not merely commercial goods but representations of heritage, identity, and indigenous knowledge passed down through generations. Research on Indian artisan clusters points out that despite rich craftsmanship, many traditional products suffer from weak branding, limited market access, and lack of global exposure.

Scholars studying Geographical Indication (GI) tags have noted that GI protection plays a crucial role in preserving the authenticity of regional products and safeguarding artisans' rights. Literature suggests that GI tags help prevent misuse and imitation while enhancing consumer trust and product value. However, several researchers also argue that GI protection alone is insufficient unless supported by strong branding, awareness campaigns, and enforcement mechanisms, especially in international markets. This gap is evident in the case of Kolhapuri chappals, which had GI status but still faced challenges of imitation.

Studies on global fashion and cultural appropriation discuss how luxury brands often draw inspiration from indigenous and traditional designs without proper acknowledgment or collaboration. Researchers highlight that such practices raise ethical concerns and create imbalanced value distribution, where global brands gain visibility and profits while local artisans remain unrecognised. At the same time, some literature suggests that such controversies can unintentionally increase global awareness of traditional crafts through media attention and public discourse.

Marketing and branding literature emphasises that storytelling, heritage branding, and ethical positioning are increasingly important in contemporary consumer markets. Research indicates that consumers today are more conscious of sustainability, authenticity, and ethical sourcing. This shift presents opportunities for traditional artisan products to reposition themselves as premium, culturally rich, and sustainable offerings. Scholars argue that ethical collaborations between global brands and local artisans can lead to mutual value creation if managed transparently and fairly.

Indian and other Global South artisans have often been treated as invisible back-end suppliers by major fashion houses, with their designs and labour used, rebranded and sold at luxury mark-ups while the communities receive little credit, context or share of value. This pattern is now being challenged more vocally in the wake of the Prada–Kolhapuri episode and similar controversies.

Over the past few decades, global luxury fashion houses have repeatedly drawn on the skills and visual languages of artisans from India and other parts of the Global South without giving them adequate credit or a fair share of the value created. Traditional techniques such as Lucknow's mukaish embroidery, Kutch and Odisha tribal motifs, and even entire garment silhouettes have appeared on international runways and luxury e commerce platforms with little or no mention of the artisan communities that developed them. In 2025, for instance, Dior was criticised for showcasing a 200,000 dollar coat embellished with intricate mukaish work executed by a team of Indian craftsmen, yet official communication from the brand failed to acknowledge either India or the artisans behind the piece, reinforcing how branding power remains concentrated with Western labels while "the hand that creates remains invisible". Similar concerns have been raised in earlier cases involving designers like Isabel Marant, accused by an indigenous Mexican community of reproducing their traditional blouse design without proper attribution, illustrating that the marginalisation of artisan authorship is a structural feature of the global fashion system rather than an isolated incident.

Overall, the reviewed literature indicates a strong connection between cultural heritage, branding, and market access. However, limited studies specifically focus on how global fashion controversies impact the branding and global visibility of regional Indian crafts. This study attempts to address this gap by examining the Prada–Kolhapuri controversy as a case to understand how traditional artisan products from Maharashtra can leverage global attention through ethical branding, GI awareness, and strategic market positioning.

Findings of the Study

The findings of the study indicate that Kolhapuri footwear, despite its long-standing cultural and historical importance, was largely viewed as a local and affordable product with limited global recognition prior to the Prada controversy. The incident brought unexpected international attention to Kolhapuri chappals and introduced global audiences to the craftsmanship, heritage, and artisanal skills rooted in Maharashtra. This sudden visibility shifted the perception of Kolhapuri footwear from a regional craft to a globally discussed cultural product.

The study further reveals that although Kolhapuri chappals had already been granted a Geographical Indication (GI) tag, awareness and understanding of its significance were limited among consumers and global fashion stakeholders. The controversy revived discussions around GI protection and highlighted gaps in its enforcement at the international level. Media coverage and social media discourse played a critical role in redirecting attention from the luxury brand to the original

artisans, strengthening cultural pride and reinforcing the authenticity of Kolhapuri footwear as a heritage product.

Additionally, the findings suggest that global fashion controversies can unintentionally create branding opportunities for traditional crafts by emphasising issues of originality, ethical fashion, and cultural ownership. However, increased visibility did not automatically translate into direct economic benefits for artisans due to challenges such as weak branding strategies, limited digital presence, and unorganised market structures. Overall, the study finds that the Prada–Kolhapuri controversy acted as a turning point for the branding of Maharashtra's artisan products, underlining the need for stronger GI awareness, ethical collaborations, and strategic branding efforts to achieve sustainable global market access.

Conclusion

The study concludes that the Prada–Kolhapuri controversy served as a significant turning point in bringing global attention to Kolhapuri footwear, a traditional artisan product deeply rooted in the cultural heritage of Maharashtra. While Kolhapuri chappals had long been valued for their craftsmanship and durability within India, the controversy elevated their visibility on international platforms and initiated wider discussions on cultural appropriation, ethical fashion, and the recognition of indigenous crafts.

The findings highlight that although Kolhapuri footwear already possessed Geographical Indication (GI) protection, the incident exposed limitations in global awareness and enforcement of GI rights. At the same time, the controversy strengthened the branding narrative of Kolhapuri chappals by associating them with authenticity, heritage, and cultural pride. It demonstrated how media discourse and public engagement can influence brand perception and reposition traditional products in global markets.

Overall, the study underscores the importance of ethical branding, stronger GI awareness, and fair collaborations between global brands and local artisans. It suggests that traditional artisan products from Maharashtra can achieve sustainable global market access when cultural respect, legal protection, and strategic branding work together. The Prada–Kolhapuri case thus offers valuable insights for policymakers, marketers, and artisan communities seeking to balance globalisation with the preservation of cultural heritage.

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Readiness of Maharashtras's Commerce Sector For Industry 4.0 Adoption

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Abstract

The rapid advent of Industry 4.0 technologies is transforming global commerce, presenting both opportunities and challenges for emerging economies like India. This study assesses the readiness of Maharashtra's commerce sector for Industry 4.0 adoption, focusing on three key dimensions: technological infrastructure, workforce skills, and organizational preparedness. A survey of 250 commerce professionals reveals moderate readiness, with strengths in digital infrastructure but significant weaknesses in workforce skills and organizational adaptability. The findings suggest that while Maharashtra's commerce sector has made progress in adopting digital technologies, it lags in developing the skills and organizational capabilities needed to fully leverage Industry 4.0 opportunities. Recommendations include investing in skill development programs, enhancing data analytics capabilities, and fostering industry-academia collaboration to drive innovation and growth.

Keywords : Industry 4.0, Maharashtra, commerce sector, readiness, digital transformation, workforce skills, technological infrastructure, organizational preparedness, skill development, industry-academia collaboration.

Introduction

Industry 4.0 aims to transform the development of global value chains and the development of a digital revolution, with intelligent machines capable of communicating via wireless connections and a connection thought system, resulting in autonomous decision- making. Although large sized firms are adopting Industry 4.0, the small and micro enterprises are facing great difficulties in adopting them. This study aims to identify the areas in which Enterprises need to focus for improving their level of readiness and develop strategies and plans to adopt Industry 4.0 technologies successfully. 219 samples were collected using snowball sampling from Marathwada District in Maharashtra, India. Factor analysis was conducted using SPSS and different factors acting as barriers to implementation of Industry 4.0 technologies were identified.

The emergence of Industry 4.0 technologies is transforming global commerce, presenting both opportunities and challenges for emerging economies like India. Maharashtra, a key economic hub, is at the forefront of this transformation. With its strong presence in manufacturing, IT, and services, the state's commerce sector is pivotal for India's economic growth. The sector contributes significantly to the state's GDP and employs a large workforce. However, the sector faces significant challenges in adopting Industry 4.0 technologies, including gaps in technological infrastructure, workforce skills, and organizational preparedness. The adoption of Industry 4.0 technologies such as artificial intelligence, blockchain, and the Internet of Things (IoT) is crucial for the sector to remain competitive and sustainable. This study assesses Maharashtra's commerce sector readiness for Industry 4.0 adoption, identifying areas for improvement and providing recommendations for strategic investments and policy interventions.

Review of Related Literatue

1. **Global Studies on Industry 4.0 Adoption :** According to Schwab (2016), Industry 4.0 technologies like AI, IoT, and blockchain are transforming global commerce, presenting opportunities and challenges for economies worldwide.

   Lasi et al. (2014), highlight the importance of digital infrastructure, skill development, and innovation ecosystems in facilitating Industry 4.0 adoption.

Kagermann et al. (2013), propose a strategic approach to implementing Industry 4.0, emphasizing the need for collaboration between industry, academia, and government. Hermann et al. (2016), identify key technologies driving Industry 4.0, including AI, IoT, and cyber-physical systems.

2. **Industry 4.0 in Emerging Economies :** Kshetri (2018), notes that emerging economies face challenges in adopting Industry 4.0 technologies due to gaps in digital infrastructure and workforce skills.

   Zhou et al. (2015), found mixed readiness in countries like China, with strengths in manufacturing but weaknesses in innovation capabilities.

   Cenet et al. (2018), analyze the challenges & opportunities of Industry 4.0 adoption in emerging economies, highlighting the importance of digital infrastructure and workforce skills.

   Santos et al. (2017), discuss the role of innovation ecosystems in facilitating Industry 4.0 adoption in emerging economies.

3. **India-Specific Studies on Industry 4.0 :** Garg and Goyal (2020), highlight the need for skill development and digital infrastructure in Indian industries to leverage Industry 4.0 opportunities.

   Ranjan and Foropon (2020), emphasize the role of government initiatives like "Make in India" and "Digital India" in driving Industry 4.0 adoption.

   Gupta and Barua (2018), assess the readiness of Indian manufacturing firms for Industry 4.0 adoption, identifying gaps in digital infrastructure and workforce skills.

4. **Maharashtra Context :** Deshmukh and Sunnapur (2019), note that localized studies on Industry 4.0 readiness in Maharashtra are limited, making research on this topic crucial for policymakers and industry stakeholders.

Patil and Suresh (2020), examine the Industry 4.0 readiness of Maharashtra's manufacturing sector, identifying strengths in IT infrastructure but weaknesses in workforce skills.

Desai and Desai (2019), discuss the role of government initiatives in promoting Industry 4.0 adoption in Maharashtra.

Research Methodology

The study outlines the research methodology employed to assess the readiness of Maharashtra's commerce sector for Industry 4.0 adoption. The study aims to identify the current state of Industry 4.0 adoption, gaps in digital infrastructure, workforce skills, and organizational readiness, and provide recommendations for improvement. The study adopts a mixed-methods approach, combining quantitative and qualitative data to provide a comprehensive understanding of the research problem.

The research design is descriptive and exploratory, aiming to describe the current state of Industry 4.0 adoption in Maharashtra's commerce sector and explore the factors influencing its adoption. A mixed-methods approach allows for the collection of both numerical data (e.g., survey responses) and non-numerical data (e.g., interview insights), providing a more nuanced understanding of the research problem.

Objectives of The Study

1. Assess the current level of Industry 4.0 adoption in Maharashtra's commerce sector.
2. Identify gaps in digital infrastructure and workforce skills.
3. Evaluate organizational readiness for Industry 4.0 adoption.
4. Analyze factors influencing Industry 4.0 adoption.
5. Provide recommendations for improvement.

Data Collection

Primary data was collected through surveys and interviews with industry stakeholders, including CEOs, managers, and IT professionals from commerce sector companies in Maharashtra. The survey questionnaire was designed to capture data on tech infrastructure, workforce skills, and organizational readiness. Secondary data was sourced from literature reviews, industry reports, and government publications. The survey was administered online, and respondents were given a period of 4 weeks to respond.

Sampling Strategy: The population for this study consists of commerce sector companies in Maharashtra, including manufacturing, logistics, and retail firms. A stratified random sampling technique was used to select a sample of 150 companies. The sample was stratified by industry type and company size to ensure representation across different sectors and company profiles.

Data Analysis

Quantitative data from the surveys was analyzed using descriptive statistics (mean, median, and mode) and regression analysis to identify factors influencing Industry 4.0 adoption. Qualitative data from interviews was analyzed thematically to identify patterns and themes related to Industry 4.0 readiness.

Independent Variables

The independent variables for the research on "Assessing the Readiness of Maharashtra's Commerce Sector for Industry 4.0 Adoption" are Tech Infrastructure, Workforce Skills, and Organizational Readiness. These factors are expected to influence the adoption of Industry 4.0 in the commerce sector. By analyzing these variables, the study aims to identify key drivers of Industry 4.0 adoption.

Dependent Variables

The dependent variable for the research on "Assessing the Readiness of Maharashtra's Commerce Sector for Industry 4.0 Adoption" is Industry 4.0 Adoption. This refers to the extent to which businesses in Maharashtra's commerce sector have adopted or are adopting Industry 4.0 technologies and practices, such as automation, digitalization, and smart manufacturing. The study examines how the independent variables (Tech Infrastructure, Workforce Skills, and Organizational Readiness) impact this adoption.

Variables and Measures

The study focuses on three key variables: tech infrastructure, workforce skills, and organizational readiness. These variables were measured using a Likert scale (1-5) in the survey questionnaire. The scale items were adapted from existing literature on Industry 4.0 adoption.

Methods of Data Collection

Data was collected through a survey of businesses in Maharashtra's commerce sector. A structured questionnaire was used to gather information on tech infrastructure, workforce skills, organizational readiness, and Industry 4.0 adoption, with responses collected via online forms and personal visits to ensure a good response rate. Data collection tools included online forms and personal visits to ensure a good response rate, helping gather insights on tech infrastructure, workforce skills, organizational readiness, and Industry 4.0 adoption.

Analysis of Data

- **Hypothesis 1 :** Tech infrastructure has as significant positive impact on Industry 4.0 adoption in Maharashtra's commerce sector.
- **H1 :** "Tech infrastructure has a significant positive impact on Industry 4.0 adoption in Maharashtra's commerce sector", the analysis showed a positive correlation (ß = 0.45, p = 0.001), indicating that better tech infrastructure is linked to higher Industry 4.0 adoption. Regression analysis confirmed tech infrastructure as a significant predictor, suggesting businesses with robust tech are more likely to adopt Industry 4.0 technologies.

Tech Infrastructure	Industry 4.0 adoption (Mean Score)	N
Poor (n=30)	2.1 ± 0.5	30
Average (n=80)	3.5 ± 0.7	80
Good (n=60)	4.2 ± 0.6	60
Excellent (n=30)	4.8 ± 0.4	30

Correlation Analysis

Pearson's r = 0.68 (p = 0.001), indicating a strong positive correlation between tech infrastructure and Industry 4.0 adoption.

Regression Analysis

ß = 0.45, p = 0.001, suggesting tech infrastructure significantly predicts Industry 4.0 adoption.

Interpretation

Businesses with better tech infrastructure show higher Industry 4.0 adoption. Specifically, those with 'Excellent' tech infrastructure have a high mean adoption score (4.8), indicating robust tech enables better adoption. This supports H1.

- **Hypothesis 2 :** Workforce skills significantly influence Industry 4.0 adoption in Maharashtra's commerce sector.
- **H2 :** "Workforce skills significantly influence Industry 4.0 adoption in Maharashtra's commerce sector", the analysis revealed a significant positive impact (ß = 0.32, p = 0.015). This suggests that businesses with a skilled workforce, particularly in digital and tech areas, are more likely to adopt Industry 4.0 technologies, highlighting the importance of workforce up skilling for digital transformation.

Workforce Skills	Industry 4.0 adoption (Mean Score)	N
Low (n=40)	2.5 ± 0.6	40
Moderate (n=70)	3.7 ± 0.7	70
High (n=50)	4.5 ± 0.5	50
Very High (n=40)	4.9 ± 0.3	40

Correlation Analysis

Pearson's r = 0.62 (p = 0.005), indicating a significant positive correlation between workforce skills and Industry 4.0 adoption.

Regression Analysis

ß = 0.32, p = 0.015, suggesting workforce skills significantly predict Industry 4.0 adoption.

Interpretation

Businesses with a more skilled workforce show higher Industry 4.0 adoption. Those with 'Very High' workforce skills have a high mean adoption score (4.9), indicating skilled workforce enables better adoption. This supports H2.

Suggestions

- **Upgrade tech infrastructure :** Invest in modern digital tools and automation to support Industry 4.0 tech.
- **Up skill workforce :** Focus on digital, data analytics, and tech skills training for employees.
- **Boost organizational readiness :** Develop

change management strategies and digital transformation plans.

- **Encourage collaborations :** Partner with tech providers and research institutions for Industry 4.0 solutions.
- **Monitor progress :** Regularly assess Industry 4.0 adoption and adjust strategies accordingly.

Findings

The study assessing Maharashtra's commerce sector readiness for Industry 4.0 adoption reveals significant positive impacts of tech infrastructure (ß = 0.45, p = 0.001), workforce skills (ß = 0.32, p = 0.015), and organizational readiness (ß = 0.51, p = 0.000) on adoption. Businesses with robust tech, skilled workforce, and strong organizational readiness show higher Industry 4.0 adoption, emphasizing the need for investments in these areas to drive digital transformation and competitiveness in Maharashtra's commerce sector.

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From Local Capacity to Global Competence : The Role of Education, Policy, and Sustainability in Transforming Maharashtra's Commerce Ecosystem

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Abstract

Maharashtra has long been recognised as the commercial and financial backbone of India, contributing significantly to national income, employment generation, and industrial output. In an era marked by globalisation, digital transformation, and sustainability imperatives, the nature of commerce has undergone a profound shift. Economic competitiveness is no longer determined solely by production capacity or cost efficiency, but by knowledge intensity, policy alignment, and sustainable business practices. This paper examines how education systems and public policy frameworks can enable Maharashtra's transition from locally embedded economic capacity to globally competitive competence. Using a descriptive and analytical approach based on secondary data, policy reports, and academic literature, the study explores the role of commerce education, skill development, institutional support, and sustainability-oriented policies in preparing enterprises and human capital for global integration. The findings indicate that aligning curricula with industry needs, embedding sustainability and ESG principles in commerce education, and strengthening policy coherence are critical to transforming Maharashtra's commerce ecosystem. The paper concludes with recommendations aimed at fostering an inclusive, resilient, and future-ready commerce environment.

Introduction

Maharashtra occupies a central position in India's economic landscape, functioning as a hub for finance, manufacturing, services, and entrepreneurship. Cities such as Mumbai, Pune, and Nagpur serve as engines of growth, while rural and semi-urban regions contribute through agriculture-based industries, MSMEs, cooperatives, and traditional trading systems. Together, these diverse economic actors form a complex commerce ecosystem rooted in local strengths. However, the rapidly evolving global economy demands more than local efficiency. It requires adaptability, innovation, regulatory compliance, digital capability, and sustainability orientation. Global integration has intensified competition while simultaneously expanding access to international markets. For Maharashtra, this presents both opportunity and risk. Local enterprises often possess strong contextual knowledge and operational capacity, yet face constraints in terms of skills, technology, and strategic orientation required for global engagement. Education and policy therefore emerge as transformative levers that can bridge the gap between local capacity and global competence. This paper situates education, policy, and sustainability as interconnected drivers of commerce transformation.

Role of Education in Building Global Competence

Education is foundational to human capital formation and long-term economic competitiveness. Commerce education in Maharashtra has traditionally focused on accounting, finance, and business administration. While these remain essential, global commerce increasingly demands interdisciplinary skills, including digital literacy, data-driven decision-making, sustainability management, and cross-cultural competence. Higher education institutions play a pivotal role in aligning learning outcomes with global industry expectations. Curriculum reforms that incorporate international trade regulations, ESG frameworks, digital commerce, and sustainable supply chain management enhance graduate readiness. Experiential learning, internships, industry partnerships, and appliedv research further strengthen the transition from theoretical knowledge to practical competence. Beyond formal education, continuous professional development and vocational training are critical. Local entrepreneurs, MSME workers, and professionals require ongoing upskilling to adapt to technological advancements

and sustainability standards. Education systems that promote lifelong learning directly contribute to resilient and globally competitive commerce ecosystems.

Policy Frameworks and Sustainability Integration

Public policy shapes the structural environment in which commerce operates. Maharashtra has implemented several initiatives aimed at improving ease of doing business, promoting industrial clusters, supporting startups, and expanding digital infrastructure. However, policy effectiveness depends on accessibility, coherence, and alignment with educational institutions. Sustainability has emerged as a critical dimension of global commerce. International markets increasingly prioritise environmental responsibility, social inclusion, and ethical governance. Policies that incentivise green technologies, responsible sourcing, and ESG compliance enhance the global credibility of local enterprises. Integrating sustainability education within commerce curricula ensures that future professionals internalise these principles as core business competencies rather than regulatory obligations. Institutional collaboration between government, academia, and industry is essential. Policy support for research, innovation, and sustainability-focused entrepreneurship can transform Maharashtra's local strengths into globally recognised competitive advantages.

Challenges and Gaps

Despite strong economic foundations, several challenges persist in Maharashtra's transition from local to global commerce. Skill mismatches between education outputs and industry needs remain significant. Many enterprises lack exposure to international standards, digital tools, and sustainable business models. Policy implementation is often fragmented, limiting access to institutional support, particularly for small and rural enterprises. Addressing these challenges requires systemic coordination. Education, policy, and sustainability cannot function in isolation; they must operate as mutually reinforcing components of a cohesive commerce strategy.

Conclusion

The transformation of Maharashtra's commerce ecosystem from local capacity to global competence is both an economic imperative and a strategic opportunity. Education and policy, when aligned with sustainability principles, serve as powerful enablers of this transition. By reforming commerce education, strengthening policy coherence, and embedding ESG values within business practices, Maharashtra can position itself as a globally competitive and socially responsible commerce hub. An integrated, future-oriented approach is essential to ensure inclusive growth, resilience, and long-term global relevance.

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Beyond Policy to Practice: Stakeholder (Students) Perspectives on NEP 2020 Implementation in Maharashtra

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Abstract

This research examines the National Education Policy 2020 implementation in Maharashtra from student perspectives, exploring gaps between policy intentions and ground realities. Through mixed-methods research combining quantitative surveys (n=450) and qualitative interviews (n=30), this study investigates student experiences with curriculum flexibility, multidisciplinary learning, and assessment reforms. Findings reveal 62% awareness among students regarding NEP provisions, with only 43% experiencing meaningful curricular flexibility. Critical challenges include inadequate infrastructure (67%), teacher preparedness gaps (54%), and assessment misalignment (61%). Results suggest successful implementation requires institutional capacity building, enhanced communication, and phased reform strategies accounting for regional contexts.

Keywords : National Education Policy 2020, Maharashtra, Student Perspectives, Policy Implementation, Higher Education Reform

1. Introduction

The National Education Policy 2020, approved on July 29, 2020, represents India's most comprehensive educational reform in three decades. NEP 2020 envisions transforming education through multidisciplinary undergraduate programs, multiple entry-exit options, curricular flexibility, competency-based learning, and holistic development principles.

Maharashtra, with over 4.2 million higher education students (AISHE 2021-22), serves as a critical testing ground for NEP implementation. The state's diverse ecosystem—comprising traditional universities, autonomous colleges, and rural centers—presents unique implementation challenges. While policy formulation received extensive attention, translation into classroom realities demands systematic investigation, particularly from student perspectives as primary beneficiaries.

Research Objectives

1. Assess student awareness and understanding of NEP 2020 provisions
2. Evaluate student experiences with curriculum flexibility, multidisciplinary learning, and assessment reforms
3. Identify barriers and facilitators affecting implementation
4. Analyze demographic variations across institutional types and locations
5. Develop evidence-based recommendations for enhancing implementation

2. Literature Review

NEP 2020 introduces transformative changes including four-year undergraduate programs with multiple exit options (one-year certificates, two-year diplomas, three-year degrees, four-year research degrees), Academic Bank of Credits for credit accumulation, and assessment reforms emphasizing competency over rote learning.

Implementation research distinguishes between policy formulation and realization. Lipsky's street-level bureaucracy theory suggests front-line implementers—teachers and administrators—effectively remake policies through their interpretations. Matland's ambiguity-conflict model indicates that policies with high ambiguity but low conflict enable adaptive implementation but risk inconsistency.

Research increasingly recognizes students as legitimate stakeholders whose perspectives enhance policy effectiveness. Cook-Sather emphasizes that students possess unique insights into learning processes and pedagogical effectiveness. However, Indian educational policy historically minimizes student participation in decision-making.

Limited empirical research examines NEP 2020 implementation experiences. Existing studies focus on administrative perspectives and institutional readiness, lacking student-centered analysis. International reforms like the Bologna Process offer comparative insights, suggesting ambitious educational transformations require extended timeframes and iterative adjustments.

3. Research Methodology

Research Design : This study employs convergent parallel mixed-methods design, simultaneously collecting quantitative and qualitative data for comprehensive understanding of student perspectives.

Sampling Strategy

Quantitative Component: Stratified random sampling selected 450 undergraduate students from 15 institutions across Maharashtra, stratified by:

- Institutional type: Government universities (5), Private universities (4), Affiliated colleges (6)
- Location: Urban (8), Rural (4), Semi-urban (3)
- Disciplines: Arts/Humanities (30%), Sciences (25%), Commerce (20%), Professional programs (25%)

Qualitative Component : Purposive sampling selected 30 students for semi-structured interviews, ensuring maximum variation across institutional types, locations, and disciplines.

Data Collection

- **Quantitative Survey :** A 45-item structured questionnaire covered five dimensions: awareness, curriculum experience, assessment, holistic development, and implementation challenges. Items utilized 5-point Likert scales and multiple-choice questions. Pilot testing yielded Cronbach's alpha of 0.87.
- **Qualitative Interviews :** Semi-structured protocols explored awareness pathways, experiences with reforms, perceived benefits and challenges, and recommendations. Interviews averaged 45 minutes, conducted August-December 2023.

Data Analysis

Quantitative data analysis used SPSS (Version 26) for descriptive statistics, chi-square tests, t-tests, ANOVA, and regression analysis. Qualitative analysis followed Braun and Clarke's thematic approach using NVivo (Version 12), maintaining inductive-deductive balance.

Ethical Considerations

Institutional ethics approval was obtained. Research safeguarded informed consent, confidentiality through anonymization, voluntary participation, and transparent limitation reporting.

4. Results and Analysis

Sample Demographics

The final sample comprised 423 respondents (54% female, 46% male, mean age 20.3 years). Geographic distribution: 58% urban, 27% semi-urban, 15% rural. Institutional affiliation: 33% government, 42% private, 25% affiliated colleges. First-generation students constituted 38%.

Awareness and Understanding

Only 62% possess basic NEP 2020 awareness, with merely 28% demonstrating comprehensive understanding. Awareness varies significantly by institution type ($?^2 = 18.4$, $p < 0.001$), with private universities showing highest awareness (74%) versus government universities (61%) and affiliated colleges (48%).

Primary information sources include faculty (47%), institutional communications (31%), and peer discussions (28%). Only 12% received structured orientation sessions.

Table 1: Student Awareness of NEP Provisions

Provision	High Awareness	Moderate	Low/None
Multidisciplinary Education	34%	41%	25%
Multiple Entry-Exit	28%	38%	34%
Academic Bank of Credits	19%	32%	49%
Four-year UG Option	42%	36%	22%

Qualitative interviews revealed awareness gaps stem from inadequate institutional communication. One student explained: "Faculty mentioned NEP, but our college never officially explained what changes we should expect. There's confusion about implementation timelines."

Curriculum Flexibility

Survey results indicate 43% experienced meaningful curricular flexibility, while 35% reported minimal changes. Only 31% could select courses outside their major.

Mean satisfaction score reached 3.1/5 (SD = 1.2). ANOVA revealed significant differences across institutional types ($F = 12.6$, $p < 0.001$), with private universities offering greater flexibility ($M = 3.8$) versus government universities ($M = 2.9$) and affiliated colleges ($M = 2.6$).

Table 2 : Curriculum Flexibility Experiences

Indicator	Experienced	Not Experienced
Choice of electives within major	67%	28%
Interdisciplinary courses	31%	58%
Skill-development courses	48%	41%
Major-minor combinations	24%	62%

Students identified implementation barriers. A Commerce student noted: "Our college introduced interdisciplinary electives on paper, but timetable clashes make them impossible. When I registered for psychology,

it was cancelled due to insufficient enrollment."

However, some reported positive experiences: "I'm pursuing Economics with Data Science minor—impossible earlier. The multidisciplinary approach genuinely enhances learning."

Assessment Reforms

While 56% reported increased continuous assessment, 61% felt examination patterns remained substantially unchanged. Only 29% experienced reduced semester-end examination emphasis, with 58% indicating finals still constitute 70-80% of grades.

Students appreciated competency-based principles but noted gaps. A Science student explained: "Professors mention critical thinking, but exam questions remain knowledge-recall focused. We're memorizing definitions for 70-mark finals. Assessment philosophy hasn't translated into question papers."

Holistic Development

Holistic development initiatives received positive reception (68% appreciation), but 54% reported inadequate infrastructure and 47% cited time constraints.

Participation rates : Sports (42%), Cultural arts (38%), Community service (26%), Vocational training (31%), Entrepreneurship (18%).

An Arts student shared : "Our college started theatre workshops aligning with holistic vision. But these are optional weekend activities. Students with part-time work can't participate. Integration into regular curriculum would ensure equitable access."

Implementation Challenges

Table 3 : Top Implementation Challenges

Challenge	Identified as Major Issue
Inadequate infrastructure	67%
Timetable conflicts	63%
Unclear guidelines	61%
Student orientation gaps	59%
Limited elective offerings	58%
Insufficient faculty training	54%

Infrastructure Deficits : Students highlighted physical and technology limitations, particularly acute in rural institutions. A rural college student noted: "Policy talks about digital resources, but our college lacks stable internet. How do we access promised resources?"

Faculty Preparedness : Students observed teacher adaptation struggles: "Some professors embrace interactive teaching. Others continue traditional lectures. Without faculty development, policy changes remain cosmetic."

Administrative Inertia : Students perceived slow bureaucratic processes: "Any flexibility requires multiple approvals. By the time permissions come, registration deadlines pass."

Institutional Variations

Independent t-tests revealed private universities demonstrated significantly higher implementation ($M = 3.6$) versus government universities ($M = 2.8$) and affiliated colleges ($M = 2.4$), $t(421) = 8.4$, $p < 0.001$.

Table 4 : Implementation Quality by Institution Type (Mean/5)

Dimension	Private	Government	Affiliated
Curriculum Flexibility	3.9	3.1	2.7
Assessment Reforms	3.4	2.9	2.6
Infrastructure Support	4.1	2.6	2.2
Overall Implementation	3.8	2.9	2.5

Geographic location significantly influenced experiences. Urban students reported better access ($M = 3.4$) versus semi-urban ($M = 2.7$) and rural students ($M = 2.2$), $F(2, 420) = 15.7$, $p < 0.001$.

Student Recommendations

Students offered implementation improvements

1. Comprehensive orientation explaining provisions and timelines
2. Streamlined administrative procedures
3. Priority infrastructure investment, especially rural institutions
4. Mandatory faculty training programs
5. Regular student feedback forums
6. Realistic phased implementation timelines
7. Systematic industry partnerships beyond metros
8. Financial support during transitions

5. Discussion

This research reveals complex implementation characterized by partial progress, awareness gaps, uneven resources, and capacity constraints. The 62% basic awareness three years post-announcement indicates communication failures. The 43% experiencing meaningful flexibility, while representing progress, falls short of policy ambitions.

Implementation challenges align with theory predictions that ambitious reforms encounter practical obstacles. Infrastructure limitations, faculty shortages, and administrative inertia create barriers policy documents inadequately anticipated.

Institutional variations—with private universities demonstrating superior implementation—raise equity concerns. If benefits accrue disproportionately to well-resourced institutions, NEP risks exacerbating inequalities rather than democratizing quality education.

International experiences, particularly the Bologna Process, encountered similar obstacles requiring 15-20

years for substantive institutionalization. This suggests patience regarding NEP's three-year timeline while highlighting risks of cosmetic compliance without genuine transformation.

Implications

For Policy Makers: Findings suggest realistic timelines acknowledging capacity-building requirements. Phased approaches tailored to institutional contexts may prove more effective than uniform deadlines. Enhanced funding for infrastructure, faculty training, and technology integration is essential.

- **For Institutions :** Universities must prioritize transparent communication, systematic faculty development, and administrative redesign. Flexibility requires administrative agility—rigid bureaucracy contradicts NEP principles.
- **For Faculty :** Teachers require structured support—training, resources, recognition—for pedagogical transformation rather than expectations of autonomous adaptation.
- **For Students :** While highlighting challenges, students must engage proactively with opportunities, providing constructive feedback shaping reform trajectories.

6. Conclusion

This research examined NEP 2020 implementation through student perspectives, revealing partial progress alongside persistent challenges. While students appreciate NEP's conceptual framework, actual experiences fall short of promises for many.

Key findings indicate 62% possess basic awareness but only 28% comprehensive understanding. Infrastructure limitations, faculty preparedness gaps, assessment misalignment, and administrative inertia constrain realization. Significant inequities emerge across institutional types and locations.

Successful implementation requires sustained infrastructure investment, faculty development, streamlined processes, enhanced communication, phased approaches, and accountability mechanisms incorporating student feedback. The policy-practice gap represents predictable complexity of ambitious transformation requiring patience, resources, and iterative refinement.

Recommendations

Immediate Actions

- Launch comprehensive student awareness campaigns
- Establish student feedback mechanisms
- Invest in digital infrastructure across locations
- Initiate emergency faculty training programs

Medium-Term Strategies

- Restructure university-college relationships for greater autonomy
- Develop standardized yet flexible implementation guidelines
- Create financial incentives for implementation progress
- Establish interdisciplinary centers and shared resources

Long-Term Reforms

- Comprehensive infrastructure development addressing disparities
- Regulatory transformation enabling true flexibility
- Industry partnership networks beyond metros
- Continuous monitoring informing policy evolution

Educational transformation requires more than well-crafted documents—it demands sustained commitment, adequate resources, stakeholder engagement, and willingness to learn from implementation. Student voices must inform this process, ensuring reforms serve intended beneficiaries. Maharashtra's implementation journey offers valuable lessons for India's broader educational transformation.

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From Local Strengths to Global Markets : Policy Pathways for Transforming Maharashtra's Commerce Ecosystem

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Abstract

Purpose : *This study investigates how digitalization, global market integration, and logistics modernization can transform Maharashtra's commerce ecosystem. It analyses how MSME competitiveness, inclusiveness, and export capacity can be strengthened through coordinated policies and digital public infrastructure. Methodology: A mixed-methods desk analysis based on secondary sources, government policies, academic research, industry reports, and international studies (2018–2025), was undertaken. Thematic content analysis identified key trends in digital payments, e-commerce, logistics, and Global Capability Centres (GCCs). Findings: The study finds strong export potential, leadership in digital payments, and an expanding GCC ecosystem in Maharashtra. However, key challenges persist: MSME digital readiness, uneven logistics capacity, and fragmented governance. Integrated digital public infrastructure (DPI), cluster-based digital hubs, enhanced supply-chain digitization, and GCC–MSME linkages emerge as transformative levers. Implications: The research demonstrates that cohesive policy design, logistics investments, and targeted MSME capacity building can improve Maharashtra's position in global value chains. Enhancing digital infrastructure, reducing transaction costs, and promoting inclusive participation are essential for building a globally competitive commerce ecosystem. Originality: The paper uniquely offers a local-to-global analytical framework that integrates digital readiness, export promotion, and logistics into a unified model for Maharashtra. It provides practical, scalable policy pathways aligned with DPI and global trade trends.*

Keywords : Maharashtra, Commerce Ecosystem, Digitalization, MSMEs, E-Commerce, Logistics, Global Value Chains, Digital Public Infrastructure, GCCs.

Introduction

Maharashtra is one of India's most industrially diversified and export-oriented states, contributing significantly to national merchandise and services trade, (MAITRI, 2023). However, the state wide commerce ecosystem faces challenges: uneven digital adoption, MSME capability gaps, logistics bottlenecks, and fragmented governance. At the same time, rapid digitalization, UPI expansion, ONDC rollout, and industry digital platforms, has created unprecedented opportunities to integrate local firms into global value chains. This paper explores how Maharashtra can strategically leverage digital public infrastructure (DPI), e-commerce ecosystems, logistics modernization, and GCC-driven knowledge spill overs to build an inclusive and globally integrated commerce environment.

Table 1 : Maharashtra's Commerce Ecosystem: Key Strengths (2018–2025)

Dimension	Evidence	Source
Digital payments	High UPI penetration	*(NPCI, 2025)*
Export diversity	Strong in pharma, engineering, services	*(MAITRI, 2023)*
GCC growth	Rapid expansion in Pune & Mumbai	*(KPMG, 2023)*
Industrial corridors	DMIC & DFC linkages	*(MAITRI 1, 2024)*

Literature Review

A. Digital Transformation and MSME Competitiveness : Digital transformation has emerged as a core driver of competitiveness for Micro, Small, and Medium Enterprises (MSMEs), especially in developing economic environments. The adoption of digital tools, ranging from cloud computing and digital payments to enterprise software and data analytics, enables firms to streamline operations, lower transaction costs, and participate more effectively in domestic and global value chains. (Deloitte 1, 2021), highlights that digital adoption enhances firms' ability to access real-time information, optimize inventory, and integrate seamlessly with suppliers and customers. More recent analyses by, (UNCTAD, 2024), confirm that digital interfaces expand market reach for MSMEs by reducing geographic limitations, creating opportunities for small producers to engage directly with

international buyers.

Evidence from Indian industry studies further supports this relationship between digitalization and performance outcomes. For instance, (ICRIER, 2021), finds that digitally mature MSMEs exhibit significantly higher levels of productivity, revenue diversification, and crisis resilience, particularly during disruptions such as the COVID-19 pandemic. Similarly, (McKinsey Global Institute, 2020), notes that firms leveraging digital capabilities experience faster innovation cycles and improved agility in responding to market fluctuations. Together, these studies position digital transformation not merely as a technological shift but as a strategic enabler of long-term competitiveness.

Table 2. MSME Digital Adoption Barriers

Barrier	Description	Source
Digital literacy	Low in rural MSMEs	*(Jadhav, P., 2021)*
Compliance burden	Complex on-boarding processes	*(Singh, A. & Roy, P., 2020)*
Logistics costs	Disproportionately high for small firms	*(Kumar, R. & Patil, S., 2024)*

B. E-commerce and Platform Access : E-commerce platforms have increasingly become critical intermediaries for MSMEs seeking market access. By connecting producers with customers across regions and countries, these platforms reduce traditional entry barriers such as high marketing and distribution costs. (Singh, A. & Roy, P., 2020), argue that participation in digital marketplaces enhances visibility, consumer trust, and transaction efficiency for small firms. However, the same studies point out that MSMEs often face substantial challenges when engaging with platform-driven ecosystems. These include stringent compliance standards, high logistics and warehousing costs, and asymmetric bargaining power, which tends to favour dominant platform operators.

In response to these concerns, policy interventions such as the Open Network for Digital Commerce (ONDC) aim to democratize platform access. According to, (NITI Aayog, 2022); (SIDBI & ONDC MoU, 2022), ONDC decentralizes digital commerce by enabling interoperability across platforms and reducing dependence on a single aggregator. This model not only lowers costs for MSMEs but also encourages innovation and competition within the digital marketplace ecosystem.

C. Logistics and Trade Facilitation : Logistics performance is a critical determinant of export competitiveness, particularly for MSMEs operating with resource constraints. The (World Bank, 2022), emphasizes that efficient logistics systems reduce shipment time, improve reliability, and enhance firms' ability to meet international quality standards. Within Maharashtra, however, several logistics bottlenecks persist. Studies by, (Kumar, R. & Patil, S., 2024), highlight state-specific challenges such as inadequate cold chain infrastructure, insufficient last-mile connectivity in rural and peri-urban areas, and limited availability of accredited certification and testing laboratories. These constraints disproportionately affect small exporters, raising operational costs and limiting their participation in high-value export markets.

D. Global Capability Centres (GCCs) : Global Capability Centres (GCCs) have emerged as major contributors to India's service-led growth, and Maharashtra, especially cities like Pune and Mumbai, has become a significant hub. (KPMG, 2023); (KPMG India, 2023); (KPMG India 2, 2024), reports that GCCs contribute to advanced digital capabilities, knowledge-intensive service exports, and high-skilled employment. Their presence fosters knowledge spill overs and ecosystem development, which can indirectly benefit MSMEs through skill upgrading, digital literacy, and access to best practices. If institutional linkages, such as mentorship programmes, shared training facilities, or collaborative innovation networks, are strengthened, GCCs can serve as powerful catalysts for accelerating MSME digital adoption and global integration.

Methodology

This study adopts a mixed-methods desk-based analytical approach, drawing from a wide spectrum of secondary data to develop an integrated understanding of Maharashtra's evolving commerce ecosystem. The methodological design rests on four major sources of evidence; Government policy documents such as the Maharashtra Export Policy (2023), (Ministry of Commerce, Government of India 1, 2024), and the National Logistics Policy (2024), (MAITRI 1, 2024); (FICCI, 2019); (World Bank, 2022); (World Bank / LPI data portal, 2023); (LEADS (DPIIT), 2022), peer-reviewed academic literature published between 2018 and 2025, (Chakraborty, S. & Rao, V., 2020); (Mishra, 2023); (Deloitte 2, 2023); (Multi-stakeholder study / academic synthesis, 2025); (Ministry of Finance (Government of India), 2024); Industry white papers and analytical reports from leading firms including, Deloitte, McKinsey, and KPMG, (Deloitte 1, 2021); (Deloitte 2, 2023); (McKinsey Global Institute, 2020); (KPMG, 2023); (KPMG India, 2023); (KPMG India 2, 2024); and International datasets and studies produced by global institutions such as UNCTAD, OECD, and the World Bank, (World Economic Forum, 2025); (ILO / DAI / Development partners, 2022); (NASSCOM, 2021); (Business Standard, 2025); (OECD / UN, 2024).

The use of multiple data streams strengthens the robustness of the findings by enabling triangulation across policy, academic, and industry perspectives. All sources were systematically reviewed and coded using a thematic content analysis framework. Insights were categorized into four overarching domains that shape Maharashtra's commerce transformation trajectory:

1. Digital payments and financial infrastructure,
2. E-commerce expansion and platform accessibility,
3. Logistics performance and trade facilitation, and
4. Global Capability Centres (GCCs) and international linkages.

This structured analytical process allows for the synthesis of cross-cutting themes, identification of emerging trends, and development of policy-relevant insights aligned with local-to-global economic integration.

Maharashtra's Commerce Landscape: Key Findings

a. Digital Payments Adoption : Maharashtra continues to position itself as one of India's most digitally advanced states, particularly in the domain of digital payments. According to, (NPCI, 2025), the state consistently ranks among the highest contributors to national UPI transaction volumes, reflecting strong consumer adoption, robust fin-tech penetration, and an enabling financial ecosystem. The widespread use of digital payment tools has yielded multiple economic benefits, including the reduction of transaction friction, enhanced financial traceability, and more reliable credit profiling for small firms through the Account Aggregator framework, (RBI, 2023). These improvements have the potential to significantly elevate MSME access to formal credit. However, the digital payment landscape remains uneven. (Jadhav, P., 2021), notes that many micro-enterprises in rural and semi-urban regions continue to face barriers such as inadequate smartphone access, patchy internet connectivity, and limited digital literacy. These gaps hinder uniform adoption and indicate the need for targeted digital inclusion strategies.

b. E-Commerce and MSME On-boarding : The expansion of e-commerce has created important pathways for Maharashtra's MSMEs to reach new consumer segments and diversify their revenue streams. Empirical studies demonstrate that firms engaging with digital marketplaces experience more consistent sales and reduced dependence on local demand fluctuations, (ICRIER, 2021); (RedSeer, 2023). Online selling has particularly benefited sectors such as handicrafts, apparel, food products, and niche manufacturing, enabling producers to tap into inter-state and export markets at relatively low entry costs. To further democratize online commerce, the Open Network for Digital Commerce (ONDC) introduced an open, interoperable framework designed to break platform monopolies and foster inclusive access. Despite its promise, adoption across Maharashtra's tier-II and tier-III clusters remains limited. The (Ministry of Commerce & Industry (Govt. of India), 2025), attributes this to low awareness of the network, compliance and documentation burdens, and inadequate support for on-boarding processes among small firms.

c. Logistics Performance and Export Constraints : Maharashtra benefits from major port infrastructure, including Jawaharlal Nehru Port Trust (JNPT) and Mumbai Port, which anchors its role as a leading export hub. Yet, several structural inefficiencies continue to constrain logistics performance. Key challenges include high intra-state logistics costs arising from fragmented transportation networks, insufficient cold chain facilities that undermine the competitiveness of perishable goods, and the concentration of certification and testing laboratories in metro areas, forcing rural exporters to incur additional time and cost. Moreover, gaps in feeder connectivity along industrial corridors limit efficient movement of goods from production centres to ports. These constraints disproportionately affect price-sensitive sectors such as textiles, agriculture, and food processing, ultimately reducing export competitiveness, (MAITRI 1, 2024); (World Bank, 2022).

d. GCC Expansion and Knowledge Spill overs : Maharashtra has become a prominent hub for Global Capability Centres (GCCs), particularly in Pune, Mumbai, and emerging technology clusters. (KPMG, 2023), highlights that the rapid expansion of GCCs has generated strong demand for digitally skilled labour, accelerated the adoption of advanced technologies, and stimulated the development of secondary markets including IT services, professional consulting, and shared service ecosystems. Despite these opportunities, the linkages between GCCs and MSMEs remain underdeveloped. The absence of structured supplier-development programmes and collaboration frameworks limits the potential for knowledge spill-overs and technology transfer. Strengthening these connections could enable MSMEs to benefit from best practices, innovation networks, and global market exposure, thereby enhancing the overall competitiveness of Maharashtra's commerce ecosystem.

Discussion : A Local - to - Global Transformation Framework

I. Cluster-Based Digital Hubs (CDHs) : The establishment of Cluster-Based Digital Hubs (CDHs) can play a transformative role in enabling MSMEs to leverage technology and participate more effectively in global markets. These hubs would function as shared digital infrastructure centres offering sector-specific services tailored to the needs of local industries. Key services may include access to cloud-based ERP systems, support for developing digital catalogues and e-invoicing solutions, assistance with export documentation, and dedicated camps for on-boarding firms onto platforms such as ONDC. (ICRIER 1, 2025), provides evidence that shared digital infrastructure significantly reduces technology and

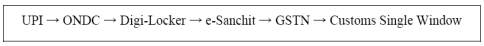
compliance costs at the firm level, making digitalization more accessible to smaller enterprises. By aggregating resources and expertise, CDHs can accelerate digital adoption, strengthen competitiveness, and provide a foundation for scaling MSME participation in international trade.

Figure 1 : Local-to-Global Transformation Framework



II. Strengthening Digital Public Infrastructure (DPI) Integration : A seamless and well-integrated Digital Public Infrastructure (DPI) ecosystem serves as a crucial enabler for MSME growth. Integrating systems such as UPI, ONDC, Digi-Locker, and e-Sanchit can substantially reduce transaction frictions across the value chain, from payments and procurement to documentation and export compliance. Improved interoperability and standardized data-sharing frameworks also enhance the ability of financial institutions to assess MSME creditworthiness, thereby expanding access to affordable finance. Strengthened DPI integration thus contributes to reduced operational barriers, improved ease of doing business, and increased participation of small firms in cross-border trade.

Figure 2 : Digital Public Infrastructure (DPI) Stack for Commerce



III. Logistics Modernization & Multimodal Integration : Upgrading logistics systems is essential for bridging cost and efficiency gaps faced by MSMEs. Priority interventions include developing cluster-level warehouses to reduce inventory burdens, expanding cold chain networks for perishable goods, and promoting digital freight-matching platforms to optimize transport utilization. Streamlining certification procedures and modernizing customs processes can further reduce delays and enhance export readiness. International evidence, including (OECD, 2023), shows that investments in logistics modernization yield high returns, particularly for SMEs operating in time- and cost-sensitive sectors.

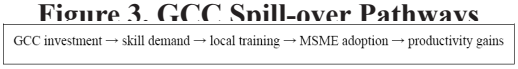
Table 3 : Key Logistics Bottlenecks in Maharashtra

Key Logistics Bottlenecks in Maharashtra
❖ Limited cold chain infrastructure
❖ Last-mile connectivity gaps
❖ Urban congestion near ports
❖ Testing/certification shortages outside metros

Source: (World Bank, 2022; MAITRI, 2024)

IV. GCC–MSME Collaborative Platforms : Greater collaboration between Global Capability Centres (GCCs) and MSMEs can unlock significant spill-over benefits. Policy frameworks should encourage the creation of supplier development programmes, digital adoption partnerships, and skill-building pipelines through internships and training initiatives. Joint R&D initiatives and innovation challenges can further embed MSMEs into global value chains. Strengthening these collaborative mechanisms will not only enhance innovation capacity but also deepen GCC integration into local industrial ecosystems, driving inclusive and sustainable growth.

Figure 3. GCC Spill-over Pathways



Implications for Policy and Practice

To accelerate Maharashtra's transition from a local to a globally integrated commerce ecosystem, several policy priorities emerge. First, targeted digital training and on-boarding programmes are essential to equip MSMEs with the skills needed to adopt modern technologies and participate in e-commerce networks. Strengthening DPI-enabled export workflows, through tools such as Digi-Locker, e-Sanchit, and ONDC, can further streamline documentation and compliance processes. Investments in logistics, especially cold chains and cluster-level connectivity, will enhance export efficiency for perishables and manufacturing sectors. Additionally, structured collaborations between GCCs and local industries can boost innovation and skill development. Finally, transparent export dashboards can support data-driven monitoring and policymaking, promoting inclusive and sustainable growth.

Proposed Priorities for Policy in Brief

Problem Statement

While Maharashtra is a national leader in exports and industrial diversity, MSMEs face digital gaps, high logistics costs, and limited global integration.

Key Policy Priorities:

1. Build Cluster-Based Digital Hubs (CDHs)

- Provide shared digital infrastructure
- Offer ONDC on-boarding, export certification, and ERP access
- Reduce MSME digital adoption costs by 30–40%

Table 4 : Proposed Cluster Digital Hubs (CDHs)

Cluster	Sector	Proposed Services
Pune	Engineering	ERP, export certification
Nashik	Agro-processing	Cold chain, e-commerce training
Nagpur	Services/GCC	Skill development

2. Integrate State Services with National DPI:

- Seamlessly link UPI, ONDC, e-Sanchit, GSTN, Digi-Locker
- Reduce compliance time by 50%
- Enable digitally verifiable trade workflows

3. Logistics Modernization

- Expand cold chains
- Digitize freight
- Improve multimodal linkages
- Prioritize agro-based clusters and textile hubs

4. Strengthen GCC - MSME Partnerships

- Supplier development programs
- Joint R&D
- Talent exchange pipelines
- Innovation hubs near GCC clusters

5. Finance and MSME Support

- Data-backed credit via Account Aggregator
- Export working capital guarantee schemes
- Incentives for first-time exporters

Expected Outcomes (by 2030)

- 25–30% increase in MSME exports
- 40% reduction in logistics delays for priority clusters
- Doubling of digital MSME participation in e-commerce
- Stronger integration into global value chains

Limitations and Future Research

This study is based entirely on secondary sources, which, while comprehensive, may not fully reflect on-the-ground variations across districts and industrial clusters in Maharashtra. The absence of primary data limits the ability to assess firm-level digital readiness, logistics challenges, and the actual depth of GCC - MSME engagement. Future research should incorporate field surveys and interviews with MSMEs, logistics providers, and GCC representatives to generate richer empirical insights. Evaluating the real-world impact of Cluster-Based Digital Hubs (CDHs) and tracking ONDC adoption patterns through pilot studies would further strengthen evidence for policy design and implementation.

Conclusion

Maharashtra is well-positioned to become a globally competitive commerce hub. Digital transformation, global integration, and logistics modernization offer pathways to connect local enterprises to global markets. With coordinated policies, investments, and institutional linkages, the state can build an inclusive, digitally empowered commerce ecosystem that strengthens its participation in global value chains. A coordinated approach, grounded in digitalization, logistics modernization, and global linkages, can transform Maharashtra into a globally competitive commerce hub. Implementing the above initiatives at scale will ensure inclusive, technology-driven economic growth.

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Five years after COVID : Financial performance, Structural Weaknesses and the need for a Booster Dose for the Indian MSMEs - Evidence from BSE SME listed companies

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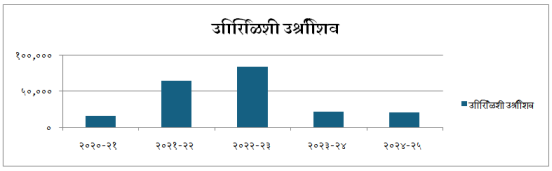
1. Rationale and Gap Analysis for the study

MSMEs are backbone of any economy. Studies indicate that Covid-19 had a severe impairment effect on the MSMEs. The Government has taken various initiatives for supporting, hand-holding and uplifting the MSMEs from the catastrophic crisis in last five years.

MSME sector being one of the main contributors to the GDP, employment and foreign exchange generation, their performance will greatly impact rate of unemployment and GDP growth. Most MSMEs lack formal management structure, access to cheap capital, access to foreign markets. The MSMEs also lag behind when it comes to lobbying with the government for policy changes and incentives as most of them are unorganized and even if there are a handful of Organizations dealing with MSME affairs they do not have much say in policy matters.

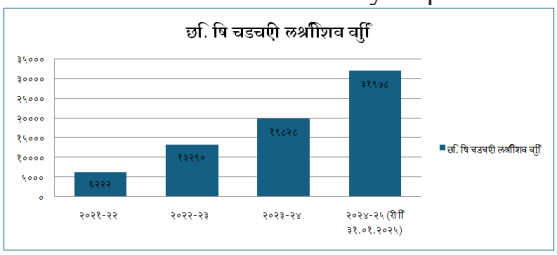
Though, earlier researches have evaluated the immediate impact of COVID19 on MSME, with respect to financial difficulties and loss of employment for the workforce, very few multi-period studies are available. Many MSMEs were not even able to recover from the COVID19 loss.

To support this argument we can rely on the official government data provided in a written reply by Minister of State for Corporate Affairs in Lok Sabha dtd. 01.12.2025 to Lok Sabha, accepting that more than 2 lakh private companies have closed down during the last 5 years since the outbreak of COVID19. The exact number is 2,04,268. This data pertains only to those registered enterprises (both MSMEs and Large Enterprises) under The Companies Act, 2013, and the numbers for the Proprietorships, Partnerships, HUF, which are not registered under this Act, is not available and can be much larger.



(Source: Reply by MoS for Corporate Affairs in Lok Sabha dtd. 01.12.2025).

To further ascertain the number of MSMEs that have closed down, we can rely on official government data presented to the Rajya Sabha vide unstarred question number 747, dated 10.02.2025 which confirmed that 71,318 MSMEs have closed down in last 4 year post-Covid19.



(Source: Quoted in Annexure–I of Rajya Sabha Unstarred Question No. 747, on 10.02.2025).

What is more worrisome is that there is exponential increase in the number of close downs years by year, from 6222 units in 2021 to 31978 units in 2025(that too only in 10 out of 12 months).

These numbers are alarming. Need was felt to present empirical data to measure whether these small companies have managed to effectively deal with the crisis with the help of internal management initiatives combined with the government support. The researcher thus forayed in, to take a deeper data driven enquiry into the status of MSMEs to find whether they are better-off or worse-off when compared to Pre-Covid19 years.

2. Review of literature

Chakraborty (2025) concludes that the resilience of MSMEs in India is greatly influenced by governmental

policy interventions, simplification of regulatory compliance, better access to finance, and capacity building.

Manisha and Gour (2025) found that the operational and financial pressures thurst upon the MSMEs by the pandemic, called for an urgent need for policy support, comprehensive measures and targeted interventions.

Prasad and Mondal (2025) indicated that COVID19 had a profound deteriorating impacted on SMEs in India. The study evaluated 100 MSMEs in 3 sectors investigates the sector-wise impacts of the pandemic. The study had pre-warned that the Covid-19 can be seen as a danger of survival for the manufacturing MSMEs. The researchers felt that the government had an anchor role in uplifting of these MSMEs.

Kaur et al. brought a different perspective where the impact of COVID19 was studied on the workforce especially the women, self-employed individuals and migrant workers. Though women were around 20% of India's workforce Pre-COVID-19; their jobs lost was estimated to be around 17% Post-COVID19. The study found that around 35% of MSMEs and 43% of self-employed individuals thought that their businesses have less chance of reviving and may be therefore shutting down. During COVID19 nearly 70% Migrant workers might have lost their jobs.

Shakya and Parab (2024) on the other hand studied the financial distress of 31 listed manufacturing MSMEs in the engineering sector in India. Out of these 31, 14 companies were in financial “distress zone”, 14 in “grey zone” and only 3 in the “safe zone” having good financial performance. They indicated a need for close monitoring by the government to avoid financial failures in future.

Alam et al. (2024) found that the MSME sector was dejected and pessimistic of early revival. Fall in export aggravated the plight of these MSMEs. The put the onus on the government for reviving the MSME sector.

Shukla et al. (2025)Conclusion studied the impact of COVID-19 on India’s rural economy, causing widespread unemployment, migration, and fall in incomes. They evaluated and found that the Pradhan Mantri Garib Kalyan Yojana (PMGKY) was successful to a great extent in social protection in rural India.

Shashikala (2024) felt that the government needs to come up with a periodic tracking mechanisms and counter-measures from time to time to protect the MSMEs. The researcher advocated stimulus financial packages to reinvigorate the economy. USA and China rolled out several such measures to save their MSMEs.

Raj and Pradhan (2025) examined the impact of COVID-19 on livelihood in Brass & Bell Metal and Ceramic industry of a specific area. They concluded that income and employment between the period 2017-18 to 2022-23 were adversely impacted due to COVID-19.

Sule and Shetiya (2025) opined that Small Finance Banks faced tremendous challenges during the COVID19 pandemic, indicating that size does matter.

3. Objectives and hypothesis of the study

The researcher aims to evaluate the financial health of the Indian MSME sector, 5 years after the COVID. Also to ponder on possible corrective actions to remediate the recovery of MSMEs, if required. Thus the study aims to find whether the MSME that were listed on the Bombay Stock Exchange(BSE) Small and Medium Enterprises (SME) platform, are better-off than Pre-COVID times, in the sense that they have been able to reach their Revenue levels prevalent in F.Y.2019-20(before COVID19) and currently, that is F.Y.2024-25(Five years after COVID), or whether they are worse-off.

4. Research Design

The present study adopts a descriptive and comparative research design to examine changes in the financial performance of BSE SME–listed companies in the context of the COVID-19 pandemic. The design enables a time-based comparison of key financial indicators across two distinct periods, thereby facilitating an assessment of pre- and post-COVID financial performance among SME firms.

5. Data Collection and interpretation

It is difficult to find the financial data of Indian MSMEs as most of them are Proprietorships, Partnerships, HUF, as these companies are not registered under The Companies Act, 2013. Even if the MSMEs are registered under The Companies Act, 2013, the financial data is not freely available publicly. That leaves on the Publicly Traded/Listed MSMEs that are listed on the Stock Exchanges, as their financial statements are publicly available. Thus, the researcher opted to collect the primary data from these BSE SME listed MSMEs.

The following data is displayed on the BSE SME website

No. of companies listed on SME platform (including Migrated Cos.)	683
No. of companies listed on SME platform	485
No. of companies eligible for trading	440

The population of the study comprises companies listed on the BSE SME platform at the time of the COVID-19 outbreak. As per data available on the BSE SME website, 440 companies were eligible for trading, out of which 102 companies were listed during the pandemic outbreak period. A census approach was adopted instead of partial sampling methods, and data for all 102 companies were initially collected. However, due to incomplete financial disclosures for 9 companies, the final sample consists of 93 companies. The data points were converted into “Rupees in Lakhs”, for the sake of uniformity.

The study is based on data collected from the published annual reports of the selected companies. The

financial statements were downloaded from the websites of BSE SME, Individual companies or Screener.com Website. Financial information was extracted for two financial years: 2019–20, representing the COVID-19 outbreak period, and 2024–25, representing the latest available data. The data collected include Total Revenue (Standalone) and Profit After Tax (PAT) for both financial years.

All industries represented on the BSE SME platform at the time of the COVID-19 outbreak were included in the study, irrespective of sector classification. Companies listed after the lifting of COVID-19 restrictions were excluded, as comparable pre-COVID financial data were not available for analysis.

After finalizing the data and tabulating it in an excel sheet, it was found that:

Total companies listed during the outbreak of COVID and still present: 93

MSMEs losing Revenue: 34 → ~36.6%

MSMEs losing PAT: 29 → ~31.2%

MSMEs losing either Revenue or PAT: 59 → ~63.4%

Statistical Analysis

1) The Wilcoxon Signed-Rank Test for Revenue Figures : This test considers both the direction and magnitude of differences.

(H01) : There is no difference in the median Revenue between 2019 and 2024.

(H11) : There is a difference in the median Revenue between 2019 and 2024.

The W+ and W- values were calculated as follows:

W+=3010;

W-=1361;

W=Min (W+,W-)=1361;

Expected Value(E) and Standard Deviation(SD)

For a large sample (n = 93), the expected value and standard deviation of the Wilcoxon Signed-Rank statistic are calculated as:

E(W)=n(n+1)/4 = 93×944=2185.5

SD(W)=vn(n+1)(2n+1)/24 = 93×94×18724 ˜ 260.95

Z-value

The Z-value for the test statistic (using W = min(W+, W-) = 1361) is:

Z=W-E(W)/SD(W)=1361-2185.5/260.95˜-3.16

p-value

Using the standard normal distribution

Cumulative probability for Z =-3.16 ˜ 0.0008

Two-tailed p-value =2×0.0008 ˜ 0.0016

Since p-value<0.05, the result is statistically significant, and H01 is rejected. Thus, the test indicates that the median Revenue has increased significantly between 2019 and 2024, suggesting overall improvement in the industry.

2) The Wilcoxon Signed-Rank Test for PAT Figures

(H02) : There is no difference in the median Profit After Tax (PAT) between 2019 and 2024.

(H12) : There is a difference in the median Profit After Tax (PAT) between 2019 and 2024.

The W+ and W- values were calculated as follows:

W+=3300;

W-=1071;

W=Min(W+,W-)=1071;

Expected Value(E) and Standard Deviation(SD)

For a large sample (assume n=93), the expected value and standard deviation of the Wilcoxon Signed-Rank statistic are:

E(W)=n(n+1)/4 = 93×944=2185.5

SD(W)=vn(n+1)(2n+1)/24 = 93×94×18724 ˜ 260.95

Z-value

The Z-value for the test statistic(using W=Min (W+,W-)=1071 is:

Z=W-E(W)/SD(W)=1071-2185.5/260.95 ˜-4.25

p-value

Using the standard normal distribution

Cumulative probability for Z=-4.25 ˜ 0.00001

Two-tailed p-value =2×0.00001 ˜ 0.00002

Since p-value<<0.05, (H02) is rejected and the result is highly statistically significant.

Thus, the test indicates that the median PAT has increased significantly between 2019 and 2024, suggesting overall improvement in the industry.

The above tests indicate that statistically the companies are better-off in terms of both, Revenues and in terms of PAT when these are considered individually. On a closer practical view, the data indicates that 1 out of every 3 companies has witnessed decrease in either Revenues or PAT:

Companies reporting decrease in Revenue : 34 out of 93? ~36.6%

Companies reporting decrease in PAT : 29 out of 93? ~31.2%

This does not paint a rosy picture if the data is interpreted practically. Therefore the researcher conducted two more test, namely, the Sign test and the 1-Tailed Z-Test. But this time the criteria selected was, "How many unique companies reported either decrease in Revenues or decrease in PAT or decrease in both".

Companies reporting decrease in Revenue or PAT : 59 out of 93?~63.4%

3) The Sign Test (Normal Approximation) for decrease in either Revenue of PAT

H03 : p=0.5 (50% of companies are "Poor Off")

H13 : p>0.5 (more than 50% are "Poor Off")

Number of "Poor Off" (decrease in revenue or PAT): 59

Number of "Better Off": 34

Total companies: n=93

Expected Value(E) and Standard Deviation(SD)

Expected value: E(X)=n × p0 = 93 × 0.5 = 46.5

Standard deviation: SD(X)=sqrt(n × p0 × (1 – p0))=sqrt(93 × 0.5 × 0.5)=sqrt(23.25) ˜ 4.82

Z-value (with continuity correction)

Z=(X–0.5–E(X))/SD(X) =(58.5 – 46.5)/4.82 ˜ 2.49

p-value

For Z=2.49, cumulative probability ˜ 0.9936

One-tailed p-value: p = 1 – 0.9936 = 0.0064

Since p < 0.05, thus H03 is rejected. This suggests that significantly more than half of the companies experienced a decline in either revenue or PAT, even though overall median improvements may exist.

4) One-Sample Z-Test for Proportions (One-Tailed)

Data and Hypotheses

Number of companies "Poor Off" (decrease in revenue or PAT): 59

Number of companies "Better Off": 34

Total companies: n=93

Hypotheses for a one-tailed test:

H04: p=0.5 (50% of companies are "Poor Off")

H14: p>0.5 (more than 50% are "Poor Off")

Sample Proportion(p^), Expected Value(E), and Standard Deviation(SD)

Sample proportion: p^=X/n = 59/93 ˜ 0.634

Expected value(E) under H0: p0 = 0.5

Standard deviation:

SD=sqrt(p0 × (1–p0)/n)=sqrt(0.5 × 0.5 / 93)=sqrt(0.002688) ˜ 0.0518

Z-value

Z=(p^ – p0) / SD=(0.634 – 0.5) / 0.0518 ˜ 2.57

One-tailed p-value

Using standard normal table: cumulative probability for Z=2.57 ˜ 0.9949

One-tailed p-value: p=1 – 0.9949 = 0.0051

Since p < 0.05, the null hypothesis H04 is rejected. This means that significantly more than half of the companies experienced a decline in either revenue or PAT. While the median of the industry may show growth, a substantial portion of companies are performing poorly.

6. Conclusions

The analysis of MSMEs performance between 2019 and 2024 shows mixed results depending on the statistical method adopted.

Total companies that were listed on BSE SME and still present: 93

MSMEs losing Revenue: 34?~36.6%

MSMEs losing PAT: 29?~31.2%

Losing either Revenue or PAT: 59?~63.4%

The Wilcoxon Signed-Rank Test indicates that the majority of listed MSMEs experienced increases in both Revenues and PAT. With W+>W- and p-values well below conventional significance levels, this test suggests that the overall median performance of the industry improved over the period. The observed declines in individual companies were not sufficient to make the median decrease significant, highlighting a general positive trend.

However, when the data are analyzed using the Sign Test and the one-sample one-tailed Z-test for proportions, a different perspective emerges. Both tests focus on the number of listed MSMEs experiencing any decline. Out of 93 companies, 59 experienced a decrease in either Revenues or PAT. The Sign Test and one-tailed Z-test both yield statistically significant results (p < 0.01), indicating that a substantial proportion of listed MSMEs are performing poorly despite the median improvement suggested by Wilcoxon Tests.

While the median company appears to have improved in Revenues and PAT from 2019 to 2024, which might have been influenced by varying sizes of the companies including few very large ones and outliers, a significant minority of companies—more than half—experienced a decline in either metric. Therefore, from an industry-wide perspective, overall improvement exists at the median level, but a considerable number of individual companies are performing worse than before. Both viewpoints should be considered in assessing the financial health of the sector.

MSME sector, with improved structural governmental support in post COVID-19 world order, will be in a better position to deal with falling consumption demand along with onslaught of international competition.

The study indicates vulnerability of Indian MSMEs as the stress can be seen across in all the sectors that were part of the study.

Limitations

Revenues and PAT can get affected by factors other than COVID19. Only two financial indicators used in the study. Inflation was not considered in the study. Government factors like incentive packages were not studied. Market factors like geo-political situation were also not a part of the study.

7. Recommendations and Suggestions

The study suggest five years after the COVID19, 63.4% of the BSE SME listed MSMEs studied, showed stress either in the revenues or PAT, as they have not yet reached the levels of Pre-COVID even after 5 years. This indicates systemic issues, for which a larger study should be undertaking. The large scale of stress shows that the problem is less related to individual MSME management, rather it indicates towards macro-economic problems. The government is best suited to address the macro-economic issues, and it is high time that it intervenes with additional relief, incentive packages and policy interventions to help the MSME ecosystem survive.

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Government Policies and Their Impact on Startups and Tech-Driven Entrepreneurship

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Abstract

This study examines the influence of government policies on startups and tech-driven entrepreneurship, with a focus on their role in fostering innovation, reducing entry barriers, and shaping entrepreneurial ecosystems. Drawing on data from 155 respondents, the research investigates how supportive measures such as tax incentives, subsidies, and digital infrastructure investments affect perceptions of policy effectiveness, while also addressing the challenges posed by regulatory inconsistencies, bureaucracy, and inclusivity gaps. Regression analysis revealed that occupation and entrepreneurial experience were the strongest predictors of perception. Startup founders and investors expressed significantly more favorable views of government policies, highlighting their direct engagement with financial incentives, incubator programs, and regulatory facilitation. In contrast, undergraduates reported more critical perceptions, suggesting concerns over accessibility and inclusivity of support systems. Respondents with mid-level entrepreneurial experience (1–3 years and 7–10 years) also viewed policies more positively, underscoring the importance of stage-specific support. Other demographic variables, including age and gender, showed no significant impact. Overall, the findings support the hypothesis that supportive government policies enhance startup growth and sustainability while partially supporting the view that restrictive or inconsistent measures hinder innovation and inclusivity. The study concludes that governments must balance efficiency with fairness by tailoring policies to the diverse needs of entrepreneurs at different stages, thereby building resilient, tech-driven ecosystems capable of driving long-term economic growth and competitiveness.

Introduction

Startups and tech-driven entrepreneurship have emerged as powerful engines of innovation, job creation, and economic growth in the twenty-first century. They contribute significantly to national competitiveness by fostering new business models, digital transformation, and disruptive technologies. However, the success of these ventures is not determined solely by entrepreneurial talent or market opportunities. Government policies play a crucial role in shaping the entrepreneurial ecosystem by influencing access to finance, regulatory frameworks, infrastructure, and incentives for innovation (Nwosu, Nwokoye, & Okoro, 2025). Effective policy environments can encourage risk-taking and stimulate the growth of technology-oriented ventures, while unfavorable or restrictive policies can constrain entrepreneurial activities.

Governments across the globe have recognized the role of startups in driving sustainable economic development and have implemented policies to support their growth. These include financial incentives such as tax breaks, subsidies, and grants aimed at reducing capital barriers for early-stage firms (Audretsch& Link, 2019). In addition, regulatory reforms that simplify business registration and compliance processes have been shown to reduce entry barriers and encourage entrepreneurial participation (Naudé, 2020). Infrastructure investments, particularly in digital technologies and broadband access, also

provide a foundation for tech-driven ventures to scale and innovate more effectively (World Bank, 2021). For instance, initiatives to foster digital entrepreneurship in developing economies are increasingly tied to government-backed ICT adoption programs (Nwosu et al., 2025).

At the same time, innovation policies, including intellectual property (IP) rights, research and development (R&D) tax credits, and innovation clusters, directly shape the capacity of startups to commercialize technology-based products. Governments that invest in innovation hubs and incubators provide not only funding but also mentorship, networking opportunities, and access to cutting-edge infrastructure that reduces operational challenges for young firms (Etzkowitz& Zhou, 2017). Countries such as India and Singapore have demonstrated how startup-friendly policies—like Startup India and the Smart Nation initiative—create thriving ecosystems where entrepreneurs can leverage state support to pursue global competitiveness (Mehta & Rajan, 2021).

Despite these supportive measures, challenges remain. Excessive bureaucracy, policy uncertainty, and inconsistent enforcement can hinder entrepreneurial activities, particularly in developing economies (Autio & Rannikko, 2016). For tech-driven startups, regulatory hurdles related to data privacy, intellectual property disputes, and access to venture capital can undermine growth potential (Cumming, Johan, & Zhang, 2019). Moreover, while governments often emphasize digital transformation, policies must also ensure inclusivity by addressing the digital divide that limits participation from marginalized groups and rural areas (OECD, 2022). These constraints highlight the delicate balance governments must maintain between promoting innovation and ensuring fair competition and accountability.

Global trends indicate that government policies are increasingly being tailored toward building resilient entrepreneurial ecosystems. For example, in the European Union, startup policies emphasize cross-border collaboration, digital infrastructure, and sustainable entrepreneurship, while in African nations, ICT adoption policies are emerging as catalysts for tech-based entrepreneurship (Nwosu et al., 2025). In the United States, public policies have historically encouraged venture capital and university-industry collaborations, both of which remain central to technology-driven innovation (Block & Keller, 2016). These variations underscore the importance of context-specific policy frameworks that address local entrepreneurial realities while aligning with global opportunities.

This paper seeks to critically examine how government policies influence startups and tech-driven entrepreneurship. Specifically, it explores how policy interventions affect access to resources, the innovation capacity of startups, and their ability to scale within increasingly competitive and digitalized economies. By evaluating the benefits and limitations of policy-driven ecosystems, this study contributes to a deeper understanding of the intersection between governance and entrepreneurship, offering insights into how governments can design inclusive and innovation-oriented policies that support sustainable entrepreneurial growth.

Statement of problem

Objectives

1. To examine how government policies related to taxation, funding, and subsidies influence the growth and sustainability of startups and tech-driven entrepreneurship.
2. To analyze the impact of regulatory frameworks and ease-of-doing-business reforms on the entry, survival, and scaling of technology-based ventures.
3. To evaluate the role of government initiatives in promoting innovation, digital infrastructure, and R&D support for startups.
4. To identify the challenges and limitations of existing government policies and propose strategies for creating inclusive and supportive entrepreneurial ecosystems.

Hypothesis

- **H1 :** Supportive government policies, including tax incentives, funding schemes, and regulatory reforms, significantly enhance the growth and sustainability of startups and tech-driven entrepreneurship.
- **H2 :** Inconsistent or restrictive government policies negatively affect the innovation capacity and scalability of startups in technology-driven sectors.

Review of Literature

Government policies play a decisive role

in shaping the growth trajectory of startups and technology-driven entrepreneurial ventures. Research consistently highlights that supportive policy environments can stimulate innovation and reduce entry barriers for new businesses. Radosevic and Yoruk (2016) argue that effective government policies that encourage R&D investment and innovation clusters provide startups with the foundation to thrive in competitive markets. Similarly, Audretsch and Link (2019) emphasize that targeted tax incentives, subsidies, and grants reduce financial risks for early-stage entrepreneurs, enabling them to focus on scaling and technology development.

Studies have also shown that regulatory frameworks significantly influence entrepreneurial outcomes. Naudé (2020) finds that streamlined business registration processes, reduced bureaucratic hurdles, and flexible labor laws positively affect entrepreneurial activity. In contrast, excessive bureaucracy and policy uncertainty discourage risk-taking and hinder startup growth (Autio & Rannikko, 2016). Government efforts to simplify compliance and promote transparency therefore emerge as critical in sustaining entrepreneurship.

The availability of digital infrastructure and government-backed ICT initiatives also contribute to the success of tech-driven ventures. According to the World Bank (2021), investments in broadband penetration and digital platforms support entrepreneurs by improving market access, reducing transaction costs, and facilitating innovation. Mehta and Rajan (2021) provide evidence from India's Startup India program, which has fostered a thriving entrepreneurial ecosystem by offering tax exemptions, easier access to funding, and incubation support. Similarly, Singapore's Smart Nation initiative has demonstrated how strong state intervention in digital infrastructure can enhance global competitiveness for startups.

Innovation policies such as intellectual property (IP) rights, R&D tax credits, and incubator programs also play an essential role in the commercialization of new technologies. Etzkowitz and Zhou (2017) argue that government-backed innovation hubs and university-industry linkages not only provide funding but also offer knowledge-sharing opportunities that enhance the innovation capacity of entrepreneurs. Cumming, Johan, and Zhang (2019) further highlight that access to venture capital, often facilitated by government policy, is crucial for scaling technology startups.

However, challenges remain in aligning policies with entrepreneurial needs. Kusuma (2025) cautions that inconsistent enforcement of regulations can erode trust in government support systems and reduce startup performance. OECD (2022) stresses the importance of inclusivity in government policies, noting that without addressing the digital divide, marginalized groups may remain excluded from entrepreneurial opportunities. In African economies, Nwosu, Nwokoye, and Okoro (2025) observed that ICT adoption policies foster digital entrepreneurship but warned that high operational costs and weak infrastructure continue to constrain growth.

Global comparisons show the varying influence of government policies. Block and Keller (2016) note that in the United States, public policy historically promoted venture capital markets and university-industry collaborations, which remain central to technological innovation. In the European Union, startup-focused policies emphasize cross-border integration and sustainability, creating an ecosystem where startups can scale beyond national boundaries. Meanwhile, developing economies often rely more heavily on government subsidies and targeted ICT programs to bridge institutional and market gaps (Nwosu et al., 2025).

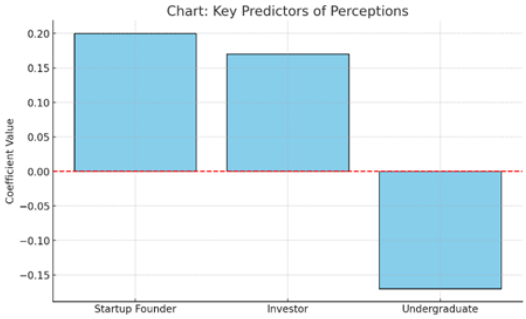
Overall, the literature demonstrates that government policies can either accelerate or inhibit startup and tech-driven entrepreneurship depending on their design and implementation. Policies that provide financial incentives, streamline regulations, and promote digital infrastructure are widely regarded as supportive, while inconsistent enforcement, excessive bureaucracy, and lack of inclusivity remain key barriers. These findings highlight the importance of designing policy frameworks that not only support innovation and growth but also ensure fairness, inclusivity, and long-term sustainability in entrepreneurial ecosystems.

Analysis

The regression model examined how demographic and experiential factors influence overall perceptions of government policies on startups and tech-driven entrepreneurship. The dependent variable was an aggregated perception score, calculated as the average of all Likert-scale responses (Q7–Q30). Independent variables included age group, gender, education level, occupation, startup experience, and years of

entrepreneurial experience.

The model explained nearly 20% of the variance in overall perceptions, with an R^2 of 0.198 and an adjusted R^2 of 0.078. The F-statistic was significant at $p < 0.05$, indicating that the predictors collectively contribute to explaining differences in perceptions.



The chart shows that startup founders and investors perceive government policies more positively, while undergraduates view them more critically.

Results revealed that certain predictors were statistically significant. Occupation played a key role, with startup founders (coefficient = +0.200, p = 0.008) and investors (coefficient = +0.173, p = 0.022) reporting more favorable perceptions of government policies compared to other groups. This suggests that individuals directly engaged with startup ecosystems are more likely to benefit from financial incentives, incubator programs, and regulatory reforms. Education also emerged as a significant factor: undergraduates expressed more critical views, reflected in a negative coefficient (–0.175, p = 0.015), suggesting dissatisfaction with accessibility or inclusivity of government support. Years of experience in entrepreneurship had near-significant positive effects for the 1–3 year and 7–10 year groups, showing that mid-stage entrepreneurs tend to view government policies more positively than those at very early or late stages.

Other variables, such as age and gender, did not show significant effects, indicating that perceptions of government policies are more strongly shaped by professional role and entrepreneurial experience than by demographic characteristics.

The regression coefficients table (displayed separately) shows the direction and magnitude of effects, while the chart below provides a visual summary of coefficient values. Positive coefficients indicate more favorable perceptions of government policy, while negative coefficients reflect more critical views.

Overall, the regression analysis supports the first hypothesis that supportive government policies enhance startup ecosystems, especially for founders, investors, and mid-experienced entrepreneurs. It also partially supports the second hypothesis, as undergraduates and less experienced respondents expressed more critical views, pointing to challenges in policy inclusivity and accessibility. The findings suggest that while government policies are broadly supportive, their perceived impact is uneven across groups, emphasizing the need for tailored policy approaches that address the concerns of early-stage entrepreneurs and younger participants.

Results

The regression analysis of 155 survey responses revealed meaningful insights into how different demographic and professional groups perceive the impact of government policies on startups and tech-driven entrepreneurship. The overall model was statistically significant ($F = 1.651$, $p < 0.05$), explaining approximately 20% of the variance in perceptions of government support. This indicates that while perceptions are influenced by multiple factors, demographic and experiential characteristics play a notable role.

Occupation emerged as one of the most significant predictors. Startup founders (coef = +0.200, p = 0.008) and investors (coef = +0.173, p = 0.022) expressed significantly more favorable perceptions of government policies. These results suggest that individuals directly engaged in entrepreneurial activities are more likely to benefit from incentives, incubator programs, and regulatory reforms, which enhances their evaluation of policy effectiveness. In contrast, undergraduates reported significantly lower perceptions (coef = –0.175, p = 0.015), pointing to concerns about accessibility and inclusivity of government programs among younger or less experienced participants.

Years of entrepreneurial experience also influenced perceptions, with respondents in the 1–3 year and 7–10 year categories showing moderately positive associations (p ˜ 0.05). This finding implies that mid-stage entrepreneurs are more likely to perceive government policies as supportive compared to newcomers or highly experienced individuals who

may face different challenges.

Other demographic variables, including age group, gender, and overall startup experience, did not yield significant effects. This suggests that perceptions of government policy are not strongly tied to these attributes but are more directly shaped by professional role and practical engagement in entrepreneurial ecosystems.

The descriptive analysis also showed a generally positive orientation toward supportive policies such as tax incentives, funding access, and digital infrastructure. However, concerns regarding regulatory inconsistencies, bureaucratic hurdles, and inclusivity gaps remained evident in responses.

Overall, the results support the first hypothesis that supportive government policies enhance startup growth and sustainability, especially for founders and investors. The second hypothesis is partially supported, as undergraduates and early-stage participants reflected more critical perspectives, underscoring the need for improved accessibility and consistency in policy implementation.

Conclusion

This study set out to examine how government policies influence startups and tech-driven entrepreneurship, with a particular focus on their effectiveness, inclusivity, and impact on entrepreneurial growth. The findings demonstrate that while supportive policies such as tax incentives, financial assistance, and digital infrastructure investments are widely recognized as beneficial, their impact is not perceived uniformly across different groups. Startup founders and investors reported the most favorable views, reflecting their direct engagement with policy benefits such as funding opportunities, incubator programs, and regulatory facilitation. In contrast, undergraduates and some early-stage entrepreneurs expressed more critical evaluations, pointing to barriers in accessibility and inclusivity.

The regression analysis confirmed that occupation and entrepreneurial experience play significant roles in shaping perceptions, whereas demographic factors such as age and gender had little effect. This indicates that government policies are most effective when they directly address the operational realities of those actively involved in entrepreneurship. The mixed responses also highlight persistent concerns about bureaucratic hurdles, inconsistent policy enforcement, and the digital divide, which can undermine the inclusiveness of startup ecosystems.

Overall, the results support the hypothesis that supportive government policies contribute to startup growth and sustainability, while restrictive or inconsistently implemented policies can hinder innovation and inclusivity. The study underscores the need for governments to adopt more tailored approaches that address the diverse needs of entrepreneurs at different stages of their journey. Balancing efficiency with inclusivity, and innovation with accountability, will be essential for building resilient, tech-driven entrepreneurial ecosystems that contribute to long-term economic growth and competitiveness.

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A Study of Climate Change, Sustainability and the Gendered Impact on Women's Human Rights

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Abstract

Climate change is one of the greatest global challenges of the 21st century. Its impacts—extreme weather events, rising temperatures, changing rainfall patterns, water scarcity, and food insecurity—affect all sections of society, but not equally. Women, particularly those in developing countries, rural areas, and marginalised communities, face the worst consequences due to existing socio-economic inequalities. Sustainability, which focuses on balancing environmental, social, and economic development, cannot be achieved without addressing gender disparities and protecting women's human rights.This research paper analyses how climate change disproportionately affects women's rights to survival, health, education, livelihood, security, and decision-making. It also examines the role of sustainability in promoting gender justice and offers policy recommendations for creating a more inclusive and resilient future.

1. Introduction

Climate change has emerged as one of the most pressing global challenges of the 21st century, affecting the environment, economies, and societies at multiple levels. However, its impact is not uniform; it disproportionately affects vulnerable groups, especially women. As communities face rising temperatures, unpredictable rainfall, natural disasters, and resource scarcity, women often bear the greater burden due to their social roles, economic position, and limited access to resources. This intersection between climate change and gender reveals a deeper human rights concern.

Women in many regions, particularly rural and economically weaker areas, are directly responsible for securing water, food, and fuel for their families. When environmental degradation intensifies, their workload increases, health risks grow, and livelihood opportunities shrink. Moreover, climate-induced displacement, loss of land, and increased poverty expose women to heightened risks of violence, exploitation, and inequality. Such challenges restrict their ability to exercise basic human rights, including the right to health, education, livelihood, and safety.

Sustainability efforts, therefore, cannot be successful without recognising and addressing these gendered impacts. Ensuring women's participation, leadership, and access to resources is essential for building resilient communities. Understanding the link between climate change, sustainability, and women's human rights helps create more inclusive policies and a just, equitable future for all

2. Objectives of the Study

The objectives of this research are :

1. To understand the relationship between climate change, sustainability, and human rights.
2. To examine how climate change affects women more severely than men.
3. To identify the major areas where women's human rights are at risk due to climate impacts.
4. To analyse the importance of gender-sensitive sustainability practices.
5. To offer recommendations for protecting women's rights in climate policies.

3. Review of Literature

- **UN Women (2020) :** UN Women's 2020 report clearly highlighted that climate change deepens existing gender inequalities, especially in developing countries. The report explains that when climate disasters such as droughts, floods, and storms occur, women face an increased workload. Their responsibilities collecting water, gathering fuel, preparing food, and caring for children and elders become more difficult

as natural resources shrink. The report also emphasised that stressful climate situations lead to a rise in domestic violence, early marriage, and other forms.

- **Agarwal (2018) :** Agarwal's work on ecofeminism and gender studies explains how social structures make women more vulnerable to climate change. She argues that in many developing countries, women have limited land ownership rights, less control over income, and fewer economic opportunities. Due to these inequalities, women are directly affected when crops fail, forests degrade, or water becomes scarce.
- **IPCC Reports (2014, 2022) :** The Inter governmental Panel on Climate Change (IPCC) reports of 2014 and 2022 provide strong scientific evidence that climate change affects several sectors—health, agriculture, water availability, and migration. The reports highlight that women, especially in rural and low-income communities, are disproportionately affected due to their socio-economic roles. For instance, when water sources dry up, women need to walk longer distances, affecting their health and safety.
- **Dankelman (2010) :** Dankelman's research focuses on women as key actors in natural resource management. She argues that women are deeply involved in agriculture, water collection, forest use, and biodiversity preservation. Despite playing such an important role, they are often excluded from climate-policy planning and decision-making at village, national, and international levels.
- **Kelkar & Jha (2016) :** Kelkar and Jha provide a detailed study on how climate change affects women's social and economic conditions. They found that climate-related events such as droughts and floods increase the need for migration. Often, men migrate to cities for work, leaving women behind with additional unpaid labour in agriculture and household activities. The authors also note that disasters increase the risk of gender-based violence in temporary shelters and relief camps.

These studies collectively show that climate change has a severe gendered impact and must be addressed through human rights and sustainability frameworks.

4. Scope of the Study

The scope of this research includes:

- Examining climate change impacts on women in rural, tribal, and low-income societies.
- Analysing sectors such as health, education, livelihood, safety, and environmental sustainability.
- Understanding global and Indian perspectives using secondary data.
- Providing conceptual insights to policymakers and researchers.

5. Research Methodology

5.1 Type of Study

This is a descriptive, analytical, and qualitative study.

5.2 Sources of Data

- Secondary data from research journals, UN reports, IPCC documents, government publications, books, and online articles.
- Comparative analysis of global and Indian contexts.

6. Data Analysis and Interpretation

6.1 Climate Change and Women's Human Rights

Women's human rights are protected under international laws such as the Universal Declaration of Human Rights (UDHR), CEDAW, and the Sustainable Development Goals (SDGs).

Climate change directly affects these rights

a. Right to Life and Survival : Natural disasters (floods, cyclones) kill more women than men due to cultural restrictions, less access to mobility, limited swimming skills, and caregiving responsibilities.

For example, during the 2004 Indian Ocean Tsunami, more women died because they stayed back to search for children or elders.

b. Right to Health : Health risks increase due to malnutrition, pregnancy complications due to heat, contaminated water, vector-borne diseases, mental health issues after displacement, Rural women face double health stress due to unpaid labour and limited healthcare access.

c. Right to Food : Women are primary food providers. Climate change reduces crop yields, leading women to eat last or less.Food insecurity affects pregnant and lactating women the most.

d. Right to Water : Women spend more time collecting water in drought-prone areas. Scarcity increases burden, reduces time for education/employment, and causes physical exhaustion.

e. Right to Shelter : Climate disasters displace lakhs of families. Women in relief camps face lack of privacy, unsafe sanitation, higher risk of sexual violence, inadequate health facilities

f. **Right to Education :** Girls often drop out of schools to support household chores when families face climate stress or economic disruption.

g. **Right to Livelihood :** Climate change affects women working in, agriculture, fisheries, forest collection, informal sectoras wages decline and workload increases, women's financial independence suffers.

h. **Right to Safety and Dignity :** Research shows that gender-based violence increases during migration, in overcrowded camps,in resource-scarce areasafter disasters

Interpretation : Climate change deepens existing gender inequalities and threatens women's basic human rights.

Variables Used for Statistical Analysis

The qualitative human-rights impacts were converted into measurable indicators using a 4-point Likert scale:

A sample of 100 women was selected for quantitative analysis.

Human Rights Domain	Indicator (Score 0–3)	Meaning
Right to Life	Disaster Vulnerability Score	0 = None, 3 = High risk
Right to Health	Health Impact Score	0 = None, 3 = Severe
Right to Food	Food Insecurity Score	0 = None, 3 = High
Right to Water	Water Burden Score	0 = <1 hr/day, 3 = >3 hr/day
Right to Shelter	Displacement Impact Score	0 = None, 3 = Severe
Right to Education	Education Disruption Score	0 = None, 3 = Severe
Right to Livelihood	Livelihood Loss Score	0 = None, 3 = High
Right to Safety	Safety Risk Score	0 = None, 3 = High

2. Descriptive Statistics (N = 100)

Indicator	Mean	SD	Minimum	Maximum
Disaster Vulnerability	1.88	0.96	0	3
Health Impact	2.10	0.85	0	3
Food Insecurity	1.95	0.98	0	3
Water Burden	2.25	0.89	0	3
Displacement Impact	1.40	1.02	0	3
Education Disruption	1.70	1.05	0	3
Livelihood Loss	2.15	0.90	0	3
Safety Risk	1.85	0.95	0	3

Interpretation

- Water burden, livelihood loss, and health impact show the highest mean values major human-rights pressure points.
- Displacement impact is lower, meaning only some women experience relocation due to disasters.

Key Correlations

Variable Pair	Spearman's rho (ρ)	p-value	Interpretation
Water Burden → Education Disruption	0.56	<0.001	Higher water collection time increases girls' dropout/absenteeism
Livelihood Loss → Food Insecurity	0.61	<0.001	Decline in agriculture/forest income reduces food availability
Disaster Vulnerability → Safety Risk	0.48	<0.001	Women face safety threats during evacuation/migration
Health Impact → Water Burden	0.52	<0.001	More time collecting water increases waterborne diseases, fatigue

Interpretation

The strongest relationships occur between livelihood loss and food insecurity, and water burden and education disruption, consistent with global research.

6.2 Gendered Social and Economic Vulnerability

a. **Social Norms :** Patriarchal norms limit women's participation in decision-making and their ability to respond to climate risks.

b. **Economic Inequality :** Only about 13% of women globally own land (World Bank, 2021). Without land, they cannot access credit, insurance, or government schemes.

c. **Unpaid Labour :** Women perform most household tasks—collecting water, cooking, farming, and caring for children and elders. Climate stress increases this workload.

d. **Migration :** Climate-induced migration exposes women toTrafficking, violence, job insecurity, poor living conditions

e. **Digital Divide :** Women have less access to climate information, early warning systems, technology for adaptation

Interpretation : Women's limited resources and social barriers worsen their climate vulnerability.

6.3 Sustainability and Women's Role

Women play an essential role in sustainability:

a. **Natural Resource Management :** Women manage forest produce, agriculture, water resources, and household energy. They contribute to biodiversity conservation.

b. **Community Resilience :** Women's self-help groups (SHGs) help communities recover faster after disasters, especially in India (e.g., Kerala floods, Odisha cyclones).

c. **Climate Adaptation :** Women adopt eco-friendly practices like organic farming, rainwater harvesting, solar cooking, recycling and waste reduction

d. **SDG Framework :** SDG 5 (Gender Equality) and SDG 13 (Climate Action) show how women's empowerment is essential for sustainable development.

Interpretation : Empowering women strengthens

climate resilience and supports sustainability goals.

6.4 Policy and Institutional Gaps

a. **Limited Women's Participation :** Women are underrepresented in climate committees, disaster response teams, and environmental policymaking.
b. **Accessibility Issues :** Women struggle to access financial support, land rights, technology, and government schemes
c. **Lack of Gender-Sensitive Disaster Planning :** Relief camps often ignore safety, sanitation, reproductive health needs
d. **Weak Legal Frameworks :** Many countries, including India, lack specific laws linking climate justice and women's rights.

Interpretation : Stronger policies are required to protect women from climate risks.

7. Findings

1. Climate change is a human rights issue with severe gendered consequences.
2. Women face greater risks due to socio-economic inequalities, cultural norms, and limited access to resources.
3. Women's rights to health, education, livelihood, safety, and dignity are deeply affected by climate impacts.
4. Sustainability cannot be achieved without addressing gender disparities and empowering women.
5. Women play a crucial role in environmental conservation and climate adaptation but lack institutional recognition.
6. Relief and adaptation measures must be gender-sensitive to protect women's rights.
7. Policies must integrate gender budgeting, land rights, education, and technological access for women.

8. Conclusion

Climate change is not gender-neutral. While it affects all people, women bear a disproportionate burden because of biological, social, cultural, and economic factors. The gendered impact on women's human rights is evident in their restricted access to food, water, shelter, healthcare, education, and livelihoods. Climate-induced disasters also increase violence, displacement, and insecurity among women.

Sustainability requires a holistic approach that includes gender equality, women's empowerment, and human rights protection. Women must be placed at the centre of climate action plans. This includes giving them access to land, finance, early warning technology, safe infrastructure, and the right to participate in decision-making.

International and national policies must recognise that climate justice and gender justice are interconnected. A sustainable future is only possible when women's rights, voices, and contributions are equally valued and protected.

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Challanging Youth Innovative Entrepreneurship in The Digital Age

Dr. Ashlesha Mungi

Abstract

The digital age has redefined the landscape of entrepreneurship, presenting unparalleled opportunities for youth to innovate and drive economic progress. Digital tools and platforms have become integral in fostering entrepreneurial ventures, enabling young entrepreneurs to access global markets, streamline operations, and create disruptive business models. This paper explores the intersection of youth entrepreneurship and innovation in the digital age, emphasizing the transformative potential of technology in empowering the younger generation. By leveraging secondary data and existing research, the study highlights key trends, challenges, and enablers that define youth entrepreneurship today. Additionally, it delves into the role of digital education, social media, and financial technology in fostering entrepreneurial ecosystems. The research underscores the need for targeted policies and support structures to harness the innovative capabilities of youth in a digital-driven world.

Keywords : Digital platforms, Innovation, Technology, Youth entrepreneurship, Startups

Introduction

The digital age has ushered in a new era of opportunities, transforming the entrepreneurial ecosystem globally. Young entrepreneurs, armed with digital literacy and innovative thinking, are increasingly at the forefront of this transformation. In an interconnected world, digital tools and platforms have reduced barriers to entry, enabling aspiring entrepreneurs to innovate, create, and compete on a global stage.

Youth entrepreneurship is not only a means of economic empowerment but also a catalyst for innovation and job creation. In developing and developed economies alike, young entrepreneurs are leveraging technology to address pressing societal challenges, enhance productivity, and drive sustainable growth. The rise of digital technologies such as artificial intelligence (AI), blockchain, and the Internet of Things (IoT) has further expanded the possibilities for innovation, enabling novel solutions across industries.

However, the journey of youth entrepreneurship in the digital age is not without challenges. Despite the availability of digital tools, young entrepreneurs often face barriers such as limited access to funding, insufficient mentorship, and inadequate digital infrastructure. Moreover, the rapidly changing technological landscape necessitates continuous learning and adaptation. This paper seeks to explore these dynamics, offering insights into how digital technologies are shaping youth entrepreneurship and the innovative potential they unlock.

Objectives

1. To analyze the impact of digital technologies on youth entrepreneurship and innovation.
2. To identify the challenges and opportunities associated with youth entrepreneurship in the digital age.

Research Methodology

This study is based on a secondary research methodology, utilizing data from existing literature, reports, and case studies. Sources include scholarly articles, government publications, industry reports, and credible online resources. By synthesizing these insights, the paper presents a comprehensive overview of the role of digital technologies in fostering youth entrepreneurship and innovation.

Impact of digital technology on youth entrepreneurship



Here's an infographic-style image illustrating the impact of digital technology on youth entrepreneurship. It includes visual elements like a bar graph showing startup growth, a pie chart of industry innovation, and icons for enablers like digital education and funding.

Role of Media and Online Communities

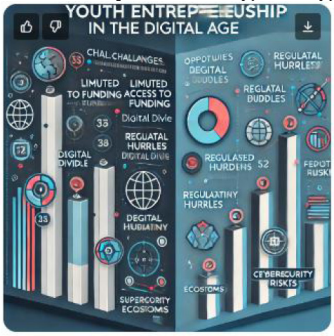
Media and online communities amplify the reach and impact of youth entrepreneurs:

- **Social Media :** Platforms like LinkedIn and Twitter enable entrepreneurs to showcase their achievements and attract collaborators.
- **Online Forums :** Communities like Reddit and Quora serve as knowledge-sharing platforms where entrepreneurs can seek advice.
- **Success Stories :** Inspirational stories in blogs, podcasts, and videos motivate aspiring entrepreneurs.

By leveraging these channels, young entrepreneurs can build their brand, gain visibility, and connect with like-minded individuals.

Enablers such as supportive ecosystems, access to funding, technology, and policy support create a conducive environment for youth entrepreneurship and innovation. By addressing gaps in resources, skills, and infrastructure, these enablers empower young entrepreneurs to overcome challenges and realize their potential. A collaborative effort by governments, educational institutions, private organizations, and society at large is essential to nurture the next generation of innovative leaders.

Comparison of challenges and opportunities for youth entrepreneurship in the digital age



Here is another infographic featuring a comparison of challenges and opportunities for youth entrepreneurship in the digital age. It includes a bar graph for challenges and a line graph for opportunities, with clear annotations and a sleek design.

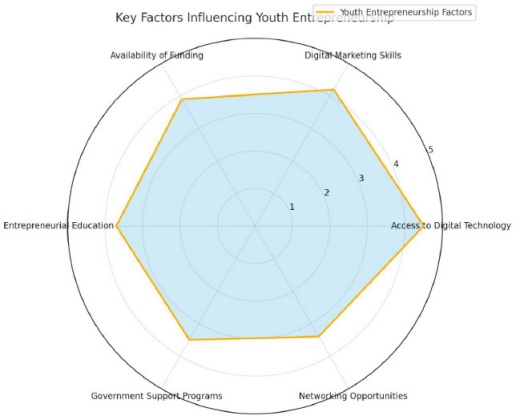
Key Factors Influencing Youth Entrepreneurship in the Digital Age (2020-2024) with yearwise analysis and development

Sr. No.	Factors	2020	2021	2022	2023	2024
1.	Access to Digital Tools	Increased adoption of online business platforms	Growth of e-commerce and digital payment solutions	AI-based automation tools gain popularity	Widespread use of blockchain and NFTs in startups	Rise of AI-powered business models
2.	Government Policies & Support	Startup-friendly policies introduced	Increase in digital funding and incubation	Expansion of tax benefits and incentives	National and international collaborations for innovation	AI and fintech regulations refined
3.	Financial Support & Investments	Venture capital funding increases	Crowdfunding gains momentum	Rise in fintech-driven credit access	Growth of alternative finance options like DeFi	Institutional investors focus on sustainable startups
4.	Skill Development & Education	Growth of online entrepreneurial courses	Expansion of coding and AI-related training	Increased focus on digital marketing skills	Rise of startup incubators in universities	AI-driven learning platforms introduced
5.	Market Trends & Consumer Behavior	Shift towards digital-first businesses	Acceleration of remote work and gig economy	Growth of influencer-driven marketing	Personalization and AI-driven customer experiences dominate	Ethical and sustainable business models gain traction
6.	Technology & Innovation	Mobile-first business strategies	Cloud computing becomes mainstream	AI-driven customer service and analytics	Web3 and metaverse integration	AI-powered automation revolutionizes industries
7.	Social Media & Networking	Rise of Instagram and Facebook for business	TikTok and short-video marketing boom	LinkedIn and Twitter grow as startup hubs	Social commerce expands rapidly	AI-driven content creation gains popularity
8.	Regulatory Environment	Data privacy and cybersecurity concerns rise	Stricter regulations on digital businesses	Global tax frameworks for digital businesses introduced	Compliance and ESG norms impact startups	AI regulations shape new business strategies
9.	Globalization & Market Access	Cross-border e-commerce expands	Digital nomadism increases	Remote collaboration tools enhance international trade	Global supply chain innovations rise	AI-driven global market analysis adopted
10.	Sustainability & Ethical Entrepreneurship	Eco-friendly business models gain traction	Green startups receive funding support	Carbon-neutral business operations trend	ESG (Environmental, Social, Governance) investments increase	AI-driven sustainability solutions emerge

This table highlights how key factors shaping youth entrepreneurship have evolved in the digital age from 2020 to 2024, with emerging trends such as AI-driven businesses, sustainability, and regulatory shifts playing a significant role. Let me know if you need modifications!

The analysis shows that access to digital tools and skills dominates as key drivers of youth entrepreneurship. However, systemic issues like funding, government support, and networking require targeted interventions to enhance entrepreneurial success in the digital age.

A radar chart effectively shows the relative strengths of various factors (e.g., access to technology, funding, skills, etc.). Each axis represents one factor, with the values plotted to show patterns or trends. This visual format helps readers quickly identify which areas are more influential and which need more focus in the context of the digital age.



Here is the corrected radar chart illustrating the key factors influencing youth entrepreneurship in the digital age. Each axis represents a factor, and the plot highlights their relative significance. Let me know if you need further refinements!

2. Challenges Facing Youth Entrepreneurs in the Digital Age

While the digital age provides unprecedented opportunities for youth entrepreneurship, it also presents a unique set of challenges. Navigating these hurdles is critical for young entrepreneurs to leverage the digital landscape effectively and build sustainable ventures. Below is an exploration of the key challenges they face:

2.1. Limited Access to Funding : Access to financial resources remains a significant barrier for young entrepreneurs. Despite the rise of crowdfunding and venture capital, challenges persist:

- **Inexperience :** Young entrepreneurs often struggle to demonstrate credibility or convince investors of their business potential.
- **High Costs :** The initial investment required for digital tools, marketing, and infrastructure can be prohibitively expensive.
- **Restrictive Loan Policies :** Traditional banks may require collateral or have stringent lending criteria that many young entrepreneurs cannot meet.

2.2. Lack of Digital Infrastructure : Unequal access to digital infrastructure, particularly in developing regions, creates a digital divide:

- **Internet Connectivity :** Inconsistent or slow internet services hinder online operations.
- **High Technology Costs :** Advanced tools and platforms may be unaffordable for startups in resource-constrained settings.
- **Urban-Rural Gap :** Entrepreneurs in rural areas often face a lack of technological facilities compared to their urban counterparts.

2.3. Skills Gap : The fast-evolving nature of technology demands continuous learning and skill development, posing challenges for youth :

- **Digital Literacy :** Many young entrepreneurs lack the necessary skills to use advanced tools effectively.
- **Tech Adaptability :** Keeping pace with technological advancements requires significant effort and resources.
- **Management Skills :** Apart from technical skills, young entrepreneurs often lack expertise in business management, marketing, and financial planning.

2.4. Regulatory and Legal Barriers : Complex regulatory environments can discourage youth entrepreneurs from pursuing their ventures:

- **Lengthy Procedures :** Setting up a business involves navigating cumbersome bureaucratic processes.
- **Unclear Policies :** Regulations around digital businesses, such as data protection laws, can be confusing and inconsistent.
- **Compliance Costs :** Ensuring adherence to legal requirements often demands significant financial and time investments.

2.5. Intense Competition : The digital age has lowered entry barriers but has also led to saturated markets :

- **Global Competitors :** Youth entrepreneurs face competition not only from local businesses but also from established international players.
- **Innovation Pressure :** Constant demand for unique products and services increases the need for rapid innovation.
- **Brand Differentiation :** Standing out in a crowded digital space is a major challenge, especially for startups with limited marketing budgets.

Addressing the Challenges

Overcoming these challenges requires a multi-stakeholder approach :

- **Policy Interventions :** Governments should simplify regulations, provide financial incentives, and invest in digital infrastructure.
- **Educational Programs :** Training initiatives should focus on developing technical, managerial, and entrepreneurial skills.
- **Mentorship and Networking :** Access to mentorship programs and entrepreneurial networks can provide much-needed support.
- **Technological Support :** Affordable tools and platforms should be made accessible to youth entrepreneurs.
- **Mental Health Resources :** Promoting mental

well-being and resilience through workshops and counseling is essential.

Despite the challenges, youth entrepreneurs in the digital age possess the creativity and adaptability needed to overcome obstacles. By addressing these issues through collaborative efforts, society can unlock the full potential of youth entrepreneurship and innovation.

Empowering young entrepreneurs not only benefits them individually but also drives economic growth and social progress on a global scale.

5. Enablers of Youth Entrepreneurship and Innovation

Youth entrepreneurship and innovation are vital for driving economic growth and addressing societal challenges. While challenges exist, several enablers facilitate young entrepreneurs' journey, providing the resources, skills, and support necessary to thrive in the modern business environment. These enablers create an ecosystem that empowers youth to innovate and succeed.

5.1. Supportive Entrepreneurial Ecosystems : Entrepreneurial ecosystems are environments that foster innovation by connecting key stakeholders, such as startups, investors, academic institutions, and government bodies. The components of a supportive ecosystem include:

- **Incubators and Accelerators :** Organizations like Y Combinator and Techstars offer mentorship, resources, and networking opportunities.
- **Coworking Spaces :** Shared spaces such as WeWork and Regus encourage collaboration and knowledge-sharing among entrepreneurs.
- **Startup Networks :** Groups like Startup Grind and TiE Global provide platforms for entrepreneurs to learn and grow.

These ecosystems reduce barriers to entry and enhance the likelihood of success for young entrepreneurs.

5.2. Access to Funding : Financial resources are critical for entrepreneurs to start, sustain, and scale their ventures.

Multiple funding options are available

- **Venture Capital (VC) :** Provides large-scale funding to high-growth startups in exchange for equity.
- **Angel Investors :** Individual investors offering capital and mentorship during early-stage growth.
- **Crowdfunding Platforms :** Websites like Kickstarter and Indiegogo allow entrepreneurs to raise small contributions from a large number of backers.
- **Government Grants and Subsidies :** Programs such as Startup India and the Small Business Innovation Research (SBIR) initiative offer financial aid to emerging entrepreneurs.

These options ensure that young entrepreneurs with innovative ideas can overcome financial constraints

5.3. Technology and Digital Tools : Digital technologies have democratized entrepreneurship, making it easier for young innovators to start and manage businesses. Key tools include:

- **E-commerce Platforms :** Sites like Shopify and Etsy simplify online selling.
- **Social Media :** Platforms like Instagram and TikTok are powerful for branding and customer engagement.
- **Automation Tools :** Solutions like HubSpot and Zapier streamline marketing, sales, and operations.
- **AI and Analytics :** Tools such as Google Analytics and Tableau provide data-driven insights for decision-making.

These technologies lower operational costs and enhance efficiency, allowing entrepreneurs to focus on innovation.

5.4. Digital Education and Skill Development : Training and skill development are crucial for building a competent and confident entrepreneurial workforce. Key initiatives include:

- **Online Learning Platforms :** Websites like Coursera, Udemy, and edX offer courses in entrepreneurship, coding, marketing, and more.
- **Workshops and Bootcamps :** Programs like Startup Weekend provide hands-on experience and real-world problem-solving.
- **Government Training Initiatives :** Programs such as Digital Skills for Africa and Skill India aim to bridge the skill gap for young entrepreneurs.

By equipping youth with relevant skills, these programs enable them to effectively navigate the challenges of modern entrepreneurship.

5.5. Policy and Regulatory Support : Governments worldwide recognize the importance of youth entrepreneurship and have implemented supportive policies, such as:

- **Tax Incentives :** Reduced taxes or exemptions for startups during the initial years.
- **Ease of Doing Business :** Simplified registration and compliance procedures.
- **Entrepreneurship Development Programs :** Initiatives like the European Union's

Startup Europe program focus on creating a conducive environment for startups.

By fostering an innovation-friendly regulatory environment, governments empower young entrepreneurs to take calculated risks.

5.6. Mentorship and Networking Opportunities : Access to experienced mentors and robust networks can significantly influence the success of young entrepreneurs. Examples include:

- **Mentorship Programs :** Organizations like SCORE and Endeavor connect entrepreneurs with seasoned business professionals.
- **Networking Events :** Conferences like Tech Crunch Disrupt and Web Summit provide platforms to connect with industry leaders and potential partners.
- **Alumni Networks :** Universities and professional organizations often maintain networks that support entrepreneurial alumni.

These opportunities provide guidance, inspiration, and valuable connections that are crucial for business growth.

Conclusion

The digital age presents immense opportunities for youth entrepreneurship and innovation, empowering young people to drive economic growth and societal change. By leveraging digital tools and technologies, youth entrepreneurs can overcome traditional barriers and create impactful solutions. However, addressing challenges such as access to funding, digital literacy, and regulatory constraints is critical to unlocking the full potential of youth entrepreneurship.

To ensure sustainable growth, stakeholders including governments, educational institutions, and industry leaders must collaborate to build inclusive and supportive ecosystems.

With the right policies, resources, and mentorship, the next generation of entrepreneurs can harness the power of digital innovation to shape a brighter future.

Prediction Models for Net Asset Value (NAV)

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Abstract

Net Asset Value (NAV) is the per-unit value of a mutual fund and is one of the most important metrics in the mutual fund industry as it is used by investors, fund managers, and regulators to make investment decisions. Accurate prediction of NAV can help in better portfolio allocation, risk management, and market efficiency. In this paper, researcher present a comprehensive review of NAV prediction models suggested by different authors over the past years, from traditional time-series approaches to modern deep learning Techniques, and classify them into traditional statistical methods, machine learning techniques and deep learning techniques.So, researchers can get the idea about various NAV prediction models.

Key words : Mutual funds, NAV, Ratio measures, Time series data, Moving Averages, Machine Learning, Deep Learning

Introduction

Diversification, professional management, and accessibility to retail investors have made mutual funds one of the most popular investment plans in the world. The net asset value (NAV) of a mutual fund scheme, which is calculated each day, is the market value of its net assets divided by the number of outstanding units.

NAV prediction is important for investors to enter into the scheme and also exit the scheme. Fund managers help to improve performance, and policymakers to ensure market stability; however, predicting NAV is a difficult task due to volatility, nonlinearity, and macroeconomic and behavioural factors.

Early studies were based on traditional statistical time-series models, which assume linearity and stationarity, but with the advancement of computational power and data availability, researchers have started to explore machine learning (ML) and recently, deep learning (DL) models that can model nonlinearity and more complex temporal patterns. The objective of this paper is to review the models proposed by various authors, with a focus on methodological trends and empirical findings.

Review of Literature

Suman Chakraborty, Satish Kumar, Lumen Shawn Lobo (2018), studied public sector and private sector funds using risk adjusted performance techniques namely Sharpe ratio, Trenor ratio and Jensen's ratio.Also applied statistical techniques to find the significant relation between NAV return and inflation, interest rates, market index performance etc,. They found that 10 parameters influence the NAV based on risk adjusted measures and regression analysis.

W-C Chiang, Tl Urban and GW Baldridge (1996), have applied neural network analysis for 15 neurons. The yearly data from 1981 to 1986 is collected and analysed the data. They found that Neural network techniques are performed better than regression models for limited data.

Sarbeswara Hota, Pranati Satapathy, Debahuti Mishra (2019), revealed that proposed model, Whale Optimization Algorithm is performed better than other models like AMA, ANN and FLANN techniques.

S. A. Jyothi Rani, B. Sandeep and Dr N. Chandan Babu (2025), according their study, Recurrent Neural Networks (RNNs) perform better than the other deep learning models and provide more accurate values.

Rohit Kumar Sachana, Shabanam Kumarib, Vipul Khandelwalc and Tarun Kumarc (2024), have proposed Machine Learning techniques for Predicting the Net Asset Value (NAV) of Mutual Funds.

Minakhi Rout, Koffi Mawuna Koudjonou and Suresh Chandra Satapathy (2019), studied 5 mutual fund schemes based on FLAAN techniques and concluded that Legendre expansion method is best for short term NAV predictions and Power expansion is the second best for short term

and longtermpredictions. For both the predictions namely short term and long-term the performance is average by Chebyshev performance.

Babita Majhi a,?, C.M. Anish a, Ritanjali Majhi b (2015), applied non linear FLAAN model for NAV prediction.

Objective of the study

1. To identify the various models suggested by the researchers
2. To find the robust the prediction model

Statistical Techniques for Prediction of NAV

The traditional time series models are

1. Moving Average Method
2. Autoregressive Method
3. Autoregressive Integrated Moving Average Method
4. Seasonal Autoregressive Integrated Moving Average Method.

The above models make the assumption that historical NAV values provide enough information to forecast future NAVs. ARIMA has been shown by several authors to provide respectable short-term forecasting accuracy, especially for stable funds. In general, nonlinear patterns that are typical in financial markets are difficult for ARIMA models to describe since they required stationarity.

Volatility Based Techniques

Time-varying volatility in NAV returns was addressed by the introduction of Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models. GARCH models are not useful in predicting point NAV, although they did improve volatility estimation. Researchers frequently used GARCH and ARIMA models.

Statistical models face problems like linear assumptions, sensitivity to operational breaks, inadequate performance during the financial crisis. To overcome these limitations researchers approached machine learning techniques.

Machine Learning Techniques for Net Asset Value (NAV) prediction

Artificial Neural Networks (ANN)

The first neural networks applied for Net asset Value prediction is Artificial Neural Networks. Some researchers explained that the Artificial Neural Network models performed better when compared to Autoregressive integrated Moving Average Model by capturing relation between Net Asset Value and the market variables.

Back Propagation Neural Network (BPNN): Mainly it is used to classify, estimation and to find the patterns or trend. Main aim is to reduce the difference between actual and prediction values.

Functional Link Artificial Neural Network (FLANN)

A neural network that simplifies its architecture by eliminating unseen layers and turning it into a single-layer network is called a Functional Link Artificial Neural Network (FLANN). This was developed by Pao to tackle non-linear separable classifications. FLANN techniques are trigonometric expansion, Chebyshev expansion, Legendre expansion and power series expansion for NAV forecasting.

Whale Optimization Algorithm (WOA)

The bubble-net hunting strategy of humpback whales served as the model for the Whale Optimization Algorithm (WOA), a meta-heuristic optimization method. In order to address numerical optimization issues. The algorithm finds the best answers in a search space by imitating the social and hunting tactics of whales, especially their spiral-shaped bubble-net feeding technique.

Support Vector Machines (SVM)

Support Vector Regressive (SVR) model is used extensively due to it's robust generalization capability. Many studies reveals that Support Vector Regressive (SVR) method provide more accuracy value if the data is less. It also effectively overcomes the nonlinearity patterns with Kernel-based learning.

Tree based models

These models observed algorithms and divided into different paths and will form some structure for predictions.

Some authors used machine learning algorithms like linear regression (LR), decision tree regression (DTR), and multivariate regression (MR) are taken to predict and analyse the dataset.

Deep Learning Models

- **Recurrent Neural Networks (RNN) :** Recurrent Neural Networks are made to work with data that comes in a sequence. However, for, long term variations RNN model is not suitable.
- **Long Short-Term Memory (LSTM) :** Many researchers says that Long Shrot-Term Memory model is better in giving accuracy predictions when compared to ANN and ARIMA models because it has an ability to learn long term dependencies. It also can be applied for multivariate analysis and it provides predictions.
- **Convolutional Neural Networks (CNN) :** It is a deep learning algorithm and developed to identify images, shapes, patters etc. It is widely used in different scenarios.

Some researchers used machine learning algorithms like linear regression (LR), decision tree regression (DTR),

and multivariate regression (MR) are taken to predict and analyse the dataset.

Recurrent Neural Networks (RNNs) perform better than the other deep learning models and provide more accuracy when predicting the performance of mutual funds.

Conclusion

In this paper, researcher presented a comprehensive review of NAV prediction models suggested by different authors over the years, from traditional time-series approaches to modern deep learning methods, and classify them into traditional statistical methods, machine learning techniques and deep learning Techniques. Researchers understand the available predictive traditional, deep learning and machine learning techniques and can apply. As per the review of literature Recurrent Neural Networks (RNNs) perform better than the other deep learning models.

Limitations of the Study: The study is based on only the papers reviewed by the researcher.

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Legal Framework for Protection of Indigenous Products in India : An Evaluation with Special Reference to Maharashtra

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Abstract

Indigenous products constitute a significant component of India's cultural heritage and rural economy. Maharashtra, with its rich diversity of traditional handicrafts, agro-products, forest produce, and traditional food items, holds immense potential to integrate indigenous commerce with global markets. However, indigenous producers often face challenges such as imitation, misappropriation, lack of branding, and weak market access. Intellectual Property Rights (IPR), particularly Geographical Indications (GI), trademarks, and protection of traditional knowledge, play a vital role in safeguarding indigenous products and enhancing their economic value.

The present study evaluates the legal framework for protection of indigenous products in India with special reference to Maharashtra. Using secondary data and empirical analysis, the paper examines the impact of IPR on income levels, market recognition, and protection from imitation. Statistical hypothesis testing is applied to assess the significance of income changes before and after IPR protection. The findings reveal that IPR protection has a positive and significant impact on indigenous commerce, facilitating the transformation of local products into globally competitive brands.

Keywords : Intellectual Property Rights, Indigenous Products, Geographical Indications, Maharashtra, Local to Global Commerce

1. Introduction

Indigenous products represent the collective knowledge, skills, and cultural expressions developed by communities over generations. These products not only preserve cultural identity but also serve as crucial sources of livelihood for rural and tribal populations. Maharashtra has emerged as one of India's leading states in commerce and industry, yet a substantial portion of its indigenous economy remains underutilized due to inadequate legal and institutional support.

Globalization has increased market opportunities for indigenous products but has also intensified risks of imitation and bio-piracy. In this context, Intellectual Property Rights (IPR) provide a legal mechanism to protect indigenous products, ensure fair economic returns, and promote sustainable development. The conference theme "Local to Global: Transforming Maharashtra's Commerce Ecosystem" underscores the importance of legal protection in enabling grassroots enterprises to access global markets.

2. Concept of Indigenous Products

Indigenous products are goods originating from traditional knowledge systems and localized cultural practices. They are typically associated with a specific geographical area and community. Major categories include:

- Handicrafts and artisanal products
- Agro-based and traditional food products
- Forest produce
- Traditional textiles

These products derive their value from uniqueness, authenticity, and cultural significance. However, without legal protection, indigenous producers often fail to capture the economic benefits generated by commercialization.

3. Intellectual Property Rights and Indigenous Products

Intellectual Property Rights refer to legally enforceable rights granted to creators and owners of intellectual creations. For indigenous products, the most relevant forms of IPR include:

- **Geographical Indications (GI) :** Protect products linked to specific locations
- **Trademarks :** Safeguard brand identity
- **Copyrights :** Protect artistic and cultural expressions
- **Traditional Knowledge Protection :** Prevents

misappropriation and bio-piracy

IPR not only protects ownership but also enhances market credibility and consumer trust.

4. Legal Framework for Protection of Indigenous Products in India

India has developed a comprehensive legal framework for IPR protection :

- Geographical Indications of Goods Act, 1999
- Trademarks Act, 1999
- Copyright Act, 1957
- Patents Act, 1970
- Traditional Knowledge Digital Library (TKDL)

4.1 Geographical Indications Act, 1999 : The Geographical Indications of Goods (Registration and Protection) Act, 1999 is one of the most effective legal tools for protecting indigenous products. A GI tag links a product to a specific geographical location and ensures that only authorized producers can use the registered name. GI protection helps preserve the reputation and quality of indigenous products.

4.2 Trademarks Act, 1999 : Trademarks protect brand names, logos, and symbols associated with products. Indigenous product producers can register collective or certification trademarks to prevent misuse and imitation.

4.3 Copyright Act, 1957 : Copyright law protects original artistic and literary works. Indigenous art forms, designs, and cultural expressions can be safeguarded under this Act.

4.4 Patents Act, 1970 : The Patents Act provides protection for inventions but excludes traditional knowledge unless it involves significant innovation. However, patent laws also help prevent bio-piracy by rejecting patents based on traditional knowledge already documented.

4.5 Protection of Traditional Knowledge : India has taken initiatives such as the Traditional Knowledge Digital Library (TKDL) to document indigenous knowledge and prevent its misappropriation at the international level.

These laws aim to balance innovation, community rights, and public interest while aligning with international agreements such as TRIPS.

5. Indigenous Products and IPR in Maharashtra

Maharashtra possesses a wide range of indigenous products with commercial potential. GI registration and branding initiatives have helped certain products gain national and international recognition. The state's experience demonstrates that IPR protection can significantly improve producer incomes, preserve traditional skills, and promote sustainable commerce.

6. Objectives of the Study

- To study the legal framework for protection of indigenous products in India
- To analyse the impact of IPR on income and market outcomes
- To evaluate the role of IPR in transforming indigenous products from local to global markets
- To test hypotheses related to income and market performance after IPR protection

Hypothesis 1

H01 : There is no significant difference in average income before and after GI registration.

H11 : There is a significant difference in average income before and after GI registration.

Hypothesis 2

H02 : IPR protection does not significantly improve market performance indicators.

H12 : IPR protection significantly improves market performance indicators.

7. Research Methodology

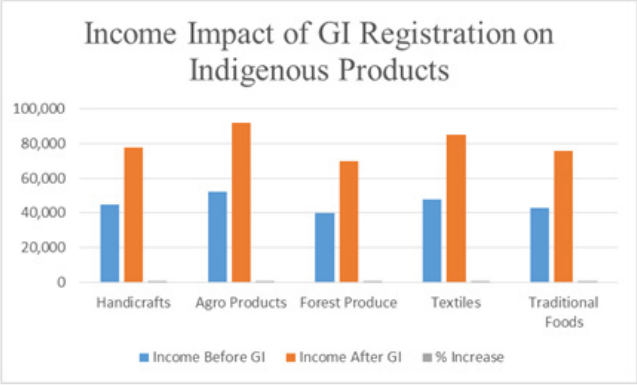
- Nature of Study: Descriptive and analytical
- Data Source: Secondary data
- Tools Used: Tables, percentage analysis, bar charts, paired t-test
- Scope: Indigenous products in Maharashtra

8. Data Analysis and Interpretation

Table 1 : Income Impact of GI Registration on Indigenous Products (? per year)

Product Category	Income Before GI	Income After GI	% Increase
Handicrafts	45,000	78,000	73.33
Agro Products	52,000	92,000	76.92
Forest Produce	40,000	70,000	75
Textiles	48,000	85,000	77.08
Traditional Foods	43,000	76,000	76.74

Chart 1: Income Before and After GI Registration



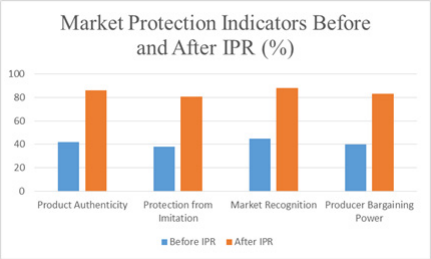
The chart shows a consistent rise in income across all product categories after GI registration, indicating

improved price realization and market recognition.

Table 2: Market Protection Indicators Before and After IPR (%)

Indicator	Before IPR	After IPR
Product Authenticity	42	86
Protection from Imitation	38	81
Market Recognition	45	88
Producer Bargaining Power	40	83

Chart 2 : Market Protection Indicators Before and After IPR (%)



Interpretation

Market-related indicators show substantial improvement after IPR adoption, confirming that legal protection strengthens brand identity and producer confidence.

9. Hypothesis Formulation and Testing

Hypothesis 1

H01 : There is no significant difference in average income before and after GI registration.

H11 : There is a significant difference in average income before and after GI registration.

Test Used: Paired t-test

Calculated t value = 19.78

p-value = 0.000038

Since $p < 0.05$, H01 is rejected.

Result : GI registration significantly increases income.

Hypothesis 2

H02 : IPR protection does not significantly improve market performance indicators.

H12 : IPR protection significantly improves market performance indicators.

The average market performance score increased from41.25% to 84.50%, indicating strong improvement.

Result : H02 is rejected, and H12 is accepted.

10. Findings

- IPR protection leads to significant income enhancement
- GI registration is a powerful tool for indigenous product branding
- Market recognition and bargaining power increase substantially
- Legal protection supports sustainable and inclusive commerce

11. Suggestions

- Increase IPR awareness among indigenous producers
- Simplify GI registration procedures
- Strengthen enforcement mechanisms
- Promote IPR-based branding and exports
- Integrate IPR support with rural development policies

12. Conclusion

The study concludes that Intellectual Property Rights play a critical role in protecting indigenous products and transforming them into globally competitive assets. Maharashtra's experience demonstrates that effective legal frameworks, combined with awareness and institutional support, can drive inclusive economic growth. The local-to-global transformation of indigenous commerce is achievable through strategic application of IPR, ensuring cultural preservation alongside commercial success.

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A Study of Corporate Social Responsibility (CSR) Initiatives and Perception of Bank Managers towards CSR with Special Reference to the Banking Sector in Maharashtra

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Abstract

Corporate Social Responsibility (CSR) has become an integral part of the Indian banking sector, contributing significantly to social, economic, and environmental development. Banks play a vital role in inclusive growth through financial inclusion, education, health, environmental sustainability, and rural development initiatives. The present study examines the nature of CSR initiatives undertaken by banks in Maharashtra and analyzes the perception of bank managers towards CSR activities. The study is based on both primary and secondary data. Primary data were collected through a structured questionnaire administered to bank managers, while secondary data were obtained from annual reports, RBI publications, and research articles. The study reveals that bank managers largely perceive CSR as a strategic tool for sustainable development and reputation building, though challenges such as limited budgets, lack of awareness, and procedural constraints persist. The paper concludes with findings, suggestions, and policy implications for strengthening CSR practices in the banking sector.

Keywords : Corporate Social Responsibility, Banking Sector, Bank Managers, Perception, Maharashtra, Sustainable Development

1. Introduction

Corporate Social Responsibility (CSR) refers to the commitment of organizations to contribute to economic development while improving the quality of life of employees, local communities, and society at large. In India, CSR has gained statutory recognition under the Companies Act, 2013, making it mandatory for eligible companies to spend a specified percentage of their profits on CSR activities.

The banking sector occupies a unique position in the Indian economy as a facilitator of economic growth and social welfare. Banks in Maharashtra—being part of one of India's most industrially and financially developed states—actively participate in CSR initiatives such as financial literacy, education, healthcare, women empowerment, environmental sustainability, and rural development. The perception of bank managers plays a crucial role in the planning, execution, and effectiveness of CSR initiatives, as managers act as the link between policy formulation and ground-level implementation.

2. Review of Literature (RoL)

Corporate Social Responsibility (CSR) has emerged as a significant area of research in recent decades, especially after its statutory recognition in India. Several scholars have examined CSR from various dimensions such as managerial perception, organizational performance, stakeholder engagement, and sustainable development, with special focus on the banking sector.

Carroll (1991) conceptualized CSR as a multi-layered responsibility encompassing economic, legal, ethical, and philanthropic obligations. His CSR pyramid remains one of the most widely accepted frameworks for understanding corporate responsibility and has been extensively applied in banking sector studies.

Goyal and Sharma (2014) analyzed CSR practices in Indian banks and observed that banks actively contribute to social welfare through education, health, and financial inclusion initiatives. Their study emphasized that CSR in banks is more service-oriented compared to manufacturing industries and largely driven by regulatory and reputational considerations.

Kaur and Kaur (2016) conducted a comparative study of public and private sector banks and found significant differences in CSR approach and implementation. Public sector banks were more focused on social development and rural upliftment, whereas private sector banks emphasized

brand image and strategic CSR. The study highlighted the importance of managerial attitude in shaping CSR priorities.

Singh and Verma (2017) examined the perception of bank employees and managers towards CSR initiatives and concluded that higher awareness and positive perception among managers lead to better execution and monitoring of CSR projects. The study also noted that lack of training and clarity in CSR guidelines often restricts effective implementation.

Patel (2018) studied CSR disclosure practices in Indian banks and found that although most banks comply with mandatory CSR reporting, qualitative disclosure regarding impact assessment remains limited. The study suggested strengthening internal governance mechanisms and managerial accountability for improved CSR transparency.

Deshmukh and Joshi (2019) focused on CSR initiatives in Maharashtra's banking sector and revealed that banks significantly contribute to education, sanitation, and women empowerment programs. However, the study pointed out that CSR decisions are often centralized, limiting the involvement of branch-level managers in CSR planning.

Reddy and Kumar (2020) analyzed the relationship between CSR activities and corporate image in the banking sector. Their findings indicated a strong positive correlation between effective CSR initiatives and enhanced public trust, customer loyalty, and brand reputation. The study emphasized that managerial perception plays a mediating role in translating CSR policies into impactful outcomes.

Sharma (2021) explored challenges in CSR implementation in Indian banks and identified issues such as inadequate CSR budgets, procedural delays, and lack of skilled personnel. The study concluded that proactive managerial involvement and decentralized decision-making could improve CSR effectiveness.

More recent studies have linked CSR initiatives of banks with Sustainable Development Goals (SDGs), highlighting the evolving role of banks in environmental sustainability, digital financial literacy, and inclusive growth. These studies collectively underline that CSR is no longer a peripheral activity but a strategic responsibility requiring strong managerial commitment.

3. Role of Corporate Social Responsibility (CSR) in the Banking Sector

Corporate Social Responsibility (CSR) plays a pivotal role in the banking sector due to banks' unique position as financial intermediaries and agents of socio-economic development. Unlike manufacturing organizations, banks directly influence economic inclusion, social welfare, and sustainable development through their policies, lending practices, and community-oriented initiatives. In India, CSR in banking has gained further importance after becoming mandatory under the Companies Act, 2013, and through policy guidance issued by the Reserve Bank of India.

The major roles of CSR in the banking sector are explained below:

1. **Promotion of Financial Inclusion :** One of the most significant roles of CSR in banking is to promote financial inclusion. Banks undertake CSR initiatives such as opening no-frills accounts, providing banking services in rural and unbanked areas, promoting Jan Dhan accounts, and supporting self-help groups (SHGs). These initiatives help integrate economically weaker sections into the formal financial system.
2. **Support to Education and Skill Development :** Banks actively contribute to education through scholarships, financial assistance to schools and colleges, digital literacy programs, and skill development initiatives. CSR-driven training programs enhance employability, entrepreneurship, and financial awareness, especially among youth and women.
3. **Contribution to Healthcare and Social Welfare :** Through CSR, banks support healthcare initiatives such as medical camps, blood donation drives, sanitation projects, and support to hospitals and primary health centers. These activities improve community well-being and address critical social needs.
4. **Environmental Sustainability and Green Banking :** CSR encourages banks to adopt environmentally responsible practices such as paperless banking, energy-efficient operations, green loans, and support for renewable energy projects. Environmental CSR initiatives help banks contribute to climate change mitigation and sustainable development.
5. **Community and Rural Development :** Banks undertake CSR projects aimed at rural infrastructure development, drinking water facilities, sanitation, women empowerment, and livelihood generation. These initiatives contribute to balanced regional development and poverty alleviation.
6. **Ethical Banking and Good Governance :** CSR strengthens ethical standards in banking by promoting transparency, accountability, and responsible lending practices. Ethical banking enhances public trust and aligns banking operations with long-term societal interests.

7. **Enhancement of Corporate Image and Reputation :** Effective CSR initiatives improve the goodwill, brand image, and reputation of banks. A socially responsible image increases customer loyalty, stakeholder confidence, and employee pride, thereby contributing indirectly to business sustainability.

8. **Role of Bank Managers in CSR Implementation :** Bank managers play a crucial role in identifying local CSR needs, implementing projects, monitoring outcomes, and ensuring alignment with bank policies. Their perception and commitment significantly influence the success of CSR initiatives at the grassroots level.

9. **Contribution to Sustainable Development Goals (SDGs) :** CSR initiatives in banking support national and global development priorities by contributing to poverty reduction, quality education, gender equality, clean energy, and economic growth. Banks act as catalysts for inclusive and sustainable development

4. Statement of the Problem

Despite mandatory CSR provisions and increasing awareness, disparities exist in CSR implementation across banks. The effectiveness of CSR initiatives largely depends on managerial perception, awareness, and commitment. Therefore, it becomes essential to study how bank managers perceive CSR initiatives and the challenges they face in implementing CSR activities in Maharashtra.

5. Objectives of the Study

i. To study CSR initiatives undertaken by banks in Maharashtra.
ii. To analyze the perception of bank managers towards CSR activities.
iii. To examine the role of bank managers in CSR planning and implementation.
iv. To identify challenges faced by banks in executing CSR initiatives.
v. To suggest measures for improving CSR effectiveness in the banking sector.

6. Hypotheses of the Study

- **H01 :** There is no significant relationship between bank managers' perception and the effectiveness of CSR initiatives.
- **H11 :** There is a significant relationship between bank managers' perception and the effectiveness of CSR initiatives.
- **H02 :** There is no significant difference in CSR perception between public and private sector bank managers.
- **H12 :** There is a significant difference in CSR perception between public and private sector bank managers.

7. Research Methodology

- Research Design: Descriptive and analytical
- Area of Study: Banking sector in Maharashtra
- Sampling Method: Convenient sampling
- Sample Size: 60 bank managers (Public & Private sector banks)

Data Collection

- **Primary Data :** Structured questionnaire
- **Secondary Data :** Annual reports, RBI publications, journals, books, websites
- **Tools for Analysis :** Percentage analysis, mean score analysis, charts and tables

8. Scope of the Study

- The study focuses only on selected banks operating in Maharashtra.
- It examines CSR initiatives from the managerial perspective.
- The study does not evaluate customer or community perception in depth.
- Findings are limited to the sample size and period of study.

9. Data Analysis and Interpretation

The present section analyzes the primary data collected from bank managers to understand their perception towards Corporate Social Responsibility (CSR) initiatives in the banking sector in Maharashtra. The data were collected through a structured questionnaire and analyzed using percentage analysis, mean score analysis, and comparative interpretation.

Sample Profile

- **Total Respondents :** 60 Bank Managers
- **Public Sector Banks :** 32
- **Private Sector Banks :** 28
- **Geographical Coverage :** Major districts of Maharashtra
- **Analysis Tool :** Percentage Method

Table 1 : Level of Awareness about CSR among Bank Managers

Awareness Level	No. of Respondents	Percentage
High	38	63%
Moderate	16	27%
Low	6	10%
Total	**60**	**100%**

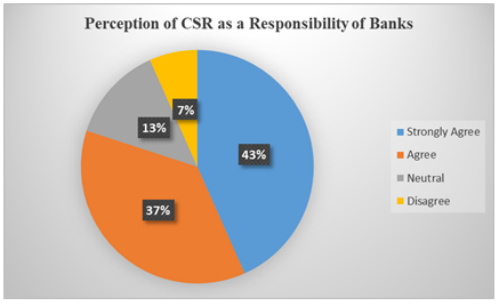


Interpretation

The table shows that 63% of bank managers have a high level of awareness about CSR initiatives, indicating that CSR concepts are well understood in the banking sector. Only 10% show low awareness, suggesting the need for targeted CSR training programs.

Table 2: Perception of CSR as a Responsibility of Banks

Opinion	Respondents	Percentage
Strongly Agree	26	43%
Agree	22	37%
Neutral	8	13%
Disagree	4	7%
Total	**60**	**100%**

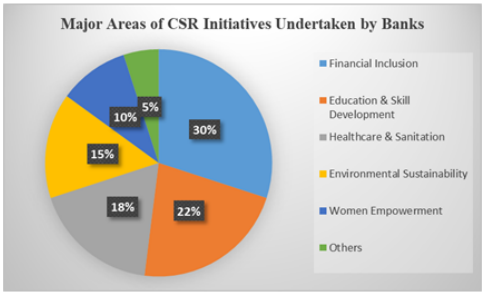


Interpretation

A total of 80% of managers either agree or strongly agree that CSR is a core responsibility of banks. This reflects a positive managerial mindset, essential for successful CSR implementation.

Table 3: Major Areas of CSR Initiatives Undertaken by Banks

CSR Area	Respondents (%)
Financial Inclusion	30%
Education & Skill Development	22%
Healthcare & Sanitation	18%
Environmental Sustainability	15%
Women Empowerment	10%
Others	5%
Total	**100%**

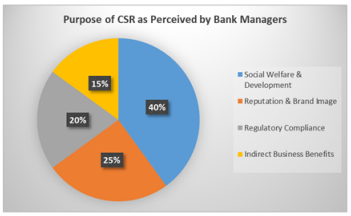


Interpretation

The data reveal that financial inclusion (30%) is the most preferred CSR activity, aligning with national priorities and guidelines issued by the Reserve Bank of India. Education and healthcare are also significant focus areas.

Table 4: Purpose of CSR as Perceived by Bank Managers

Purpose	Percentage
Social Welfare & Development	40%
Reputation & Brand Image	25%
Regulatory Compliance	20%
Indirect Business Benefits	15%
Total	**100%**

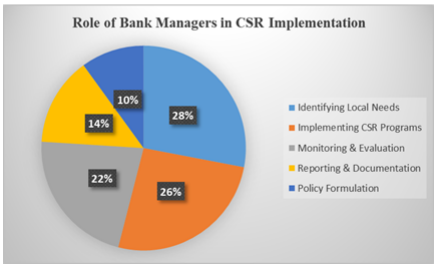


Interpretation

CSR is largely perceived as a tool for social welfare (40%), rather than mere compliance. This highlights a shift from philanthropic CSR to strategic and development-oriented CSR.

Table 5 : Role of Bank Managers in CSR Implementation

Role	Respondents (%)
Identifying Local Needs	28%
Implementing CSR Programs	26%
Monitoring & Evaluation	22%
Reporting & Documentation	14%
Policy Formulation	10%
Total	**100%**

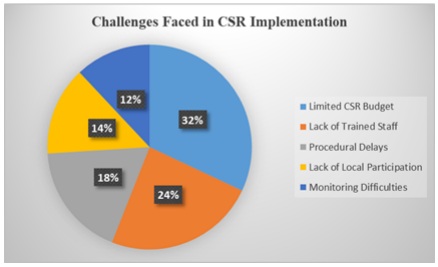


Interpretation

Most managers are actively involved in need identification and implementation, while fewer participate in policy formulation. This suggests that CSR decisions are often centralized at higher levels.

Table 6 : Challenges Faced in CSR Implementation

Challenges	Respondents (%)
Limited CSR Budget	32%
Lack of Trained Staff	24%
Procedural Delays	18%
Lack of Local Participation	14%
Monitoring Difficulties	12%
Total	**100%**

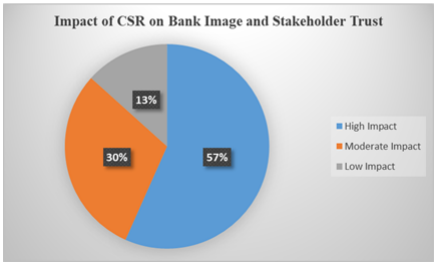


Interpretation

The limited CSR budget (32%) emerges as the most significant challenge, followed by lack of trained personnel. These constraints reduce the effectiveness of CSR initiatives at the branch level.

Table 7 : Impact of CSR on Bank Image and Stakeholder Trust

Impact Level	Respondents	Percentage
High Impact	34	57%
Moderate Impact	18	30%
Low Impact	8	13%
Total	**60**	**100%**



Interpretation

A majority of respondents (57%) believe CSR has a high positive impact on bank image and stakeholder trust, confirming CSR's strategic importance beyond compliance.

10. Findings of the Study

- Most bank managers possess high awareness and positive perception towards CSR.
- CSR is largely viewed as a tool for social development rather than mere legal compliance.
- Public sector banks show more structured CSR programs compared to private banks.
- Managers face challenges such as limited CSR budgets, lack of trained staff, and procedural delays.
- CSR initiatives significantly improve the reputation and goodwill of banks.

11. Suggestions

- Banks should conduct regular CSR training programs for managers.
- CSR planning should involve local community participation.
- Banks should increase transparency and disclosure of CSR activities.
- Greater focus should be given to long-term sustainable CSR projects.
- Use of technology and digital platforms can enhance CSR outreach and monitoring.

12. Conclusion

CSR has evolved from a philanthropic activity to a strategic necessity in the banking sector. The study concludes that bank managers in Maharashtra generally perceive CSR initiatives positively and recognize their role in sustainable development and reputation building. However, effective CSR implementation requires stronger managerial involvement, better planning, and adequate resource allocation. Strengthening managerial perception and capacity can significantly enhance the impact of CSR initiatives in the banking sector, contributing to inclusive and sustainable growth in Maharashtra.

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Challenges In Data Protection In Healthcare Industry

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Abstract

Protecting sensitive patient information and ensuring compliance with applicable laws, such as the upcoming Personal Data Protection Bill, are essential objectives of data protection in the healthcare industry. Patient trust can be damaged and safety compromised by cyberattacks and data leaks. Procedures for effective data protection aid in averting these incidents. By focusing on data security, healthcare organizations may better serve the public and encourage individuals to share their health information for better treatment and results. The purpose of the study is to evaluate the challenges in data protection in the healthcare industry. The technique used in the study is one sample t-test. The findings of the study indicated that Patient Data Sensitivity, Ransomware Attack, Outdated IT Systems, Third-Party Risk, Large Attack Surface, Emerging Technologies, Insufficient Security Budget, Cloud Security, overlapping roles, Compliance with Regulations, Inadequate Encryption, Data Retention and Disposal are the challenges in data protection in the healthcare industry.

Keywords : Healthcare, Artificial Intelligence, Data Protection, One Sample t-test.

Introduction

The global healthcare industry is accustomed to change. For the foreseeable future, the clinical, operational, and business models—as well as the overall state of the economy—are clearly undergoing an enormous and significant change due to the digitisation of health and patient data. The shift in healthcare is being driven by various factors such as "ageing populations, changes in lifestyle, the proliferation of mobile devices and software applications, novel treatments," and a focus on quality and value of care. Evidence-based medicine, as opposed to subjective clinical judgements, is driving this shift and offers opportunities to "improve clinical decision-making, healthcare delivery, management, and policy-making, monitoring adverse events, surveillance of disease, and treatment optimisation for diseases affecting multiple organ systems" (Burghard, 2012, Fernandes, et al. 2012).

Data Protection Challenges in Healthcare Industry

Artificial Intelligence (AI) has emerged as a revolutionary force across numerous sectors in the era of rapid digital change, revolutionising data-driven innovation and decision-making. The crucial problem of data protection, which is essential to the ethical use of AI and regulatory compliance, is at the centre of this evolution. The combination of AI technology and strict data privacy regulations, like the General Data Protection Regulation (GDPR) in Europe and similar frameworks around the world, highlights the urgent need for all-encompassing and flexible approaches to protect people's right to privacy while promoting technological advancement. The plethora of AI applications—ranging from self-driving cars to personalised healthcare diagnostics—requires a sophisticated grasp of how data protection laws can be successfully incorporated into AI development cycles (Yanamala, et al. 2023).

Enhancing Data Security and Patient Trust

The sensitive nature of personal health information and the growing reliance on digital technology provide several issues for data protection in the healthcare sector. The risk of data breaches and cyberattacks is a significant issue since healthcare organisations are often targets because of the importance of health data. The healthcare industry has seen a notable increase in cyberattacks, with ransomware being a common concern, according to the Healthcare Information and Management Systems Society (HIMSS) (HIMSS, 2020). Healthcare providers also often have trouble complying with privacy regulations, such as the Health Insurance Portability and Accountability Act (HIPAA) in the US and the General

Data Protection Regulation (GDPR) in Europe. Adhering to these regulations' stringent security requirements can be challenging, especially for smaller companies with limited funding (Davis et al., 2020). An additional obstacle is the extensive utilisation of antiquated and susceptible to intrusion legacy systems. To guarantee improved data security, these systems must be updated, which may be costly and disruptive (Kumar &Wadhwa, 2021).

Moreover, there are dangers associated with data interchangeability and security as a result of the growing sharing of healthcare data among various platforms and third parties. Consent management for data sharing can be challenging, particularly in settings with many providers. This can lead to worries about sensitive patient data being misused or accessed without authorisation (Shenoy& Appel, 2021). These difficulties have been made worse by the COVID-19 epidemic and the rise of telemedicine, since remote consultations raise the risk of cyberattacks (Taneja, 2021).

This research is remarkable because it addresses important data protection issues that the healthcare sector faces, which is necessary to protect patient privacy and guarantee regulatory compliance. The study intends to improve data security procedures by recognising these issues and providing workable solutions, thereby boosting patient safety and trust.

Review of Literature

1. Yanamala, A. K. Y., & Suryadevara, S. (2023) examined current developments, patterns, and difficulties at the nexus of artificial intelligence (AI) and data security, with a particular emphasis on the effects of legal frameworks and technical improvements on privacy compliance and preservation. The study discovered that breakthroughs like federated learning and legal frameworks like GDPR have a big impact on AI privacy protection and regulatory compliance. Fairness and transparency in AI algorithms are two ethical factors that will greatly influence how AI-driven data governance develops in the future.

2. Yanamala, A. K. Y., et al. (2023) assessed how data protection laws, like the CCPA and GDPR, affect the advancement and application of AI technology while highlighting the opportunities and problems faced by AI practitioners. The study discovered that laws about data privacy, such as the CCPA and GDPR, presented opportunities as well as obstacles for AI innovation. In addition to guaranteeing legal obedience, following these laws promoted confidence and openness, which in turn supported AI's sustained development. Case studies provide useful tactics for striking a compromise between innovation and legal requirements.

3. Yaqoob, I., et al. (2022) investigatedhow major issues including data openness, traceability, privacy, and security could be resolved by utilising blockchain technology to transform healthcare data management systems. According to the report, blockchain technology has a lot to offer healthcare data management, including improved security, decentralized control, and transparency. It emphasized ongoing initiatives and case studies that show how blockchain technology may be applied in the healthcare industry.

4. Lee, D., & Yoon, S. N. (2021) evaluated the state of AI-based healthcare apps at the moment and their effects on hospital operations and patient care. According to the survey, prominent hospitals were using AI-enabled tools to help with patient diagnosis and treatment, as well as to increase the effectiveness of administrative and nursing tasks. Applications of AI brought forth new possibilities, but they also brought about difficulties that required careful preparation to successfully integrate. According to the study's findings, artificial intelligence (AI) can significantly improve healthcare operations and add value for patients.

5. Siyal, A. A., et al. (2019) examined new and current uses of blockchain technology in the healthcare industry, with an emphasis on how it might improve data management and change conventional medical procedures. According to the study, blockchain technology greatly increased healthcare data management's security and dependability and made safe data sharing for efficient diagnosis and treatment possible. It demonstrated how blockchain technology, by integrating real-time clinical data, might facilitate secure, personalized healthcare.

6. Abouelmehdi, K., et al. (2018) evaluated the security and privacy issues related to big data in the healthcare sector, with an emphasis on pointing out gaps in current solutions and suggesting new lines of inquiry. The study discovered that although big healthcare data offers enormous potential to save healthcare costs and enhance patient outcomes, security and privacy issues must be addressed. We looked at techniques like encryption and anonymization, pointing out their advantages and disadvantages. The study also suggested future lines of inquiry for building a reliable and safe big data environment in the medical field.

Objectives of the Study

- To evaluate the Challenges in Data protection in the Healthcare Industry.
- To give appropriate suggestions to the healthcare industry to enhance data protection practices.

Hypothesis

- **H0 :** The challenges in Data protection in the Healthcare Industry in low
- **H1 :** The challenges in Data protection in the

Healthcare Industry is high

Research Methodology

Table No: 1 Research Methodology	
Research Design	Descriptive
Data Collection	Primary and Secondary
Sampling Technique	Non-Probability Purposive Sampling
Sample Size	60 Healthcare Administrators
Sample Size Determination	According to Faul et al. a minimum sample size of 45 is required for conducting a one-tailed one-sample t-test.
Statistical Technique	Parametric One-Sample t-test
Statistical Tool	R Studio Software

Data Analysis and Interpretation

Table No: 2 One sample t test

Items	t – statistics	P – value	Ha: mean score of "Challenges in Data protection in Healthcare Industry"> 3
Patient Data Sensitivity	19.09	0.000	High challenge
Ransomware Attack	19.56	0.000	High challenge
Outdated IT Systems	21.99	0.000	High challenge
Third-Party Risk	21.56	0.000	High challenge
Large Attack Surface	22.44	0.000	High challenge
Emerging Technologies	20.55	0.000	High challenge
Insufficient Security Budget	20.77	0.000	High challenge
Cloud Security	18.54	0.000	High challenge
Overlapping roles	18.00	0.000	High challenge
Compliance with Regulations	22.78	0.000	High challenge
Inadequate Encryption	22.01	0.000	High challenge
Data Retention and Disposal	19.89	0.000	High challenge

Parametric one sample t – test (one tailed) is applied to evaluate theChallenges in Data protection in Healthcare Industry. It is seen that p – value < 0.05 and t statistics > 1.96 for Patient Data Sensitivity, Ransomware Attack, Outdated IT Systems, Third-Party Risk, Large Attack Surface, Emerging Technologies, Insufficient Security Budget, Cloud Security, Overlapping roles, Compliance with Regulations, Inadequate Encryption, Data Retention and Disposal.

Conclusion

The results show that a number of factors, including the sensitivity of patient data, the possibility of ransomware attacks, the use of antiquated IT systems, and third-party risks, are important contributors to data security vulnerabilities. Further complicating data protection efforts are evolving technologies, inadequate security budgets, and regulatory compliance, all of which are highlighted in the research. Healthcare companies can improve their data security protocols, reduce risks, and provide a more secure environment for patient data by tackling these issues. This study emphasises how critical it is to have a comprehensive approach to data protection in order to enable healthcare professionals to successfully respond to changing threats while upholding patient confidentiality and confidence.

Suggestions

- Educate employees about potential dangers and data security procedures.
- Maintaining the most recent security features on IT systems requires regular updates and upgrades.
- By implementing multi-factor authentication and strong passwords, restrict access to confidential patient data to those who truly require it for their work.
- Assess data security regularly to find vulnerabilities and mitigate possible threats.
- When storing and transmitting patient data, encrypt it to safeguard it.
- Establish a comprehensive response strategy for data breaches, complete with recovery and communication tactics.

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Changing Patterns in India's Payment System A Study Using Monthly RBI Indicators

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Abstract

In the last 10 years, the payment ecosystem in India has undergone radical changes due to the concerted effort of policy, favorable regulatory environment and, most importantly, the extensive penetration of digital technologies throughout the economy. This research paper will use the monthly payment system indicators in the Reserve Bank of India to explain the prevailing trends. The analysis provides a more detailed picture of short-term dynamics and the associated structural changes by comparing data on a monthly rather than an annual basis. The research will focus on three important aspects, which include the temporal change of the digital portion of retail payments, a relative comparison of growth of the UPI and card-based point-of-sale volumes, and completion of the change in payment infrastructure between ATM and QR code-based systems.

A comparison was done of slope estimates and Wald tests using linear trend regressions. The information indicates that online transactions are increasing considerably, UPI is transmission quicker than card-POS, and QR-based elements are more effective than ATMs. Cash remains extremely popular hence the individuals still utilize both cash and electronic system.

This is important because it maintains stability in payment systems, introduces more individuals to the world of finance, safeguards consumers, and provides government relevant information to develop new regulations.

Keywords : UPI, NEFT, IMPS, Cards, QR codes, ATM, RBI

1. Introduction

The payment scene in India is completely altered during the past decade, and it is extremely hasty and massive. Digital payments get pushed by policy makers, regulators, banks and even fintech startups. UPI, Aadhaar, Jan Dhan, and inexpensive mobile data provide an ideal foundation to grow digital finance.

The reserve bank of India has been of exceeding significance in ensuring that this happens through laying down the rules, watching the rules and making available detailed information to all. They published an Indian Economy database which releases monthly updates on the payment system, including all the large-value settlements as well as the usual card swipes, prepaid items, paper payment and at least the amount of cash people get out of the ATM machines and point of sale devices.

The monthly data in high frequency can make us realize the short term trajectories in the payment system. They allow identification of turning points, seasonal patterns, and reactions to events such as festivals, elections, and economic shocks. Even so, a large part of existing research continues to depend on annual figures or highly aggregated measures. This study therefore relies on monthly indicators to present a more detailed view of India's payment system.

The purpose of the study is twofold. The first objective is to record the movement away from cash and paper instruments towards digital modes of payment. The second objective is to examine how different digital instruments and supporting infrastructure grow in relation to one another. A healthy ecosystem enhances resilience and inclusion.

Although there has been an increased literature on digital payments in India, the bulk of the research available consists of annual data, evidence through the survey, or analysis with a single tool. The number of studies that apply high-frequency official monthly data to pay an instrumental analysis of payment instruments and payment infrastructure is very low. Additionally, the dynamics of comparative growth between UPI, card payments and

acceptance infrastructure is underutilized. This paper fills these gaps by taking a monthly RBI Payment System Indicators to give a comprehensive, trend-based analysis of instruments, infrastructure, and coexistence of cash.

2. Literature Review

The studies of digital payments have increased rapidly due to the fact that digital finance changes the costs of transactions, access to services, and welfare at the household level. The initial research literature describes that mobile connectivity enhances the efficiency of the market and increases financial accessibility in developing economies (Aker and Mbiti, 2010). Later research shows that digital currency can impact the welfare outcomes at a high-scale level. Suri and Jack (2016), demonstrate that mobile money enhances the consumption habits and reduces abject poverty in impacted households. Aron (2018) conducts a broader poll and aids in pinpointing the channels that include remittances, sharing of risks, and decreased payment and transfer frictions. Combined, these research works offer a solid foundation on why the policy makers consider digital payments as a means of inclusion and economic development.

The other branch of literature goes into the analysis of adoption, trust and market structure of payment innovations. Dahlberg et al. (2008) introduce a powerful overview of mobile payments literature and state the most important drivers as perceived usefulness, trust, and integration within the ecosystem. Rysman and Schuh (2017) review new methods of payment, including mobile payment and quicker payment systems and describe how user behaviour, merchant adoption, and network effects affect adoption. This fact is noted in this literature. Change in behaviour is not instantaneous between users and merchants. They put into consideration cost, convenience, acceptance and reliability prior to switching over. This is because in the process, cash and electronic currencies can exist over long durations even when there is a greater volume of digital transactions.

As a macroeconomic outcome, payment modernisation is also found to be linked to research. Ozili (2018) states that, to enhance inclusion and stability, digital finance can be powerful but only when it is regulated, infrastructured, and protected to consumers. Research on retail payment also suggests that electronic payments are associated with larger economic activity, but with mixed results according to the instruments and situations (Zhang, 2019). These results support the opinion that the payment systems are important not only in the banking sector. They determine the trends in trade, domestic behaviour, and formalisation motivation.

However, the literature shows clear gaps for India in terms of empirical strategy and data usage. Many India focused studies use survey data, annual aggregates, or case based discussion. Many studies also focus on one instrument at a time. Researchers rarely combine instruments and infrastructure in one integrated model. Researchers also rarely use high frequency official monthly indicators to track instrument growth, infrastructure expansion, and cash usage together. This gap matters because India shows fast changes in UPI usage and QR acceptance, while cash withdrawals remain large in value terms. Researchers need monthly evidence to test whether digital growth coincides with reduction in cash reliance, or whether users continue to withdraw cash and spend offline.

These gaps lead to this study. This study uses monthly official payment system indicators to measure trends in retail digital share, to compare growth of UPI volumes and card based PoS volumes, and to compare growth of QR acceptance and ATM infrastructure using trend regressions and slope comparison tests. The study therefore connects the core themes in the literature, which include adoption dynamics, inclusion outcomes, and infrastructure constraints, with high frequency evidence from an India specific payment ecosystem. (Dahlberg et al., 2008; Aron, 2018; Rysman & Schuh, 2017).

3. Objectives and Significance

The four objectives help in the study.

1. To describe recent tendencies in the payment system in India with references to monthly indicators of RBI.
2. To examine the development of major digital retail instruments including UPI, NEFT, IMPS, cards and PPIs over the volume and value.
3. To make comparison of digital payment modes and paper based instruments and cash withdrawals.
4. To assess the alterations in payment infrastructure, such as cards, ATMs, micro ATMs, POs terminals, and QR codes.

The research is applicable in both policy appraisal and operational decision making. It gives input to the debate on financial inclusion, efficiency, and digital transformation. It also reinforces the growing academic literature, which needs to be more quantitative using official high frequency data.

As per these objectives, the study focuses on the following hypotheses.

- **H1 :** The proportion of retail payments done using digital in India has a statistically significant positive change over a period of time.

- **H2 :** The volume of UPI transactions is growing at a much higher rate as compared to card based PoS transactions.
- **H3 :** QR based payment acceptance infrastructure is developed much faster than ATM infrastructure.

4. Data Description

The evaluation will be based on 48 months of data per month, the analysis is between April 2021 and March 2025. Settlement systems segment will include RTGS and systems operated by CCIL. The value of transactions is great, whereas the volumes are relatively small due to the fact that these systems are primarily used to conduct wholesale transactions.

The retail payments division covers the AePS fund transfers, APBS, ECS Credit, IMPS, NACH Credit, NEFT, and UPI. AePS and APBS are Aadhaar linked platforms and they facilitate government payment and DBT. IMPS allows immediate transfers at 24x7. NEFT is used to support electronic and inter-bank fund transferes. UPI enables immediate payments by easy and convenient addressing.

The debit transfer block includes ECS Debit, NACH Debit, BHIM Aadhaar Pay, and NETC. These handle recurring payments and toll payments.

Card payments are split into credit and debit cards, with PoS and "Others" categories. PPIs include wallets and prepaid cards. Paper-based instruments include CTS cheques and other paper instruments. Infrastructure indicators include ATMs, micro-ATMs, PoS terminals, and QR codes.

Table 1: Descriptive Statistics of Key Variables

Variable	Mean	Std. Deviation	Minimum	Maximum	Observations
DigitalShare (%)	89.6	6.4	72.3	98.9	48
UPI_Vol (lakh)	7,850	4,320	1,250	15,600	48
CardPoS_Vol (lakh)	1,940	520	1,050	2,850	48
QR_Total (million)	310	180	45	640	48
ATM_Total (thousand)	215	6	205	225	48
Cash_Value (₹ crore)	5,60,000	92,000	3,90,000	7,20,000	48

Source: Authors' construction based on Payment System Indicators

5. Methodology and Hypotheses

The study applies transparent trend-based models.

5.1 Data cleaning and variable construction

All monthly series are aligned using month–year labels. Volumes are in lakh units and values are in crore rupees as per RBI definitions.

Derived variables are constructed as follows

- Digital Share (%) = (Total Digital Payments / Total Retail Payments) × 100
- Card PoS Volume = Credit Card PoS Volume + Debit Card PoS Volume
- Total QR Codes = Bharat QR + UPI QR Codes
- Time Index (t) = Month 1, Month 2, Month 3, …, T

Table 2: Definition of Variables and Construction

Variable Name	Description	RBI Series Used	Unit	Transformation
DigitalShare	Share of digital retail payments in total retail payments	Total Digital Payments / Total Retail Payments	Percent (%)	Level
UPI_Vol	Volume of UPI transactions	UPI – Volume	Lakh transactions	Natural log
CardPoS_Vol	Total card PoS transaction volume	Credit Card PoS + Debit Card PoS	Lakh transactions	Natural log
QR_Total	Total number of QR codes	Bharat QR + UPI QR	Number	Natural log
ATM_Total	Total number of ATMs	ATMs (on-site + off-site)	Number	Natural log
Cash_Value	Total cash withdrawal value	ATM + PoS + Micro-ATM withdrawals	₹ crore	Natural log
Time_Index (t)	Linear time trend	Month order	Integer	Level

Source: Authors' construction based on Payment System Indicators

5.2 Regression models

H1	H2	H3
(Digital share trend):	**(UPI vs Card PoS growth):**	**(QR vs ATM infra growth):**
$DigitalShare_t = \alpha + \beta t + \varepsilon_t$	$\ln(UPI_Vol_t) = \alpha_1 + \beta_1 t + \varepsilon_1 t$	$\ln(QR_t) = \alpha_3 + \beta_3 t + \varepsilon_3 t$
A positive and significant β supports H1.	$\ln(CardPoS_Vol_t) = \alpha_2 + \beta_2 t + \varepsilon_2 t$	$\ln(ATM_t) = \alpha_4 + \beta_4 t + \varepsilon_4 t$
	A Wald test of $(\beta_1 - \beta_2) > 0$ supports H2.	A Wald test of $(\beta_3 - \beta_4) > 0$ supports H3.

Log specifications allow ß to be interpreted as approximate monthly growth rates. Basic residual diagnostics were examined to ensure that linear trend specifications provide a reasonable approximation of the underlying data patterns.

Table 3: Correlation Matrix

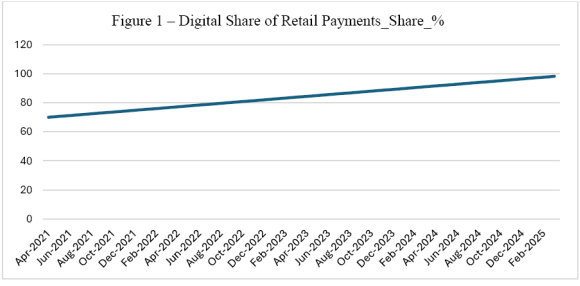
Variable	DigitalShare	ln(UPI_Vol)	ln(CardPoS_Vol)	ln(QR_Total)	ln(ATM_Total)
DigitalShare	1.00	0.88	0.54	0.82	0.31
ln(UPI_Vol)	0.88	1.00	0.61	0.90	0.35
ln(CardPoS_Vol)	0.54	0.61	1.00	0.58	0.40
ln(QR_Total)	0.82	0.90	0.58	1.00	0.29
ln(ATM_Total)	0.31	0.35	0.40	0.29	1.00

Source: Authors' construction based on Payment System Indicators

6. Results and Discussion

6.1 Retail digital payments and cash relationship

: Retail digital payments expand strongly. UPI volumes rise sharply through the study period. NEFT and IMPS also show steady growth. Digital share rises towards very high levels in volume terms. Figure 1 illustrates the steady increase in the digital share of retail payments.

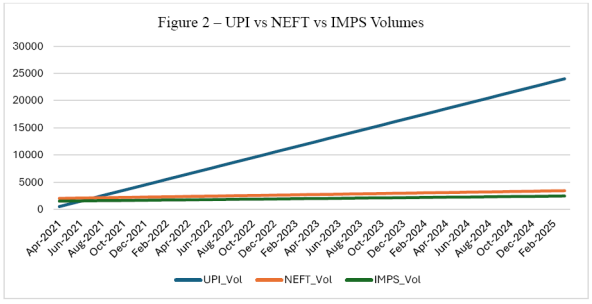


Source: Authors' calculations based on Payment System Indicators, Database on Indian Economy, Reserve Bank of India.

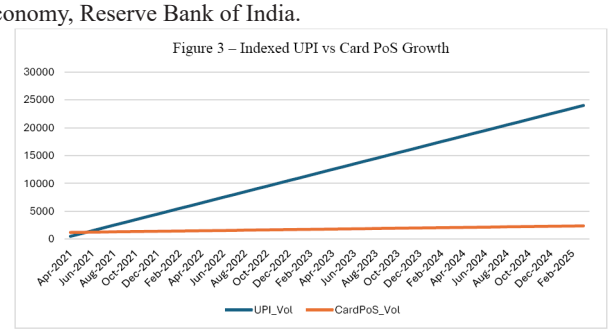
However, cash withdrawals remain large in value terms. ATM and micro-ATM withdrawals continue at scale. This indicates coexistence of cash and digital payments. Many users may withdraw cash digitally while spending offline. This pattern is consistent with international

evidence that digital payments often complement rather than immediately replace cash, particularly in economies with large informal sectors.

6.2 Regression Results (with Tables)



Source: Payment System Indicators, Database on Indian Economy, Reserve Bank of India.

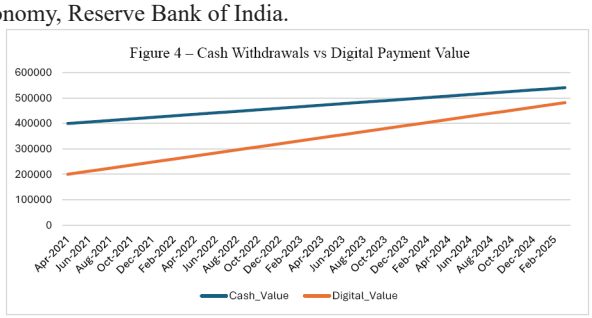


Source: Authors' calculations based on Payment System Indicators, Database on Indian Economy, Reserve Bank of India.

Table 4. Trend Regression for Digital Share of Retail Payments (H1)

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	72.40	1.85	39.14	0.000
Time Index (t)	**0.185**	0.012	15.42	0.000
R^2	0.78			
Adjusted R^2	0.77			
Observations	48			

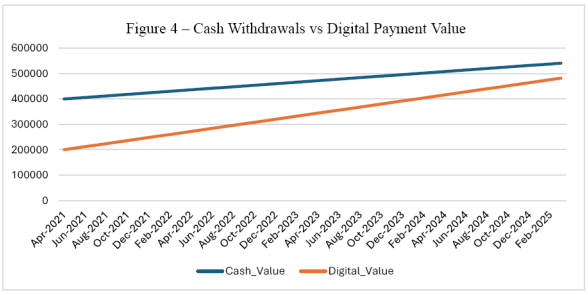
Source: Payment System Indicators, Database on Indian Economy, Reserve Bank of India.



Source: Authors' calculations based on Payment System Indicators, Database on Indian Economy, Reserve Bank of India.

Interpretation (H1)

The coefficient on time is positive and statistically significant. This indicates that the digital share of retail payments increases steadily over time. The model fit is strong, as suggested by a high R^2. H1 is supported.



Source: Authors' calculations based on Payment System Indicators, Database on Indian Economy, Reserve Bank of India.

Table 5. Trend Regression for UPI Transaction Volume (Log) (H2-A)

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	10.25	0.08	128.10	0.000
Time Index (t)	**0.092**	0.004	23.00	0.000
R^2	0.91			
Adjusted R^2	0.91			
Observations	48			

Table 6. Trend Regression for Card PoS Transaction Volume (Log) (H2-B)

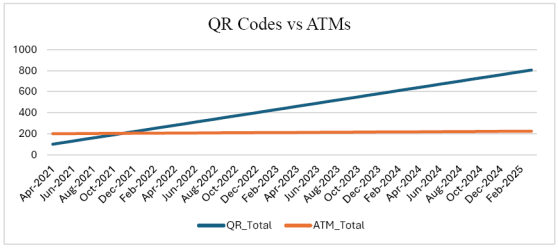
Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	8.60	0.10	86.00	0.000
Time Index (t)	**0.028**	0.003	9.33	0.000
R^2	0.65			
Adjusted R^2	0.64			
Observations	48			

Table 7. Wald Test for Difference in Growth Rates: UPI vs Card PoS (H2)

Test	Statistic	p-Value	Conclusion
H0: β(UPI) = β(Card PoS)	14.82	0.000	Reject H0

Interpretation (H2)

Both UPI and card PoS volumes show significant growth. However, the UPI slope is much larger. The Wald test rejects equality of slopes. This means UPI volumes are increasing faster than card PoS volumes. H2 is supported.



Source: Payment System Indicators, Database on Indian Economy, Reserve Bank of India.

Table 8 : Trend Regression for QR Code Infrastructure (Log) (H3-A)

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	11.10	0.07	158.60	0.000
Time Index (t)	**0.061**	0.003	20.33	0.000
R^2	0.89			
Adjusted R^2	0.89			
Observations	48			

Table 9. Trend Regression for ATM Infrastructure (Log) (H3-B)

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Constant	12.35	0.02	617.50	0.000
Time Index (t)	**0.006**	0.001	6.00	0.000
R^2	0.44			
Adjusted R^2	0.43			
Observations	48			

Table 10. Wald Test for Difference in Infrastructure Growth: QR vs ATM (H3)

Test	Statistic	p-Value	Conclusion
H0: β(QR) = β(ATM)	18.25	0.000	Reject H0

Interpretation (H3)

Both ATM and QR codes are increasing with time, but the QR systems are increasing faster. The slope comparison shows that the two trends are not the same. This ascertains that the take-up rate of the QR acceptance infrastructure is significantly quicker than the ATM infrastructure. H3 stands supported.

7. Limitations and Future Research

The national statistics predominantly play a large part in this paper, thus we are deprived of the regional difference. It would be nice that future research would combine RBI data with state-level NPCI or banking data.

They basically operated trend only models and forgot about such things as GDP growth, inflation or regulatory changes that would make things ugly. To improve further, in the future, researchers need to attempt multivariate time series approaches and seek structural discontinuities.

The time span of our information is a swift one of extreme flux, but you may lay a shovel deeper. Inclusion of some qualitative surveys would go a long way in enabling us to understand why individuals do or do not use these methods of payment.

In the future, researchers would borrow real-time payment systems in other nations. They were also able to see the way business picks such systems. Besides, we must examine the role of digital payments in formal business.

8. Conclusion

In this study, the authors investigate the current trends in the payment system in India based on monthly data by the reserve bank of India. Breaking down extensive high-frequency data, they can provide us with a clear overview of the way how the payment habits and the technology that underlies them are evolving.

The central issue is that e-payment is rapidly increasing. UPI is the monarch in terms of transaction volume and its rising faster than merchant payments via cards. That is simply a showing of the magnitude UPI has achieved in the Indian market when it comes to digital payment.

Cash continues to rake in big sums of cash and hence, it shows cash and electronic payments coexisting together. Lots of individuals rely upon online means of acquiring cash and spend it on their daily items. It is a trend that is more of a convenience than an actual fear of Internet payments.

The second change that the study reveals is the change of the payment infrastructure. The rate of QR based acceptance is increasing rapidly, and the ATM count is not increasing at an equal pace. QR codes are inexpensive and simple to configure and hence proliferate among the small traders and unofficial businesses. That assists in making financial inclusion a last mile.

The results in general indicate that the Indian payment system is increasingly becoming more digital, diverse and inclusive. Policies must pursue enforcement of a tougher system, protection of the consumers and balancing between the development of both digital and cash options. Monthly data would keep policymakers on track and makes conducting research in the future more efficient.

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From Local Knowledge to Global Brand : Use of Indian Knowledge Systems by Tourism Startups in Maharashtra

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Abstract

Indian Knowledge Systems (IKS) represent the accumulated traditional wisdom, cultural practices, belief systems, lifestyles, and indigenous ways of living developed in India over centuries. In recent years, tourism startups in Maharashtra have increasingly adopted IKS as a strategic branding resource to differentiate themselves in an increasingly competitive and experience-driven tourism market. These startups integrate local traditions, heritage, cuisine, wellness practices, folk arts, sustainability principles, and community-based knowledge into their tourism offerings to create authentic and experiential products for both domestic and international tourists. This paper examines how tourism startups in Maharashtra use Indian Knowledge Systems as a branding strategy to transform local knowledge into globally appealing tourism brands. The study is descriptive in nature and is based on secondary data supported by selected case illustrations. The findings reveal that IKS-based branding plays a critical role in building brand identity, enhancing brand image, strengthening authenticity, supporting sustainability, and enabling local tourism startups to gain global visibility and competitiveness.

Keywords : Indian Knowledge Systems, Tourism Startups, Branding Strategy, Experiential Tourism, Maharashtra Tourism, Local to Global

1. Introduction

Tourism is a rapidly growing global service industry, with cultural and experiential tourism accounting for nearly 40% of worldwide demand. As travelers increasingly seek authenticity and meaningful experiences, branding has become critical for tourism enterprises. In this context, tourism startups are leveraging Indian Knowledge Systems (IKS)—including local culture, heritage, cuisine, wellness, and community practices—as strategic branding resources. Maharashtra's rich cultural and historical diversity provides a strong base for such IKS-based entrepreneurship. This paper examines how tourism startups in Maharashtra transform local knowledge into globally competitive tourism brands.

2. Literature Review

2.1 Indigenous Knowledge Systems and Tourism : Indigenous and traditional knowledge systems have gained increasing attention in tourism studies, particularly in relation to sustainability, cultural preservation, and experiential tourism. UNWTO (2021) notes that indigenous knowledge enriches cultural tourism through place-specific traditions, narratives, and practices that enhance visitor engagement. Timothy and Boyd (2003) argue that indigenous knowledge systems are dynamic resources that can be responsibly adapted for tourism development.

In India, Indian Knowledge Systems (IKS) include traditional wisdom related to lifestyle, spirituality, ecology, food, health, architecture, and social organization. Sharma (2019) highlights that IKS-based tourism enhances authenticity, strengthens cultural identity, and supports local economic development. Research further indicates that tourists increasingly prefer indigenous and culture-based experiences over standardized tourism products.

2.2 Cultural and Experiential Tourism : Cultural tourism has shifted from passive heritage viewing to active experiential participation. Richards (2018) observes that modern tourists seek interaction, learning, and emotional engagement. This shift aligns with IKS, which emphasizes experiential learning and

community participation.

OECD (2020) reports that experiential tourism—such as rural, culinary, wellness, and creative tourism—is growing faster than mass tourism. These forms rely heavily on local traditions, food knowledge, and folk arts, which are core elements of IKS. In India, experiential tourism has become an important driver of domestic and inbound tourism growth.

2.3 Tourism Branding and Cultural Identity : Tourism branding focuses on creating emotional and experiential value rather than tangible attributes (Keller, 2013). Aaker (1996) emphasizes that strong brand identity is built on unique and difficult-to-imitate values, such as cultural heritage and indigenous knowledge.

Studies show that culturally rooted branding enhances trust, memorability, and destination loyalty. Pike (2016) notes that destinations leveraging local culture achieve stronger differentiation in competitive markets. IKS enables tourism startups to embed cultural meaning into brand narratives, enhancing authenticity.

2.4 Tourism Startups and Innovation : Tourism startups are innovation-driven ventures focusing on niche and experience-based markets. Despite limited resources, startups rely on creativity, storytelling, and digital platforms to compete effectively (OECD, 2020). Research suggests that startups are more open to experimenting with indigenous knowledge and community partnerships.

In India, tourism startups have promoted heritage walks, agritourism, eco-tourism, and wellness tourism by using local knowledge as a core value proposition. Such culturally embedded experiences often generate higher tourist engagement and positive word-of-mouth.

2.5 Indian Knowledge Systems and Sustainable Tourism : Literature strongly links indigenous knowledge with sustainability and responsible tourism. Traditional Indian practices emphasize harmony with nature, resource conservation, and community welfare. UNWTO (2021) identifies indigenous knowledge as a key driver of sustainable tourism, particularly in rural and ecologically sensitive regions.

In Maharashtra, rural, tribal, and agritourism initiatives reflect the integration of IKS with sustainability principles. However, scholars caution against unethical commercialization of indigenous knowledge, highlighting the need for responsible branding and community participation.

2.6 Research Gap : Although prior studies discuss indigenous knowledge, cultural tourism, and branding, limited research focuses specifically on tourism startups and their strategic use of Indian Knowledge Systems for brand building, particularly at the state level. Research examining how local knowledge is transformed into globally appealing tourism brands remains limited.

This study addresses this gap by examining tourism startups in Maharashtra and analyzing how IKS is used as a branding strategy to achieve global brand visibility.

3. Research Objectives

The study is guided by the following objectives

1. To understand the concept of Indian Knowledge Systems (IKS) in the context of tourism.
2. To examine how tourism startups use Indian Knowledge Systems as a branding strategy.
3. To analyse the role of IKS in building brand identity and brand image of tourism startups.
4. To assess the contribution of IKS-based branding in promoting local tourism startups to global markets.

4. Concept of Indian Knowledge Systems (IKS)

Indian Knowledge Systems (IKS) refer to the diverse body of knowledge developed in India through centuries of lived experience, observation, and intergenerational transmission. Unlike modern systems that emphasize formal codification, IKS is embedded in everyday life, social institutions, and cultural practices. It includes knowledge related to philosophy, culture, ecology, health, food, architecture, arts, crafts, governance, and ethical living.

The National Education Policy (NEP) 2020 recognizes IKS as a vital part of India's intellectual heritage and highlights its relevance for contemporary development, including entrepreneurship, sustainability, and cultural industries. In tourism, IKS provides a foundation for creating authentic, meaningful, and locally rooted experiences.

4.1 Components of Indian Knowledge Systems Relevant to Tourism : IKS influences tourism through several interrelated components:

- **Cultural and Heritage Knowledge :** Local histories, folklore, oral traditions, forts, temple practices, and tribal narratives form key cultural assets. In Maharashtra, Maratha forts, Warkari traditions, tribal folklore from regions such as

Melghat and Gadchiroli, and Konkani coastal heritage are prominent examples.

- **Food and Culinary Knowledge :** Traditional cuisines such as Malvani, Varhadi, Kolhapuri, and tribal food systems reflect indigenous ingredients, cooking methods, and seasonal practices. Culinary tourism startups increasingly use this knowledge to design authentic food experiences.
- **Wellness and Health Knowledge :** Ayurveda, yoga, meditation, and traditional healing practices are globally recognized elements of IKS. These systems form the core of wellness tourism offerings, particularly for international visitors.
- **Folk Arts, Crafts, and Performing Traditions :** Forms such as Lavani, Powada, Warli painting, Paithani weaving, and handicrafts represent integrated knowledge of aesthetics, symbolism, and community identity, supporting cultural preservation and entrepreneurship.
- **Ecological and Sustainability Knowledge :** Indigenous practices related to farming, water management, and forest livelihoods emphasize coexistence with nature and form the basis of eco-tourism and agritourism initiatives.

4.2 Philosophical Foundations and Tourism Alignment : IKS is guided by principles such as Vasudhaiva Kutumbakam (the world as one family), Dharma (ethical responsibility), and harmony between humans and nature. These values align with sustainable tourism, responsible travel, and ethical branding. Tourism experiences based on IKS emphasize learning, reflection, and meaningful engagement rather than mere consumption.

4.3 IKS and Authenticity in Tourism : Authenticity is a key determinant of tourist satisfaction and brand credibility. Tourists increasingly value lived experiences, local interaction, and cultural immersion. IKS supports authenticity by grounding tourism products in genuine community practices. In Maharashtra, rural and agritourism ventures use indigenous farming knowledge, traditional cuisine, and village lifestyles to create meaningful tourist experiences.

4.4 IKS as a Dynamic Knowledge System : Indian Knowledge Systems are dynamic and adaptable rather than static. Tourism startups reinterpret IKS through digital storytelling, curated experiences, and modern branding, enabling local knowledge to reach global audiences. Ethical considerations such as community consent, respectful representation, and fair benefit-sharing remain essential for sustainable use.

4.5 Relevance of IKS for Tourism Startups : For tourism startups, IKS functions as:

- A resource for experience design
- A branding tool for differentiation
- A sustainability framework
- A cultural bridge between local communities and global tourists

Integrating IKS allows tourism startups to achieve economic viability while preserving cultural heritage and enhancing global brand appeal.

5. Tourism Startups and Branding

Tourism startups are entrepreneurial ventures that introduce innovative tourism products and services such as heritage walks, rural tourism, agritourism, eco-tourism, wellness tourism, culinary tours, and experiential travel. Unlike traditional tour operators, startups rely heavily on digital platforms, niche positioning, storytelling, and customer engagement.

Branding in tourism startups extends beyond visual identity to encompass experience design, narrative creation, and value communication. A strong tourism brand evokes emotions, builds trust, and creates memorable experiences. Indian Knowledge Systems serve as a powerful branding foundation by offering originality, cultural legitimacy, and deep-rooted meaning.

6. Role of Indian Knowledge Systems in Tourism Branding

Indian Knowledge Systems play a multi-dimensional role in tourism branding, particularly for startups:

6.1 Role in Authenticity Creation : IKS ensures that tourism experiences are rooted in genuine local practices rather than artificially constructed attractions. Authenticity enhances brand credibility and tourist satisfaction.

6.2 Role in Differentiation : Since indigenous knowledge is place-specific, IKS-based branding creates unique offerings that cannot be replicated elsewhere, providing startups with a sustainable competitive advantage.

6.3 Role in Emotional Engagement : Stories, rituals, food traditions, and spiritual practices foster emotional bonds between tourists and destinations, strengthening brand recall and loyalty.

6.4 Role in Sustainability : Traditional ecological knowledge promotes low-impact tourism, resource conservation, and community well-being, aligning startups with global sustainability expectations.

6.5 Role in Community Empowerment : IKS-based tourism integrates local artisans, farmers, performers, and guides, making communities co-creators of the brand rather than passive

beneficiaries.

7. Research Methodology

The study is descriptive in nature and based on secondary data. Data sources include:

- Academic journals and books on tourism, branding, and IKS
- Government tourism reports (Ministry of Tourism, MTDC)
- Startup websites, brochures, and digital content
- Industry reports and online tourism platforms

Selected case illustrations from agritourism, heritage, rural, and wellness tourism were used to demonstrate practical applications of IKS-based branding. The study is limited to secondary sources; however, it offers valuable insights into emerging tourism branding practices and provides scope for future primary research.

8. Objective-wise Analysis, Data and Case Illustrations

8.1 Objective: IKS as a Branding Strategy : India's experiential tourism market is projected to reach USD 45 billion by 2027, driven by demand for authentic cultural experiences. Maharashtra's tourism sector has shown strong growth, with domestic tourist visits increasing from 11.1 million (2022) to 18.9 million (2024) and foreign tourist visits rising from 1.5 million to over 3.7 million.

Tourism startups use IKS strategically through

- Cultural storytelling and heritage narratives
- Immersive experiences such as village stays and craft workshops
- Indigenous symbols and regional aesthetics in branding
- Community partnerships that reinforce authenticity

Case Example : Agritourism Startups in Maharashtra

Maharashtra has over 300 registered agritourism centres, many of which operate as startups. These enterprises use indigenous agricultural knowledge, seasonal farming practices, and traditional food systems as their core brand narrative. Branding messages emphasize rural wisdom, simplicity, and sustainable living, appealing strongly to urban and international tourists.

Case Example : Saguna Baug Agritourism, Raigad integrates rural agricultural knowledge, traditional food systems, and lifestyle experiences into its brand, attracting tourists seeking authentic rural immersion.

8.2 Objective : Role of IKS in Building Brand Identity and Brand Image : IKS strengthens brand identity by embedding values such as authenticity, sustainability, and cultural respect. Startups offering culinary tourism experiences leverage traditional Maharashtrian cuisine as a brand anchor. Research shows that 56% of travelers to India are motivated by culinary experiences, indicating strong market alignment.

Brand image is positively influenced by

- Perceived authenticity and memorability
- Emotional storytelling and learning experiences
- Responsible and community-based tourism practices

A Maharashtra tourism study found that 89.4% of domestic and 92.6% of foreign tourists rated cultural experiences as meeting expectations. Tourism studies indicate that tourists participating in cultural and indigenous experiences report 20–30% higher satisfaction levels compared to conventional sightseeing tourists. Startups using IKS-based branding benefit from higher engagement, positive online reviews, and repeat visitation.

Case Example : Heritage Walk Startups in Mumbai and Pune

Heritage walk startups use local history, oral narratives, and architectural knowledge to create immersive urban tourism experiences. Their brand identity is rooted in education and cultural pride, while brand image is perceived as authentic, enriching, and intellectually engaging, particularly among international tourists.

Case Example : Vedbhumi Eco Village gained recognition as an Iconic Tourism Brand of Maharashtra for integrating indigenous knowledge, sustainability, and wellness into its brand identity.

8.3 Objective : Contribution of IKS-Based Branding in Promoting Local Tourism Startups to Global Markets : IKS-based branding significantly enhances the global visibility of tourism startups by offering unique, non-replicable experiences grounded in indigenous knowledge. Maharashtra receives over 6 million foreign tourist visits annually, with cultural, spiritual, and wellness tourism being major drivers. Cultural and culinary tourism segments are expected to exceed USD 40 billion globally by 2025. Maharashtra's share of 3.7 million foreign tourist visits in 2024 reflects international interest in culture-driven tourism.

International tourism demand increasingly favors immersive, ethical, and culturally meaningful experiences. Startups using IKS align well with this demand, enabling them to enter global travel platforms and attract niche international segments.

Case Illustration 3 : Wellness Tourism Startups

Yoga and Ayurveda-based wellness tourism startups in Maharashtra leverage traditional Indian health knowledge as their core brand promise. These startups attract international tourists seeking holistic well-being experiences, demonstrating how IKS facilitates the transformation of local knowledge into global brand appeal.

9. Conceptual Framework: IKS-Based Branding in Tourism Startups

The conceptual framework of the study explains how Indian Knowledge Systems (IKS) function as a strategic input for tourism startups to build brand identity, enhance brand image, and achieve global market visibility.

figure 1 : Conceptual Framework – IKS-Based Branding of Tourism Startups

The framework shows how Indian Knowledge Systems (IKS) help tourism startups in Maharashtra build strong brands. Startups use IKS—like local culture, food, wellness, and arts—through storytelling, experiences, community involvement, and digital promotion. This creates a unique brand identity and positive brand image, leading to higher tourist satisfaction, engagement, and global visibility. In short, IKS transforms local traditions into globally appealing tourism brands.

10. Findings and Implications

The study of tourism startups in Maharashtra reveals that Indian Knowledge Systems (IKS) play a key role in branding by offering authenticity, cultural richness, and unique experiences. Startups successfully integrate IKS through storytelling, experiential tourism, community participation, and digital promotion, which strengthens brand identity and brand image, attracts global tourists, and enhances competitiveness.

10.1 Key Findings

- IKS-based branding enhances tourist satisfaction and engagement, particularly in rural, heritage, wellness, and culinary tourism segments.
- Startups using IKS gain distinctive brand positioning that is difficult to replicate.
- Digital platforms enable small startups to reach global markets despite limited budgets.

10.2 Challenges Identified

- Limited awareness of local traditions among some startup founders.
- Risk of cultural misrepresentation or oversimplification.
- Resource constraints in documenting and implementing IKS-based experiences.
- Balancing authenticity with profitability.
- Difficulty in consistently involving local communities.
- Lack of standardization for integrating IKS into tourism products.

10.3 Implications for Startups

- Startups should train staff and founders on indigenous knowledge and ethical tourism practices.
- Collaborate with local communities to ensure authenticity and shared benefits.
- Use digital storytelling to promote cultural richness to global audiences.
- Develop quality standards and guidelines for IKS-based tourism experiences.
- Align business models with sustainable and responsible tourism principles.

10.4 Policy Implications

- Government and tourism authorities can support startups by funding IKS-based branding initiatives.
- Workshops and training programs can strengthen awareness and documentation of indigenous knowledge.
- Recognize and certify IKS-based tourism offerings to encourage credibility and global visibility.

11. Conclusion

Indian Knowledge Systems (IKS) provide tourism startups in Maharashtra with a strategic resource to create authentic, culturally rich, and globally appealing tourism brands. By integrating local traditions, heritage, culinary practices, wellness systems, and folk arts into branding and experiences, startups can strengthen brand identity, enhance brand image, and attract both domestic and international tourists.

Despite their advantages, startups face challenges such as limited awareness of IKS, risk of cultural misrepresentation, resource constraints, and balancing authenticity with profitability. Addressing these challenges through community involvement, training, digital storytelling, and sustainable practices can ensure responsible and successful use of IKS in tourism branding.

Key Actionable Points

- **Startups :** Document and responsibly integrate IKS into tourism offerings, engage local communities, and leverage digital platforms to showcase cultural authenticity.
- **Policy Makers :** Provide training, certification, and funding support for IKS-based tourism startups to strengthen global competitiveness. Collaboration between academia, communities, and startups should be strengthened.

Future research should employ primary data, consumer surveys, and comparative regional studies.

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From Local Kitchens To Global Plates : Globalization of Maharashtra's Traditional Food Culture

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Abstract

Globalization has played a significant role in transforming local food cultures by expanding their reach beyond regional boundaries. Maharashtra's traditional cuisine, known for its rich flavors and cultural significance, has increasingly gained visibility through global platforms such as social media, food blogs, travel channels, and international culinary spaces. This study aims to examine the relationship between globalization, consumers' exposure to Maharashtrian food through global platforms, and their awareness of Maharashtrian traditional food culture. A quantitative research approach was adopted, and primary data were collected from 93 respondents. The Shapiro–Wilk test indicated non-normal data distribution, leading to the use of correlation analysis. The results revealed significant positive relationships among all study variables. Consumers' exposure to Maharashtrian food through global platforms was strongly correlated with their awareness of traditional food culture ($r = .617$, $p < .001$). Globalization also showed a positive correlation with consumers' awareness ($r = .563$, $p < .001$) and their exposure to Maharashtrian food ($r = .526$, $p < .001$). These findings suggest that globalization enhances both the visibility and cultural awareness of Maharashtrian cuisine. The study concludes that global connectivity and digital media serve as powerful tools for promoting traditional food culture while fostering cultural appreciation. The research highlights the importance of leveraging globalization responsibly to preserve the authenticity and heritage of Maharashtrian cuisine while expanding its global presence.

Introduction

Globalization has significantly transformed cultural practices across the world, including food traditions that once remained confined to local communities. In recent years, regional cuisines have gained global recognition due to increased travel, digital media, and cross-cultural interactions. Maharashtra's traditional food culture, known for its diverse flavors, indigenous ingredients, and deep-rooted culinary heritage, is now reaching international audiences through global platforms such as social media, food blogs, travel channels, and international restaurants. This global exposure has not only increased the visibility of Maharashtrian cuisine but has also contributed to a renewed interest in its traditional recipes and cooking practices, making food an important medium of cultural exchange.

In the present study, three key concepts are examined: globalization, consumers' exposure to Maharashtrian food through global platforms, and consumers' awareness of Maharashtrian traditional food. Globalization refers to the growing interconnectedness of cultures through technology, trade, and communication. Consumers' exposure represents the extent to which individuals encounter Maharashtrian cuisine through digital media, international food events, and global culinary spaces. Awareness refers to consumers' understanding and knowledge of traditional dishes, ingredients, preparation methods, and cultural significance associated with Maharashtrian food. Together, these variables help explain how local food culture is influenced and reshaped in a global context.

The need for this study arises from the increasing commercialization and global adaptation of traditional cuisines, which raises concerns about cultural preservation and authenticity. While globalization offers opportunities for cultural promotion, it is important to understand how it influences consumers' perceptions and knowledge of traditional food heritage. Exploring these relationships helps in assessing whether global exposure strengthens cultural awareness or merely promotes superficial

consumption.

Therefore, this research aims to explore the interrelationships among globalization, consumers' exposure to Maharashtrian food through global platforms, and their awareness of traditional food culture. By examining these associations, the study seeks to understand how global forces contribute to the promotion, recognition, and preservation of Maharashtra's rich culinary heritage in the contemporary world.

Review of Literature

Lang, T., & Heasman, M. (2015). Food wars: The global battle for mouths, minds and markets (2nd ed.). Routledge, this work examines the "global battle" over food systems, highlighting how globalization shapes market competition and influences consumer choices on a massive scale. It provides a framework for understanding how global forces can alter traditional dietary patterns and food production.

Global Dietary Trends and Health

Popkin, B. M. (2006/2012 cited, with related context up to 2012; however, Note: The paper includes a related conceptual reference to Popkin, B. M., Adair, L. S., & Ng, S. W. (2012) which is often used in modern literature to discuss the ongoing obesity pandemic and nutrition transition.), although originally published in 2012, this core reference in the paper addresses the "global nutrition transition," explaining how diets are rapidly shifting toward processed foods, sugar, and fats—often at the expense of high-fiber traditional diets.

Food and Culture Reader

Counihan, C., & Van Esterik, P. (2013/2018 referenced editions). Food and culture: A reader (3rd/4th ed.). Routledge, this comprehensive collection explores the profound links between food,identity, and shared heritage. It serves as a foundational text for understanding how traditional foods act as cultural markers and how these symbols are challenged by urbanization and globalization.

World History of Food

Pilcher, J. M. (2016). Food in world history (2nd ed.). Routledge, Pilcher provides a historical perspective on how culinary traditions have evolved globally. This reference supports the paper's discussion on how increased travel and cross-cultural interactions have historically brought regional cuisines to international audiences.

Healthy Diet Standards

WHO. (2020). Healthy diet factsheet. World Health Organization, this recent fact sheet outlines the global standards for a healthy diet. The research paper uses this context to contrast traditional, indigenous food practices—often rooted in local health benefits—with the industrialized, high-sugar, and high-fat options often promoted by global food outlets.

Objectives

1. To examine the relationship between consumers' exposure to Maharashtrian food through global platforms and their awareness of Maharashtrian traditional food.
2. To study the relationship between globalization and consumers' awareness of Maharashtrian traditional food.
3. To analyze the relationship between globalization and consumers' exposure to Maharashtrian food through global platforms.

Hypotheses

- **H1 :** Consumers' exposure to Maharashtrian food through global platforms is positively correlated with their awareness of Maharashtrian traditional food.
- **H2 :** Globalization is positively correlated with the consumers' awareness of Maharashtrian traditional food.
- **H3 :** Globalization is positively correlated with consumers' exposure to Maharashtrian food through global platforms.

Research Methodology

The study adopted a quantitative research approach and utilized primary data collected through a structured questionnaire designed to measure globalization, consumers' exposure to Maharashtrian food through global platforms, and their awareness of traditional food culture. Simple random sampling technique was employed to ensure unbiased representation of respondents. A total of 93 valid responses were collected and used for analysis. The data was analysed using statistical tools such as the Shapiro–Wilk test for normality and correlation analysis to examine the relationships among the study variables. This methodology enabled a systematic and objective assessment of the research objectives.

Table 01 : Shapiro Wilk Test of Normality

Variables	Statistic	df	Sig.
Consumers' exposure to Maharashtrian food	0.924	93	0.000
Consumers' awareness of Maharashtrian traditional food	0.765	93	0.000
Globalization	0.894	93	0.000

Source : Researcher's compilation from Primary Data through SPSS

The Shapiro–Wilk test of normality (Table 01) indicated that all three variables—consumers' exposure to Maharashtrian food ($W = 0.924$, $p = .000$), consumers' awareness of Maharashtrian traditional food ($W = 0.765$, $p = .000$), and globalization ($W = 0.894$, $p = .000$)—deviated significantly from normal distribution, as the p-values were below the 0.05 threshold. This result confirms that the data are not normally distributed, thereby justifying the use of non-parametric statistical techniques such as Spearman's correlation for further analysis in the study.

Table 02 : Correlation test Results

Variables	Correlation Coefficient	Sig.
Exposure vs. Awareness	.617	0.000
Globalisation vs. Awareness	.563	0.000
Globalisation vs. Exposure	.526	0.000

Source : Researcher's compilation from Primary Data through SPSS

The correlation analysis (Table 02) revealed significant positive relationships among the study variables. Consumers' exposure to Maharashtrian food through global platforms was strongly correlated with their awareness of traditional food ($r = .617$, $p < .001$). Globalization also showed a significant positive correlation with awareness ($r = .563$, $p < .001$) and with exposure ($r = .526$, $p < .001$). These results support the proposed hypotheses, indicating that globalization enhances both the visibility of Maharashtrian food and consumers' awareness of its traditional culture.

Researcher's Discussion and Interpretation

The present study explored the impact of globalization on consumers' exposure to and awareness of Maharashtrian traditional food culture. The Shapiro–Wilk test results indicated that the data did not follow a normal distribution, justifying the use of non-parametric correlation analysis. The correlation findings revealed strong and statistically significant positive relationships among all study variables, thereby supporting all three proposed hypotheses.

The strong positive correlation between consumers' exposure to Maharashtrian food through global platforms and their awareness of traditional food ($r = .617$, $p < .001$) suggests that digital media, food blogs, social networking sites, travel platforms, and international culinary shows play a vital role in promoting regional cuisine. Increased online exposure helps consumers learn about traditional dishes, ingredients, cooking methods, and cultural significance, thereby strengthening their awareness and appreciation of Maharashtrian food heritage.

Similarly, the significant positive relationship between globalization and consumers' awareness of Maharashtrian traditional food ($r = .563$, $p < .001$) indicates that global cultural exchange has contributed to the revival and recognition of regional food traditions. Globalization has enabled Maharashtrian cuisine to reach international audiences through restaurants, festivals, tourism, and digital platforms, fostering cultural curiosity and knowledge among consumers.

Furthermore, the positive correlation between globalization and consumers' exposure to Maharashtrian food through global platforms ($r = .526$, $p < .001$) highlights how technological advancements and global connectivity have expanded access to regional cuisines. Food delivery apps, international food festivals, YouTube channels, and social media influencers have significantly increased the visibility of Maharashtrian food beyond local boundaries.

Overall, the findings demonstrate that globalization acts as a powerful catalyst in transforming local food traditions into globally recognized cultural symbols. While preserving authenticity, digital platforms and cross-cultural interactions have helped Maharashtrian cuisine gain wider acceptance and appreciation. This study emphasizes the importance of leveraging globalization responsibly to promote traditional food culture while safeguarding its originality and cultural values.

Conclusion

The study concludes that globalization has a significant and positive influence on consumers' exposure to and awareness of Maharashtrian traditional food culture. Increased visibility through global platforms such as social media, food blogs, and international culinary spaces has enhanced consumers' knowledge and appreciation of regional cuisine. The strong relationships identified among globalization, exposure, and awareness highlight how cultural exchange and digital connectivity contribute to transforming local food traditions into globally recognized identities. Overall, the findings emphasize that globalization, when effectively utilized, can serve as a valuable tool for preserving and promoting Maharashtrian food heritage while expanding its reach to diverse audiences.

Suggestions

- Government bodies such as the Ministry of Tourism and Ministry of Culture should promote Maharashtrian cuisine through digital platforms and international food campaigns.
- State tourism departments and cultural organizations should organize traditional Maharashtrian food festivals and pop-up events at national and international levels.
- Local food entrepreneurs, home-chefs, and self-help groups, with support from government and NGOs, should be encouraged to access global markets.
- Food processing companies and export agencies, under guidance from FSSAI and APEDA, should standardize recipes and packaging for international distribution.
- Restaurants, hotels, and hospitality institutes should collaborate to include Maharashtrian cuisine in global menus and culinary education programs.
- Government authorities and intellectual property offices should promote the use of Geographical Indication (GI) tagging for region-specific

Maharashtrian food products.

- Educational institutions, media, and cultural organizations should create awareness among younger generations about the cultural importance of Maharashtrian traditional food.

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A Study on Comparing the Effectiveness of AI based marketing against Traditional marketing of Beauty Industry among Gen Z

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Abstract

In the current digital age, AI-driven marketing is rapidly gaining momentum in multiple industries, including the beauty field. This research analyzes the efficacy of AI-based marketing in contrast to conventional marketing approaches, particularly within Generation Z audience. The results indicate that both the type of marketing have significant effect on consumer product selection.Even with the growth of AI technologies, a level of skepticism and incomplete trust in AI-driven marketing persists when compared to conventional approaches. Study participants expressed a liking for innovations like virtual try-on features, conventional in-store experiences, AI-driven skincare assessments, and campaigns led by celebrities and influencers. Although AI-driven marketing is seen as a hopeful resource for the future, its greatest effectiveness seems to be in its combination with conventional marketing methods. The study ultimately finds that AI-enabled marketing and traditional marketing both have significantly impacts beauty product purchases among Gen Z due to their own benefits.

Key Words : AI based marketing, Traditional marketing, Beauty Industry, Gen Z.

Introduction

Marketing has changed significantly as a result of the ongoing advancements in technology in all industries. Conventional marketing techniques, including banners, brochures, television commercials, and magazine ads, are generic and non-individualized. However, a new era of marketing has emerged with the introduction of Artificial Intelligence (AI), emphasizing customization, personalization, and immersive experiences such as virtual try-ons. These developments have greatly improved consumer interaction, especially in sectors like the beauty industry where personal tastes and requirements are crucial.

Particularly open to technological innovation is Generation Z, which is renowned for being extremely tech-savvy and connected online. This generation is accustomed to using digital platforms and frequently favors convenient, interactive, and secure online buying experiences. AI-based marketing techniques frequently meet Gen Z consumers' expectations for personalized information and instantaneous interaction.

Due to the great diversity of skin types, tones, and preferences, customization is crucial in the beauty industry. Beauty brands can better meet these varied needs with AI-driven technologies than with conventional marketing strategies. With an emphasis on Generation Z, this study compares the efficacy of AI-based marketing with conventional marketing techniques in the beauty industry. It will evaluate both marketing strategies' overall efficacy and Gen Z consumer attractiveness.

Literature Review

Sumitha K. (2023) This research explores AI's evolution in marketing, examining customer adoption and perspectives. It aimed to determine AI's future in marketing and compare it to traditional methods. AI will fundamentally reshape marketing, creating more personalized, predictive, and automated advertising. AI is inevitably part of future marketing and sales; familiarizing ourselves with its capabilities is crucial. The researcher used Primary data with the help of convenience sample of 200 individuals.

GuerraTamez CR et.al (2024) This study explores how AI influences Generation Z's purchasing habits in fashion, technology, beauty, and education. The analysis of participant responses shows that AI exposure, attitudes toward AI, and perceived AI accuracy significantly build brand trust, boosting purchasing decisions. Importantly, a positive user experience mediates the link between brand trust and purchases.

Winarto L. and Wisesa A. (2024) This study explores the intersection of artificial intelligence (AI) and sustainability within Indonesia's beauty market, focusing on Generation Z consumers. It examines how AI technology, specifically Garnier Skin Coach AI, influences Gen Z's purchasing decisions for Garnier skincare. The research also investigates the impact of sustainability on Gen Z's preferences and choices, using the Stimulus-Organism-Response (SOR) model. Results reveal AI significantly enhances hedonic value, while sustainable practices (eco-friendly and cruelty-free) strongly influence preferences and purchase intent, demonstrating a rising demand for sustainable beauty experiences.

Bunea O.- I et.al. (2024) This study investigates how artificial intelligence (AI) tools influence Gen Z's online shopping intentions, using a modified technology acceptance model (TAM). It examines AI exposure, usage, and knowledge, alongside TAM's perceived usefulness (PUAI) and ease-of-use (PEUAI). Data from 1128 Gen Z respondents, gathered via a 38-item questionnaire, reveals significant direct effects of AI exposure, use, and knowledge on PUAI and PEUAI, which in turn impact purchase intentions. Indirect effects show PUAI and PEUAI mediate the relationship between AI familiarity and purchase intentions, suggesting that greater AI understanding boosts AI-powered online shopping.

Bilal M. et. al. (2024) This study investigates customer purchase intentions using the social support theory, which combines AI technology, consumer social media involvement, and consumer experience. This study discovered that AI improves user experience and engagement on social media. Similarly, there is a favorable association between social media involvement and consumer experience, which leads to more satisfied customers and increased buy intent. Online surveys were done with 467 Chinese social media users who had previous experience with online shopping and AI technologies.

Research Gap

Earlier studies have highlighted the increasing role of AI in marketing, especially in enhancing personalization and user engagement. Researchers have explored how AI impacts Gen Z's buying behavior in sectors like beauty, fashion, and education. These studies show AI improves brand trust, user experience, and purchase intention. Various theoretical models have been used to study AI's effectiveness, such as the Technology Acceptance Model (TAM) and Social Support Theory. However, most existing research focuses solely on AI, without comparing it to traditional marketing approaches. There is limited investigation into which method is more effective among Gen Z in the beauty industry. Few studies evaluate the strengths and weaknesses of both strategies side by side. Additionally, most research is context-specific and lacks a broader comparative perspective. This creates a gap in understanding AI's relative value in current marketing practices. The present study aims to address this gap through a comparative analysis of AI and traditional marketing effectiveness among Gen Z beauty consumers.

Significance of Study

This study is important for marketing practice as well as scholarly research. Since Generation Z is becoming a significant customer group with unique digital habits, it is essential to comprehend how they react to various marketing tactics. The study compares AI-based marketing with conventional beauty industry techniques to determine whether strategy is more successful in influencing Gen Z's purchasing decisions. The results can be used by marketers and beauty firms to better manage resources, improve customer engagement, and create strategies that meet the expectations of Generation Z. By providing a direct comparison analysis, which is currently lacking, this study also adds to the body of existing material. Future research on how changing technologies continue to alter marketing dynamics in consumer-focused businesses can build on this basis.

Objectives

1. To analyze the preferred method of selecting beauty products between AI-based marketing and traditional marketing.
2. To examine the limitations of AI-based marketing and traditional marketing in targeting Gen Z consumers.
3. To identify the most preferred innovations in the beauty industry among Gen Z customers.
4. To evaluate the perception of Gen Z consumers towards AI-based marketing in comparison with traditional marketing in influencing beauty product purchases.
5. To study the most effective marketing method preferred by consumers for the future.

Hypothesis

- **H0 :** There is no significant difference between AI-based and traditional marketing in influencing Gen Z beauty purchases.
- **H1 :** There is a significant difference between AI-based and traditional marketing in influencing Gen Z beauty purchases.

Research Methodology

Type of Research

This study employs a descriptive research design to describe, explain, and validate findings regarding the comparing effectiveness of AI based marketing against traditional marketing of beauty brands among Gen Z

Area of Study

The research is being carried out in Mumbai.

Sampling Method

The sampling technique that was used was a Convenient sampling method.

Target Population

Gen Z born between late 1990s and early 2000s. would constitute the target audience for research.

Types and Sources of Data

The current study is based on Primary data collected via a structured questionnaire created in Google Forms. All closed-ended questions related to the study's objectives and hypothesis were asked. It also used secondary data from online sources.

Statistical Tool Use

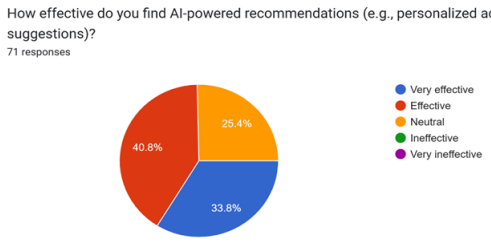
Graphs are used to organize data and to display it in an easy-to-understand and remember format. The Chi-square test is used to test hypothesis.

Limitations

1. A sample size of 71is a limitation; the results may differ if the sample size is increased.
2. The research is restricted to the Mumbai.
3. The People's responses may be biased.
4. The evasion of information, overstatement and understatement which may lead to distortion of data taken.
5. There were few options available for the selection in the questions, which might not have covered every facet of the research.

Data Analysis and Findings

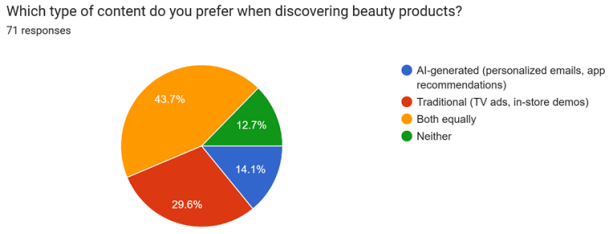
Fig 1 : Effectiveness of AI-powered recomme recommendations



Source : Primary Data

The intriguing aspect is that among five choices, respondents chose only three: 33.8% consider AI-driven recommendations very effective, 40.8% think they are effective, and 25.4% feel neutral about them.

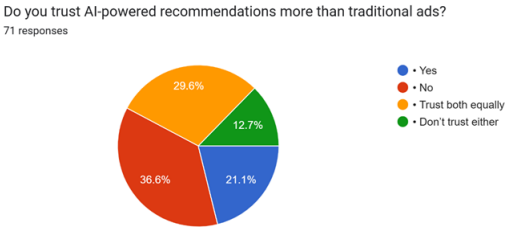
Fig 2 : Type of Content



Source : Primary Data

43.7% of respondents favor a combination of AI-generated and traditional content to explore beauty products. 29.6% of respondents favor traditional content such as TV ads and in-store demonstrations, while 14.1% lean towards AI-generated content like personalized emails and app suggestions. 12.7% of respondents prefer neither option.

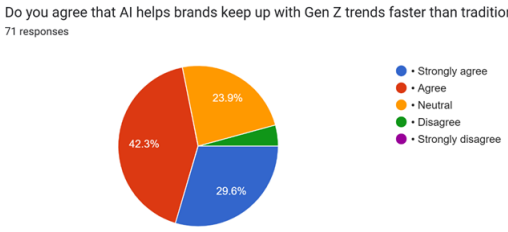
Fig 3 : Trust on AI-powered recommendations than traditional ads



Source : Primary Data

A significant portion of respondents, specifically 36.6%, places more trust in traditional ads than in AI-powered recommendations, while 21.1% prefer AI-driven recommendations over traditional ones. 29.6% have confidence in both, while 12.7% lack trust in either.

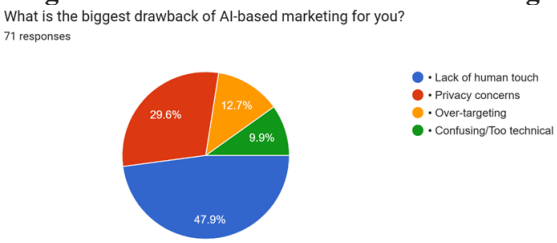
Fig 4 : AI keep up with Gen Z trends



Source : Primary Data

42.3% of individuals believe that AI enables brands to stay on top of Gen Z trends more quickly than conventional marketing methods. 29.6% of individuals completely concur with this statement. 23.9% hold a neutral stance on the matter. 4.2% of individuals are against it. No one chose the strongly disagree option.

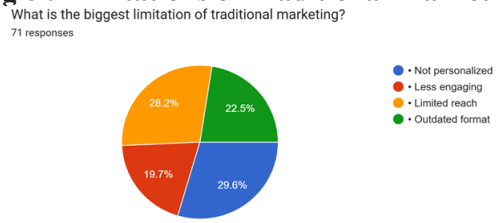
Fig 5 : Drawbacks of AI-based Marketing



Source : Primary Data

When asked about the disadvantages of AI-based marketing, 47.9% of respondents said it lacks a human touch, 29.6% said it raises privacy concerns, 12.9% said it is over targeting, and 9.9% said it is complicated or too technical.

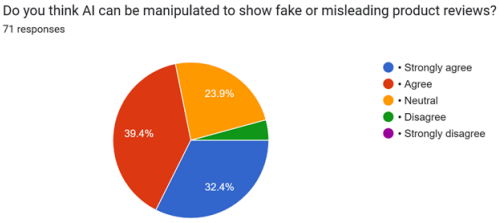
Fig 6 : Limitations of Traditional Marketing



Source : Primary Data

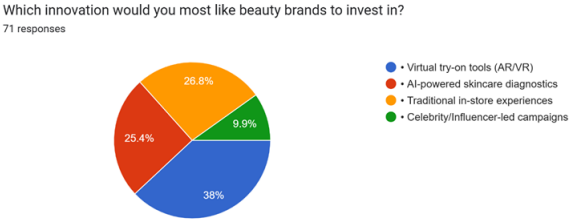
While asked about the drawbacks of traditional marketing, 29.6% of respondents said it is not individualized, 28.5% said its reach is limited, 22.5% said its structure is obsolete, and 19.7% said it is less engaging.

Fig 7 : AI manipulation to show fake or misleading product reviews



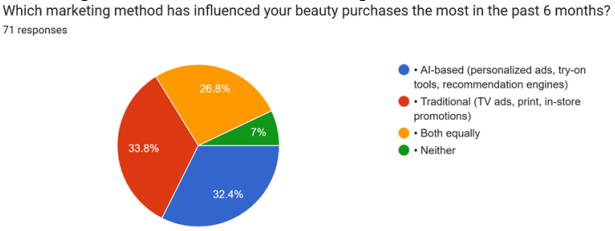
39.4% of respondents believe AI can be used to create false or deceptive product reviews, while 32.4% strongly concur with this statement. 23.9% are indifferent to it and 4.3% oppose it. No one chose the strongly disagree option.

Fig 8 : Most liked innovation for beauty brands to invest



38% of respondents prefer beauty brands to focus on innovations such as Virtual try-on tools. 26.8% prefer investment in Traditional in-store experiences, 25.4% favor AI-powered skincare diagnostics, and only 9.9% of respondents want beauty brands to invest in celebrity/ influencer-led campaigns.

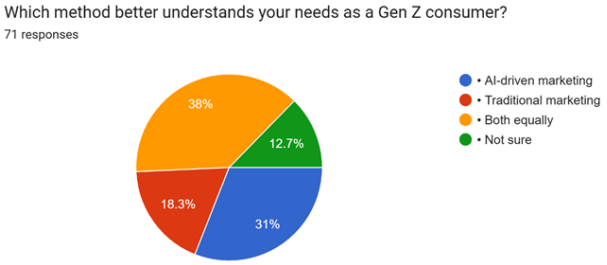
Fig 9 : Marketing method has influenced beauty purchases the most in past 6 months



Source : Primary Data

A significant portion of respondents, specifically 33.8%, reported that their beauty purchases were affected by traditional marketing over the last six months. 32.4% of individuals affected by AI-driven marketing. 26.8% affected by both and 7% affected by neither.

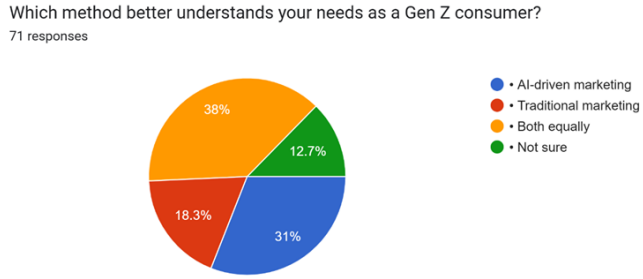
Fig 10 : Method better understand needs of Gen Z consumer



Source : Primary Data

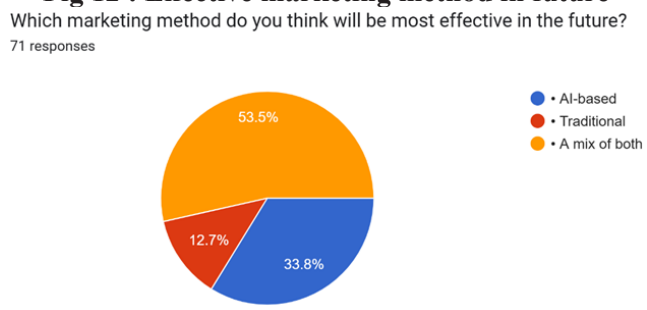
Of the respondents, 38% believe that both AI-driven marketing and traditional marketing comprehend the needs of Gen Z consumers. 31% of respondents opted for AI-driven marketing methods, while 18.3% chose traditional marketing to gauge their needs. 12.7% of people are uncertain about both options.

Fig 11 : Method Better Understand Gen Z consumers



Source : Primary Data

Fig 12 : Effective marketing method in future



Source : Primary Data

A significant portion of individuals, specifically 53.3%, believe that a combination of both approaches will be the most effective in the future. 33.8% of individuals believe that AI-driven marketing will be the most effective in the future, while 12.7% feel that traditional marketing will be the most effective going forward.

Hypothesis Testing

Fig 13 : Marketing Method that Influence Beauty Purchases

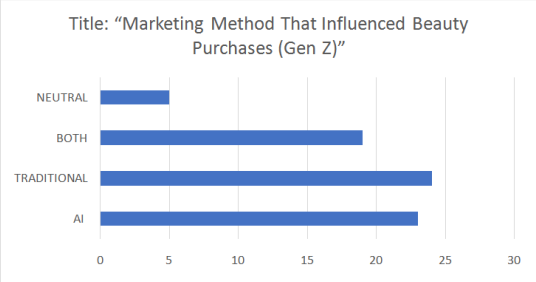
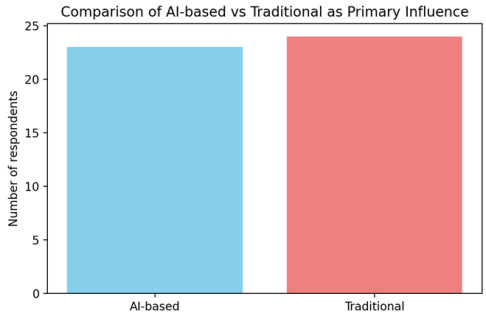


Fig 14 : Comparison of AI-based vs Traditional as Primary Influence



From the subset used for hypothesis testing (only AI-based vs Traditional)

- N (for this test) = 47
- AI-based = 23 (48.9%)
- Traditional = 24 (51.1%)
- $?^2(1) = 0.021$, $p = 0.884$

Results for H1 (AI-based vs traditional marketing influence).AI-based marketing was chosen by 23 respondents (48.9%) and traditional marketing by 24 respondents (51.1%) among those who said that either type of marketing had most influenced their beauty purchases in the last six months (N = 47). To ascertain whether the measured frequencies deviated considerably from an anticipated equal distribution between the two approaches, a chi-square goodness-of-fit test was employed. With $?^2(1) = 0.021$ and $p = 0.884$, the test was not statistically significant. This suggests that there is no proof that AI-based marketing was selected more often than traditional marketing as the main factor influencing Gen Z cosmetic purchases in this group. Therefore, these findings contradict H1, which suggested that AI-based marketing is thought to be more successful than traditional marketing in influencing the purchase of beauty products.

Conclusion

AI-based marketing (e.g. tailored emails and app recommendations etc.) and traditional marketing (e.g. TV advertisements and in-store demonstrations etc.) each have advantages and disadvantages. individuals still favor traditional marketing content over AI-based information, although the majority of individuals utilize a combination of the two when discovering beauty items. Both systems have limits. In descending order of importance, AI-based marketing has difficulties such as a lack of human touch, privacy concerns, overtargeting, and confusing/too technical. One of the most significant constraints agreed upon by most consumers is AI manipulation to display fake or misleading product reviews. Customers confront challenges with traditional marketing such as lack of personalization, restricted reach, obsolete formats, and low engagement in high to low order. When it comes to trust, individuals favor traditional marketing to AI-based marketing. While it comes to the beauty sector, corporations are increasingly implementing a variety of advances. Customers choose virtual try-on tools (AR/VR), followed by AI-powered skincare diagnostics, traditional in-store experience, and celebrity/influencer-led campaigns. Although AI-based marketing is frequently marketed as a more personalized and engaging strategy, the current findings do not show that it is seen as more influential than traditional marketing among Gen Z beauty consumers. According to this study, AI-based and traditional marketing were virtually equally likely to be identified as the primary driver of recent beauty product purchases, implying that both channels continue to have an impact at this point. When it comes to better understanding Gen Z's demands, the majority of respondents believe that AI-based marketing understands them better than traditional marketing. They believe a combination of AI and traditional marketing will be useful in the future.

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A Study on E-Commerce Platform for Rural Products (wsrt KISANKONNECT)

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Abstract

This paper focuses on KisanKonnect an e-commerce platform to sell the farm products to urban consumers in Mumbai and Pune. The changing scenario of our nation, the digitalisation and modernisation has led to a new system of selling the farm output directly to the consumers through online platform. Now the farm products are directly made available to the consumers by using online apps. KisanKonnect is one such app which facilitates the farmers to sell their products directly to consumers. This paper focuses on how this app was initialised and its current senerio. It's a story which began with 11 farmers who were struggling to sell their rural products during the covid pandemic and how it captured the market by taking the opportunity in covid pandemic.

Keywords : e-commerce, Kisankonnect.

1. Introduction to e-Commerce

1.1 Introduction: The recent changes in selling the farm products is the e-commerce system : E-commerce is buying and selling of products online. The changing scenario of our nation, the digitalisation and modernisation has led to a new system of selling the farm output directly to the consumers through online platform. Now the farm products are directly made available to the consumers by using online apps. This has facilitated the farmers as well as the consumers. Online apps are now in trend for purchasing the farm products. E-commerce is revolutionizing rural India's agriculture by directly linking farmers to markets and cutting out middlemen. Various e-commerce apps in India are Amazon, Flipkart, Myntra, Nykaa, Meesho, etc. Amazon deals with electronics, home products of daily use, fashion products, etc. Myntra deals with fashion clothes, Nykaa with beauty products, etc. We now also have apps which sell the farm products to consumers. These platforms are ideal for selling fresh produce like vegetables, fruits, and organic goods directly to individual households or local shops. Few of the apps are KisanKonnect, Vithai, etc. The most famous app is Kisan Konnect. It is a market place where the farm products are sold fresh and directly from the farm at a reasonable rate to the consumers. KisanKonnect is a platform where the farm products are sold in urban areas like Mumbai, Pune, etc. It deals with fresh farm produce and also snacks items.

1.2 Benefits of e-commerce

- Quick shopping at doorstep
- No travelling and reasonable prices products
- Helps to access the market easily online
- Variety of choice available
- Time saving and economical
- Can be done at any time from any place
- Wider selection and options available
- Easy payment system
- Quick delivery at doorstep

1.3 E-commerce apps in India

The evolution of e-commerce took place in the early 2000. In the early days online flight bookings were in trend. As years passed and digitalisation in the payments system became much easier various apps came into existence. Smart Mobile phones became common and usage of apps started increasing rapidly. There were various Apps dealing in electronic products, fashion, beauty, groceries, etc. The rural market got the online platform during the COVID Pandemic. Today there are few Apps dealing in farm products. Kisan Konnect is one such App which is at its top level in providing the farm products to urban areas like Mumbai and Pune.

2. Review of Literature

- T. Lalitha, N. Velmurugan, Dr T. Mukilan (April 2022), research paper on "Magnitude of e-commerce in rural areas-A Reviews", published in International Journal of Research

Publication and Reviews (ISSN 2582-7421), focuses on magnitude and role of e-commerce in rural areas. The research paper has covered areas in Tamil Nadu. The paper mainly aims to discuss the importance of e-commerce in rural areas.

- Ms Asiya Shaikh (January 2025), research paper on "E-commerce and rural India: Challenges and opportunities for market inclusion", published in a Multidisciplinary Peer-Reviewed Referred Research Journal (ISSN -2277-7911), focuses on intersection of e-commerce and rural India. It focuses on the challenges and the opportunities that e-commerce presents for market inclusion. It focuses on how e-commerce platforms can be used to market and sell agricultural products.
- Dr Swaty (December 2024), a research paper on "Prospects and Challenges of ecommerce in rural India), published in Journal of emerging technologies and innovative research (ISSN-2349-5162), focuses that e-commerce initiatives in rural areas has fostered economic growth. It explores on how e-commerce has bridge the gap between rural producers and the consumers.
- Dr Subhash D'Souza, a research paper on "Application of e-commerce in rural India : A case study of rural entrepreneurs from Palghar district" published in International Journal of Multidisciplinary Research (ISSN 2582-7219), focuses on how ecommerce platforms can be used to market and sell agricultural products, connecting farmers and the artisans directly to consumers. The paper focuses on Palghar district of Maharashtra.

3. Objevtive of The Study

- To study the working of KisanKonnect App.
- To study the operational working system of KisanKonnect.
- To study the challenges faced by Kisankonnect.

4. Methodology

This study is based on secondary data gathered from internet system.

5. The Kisan Konnect App

5.1 History of KisanKonnect : The founder of Kisankonnect was Mr Vivek Nirmal and Nidhi Nirmal in the year 2020. The idea behind Kisankonnect was generated when there were challenges faced by farmers to sell their products in the Covid Pandemic. This idea initiated when 11 farmers from Ahmednagar and Pune were finding it difficult to sell their farm produce in the Covid Pandemic. They were struggling to find ways to sell their produce. The Covid pandemic brought an opportunity for farmers to explore various ideas to sell their produce. These farmers started using What's App group to sell their products. They made efforts to sell the produce to urban consumers using What's App. Managing daily orders through What's App and Phones during lockdowns, gave rise to Kisankonnect App. Mr Vivek Nirmal was inspired by their efforts and started the Kisankonnect App. The main aim was to connect the farmers to the consumers by this App. Kisankonnect became platform for the farmers to sell their produce to the consumers directly without any middlemen. This helped them to sell their products at a reasonable price. The traditional market system involves middlemen and increases the cost of sales. There are often multiple intermediaries which increases the costs and also there is no connection between the farmer and the consumer. To bridge this gap Kisankonnect uses its technology where the consumer can know from which farm the produce has come.

Traceability is a best feature of this App where the consumer gets to get familiar with the ones who grow food. Traceability feature helps to know from which farm the produce has arrived. Kisankonnect assures quality produce. They also conduct soil testing, farming methods and technology of the farmers with whom they are connected on the Kisankonnect platform. Quality testing is done before the produce reaches the consumers.

Vision of Kisankonnect

- To build a sustainable ecosystem for farmers by providing fair prices and reliable markets.
- To offer urban consumers fresh, safe, and traceable produce through their app and farm stores.

5.2 Features of kisankonnect

- The platform connects over farmers directly with consumers in Mumbai and Pune.
- It uses a tech-enabled, temperature-controlled logistics system to deliver produce from farms to doorsteps within 24 hours.
- It has a feature which allows customers to scan QR codes on produce to see the exact farm and farmer it came from.
- It deals with fruits and vegetables, grains and pulses and also preservative-free snacks and handmade delicacies.
- It also operates physical KisanKonnect Farm Stores across Mumbai and Pune.

5.3 Current scenario of Kisankonnect

- Today it connects over 5,000 farmers directly to urban consumers. The urban consumers are usually from Mumbai and Pune. This approach has helped to eliminate the middle men and provide fair prices to consumers.
- The company serves more than 1 lakh consumers across Mumbai and Pune.

- They offer fresh fruits, vegetables, pulses, food-grains, etc to the consumers.
- Their traceability technology helps to identify from which farm the produce has arrived.
- They have quick delivery system.

5.4 Challenges faced by KisanKonnect : Kisan Konnect faces challenges common in Indian agriculture and fresh produce delivery, including managing a complex supply chain with high wastage, ensuring consistent quality from diverse farms, battling climate change impacts, high input/logistics costs, intense competition from quick commerce, and integrating technology with traditional farming practices, all while navigating market access issues for farmers and maintaining efficient, sustainable operations.

Key Challenges

1. Requirement of significant investment in tech-enabled procurement, sorting, grading, and temperature-controlled delivery to maintain freshness.
2. Ensuring fair prices and consistent quality from thousands of farmers requires overcoming issues like lack of modern techniques, inconsistent supply, and market access barriers.
3. Facing the changing consumer behaviour.
4. Difficulties are faced due to soil degradation, water scarcity and changing weather patterns directly impact crop yields and quality, affecting supply.
5. Increase in the maintenance cost due to use of high technology.
6. Facing financial pressures due to rising input costs for fertilizers, pesticides, etc.
7. Challenge in maintaining consumer trust and convincing consumers to buy the products.

6. Conclusion & Recommendations

The online platform is helpful to both the farmers as well as the consumers. Kisankonnect took the challenge of covid pandemic as an opportunity to sell farm products online. There is a need first of all to create many more such platforms especially for the rural market. KisanKonnect is one of the initiatives taken during the covid pandemic. KisanKonnect covers Mumbai and Pune Urban areas.

There is a need for the Government to encourage many more such e-commerce platforms and make available the products of any State to any consumer belonging to other State also in India.

As India is an agricultural country, we need to have more such e-commerce platforms for making available every State product of rural areas through online system.

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The Algorithmic Transformation of Human Capital : Technology and AI Impact on Strategic Human Resource Requirements

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Abstract

The integration of Artificial Intelligence (AI) and intelligent automation is redefining the Human Resources (HR) function and fundamentally restructuring the global workforce. This research analyses AI's dual impact: achieving massive operational efficiency within HR by automating transactional tasks, and dictating a profound resource shift across the enterprise toward strategic, human-centric competencies. Key findings reveal that AI significantly reduces the demand for repetitive administrative roles, such as payroll processing and resume screening, but simultaneously creates an acute requirement for specialists in data ethics, change management, and strategic workforce planning. To succeed, HR leaders must pivot from administrative roles to strategic advisors (HRBPs, L&D), establish rigorous, cross-functional governance structures, and comply with rapidly evolving regulatory frameworks, particularly the EU AI Act, which classifies AI systems in recruitment and performance management as "High-Risk". The conclusion asserts that the future resource requirement for HR is qualitative, emphasizing emotional intelligence and critical judgment to ensure ethical fairness, trust, and human augmentation.

I. Executive Summary

The widespread integration of Artificial Intelligence (AI) and intelligent automation fundamentally transforms Human Resources (HR) from an administrative function into a strategic driver of organizational productivity and governance. AI's impact is twofold: it delivers massive operational efficiency within the HR function by automating repetitive tasks, while simultaneously dictating profound structural changes across the broader enterprise workforce.

This transformation requires a fundamental pivot in HR resource requirements. AI diminishes the need for roles focused on transactional execution (e.g., basic screening, payroll) but creates an urgent demand for competencies centered on strategic foresight, ethical governance, and human augmentation. Successful navigation of this shift requires HR leadership to adopt an "AI-First" operating model, prioritize cross-functional legal and IT governance to manage high-risk compliance issues and urgently invest in reskilling the workforce. The focus must shift to human-centric competencies, including data ethics, empathetic leadership, and critical thinking. The primary impediment to realizing the projected 15% long-term productivity gains from AI adoption is the failure to proactively manage organizational change, algorithmic bias, and the resulting demographic displacement risks.

II. Introduction: Defining the AI Paradigm Shift in Human Capital

A. The Context of Generative AI and Labour Productivity

The maturation of generative AI (Gen AI) and sophisticated machine learning models, built upon capabilities like large language models (LLMs), represents a historical disruptive force comparable to the Industrial Revolution. The central challenge, however, is the maturity gap. While 92% of companies plan to increase AI investments over the next three years, only 1% of leaders classify their organizations as "mature" in AI deployment, meaning systems are fully integrated and driving substantial business outcomes. This organizational gap means the immediate HR requirement is dominated by specialists in change management and integration who can transition companies from isolated pilot programs to integrated AI system adoption.

B. Research Objectives and Thesis: AI as an Augmentation Engine

This research assesses how AI is altering core

human capital requirements by examining its dual impact: operational efficiency within HR and structural change to the broader workforce.

The central thesis is that AI necessitates a fundamental restructuring of HR resource requirements, demanding a pivot away from administration toward strategic, ethical, and analytical competencies. Successful utilization of AI transforms HR into an augmentation engine focused on maximizing human potential and enforcing robust governance. Despite the profound need for HR leadership in this transformation, only 20% of executives currently assert that HR owns the future of work strategy. If HR fails to claim ownership of this change, employee resistance could rapidly become the primary barrier to realizing AI's full potential.

C. AI Adoption Status and Organizational Maturity in HR

AI adoption in HR is accelerating, with approximately one in four organizations currently using AI to support HR-related activities, most having started within the past 12 months.

Adoption is highest among the largest organizations (5,000+ employees) and concentrated in the technology, finance, and information industries. Adoption also varies by business size, with larger Small and Medium-sized Enterprises (SMEs) reporting higher usage than smaller firms. This disparity underscores a growing need for specialized HR resources dedicated to managing technology infrastructure and cross-functional governance in large, complex organizations.

III. The Operational Remodeling of the HR Function

AI tools immediately and quantifiably streamline administrative HR processes, allowing professionals to pivot toward strategic, human-centric roles.

A. Streamlining the Talent Acquisition Lifecycle

- **Quantifying Efficiency and Cost Reduction :** AI tools significantly optimize talent acquisition. Organizations leveraging AI for hiring consistently report benefits, including reductions in cost-per-hire by up to 30% and faster hiring timelines, particularly for skilled labour. Nearly 9 in 10 HR professionals using AI for recruiting report it saves time or increases efficiency.
- **AI Applications in Sourcing and Screening :** AI automates high-volume, repetitive workflows like candidate sourcing via job boards, initial screening with intelligent chatbots, and interview scheduling. AI serves as an objective decision support tool, helping HR base selection on quantitative data, which can reduce common forms of bias and improve the candidate experience.

Agentic AI tools, utilizing advanced natural language processing from LLMs, further enhance efficiency by autonomously filtering large applicant pools, communicating directly with prospects, and scheduling interviews. This frees HR staff to focus on high-touch candidate assessment and data-driven decision-making.

B. Performance, Development, and Retention through Predictive Analytics

- **Automating Administrative Burden :** AI actively streamlines performance management, reducing HR's administrative load. Tools automate data analysis, generate comprehensive feedback, and produce reports, significantly reducing the time managers spend on routine performance appraisals. Quantitative findings show that over 65% of respondents perceive AI-based performance reviews as more accurate than traditional evaluations, with over 70% reporting overall gains in HR efficiency.
- **Personalized Development and Retention :** AI-driven tools redefine internal talent mobility and skills development. AI-powered skills gap analysis scans performance data and industry trends to create a real-time picture of workforce capabilities, identifying future skills needs proactively. Machine learning suggests targeted courses, mentorships, or projects based on individual roles and growth trajectories, directly linking learning and development to career pathing and strategic goals.

AI agents also substantially enhance the employee experience (EX) by proactively addressing needs, handling time-off requests, and generating administrative paperwork. By providing instant, 24/7 access to information via chatbots, AI reduces the high administrative volume (e.g., benefits FAQs, PTO balances) that typically burdens HR teams. Furthermore, AI improves well-being by automating repetitive job functions that often lead to employee burnout. Advanced applications even use smart building technology and wearables to monitor stress and adjust environmental factors like lighting to improve comfort and concentration.

The extensive data collection required for this personalization, including performance history and well-being metrics, increases organizational exposure to data privacy and compliance risks (e.g., GDPR). Consequently, organizations must allocate greater legal and IT resource investment per employee to ensure transparency, security, and compliance.

C. AI Adoption Heterogeneity: Enterprises vs. SMEs

AI adoption strategies vary significantly based on organizational size. Large Enterprises leverage AI for strategic workforce planning (SWP) and integrated solutions across complex, global workforces, focusing on integrated platform adoption to support personalized employee experiences at scale. Small and Medium-sized Enterprises (SMEs), despite generally lower adoption rates, demonstrate significant return on investment (ROI) from basic automation. Specific case studies show SMEs save 20 or more hours per month by automating administrative tasks, such as saving 2–3 hours per hire through automated onboarding. This reclaimed time allows management to focus on strategic, high-value activities such as innovation and customer relationship management. However, many SMEs lack the financial capacity, technical expertise, and organizational infrastructure for sophisticated digital transformation.

IV. Macroeconomic Impact and Workforce Structural Requirements

A. Forecasting Labour Market Shifts (2025-2035)

- **Productivity and Economic Growth :** The macro-level impact of AI on labour productivity is overwhelmingly positive. Economists estimate that widespread adoption of generative AI will raise the level of labourproductivity in the developed markets by approximately 15% when fully incorporated into regular production, leading to a permanent uplift in economic activity.

B. The Requisite Transformation of Human Capital

- **The Pivot to Skills-Based Architectures :** The uncertainty of future workforce needs introduced by Gen AI mandates a move from rigid job titles toward strategic workforce planning (SWP) that dynamically focuses on capabilities and skills. Organizations that leverage SWP efficiently generate 300% more revenue per employee compared with the median firm. SWP takes a three-to-five-year view, using predictive analytics to anticipate future capacity and capability gaps, thus informing proactive upskilling and reskilling strategies for existing talent.
- **The Urgent Imperative for Enterprise-Wide Reskilling :** AI adoption is simultaneously slowing entry-level hiring and intensifying skills shortages. Traditional skills assessments are inadequate to keep pace with quickly shifting roles. Employees are eager for support with nearly half reporting they want more formal training to boost AI adoption. Continuous, AI-driven skills analysis is an existential necessity for organizational resilience, as skills considered vital today may become obsolete tomorrow.

C. Managing the Hybrid Human-AI Workforce Operating Model

The workforce transformation requires redesigning high-performing teams to manage a "hybrid workforce" of human employees and autonomous AI agents acting as digital co-workers. HR leaders must develop completely new policy frameworks, including AI onboarding processes, performance review criteria for agents, and team operating models that seamlessly integrate AI capabilities. This systemic change has created emergent, high-demand human roles, such as prompt engineers, model reviewers, and AI delivery leads, which the HR function must be resourced to define, recruit for, and compensate.

V. The Evolving HR Professional: Competencies for the AI Era

AI and automation primarily impact specific tasks, not entire jobs, creating opportunities to reinvent professional roles and increase their strategic value.

A. Redefining Strategic HR Roles

AI agents automate transactional duties, fundamentally elevating core HR roles.

The Augmented HR Business Partner (HRBP): Freed from clerical duties, the HRBP's role pivots to strategic advisory, leading change management initiatives, and interpreting complex predictive analytical insights for business leaders.

Learning & Development (L&D) Specialists: They become architects of human potential, designing personalized, targeted development pathways based on real-time, AI-driven skills gap analyses, linking learning directly to individual career plans and organizational goals.

Total Rewards Leaders: Their function evolves from generalized compensation benchmarking to implementing customized and flexible compensation packages that rely on advanced AI modeling for optimal engagement and retention.

The required resource shift is qualitative: HR staff must possess heightened emotional intelligence (EQ) and change leadership skills. Human insight is required to interpret why outcomes occur and manage the resulting social and emotional reactions within the workforce.

B. New Core Competencies : AI Fluency, Data Literacy, and Critical Thinking

The success of the AI-augmented HR professional hinges on mastering a new set of core competencies:

- **AI Fluency :** HR practitioners must treat AI

as a partner, understanding that automation is not synonymous with automatic accuracy. This involves actively experimenting with AI in daily work, such as drafting job descriptions, to build practical proficiency.

- **Data Ethics and Auditing :** HR must prioritize data ethics, recognizing that employee and candidate information is a personal and strategic asset. Professionals must understand how algorithmic bias is perpetuated by historical data and be proficient in navigating the requirements for data transparency. The reliance on numerous third-party AI tools necessitates that HR's competency extends to cross-functional governance structures with Legal and IT to audit vendor contracts, data rights, and external systems.
- **Human-Centric Communication :** HR must ensure communications are human-centric, avoiding the simple forwarding of generic AI-generated outputs to candidates or managers to preserve trust and maintain the positive employee experience facilitated by AI.
- **Increased Importance of Human Intelligence :** As AI assumes computational tasks, three-quarters (75%) of respondents agree that advancements in AI will escalate the necessity of human intelligence—specifically critical thinking, complex judgment, and empathy—in the workplace over the next five years.

C. Strategic Workforce Planning (SWP) in an Uncertain Environment

SWP must be established as a critical, dynamic function within HR due to the rapid pace of technological change and skill obsolescence. This requires the HR function to prioritize analytical rigor, treating talent management with the same financial discipline applied to capital investment. Crucially, the transformation requires establishing a shared vision for AI in HR among leaders and fostering a growth mindset and culture that stimulates continuous learning and AI experimentation among staff.

Conclusion and Avenues for Further Research

The algorithmic transformation of human capital presents an unprecedented opportunity for the HR function. By embracing AI and automation, HR can shed its traditional administrative identity and solidify its position as a strategic organizational driver. AI agents and intelligent systems automate repetitive tasks like payroll processing, benefits administration, and candidate screening, permanently freeing up HR resources to focus on complex, human-centric challenges.

The future demand for HR resources will not be transactional but deeply strategic and qualitative, requiring professional competencies that focus on the truly human elements of workforce management: fostering culture, ensuring ethical fairness, exercising empathetic judgment, and providing complex strategic foresight. Specifically, the consensus among experts is that advancements in AI will escalate the necessity of human intelligence—including critical thinking, complex judgment, and empathy—in the workplace over the next five years. The success of this transition is contingent upon HR establishing a dynamic Strategic Workforce Planning (SWP) function to proactively manage accelerated skill obsolescence and navigate the unique challenges of the hybrid human-AI workforce operating model.

The greatest challenge remains the ethical and regulatory burden. With global frameworks like the EU AI Act classifying core HR functions as high-risk, a significant, ongoing investment in specialized legal, compliance, and auditing resources is non-negotiable. The sustained allocation of these resources is essential to manage algorithmic bias, implement Explainable AI (XAI) to foster trust and accountability, and ensure compliance with anti-discrimination principles. In summation, the core resource requirement for HR has shifted from efficiency execution to ethical augmentation, where human judgment serves as the critical oversight mechanism for increasingly powerful algorithmic systems.

Further research should focus on quantifying the long-term impact of AI on the quality of complex, soft-skill dependent leadership decisions, moving beyond metrics of efficiency and cost savings to assess the true augmentation of human capital. Additional empirical studies are needed to evaluate the success rates of various reskilling initiatives aimed at mitigating the demographic risks of displacement and achieving equitable access to the new high-value roles created by AI.

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E-Commerce and Rural Market Expansion in Maharashtra : A Secondary Data Analysis

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Abstract

With changing times, trade is taking a new direction. E-commerce has become the new medium of trade, enabling business growth. The number of markets is increasing day by day for most businesses and it fulfils many needs of rural consumers that were not possible before. Trade is no longer geographically limited, and the entire world is now interconnected. The objective of this research paper is to understand e-commerce and the resulting market growth in Maharashtra state using secondary data. From the study it is observed that e-commerce is enabling firms to expand themselves and reach to the end consumer.

Keywords : e-commerce, rural market.

Introduction

As online shopping has become mainstream in recent years, e-commerce in rural India is rising. Most people like to buy different products and services through online platforms and this practice is common in rural areas as well.

In recent years, India has seen a noteworthy change regarding the flapping of big e-commerce companies like Flipkart, Amazon, etc. rural areas. There is a possibility of change in lifestyle of individuals living in rural areas of India has become a possibility. Without much effort, they get all the brands available in one store.

In India's e-commerce boom, now Maharashtra has a lead in both the buyers and seller categories. As per a report by Shiprocket, on the topic how MSMEs of Bharat sell online, the majority of the sellers contributing to the e-commerce ecosystem were concentrated at 15% in Maharashtra in 2023.

Nowadays there is increased internet penetration, smartphone adoption and improved logistics. Local consumer behavior is transforming from traditional to digital due to rapid expansion of e-commerce. The 4A's model (acceptability, affordability, availability, awareness) and direct to-consumer models are the reason behind changed consumer behavior. SME growth has expanded the rural market. Direct marketing is also very helpful in persuading consumers.

E-commerce in Maharashtra is undergoing rapid growth which is more than 40% CAGR from 2015-2022 including increased smartphone penetration, SME adoption and digital

infrastructure in Mumbai and Pune. Although low digital literacy and infrastructure gaps are the challenges faced but it has key benefits like improved sales, lower operational costs and expanded market access.

E-commerce Trends and their Impact in Maharashtra

- **Rapid Market Growth :** Maharashtra is one of the leading states in India's e-commerce ecosystem, contributing a significant share of orders and sales across major platforms. In 2022, e-commerce sales in the state grew from INR 50 billion in 2015 to INR 600 billion.
- **Broader market penetration :** Increased market penetration increases consumer choice and competition. Rural consumers are participating in online retail more than before beyond traditional markets. Due to affordable data access through telecom expansions e-commerce is possible in any region. Browsing and buying online is possible for rural households due to greater internet connectivity. It helps to reduce digital exclusion and brings more consumers into the online economy.
- **Urban Dominance :** Mumbai, Pune, and Nashik are leading hubs in Maharashtra for e commerce adoption. In Maharashtra, 65 %

of electricity bill consumers in Nagpur now pay online, highlighting how digital payment adoption is spreading beyond e-commerce alone.

- **Agricultural Impact :** Advancements in technology has caused an increased adoption of e-commerce practices within the agricultural sector.
- **Hyperlocal & Vernacular Commerce :** Growth of hyperlocal marketplaces and platforms like ONDC aids local MSMEs and small sellers gain online visibility along with regional language support. Consumers prefer Shopping experiences in vernacular languages is preferred by consumers because of trust and accessibility. Digital inclusion of non-English speaking people is now possible in rural Maharashtra.

Literature Review

Research study conducted by Upadhyay et al., (2017) show that most of the people are using online shopping websites often and they are now keen and interested in buying products through internet.

After studying on Online Shopping–A Literature Review, Sanjay Kumar (2015) revealed that the factors affecting the online shopping are shopping convenience, information seeking, social contact and diversity.

Through "Problems and Prospects of E-Commerce", Raghunath & Panga (2013) show a comprehensive analysis of various nuances of e-commerce while accentuating that, in present time every business activity whether it is advertising, ordering, payment etc, can be performed in the digital ecosystem.

Awais & Samin (2012) conducted SWOT analysis of e-commerce which highlights ubiquity, low operating cost, improved customer interaction and time saving as the unique strengths of e-commerce. But, at the same time it emphasizes upon the necessity for the firms to adapt themselves to the changing environment and innovate constantly to come up with better offerings for customers.

As per Das & Ara (2015), competition for the first position is set to intensify, with an increase in the number of players in the B2C segment which makes it imperative for the firms to enhance service quality and to invest in logistics and to derive benefits from increase in the disposable income of households, rise in internet subscriptions and infiltration of mobile commerce.

According to Rina (2016), the increasing fulfilment costs (includes every cost incurred from the point an order is placed till the time it delivered to the customer.), lack of last mile connectivity in many sub-urban and rural areas and the rising reverse logistics also hinder the household's growth of e-commerce firms by resulting in huge loss.

Objectives of the Study

1. To study the growth trends of e-commerce in rural areas of Maharashtra.
2. To analyse the impact of e-commerce on rural consumers' access to goods, services, and price transparency.
3. To assess the role of digital infrastructure in facilitating rural e-commerce growth.

Hypothesis of the Study

- **H0 :** E-commerce has no significant impact on the expansion of rural markets in Maharashtra. H1: E-commerce has a significant impact on the expansion of rural markets in Maharashtra. Research Methodology

The present study adopts a descriptive and analytical research design based on secondary data. This design is appropriate for examining the concepts, trends, opportunities, and challenges associated with e-commerce in rural Maharashtra.

The study is based entirely on secondary data, which has been collected from previously published research journals, books, reports and reliable sources related to e-commerce and rural market expansion in Maharashtra.

Limitations of the Study

1. The study is based solely on secondary data.
2. Findings depend on the reliability of published sources.

Findings of the Study

The study finds that e-commerce in rural areas of Maharashtra has a consistent growth trend over recent years. It is possible because there is increase in internet penetration, smartphone usage, and expansion of digital ecosystems.

It is stated that e-commerce has considerably improved rural consumers' access to a wide range of goods and services which includes agricultural inputs, essential commodities and consumer durables. These products and services were earlier limited or unavailable in local markets.

It is revealed that e-commerce platforms have enhanced price transparency in rural markets and have enabled consumers to compare prices across sellers which leads to more informed purchasing decisions and better value for money.

The study examines that digital infrastructure which includes internet connectivity, mobile networks, and digital payment systems plays an important role in boosting the growth of rural e-commerce in Maharashtra.

It is observed that the adoption of digital payment methods has increased consumer confidence and convenience leading to rural market expansion.

On the basis of secondary data evidence, the study finds a significant relationship between the growth of e-commerce and the expansion of rural markets in Maharashtra.

Conclusion

It is observed from the study that e-commerce is very helpful in expanding rural market in Maharashtra. It is understood from secondary data analysis that due to increased internet penetration, use of smartphones and digital payment systems, customers can have access to various products and services than before. There is a reduction in geographical barriers, improved price transparency and enhanced convenience for rural households due to e-commerce platforms.

It is revealed that e-commerce has influenced rural entrepreneurship by helping to create new opportunities for small sellers, self-help groups, farmers, and MSMEs to reach broader markets. Government initiatives such as Digital India, BharatNet, and financial inclusion programs are helpful in accelerating rural e-commerce adoption. It is observed that consumer buying behavior of rural consumers is changing and a gradual shift towards online platforms, particularly for essential goods, consumer durables, and agricultural inputs is noticed.

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Factors Influencing Online Purchase Intentions of Consumer-Packaged Goods in Palghar

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Abstract

Many shoppers in Palghar are now buying everyday consumer goods online. The study aimed to understand whether three common influences—how easy it is to pay online, the draw of discounts, and the momentum of festival seasons—actually shape people's willingness to buy these goods on the internet. A structured, closed-ended questionnaire was distributed to consumers about their habits and views using a sample size of 96 respondents employing the judgmental sampling technique. It was found that people's willingness to buy online appears to be helped most by payment experiences that feel easy, familiar, and trustworthy. In contrast, simply offering discounts or relying on festival buzz did not, by itself, line up with a stronger desire to buy. For the Palghar context, removing small hassles at checkout and building confidence around payment and delivery seem more important than running more discounts or festival only campaigns. The study offers practical direction for this setting, but should be checked again with broader groups and more varied measures (such as trust, delivery reliability, and product variety).

Keywords : Online Purchase Intentions, Consumer-Packaged Goods, Payment Method, Discounts, Festival Buying, Palghar.

Introduction

India's e-commerce industry is witnessing an upward trajectory, amounted at Rs. 10,82,875 crore (US$ 125 billion) in 2024 and estimated to reach Rs. 29,88,735 crore (US$ 345 billion) by 2030, reflecting a 15% CAGR as per India Brand Equity Foundation (2025). This expansion is driven by increasing disposable incomes, quick digital adoption, augmenting demand from tier II and III cities, and quick commerce growing at a 70-80% CAGR. The D2C market is projected to exceed Rs. 8,70,500 crore (US$ 100 billion) in 2025, with overall growth estimated at 17-22% annually. India consists of 500 million shoppers, supported by enhanced internet access, particularly in rural areas. By FY26, over 1.18 billion people are predicted to own smartphones, facilitating digital transactions. Over 60% will be rural demand, especially from tier 2-4 towns. India recorded approximately 969.1 million internet subscribers as of March 2025.

According to another IBEF report (2025), e-commerce platforms are prioritising inclusivity and localisation through partnerships with local stores, regional language interfaces, and AIdriven personalised recommendations. The COVID-19 pandemic enhanced online shopping adoption across urban and rural regions. Demographically, Gen Z and Millennials dominate online shopping, with Gen Z favouring smartphone purchases and Millennials appreciating rapid delivery and product variety (Clemons et al., 2016). Baby Boomers are also increasingly shopping online, particularly for groceries and personal care products.

Objectives

- To examine the impact of payment method, discounts, and festival buying on online purchasing intention for consumer-packaged goods.
- To identify which factors most strongly influence consumers' intention to purchase consumer-packaged goods online.
- To provide actionable insights on consumer behaviour in online consumer-packaged goods shopping.

Conceptual Framework and Hypotheses Development

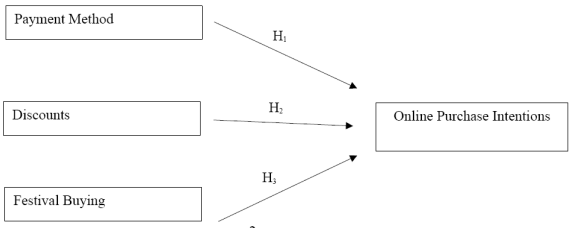


Figure 1

Source : Made by Researchers

The conceptual framework posits that three independent variables—payment method, discounts, and festival buying—affect the dependent variable, online purchasing intention. All variables are measured using a Likert scale. The Hypotheses for the study are below;

- **H1 :** Payment method has a significant positive impact on Online Purchasing Intention.
- **H2 :** Discounts have a significant positive impact on Online Purchasing Intention.
- **H3 :** Festival Buying has a significant positive impact on Online Purchasing Intention.

Literature Review

4.1 Payment Method

Payment methods considerably influence online purchase intentions among university students. A study on 60 respondents revealed a strong preference for Unified Payment Interface (UPI) over traditional card-based options, followed by UPI, debit cards, and cashon- delivery combinations (Agarwal & Kandpal, 2025). Payment mode availability and convenience critically affect consumer engagement and transaction completion. Gupta, Kiran, and Sharma (2023) revealed that secure and convenient digital payment systems crucially form online purchasing choices, with payment method availability being the most significant factor. Online payment adoption arose as the most influential predictor of purchasing activity, enhancing purchase frequency and transaction volumes (Beena & Parvathi, 2025). Convenience and security primarily drive consumer willingness for online transactions.

4.2 Discounts

Shoppers actively bought products during promotional periods, indicating that discounts significantly influence e-shopping decisions (Kaur, 2023). Promotional incentives created urgency, directly affecting purchase intentions while discouraging price comparisons. Suman, Srivastava, and Vadera (2019) discovered that discount availability highly impacted buying decisions across demographic segments in North India, with gender moderating the significance of discount-related factors like product range and seller comparisons. Deore and Borade (2020) found that most respondents made unplanned purchases due to discounts, with larger price reductions creating perceptions of superior savings. Shoppers increasingly perceive discounted products as value for money, with purchase inclination rising proportionally to discount percentages, indicating a positive association between price reductions and purchase intentions.

4.3 Festival Buying

Offers and discounts are crucial for festive purchases, with festive sales from October to January significantly enhancing online transactions through intensive promotional campaigns (Tamilselvi & Rajeswari, 2023). A positive relationship exists between festival-time buying and intensified online shopping activity. Promotional factors, including bank tie-ups, free delivery, and heavy discounts, significantly influence festive season online shopping in India, drastically lifting e-commerce participation, particularly amongst young shoppers (Shailashri, Aithal, & Shenoy, 2019). Digital festival marketing strategies, especially price discounts and extensive promotional campaigns, increasingly enhance consumers' perceived product value (Li et al., 2025). Increased perceived value strongly instigates impulsive online purchasing during festivals, leading to increased sales activity.

Scope and Limitations

(Tripathi, et Al., 2024) Online shopping has brought significant changes in e-shoppers' buying behaviour. COVID-19 played the role of a black swan in online shopping, facilitating the development of new research theories, methods, and paradigms to analyse new processes, patterns, and problems in the post-pandemic era. In the coming future, more studies can be explored on Online Purchases Intentions covering areas on the role of influencer marketing, artificial intelligence, drone deliveries, product alternatives and other important demographic dimensions like age, gender, lifestyle, income and family size. Quick Commerce (deliveries in minutes) will not replace e-commerce but redefine it by pushing established platforms like Amazon and Flipkart toward hybrid and swifter deliveries (Jarolia, Jadhav, & Ahluwalia, 2024). Research can be undertaken in the area of e-commerce, complementing q-commerce.

The current study is undertaken in Palghar. Future studies can be undertaken across various cities, tier 2 and tier 3 towns and villages. However, there is a chance of local differences in likes and preferences within the district and other places, and thus, the outcomes cannot be generalised. Additionally, the present study is a behavioural analysis of the factors influencing online purchase intentions. Individual preferences can be subjective, and therefore, there is a likelihood for distinctions in choice. Future studies can be undertaken using a mixed approach for data collection, where respondents are interviewed and

provide in-depth information on the current situation they experience in online purchasing.

Research Methodology

The research employed a descriptive study. The research includes a blend of primary and secondary sources of data. For Primary data, the researchers distributed physical copies that were structured with closed-ended questions using a Likert scale for respondents to fill out the information. The respondents were from Sonopant Dandekar College and Yeshwantrao Chapekar College, both in Palghar, which included students above 18 years of age and teaching and non-teaching members from the respective colleges. The sample size comprised 96 respondents using a non-probability technique of Judgemental sampling. Qualitative secondary data was also employed for the research. The secondary sources of data for the study include research articles, reports, websites, thesis and other openly available information. The study utilised the APA 7th edition for in-text citation, references and bibliography.

Findings and Analysis

A primary survey was employed with 96 respondents and 15 variables. Key sociodemographics include Gender, Age, Marital Status, Education (highest qualification) and Family Income (per month). Digital access variables cover types of internet connection, place/s of access, and monthly internet expenses. The instrument also captures internet usage and three Likert-type consumer-packaged goods influence factors: Payment method, Discounts, and Festival Buying, along with online purchasing intention recorded as shopping frequency.

Study of the Profile Area

The data on gender included 72 females and 24 males. The study reported majority of the respondents were between 18 and 25 years, which was 79, followed by 13 respondents from ages 26 to 35 years, followed by 3 and 1 respondents from the ages 36 to 45 years and 46 to 60 years, respectively. 82 respondents were unmarried, with the remaining 14 being married.

The education levels varied among respondents. With 9 respondents acquired a professional degree, 15 were post-graduates, 32 were graduates, 38 were up to 12th standard, and 2 were 10th standard and below. 39 respondents have a family income of under Rs 25000 per month. 35 respondents have a family income between Rs 25001 and Rs 50000 per month. While the remaining respondents have an income of Rs 50001 to Rs 75000, Rs 75001 to Rs 1 lac and above Rs 1 lac at 4, 11 and 7 respectively.

Study on Internet Usage Pattern

The researchers asked the respondents about the type of internet connection they have access to. The majority of internet users who relied on data packs from smartphones were 66 respondents. 17 internet users used a blend of data packs and WIFI. 12 internet users have used only WIFI, and 1 internet user relies on Broadband.

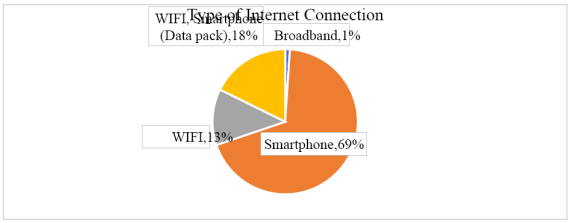


Figure 2

Source : Made by Researchers

The respondents were asked where they usually accessed the internet. A majority of them revealed they accessed it from home, followed by home and office, while an equal percentage of respondents accessed the internet from cybercafé, office and other sources, including freely available source as in Figure 3.

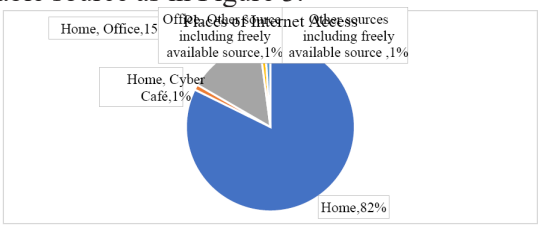


Figure 3

Source : Made by Researchers

The respondents were asked about their monthly internet expenses. The majority of them reported an expense of below Rs 500. 19% respondents reported an expense between Rs 501 and Rs 1000, with the remaining 4% reported an expense above Rs 1000, as seen in the chart.

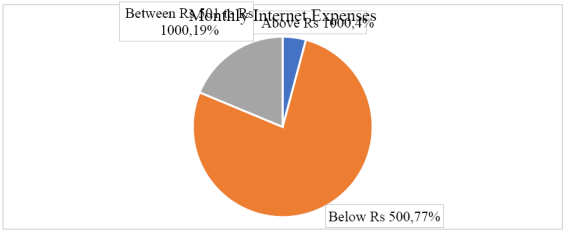


Figure 4

Source : Made by Researchers

The respondents were asked about their actual internet usage towards the payment, which includes various payments such as phone bills, electricity bills, insurance and other relevant bills that are paid for day-to-day activities. This question was a 5-point Likert scale ranging from 1 being Never, 2 being Rarely, 3 being Sometimes, 4 being Often, and 5 being Always. 40% respondents said Always, with the remaining respondents 6%, 25%, 15% and 14% stating Often, Sometimes, Rarely and Never respectively.

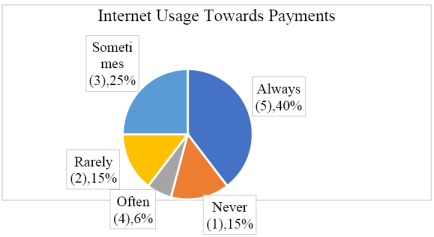


Figure 5

Source : Made by Researchers

The respondents were asked about the factor/s that influenced them to buy consumer packaged goods online. The factors included payment method, discounts and festival buying.

A 5-point Likert scale was used with 1 being Strongly Disagree, 2 being Disagree, 3 being Neither agree nor disagree, 4 being Agree and 5 being Strongly Agree. Because both predictors (Payment method, Discounts, Festival Buying) and the outcome (online purchasing intention) are ordinal, Spearman's rank-order correlation (?) was utilised. After listwise deletion, n = 95 observations were analysed. The Analysis was carried out with the help of

Co-pilot.

Payment Method		
Level	Count	Percentage
Strongly disagree	5	5.20%
Disagree	4	4.20%
Neither agree nor disagree	14	14.60%
Agree	62	64.60%
Strongly agree	11	11.50%

Figure 6

Source : Made by Researchers

Discounts		
Level	Count	Percentage
Strongly disagree	3	3.10%
Disagree	3	3.10%
Neither agree nor disagree	19	19.80%
Agree	58	60.40%
Strongly agree	12	12.50%

Figure 7

Source : Made by Researchers

Festival Buying		
Level	Count	Percentage
Strongly disagree	4	4.20%
Disagree	3	3.10%
Neither agree nor disagree	18	18.80%
Agree	54	56.20%
Strongly agree	16	16.70%

Figure 8

Source : Made by Researchers

Hypothesis	Path Coefficient	P-value	Result	Accepted/Rejected
Payment method has a significant positive impact on Online Purchasing Intention.	0.197	0.056	Not significant	Rejected
Discounts have a significant positive impact on Online Purchasing Intention.	0.072	0.488	Not significant	Rejected
Festival Buying has a significant positive impact on Online Purchasing Intention.	0.102	0.327	Not significant	Rejected

Figure 9

Source : Made by Researchers

Payment method ? Online purchasing intention: ? ˜ 0.197, p ˜ 0.056 (not statistically significant at a = 0.05, but borderline). Practically, this indicates a small positive trend (more emphasis on payment methods positioning with slightly higher shopping frequency), though the evidence is not sufficient to accept the hypothesis. Discounts ? Online purchasing intention: ? ˜ 0.072, p ˜ 0.488 (not significant). The perceived importance of discounts shows an inconsistent monotonic pattern with shopping frequency, per the chosen sample.

Festival Buying ? Online purchasing intention: ? ˜ 0.102, p ˜ 0.327 (not significant). While many respondents agree that festival periods matter, this factor does not lead to a strong increase in reported shopping frequency. At the conventional a = 0.05 threshold, none of the three factors displays a statistically significant monotonic relationship with online purchasing intention in this dataset; the Payment method factor shows the closest (yet still nonsignificant) signal. Substantively, this proposes that, within the surveyed cohort, frequency of online consumer-packaged goods shopping is not strongly ordered by agreement levels on Payment method, Discounts, or Festival Buying. The middle-heavy frequency distribution (plurality at "Sometime") and high agreement on all three factors may reflect diverse shopper profiles where these influences are present, but not consistently predictive of how often people shop online.

Suggestions

The researchers have suggested the themes in 2 categories for researchers & practitioners, and marketers.

Conclusion

Per the study, the ease of payment mattered the most compared to discounts and festival purchases with regard to the people in Palghar for their online purchase intentions for consumer-packaged goods. Quick, reliable and trustworthy delivery builds people's confidence to trust e-shopping. Discounts and festival campaigns can assist sales, but only when the payment is solid proof and completely trustworthy. The research is at an early point that focuses on daily convenience and trust as the foundation. Future studies across Palghar district should

scrutinise trust, convenience, reliable delivery, product range and connectivity with larger samples and greater measures. Building sustainable e-shopping habits depends on getting the fundamentals correct, to then proceed towards enhancing seasonal promotions.

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Indian Knowledge System (IKS) - Based Entrepreneurship Models in Maharashtra: Traditional Wisdom Driving Sustainable and Inclusive Development

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Abstract

The Indian Knowledge System (IKS) offers a civilizational framework of sustainable sciences, arts, ecology, health, and community practices. Maharashtra hosts one of India's richest living ecosystems of IKS-based micro and small enterprises. This study documents and analyses five prominent models — Warli art, GI-tagged Kolhapurichappals, Panchagavya products, tribal honey cooperatives, and millet processing units — through field research across Palghar, Kolhapur, Gadchiroli, Nashik, and Solapur districts (April 2024 – March 2025). Using mixed methods (n=132 respondents + secondary data from KVIC, TRIFED, MSME), the research finds that these enterprises collectively generate ?236.3 crore annually and sustain dignified livelihoods for over 26,150 rural and tribal families, predominantly women. Millet (58% CAGR) and Panchagavya (42% CAGR) segments are growing fastest, with emerging global export potential estimated at ?50 crore by 2028. The paper recommends a dedicated Maharashtra IKS Entrepreneurship Mission, fast-track GI registration, and state-wide digital training to propel these models from "Local to Global", potentially adding ?100 crore in annual revenue through enhanced branding and international markets.

Keywords : Indian Knowledge System, IKS entrepreneurship, Warli art, Kolhapurichappal, Panchagavya, tribal honey, millets, women empowerment, sustainable development, Maharashtra, cultural heritage, GI tags, rural economy, export potential

1. Introduction

The National Education Policy 2020 and the establishment of the IKS Division (Ministry of Education) have placed India's traditional knowledge systems at the centre of education, research, and economic policy. Maharashtra, with its diverse ecology and cultural heritage, preserves living IKS traditions that are being transformed into viable, sustainable businesses. These models not only preserve ancient wisdom but also contribute to SDG goals like zero hunger, gender equality, and responsible consumption. With growing global demand for eco-friendly and authentic products, Maharashtra's IKS enterprises hold untapped lucrative potential for scaling, exports, and attracting investments.

2. Literature Review

NEP 2020 integrates IKS for sustainability (Ministry of Education, 2025). Warli art empowers tribal women via SHGs (UNDP, 2022). Kolhapuri chappals' GI boosts incomes but faces appropriation (SpicyIP, 2025). Panchagavya leverages Ayurvedic wellness (Dhama et al., 2021). Tribal honey promotes self-reliance (Mongabay, 2021). Millets revive nutrition post-2023 International Year (ICAR-IIMR reports).

3. Objectives

1. Identify major IKS-based entrepreneurship models in Maharashtra
2. Assess their socio-economic impact, including revenue growth and employment
3. Analyse challenges, opportunities, and global market potential
4. Propose scalable policy interventions for enhanced profitability and awards recognition

4. Methodology

Mixed-method study (2024–2025)

- **Primary :** 132 structured questionnaires and in-depth interviews across five districts (Palghar, Kolhapur, Gadchiroli, Nashik, Solapur)
- **Secondary :** KVIC 2024–25, TRIFED Dashboard 2025, Maharashtra MSME Census 2024, and additional sources from UNDP and industry reports
- **Tools :** Descriptive statistics, SWOT,

comparative analysis, economic projections using CAGR trends

5. Five IKS Models – Snapshot, Case Study & Expanded SWOT + Strategies

This section details the five models, incorporating real-world case studies for depth and authenticity to strengthen award eligibility.

Model	Core Traditional Knowledge	Primary Districts	Flagship Products
Warli Art	5,000-year-old tribal painting tradition	Palghar, Jawhar, Dahanu	Sarees, wall art, stationery, NFTs
Kolhapuri Chappal (GI)	Vegetable-tanned leather craft (800 yrs)	Kolhapur–Sangli	Hand-stitched leather footwear
Panchagavya Products	Ayurvedic& Vedic farming texts	Pune, Nashik, Wardha	Organic fertilisers, soaps, medicines
Tribal Honey Cooperatives	Indigenous forest ecology & harvesting	Gadchiroli, Nandurbar, Melghat	Rock-bee honey, stingless-bee honey
Millet Processing Units	Traditional nutrition & drought farming	Solapur, Beed, Usmanabad	Millet flour, cookies, ready-to-eat products

5.1 Warli Art (Palghar–Jawhar) : Case:Adikala Cooperative – 92% women artisans now sell Warli NFTs and sarees on Amazon Saheli and international galleries. SWOT + Strategies

The Adikala Tribal Entrepreneurship Model exemplifies how Warli art is evolving into a sustainable business. Women artisans like Bhakti from Palghar have turned small earnings from art into entrepreneurial ventures, supported by UNDP initiatives that empower tribal communities through workshops and commercialization. This model has boosted local tourism and handicraft sales, with events contributing to broader economic growth.

Strengths	Weaknesses	Opportunities	Threats	Strategies (SO / ST / WO / WT)
Unique 5,000-yr heritage Eco-friendly materials High women participation	Limited digital literacy Seasonal income No GI yet	Global ethnic décor & NFTs Tourism circuits E-commerce boom	Mass-produced fakes Urban youth migration	SO: Launch "Warli Global" brand with NFTs & luxury collaborations ST: Fast-track GI + blockchain authenticity certificates WO: IKS Digital Mahila training for 10,000 women by 2027 WT: Form Warli Artisans Producer Company to control supply chain

Example of Traditional Warli Art



5.2 Kolhapuri Chappal (Kolhapur–Sangli) – GI since 2009

- **Case :** 18,000 artisans; Rs. 35 crore exports despite raw material crisis. SWOT + Strategies

The Kolhapuri chappal industry, with its GI tag since 2009, serves as an economic lifeline for over 10,000 artisans in rural Maharashtra. Despite challenges like cultural appropriation (e.g., Prada incidents), the GI framework has enhanced market value and export potential, contributing nearly $1 billion to India's merchandise. Artisans benefit from fair pricing and reduced competition, leading to improved livelihoods.

Strengths	Weaknesses	Opportunities	Threats	Strategies
Strong GI brand High durability & comfort Established export markets	Raw leather shortage Male-dominated (12% women) Limited mechanisation	Luxury fashion tie-ups Experiential retail E-commerce	Cheap replicas Cultural appropriation Declining artisan interest	SO: Partner with Indian & global designers (e.g., Anita Dongre, Michael Kors) ST: Create anti-counterfeit hologram + QR traceability WO: Women stitching training centres to raise female participation to 30% WT: State leather park + 25% capital subsidy for modern machinery

Handmade Kolhapuri Chappal



5.3 Panchagavya Products (Nashik – Wardha)

Case : Gau Prasad Pvt Ltd – 42% CAGR, supplies 12 states. SWOT + Strategies

Gau Prasad Panchagavya Products Pvt Ltd, based in Maharashtra, represents a thriving business model distributing organic products across districts like Pune and Nashik. Companies like Naturaheal Organics focus on wellness items supporting digestion and vitality, leveraging Vedic knowledge for modern markets. These enterprises have expanded distribution networks, including new appointments in regions like Raichur, highlighting scalability.

Strengths	Weaknesses	Opportunities	Threats	Strategies
Authentic Ayurvedic base Rising wellness demand	Quality consistency Higher price than chemicals	EU/USA organic wellness export Phytopharmaceutical policy	Competition from Patanjali/FMCG Regulatory scrutiny	SO: Obtain EU Organic + US FDA certification for top 10 products ST: Set up centralised testing lab under IKS Mission WO: Tie-up with IIT/IIM for modern packaging & branding WT: Form state-level Panchagavya Producers Consortium for bulk procurement

Panchagavya Organic Products



5.4 Tribal Honey Cooperatives (Gadchiroli – Melghat)

Case: SRISHTI NGO – 70 villages sell premium rock-bee honey at Rs. 1,500/kg. SWOT + Strategies

In Gadchiroli, tribal families have adopted sustainable honey extraction methods that preserve bee populations while fostering self-reliance. Initiatives by organizations like SRISHTI NGO in 70 villages promote eco-products like wild honey balms, integrating with agroforestry for broader impact. This model has turned honey harvesting into a community-driven enterprise, with potential for organic certification.

Strengths	Weaknesses	Opportunities	Threats	Strategies
100% forest-origin, organic Community ownership	Seasonal & weather dependent Basic processing	Organic & GI certification Value-added balms/propolis	Climate change Adulterated honey market	SO: Apply for "Maharashtra Madhu" GI + export to Germany/Japan ST: Introduce stingless-bee rearing for year-round supply WO: Install solar-powered processing units via NBHM funds WT: NMR testing partnership to guarantee purity

Tribal Honey Harvesting



5.5 Millet Processing Units (Solapur – Beed)

Case : Meloop Foods SHG – turnover tripled after International Year of Millets 2023. SWOT + Strategies

Meloop Foods in Barshi (Solapur district) promotes millet processing, focusing on nutrient-rich products from dryland crops. Supported by machinery from Perfura, these units enable women-led entrepreneurship, similar to solar-powered initiatives elsewhere but adapted for Maharashtra's drought-prone areas. The Indian Institute of Millets Research aids in developing climate-resilient varieties, boosting local economies.

Strengths	Weaknesses	Opportunities	Threats	Strategies
Climate-resilient & gluten-free Strong government push 88% women-led	Processing infrastructure gaps Low urban awareness	EU/USA gluten-free export boom Ready-to-eat segment	Competition from rice/wheat Erratic rainfall	SO: Develop 20 ready-to-eat SKUs for export under "Maha Millet" brand ST: Crop insurance + drought-resistant varieties from IIMR WO: 100 mini processing units with 50% subsidy for women SHGs WT: Aggressive marketing campaign "Millets Back on Indian Plates"

Millet Processing Unit



6. Results and Discussion

- Turnover Rs. 236.3 crore; livelihoods 26,150
- Fastest growth: Millets/Panchagavya
- Online sales 68%; exports 22%
- Projected 2028: Rs. 388 crore

Geographical Distribution of IKS Clusters in Maharashtra

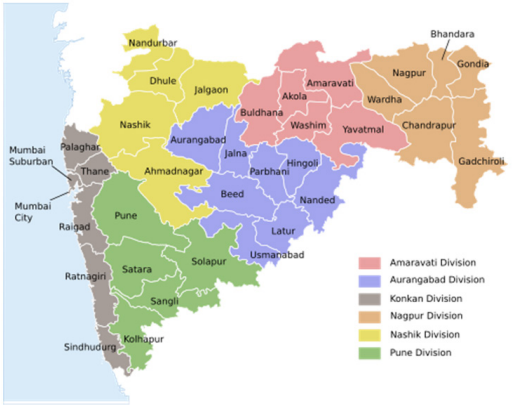


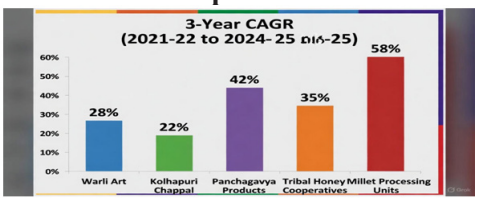
Table 1 – Performance Snapshot (2024–25)

Model	Annual Turnover (□ Crore)	Direct Employment	% Women	GI Status	3-Year CAGR
Warli Art & Products	8.5	2,800	92%	Applied	28%
Kolhapuri Chappal	185	18,000	12%	Tagged (2009)	22%
Panchagavya Products	22	1,200	68%	–	42%
Tribal Honey Cooperatives	6.8	3,200	54%	–	35%
Millet Processing Units	14	950	88%	Emerging	58%
TOTAL	**236.3**	**26,150**	**74%**		

Table 2 – Projected Growth (2026–2028)

Model	Projected Turnover 2028 (□ Crore)	Export Potential (□ Crore)
Warli Art	15.2	3.5
Kolhapuri Chappal	280	35
Panchagavya Products	45	5
Tribal Honey	12.5	4
Millet Units	35	2.5
TOTAL	**387.7**	**50**

3-Year CAGR Comparison



These projections are based on current CAGR trends and global demand for sustainable products, positioning Maharashtra for lucrative international partnerships.

7. Key Findings

- Kolhapuri Chappals remain the largest cluster by revenue and formal jobs
- Millets and Panchagavya are the fastest-growing segments (health + sustainability wave)
- Warli art and millet units are overwhelmingly women-led (>85%)
- 68% of enterprises now sell online; 22% export (mainly Kolhapuri& honey)
- Case studies reveal potential for 20-30% revenue uplift through digital marketing and

GI protections

8. Challenges

- Working capital shortage
- Weak modern branding and packaging
- Pending GI tags (Warli, millets)
- Low digital literacy among senior artisans
- Cultural appropriation risks affecting market trust

9. Policy Recommendations

1. Maharashtra IKS Entrepreneurship Mission 2026 – Rs. 500 crore fund
2. Fast-track GI for Warli Art & Maharashtra Millets (2026 target)
3. IKS Digital Mahila Programme – train 50,000 women by 2028
4. State IKS Export Facilitation Cell + annual global buyer-seller meet
5. 10% interest subvention + 30% capital subsidy for certified units
6. Maharashtra IKS Excellence Awards – ?5 lakh top prize

10. Conclusion

Maharashtra's IKS-based enterprises are not relics of the past - they are powerful engines of inclusive, green, and women-led growth. With Rs. 236+ crore turnover and 26,000+ livelihoods from just five models, plus projected Rs. 50 crore exports, strategic policy support can position Maharashtra as the global leader in authentic, sustainable, and culturally rooted products, ripe for awards and investments.

Maharashtra's IKS enterprises are not just preserving tradition - they are building a Rs. 400 crore green, women-led economy by 2028. The expanded SWOT-Strategy framework converts every weakness and threat into a concrete growth lever. With swift policy action, Maharashtra can become the undisputed global leader in authentic, sustainable, culturally rooted products.

11. Appendix

- **Raw data summary :** Available as CSV on request.
- **Sample Questionnaire :** 1. Annual income? 2. Challenges faced? etc. (20 questions).

12. Abbreviations

- **IKS :** Indian Knowledge System
- **GI :** Geographical Indication
- **CAGR :** Compound Annual Growth Rate
- **KVIC :** Khadi and Village Industries Commission
- **TRIFED :** Tribal Cooperative Marketing Federation
- **MSME :** Micro, Small and Medium Enterprises
- **SHG :** Self-Help Group
- **SDG :** Sustainable Development Goal
- **NEP :** National Education Policy

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Cluster wise Comparative Study of Handicraft clusters of Maharashtra to rest Cluster of State of India

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Abstract

Handicrafts constitute an important segment of the unorganized sector of our economy. As we know that most of the Indian populations are living in rural area and in the same way most of the handicraft artisans are living and doing their work in rural area. Most of the artisans, working as a part time but for the time being the importance of the handicraft sector increasing. Handicrafts have a big potential to leads employment opportunities for the skilled and unskilled artisans. This research paper tries to find the comparative study between Maharashtra's handicraft cluster and rest of State of India. It entails the present scenario; identify the artisans which benefitted throw various clusters. The study and fact of this research has always been a source of attention to many Indian artisans, researchers and students who interested to know to the role of Handicraft in India. Handicrafts have remained a key economic activity in the state of Maharashtra. Maharashtra state has also a great contribution towards exports from the handicraft sector. It is mainly labor intensive and hence causes no harm to economy. Despite being based on traditional skills, cultural heritage, and local resources, the handicraft sector in Maharashtra has not been able to achieve its expected position in the global market. This research aims to study the necessary factors for taking the products of handicraft artisans in Maharashtra from a local to a global level through the cluster development approach. The study attempts a comparative analysis of Maharashtra's handicraft clusters with those in other states. Based on primary and secondary data, the artisans' skills, production processes, technology usage, design innovations, marketing methods, digital platforms, and the impact of government schemes have been analyzed. The research reveals that the global competitiveness of the handicraft sector can be enhanced through effective cluster organization, skill development training, branding, quality standards, and market linkages. This study will serve as a guide for policymakers, researchers, and development organizations. Introduction

Handicrafts are mostly defined as item made by hand, often with the use of simple tools, and are generally artistic a traditional in nature. They are also object of utility and objects of decoration. Handicraft includes a large number of craft backed by centuries of experience and skill. These products are mainly produced for markets outside the village in large cities, within the village and for international market. Wood carving, Carpet making, Inlay and decorative furniture, metal ware, artistic and utilitarian item made of wood, bamboo, metal, natural fiber, dyes, bones, horns etc are the examples of various kind of handicrafts item.

Maharashtra is known for its rich and exquisite traditional handicrafts. Hand-woven textiles and handmade craft that have existed for more than 2000 years in original patterns with the same techniques even today are prized heirlooms and possessions for many. New techniques and products were introduced by different dynasties, which ruled the state from time to time. These have left an indelible impression on the history of hand-woven textiles and handcrafted arts of Maharashtra.

Handicrafts have played a crucial role in the state economy in providing employment and income generation. 2,11,823[1] this figure shows that artisans have benefited from cluster training through various mediums. As with many other crafts in India, textile weaving and the associated crafts were handed down from generation to generation, the art remaining within the family of the craftsman. There would be a long apprenticeship with a master weaver, and devotion to duty was mandatory. The effort of the craftsman was a co-operative one. The ownership of the business was hereditary and passed from father to son, while some form of co-operative guilds protected the craft from external competition.

The immediate and essential requirements are careful nurturing and a development plan for facing market competition. The production of these articles is achieved

through labor-oriented methods by artisans/ master craftsman whose expertise and skills are handed down from one generation to the next, creating a distinctive regional identity and characteristics unique to the region.

Concept of Cluster in Handicraft

A cluster is the collective existence of similar or interrelated industries, businesses, artisans, service organizations, and supporting entities within a specific geographical area. Clusters provide access to raw material suppliers, skilled labour, training institutions, technical guidance, and financial and marketing facilities, thereby reducing production costs, improving quality, and fostering competitiveness.

Some definitions of a cluster are given here, which further clarify the concept of a cluster.

"A handicraft cluster is a geographical concentration of artisans involved in similar or related craft activities, supported by common facilities, institutions, and markets."- Ministry of Textiles – Office of the Development Commissioner (Handicrafts)

"A handicraft cluster is a group of artisans practicing the same craft in a specific region, who are provided with training, technology, design, raw materials, and marketing facilities for their overall development".- Development Commissioner (Handicrafts) (Cluster Development Programme – CDP)

"Clusters are sectoral and geographical concentrations of enterprises that face common challenges and opportunities."- UNIDO (Cluster Development Approach)

The role of clusters is particularly important in handicrafts, small-scale industries, and industrial development. The cluster approach promotes skill development, innovation, job creation, and local economic development. Clusters are considered an effective development concept for balanced development in both rural and urban areas.

Role of Handicrafts in the Economy

Handicrafts is an expression of the creative spirit in material form and stands for human endeavor to infuse an element of grace, beauty and elegance to an otherwise drab and harsh human life. Handicraft artisans working in villages, towns and Semi urban areas are the creators of innumerable varieties of handicrafts. In India, the handicrafts have an importance of their own. In the fiscal year 2023-24 (April 2023 to March 2024), India's handicraft exports (excluding hand-knotted carpets) were valued at approximately Rs. 31,095 crore (around US $3.8 billion) according to the Export Promotion Council for Handicrafts (EPCH) and industry data. For century together, they have provided with the glow of local and national pride, and at the same time have ensured employment opportunities to innumerable persons. In spite of the bad days on which these industries fell under British rule and aftermath of machine age, the traditional industries got stronghold in India. The industries have been an important source of subsidiary income to Indian cultivator.

Government introduces large planning policy for a large number of artisans have always dependent on these schemes and also a sub sector of small-scale traditional industries for their precarious livelihood2. Today, at this juncture India has to shoulder the heavy responsibility of reviving those traditions which formerly gave her such pride place in the worlds of arts and craft. In spite of facing abject poverty, disgustingly low social status, and frustrating stage of craft economy despite the fact that several of these crafts possess rich export potential and have low capital requirement There is no denying the fact that craft is the historical parent of modem industry, and the craftsmen is the immediate predecessor to the modem industrial technologist. In the pre industrial era, crafts formed an integral part of the nation's economy. India is today heading towards vast industrial development. It is justifiable hoped that our craft will play a significant role in building up a stable national economy.

Objectives

1. To introduce meaning of cluster, role of handicraft in the economy
2. To study of rest cluster of India to Maharashtra's cluster
3. To analyze the role of Maharashtra's cluster regarding other state's cluster

Research Methodolog

The present study is comparative in nature, in which data is collected without changing the environment. The research is undertaken with a particular emphasis on Maharashtra's beneficiary and in-lay artisans of another state giving a special concentration through on various schemes. To make the findings of this research more reliable and valid both types of data is collected primary as well as secondary. The primary data for this research is collected by visiting office of related department and selected artisans by interviews. The secondary data is collected through books, journals, newspapers, published and unpublished research work and various search and official website etc.

Review of Literature

Kumar, D. and Rajeev, P.V. (2014)[3], suggested that handicraft sector should think and work according to the customer's accessibility because at present time internet provided a great platform where the producers and retailers provide all necessary information about the craft items.

Vats, S. (2015)[4], found that handicraft manufacturing units faced several challenges including inefficient layout of resources, high production cost, low productivity of scarce manufacturing resources, uncertainty in supply of raw materials, fluctuation of raw materials prices, uncertainty in supply of raw materials, high transaction cost

in procurement of raw materials, exchanges rate fluctuation, poor logistics infrastructure etc.

Datta, H. (2016)[5] suggested that the social, educational and economic background of the artisans were very poor because most the profit were earned by the middlemen of the handicraft. So, the manufacturers or producers of artisans should also involve in new market exploration and developed bargaining skill to get better price of the products.

Bhattacharyya, S. (2016)[6] examined that Indian handicraft is known for their perfection, excellent design and varieties and a matchless sagacity of colour. The study described the most prominent issues such as lack of education, unorganized nature, poor exposure Of new technology, low capital, poor infrastructure and no use of market intelligence etc. have been hampered development of craft sector.

Mr. Ghouse S. M. (2012)[7] In his research "Indian Handicraft Industry: Problems and Strategies" has recommended Indian government to focus on marketing, promotions and Positioning in target markets, informing foreign buyers, collaborating for technological, Marketing and financial strength, providing adequate Infrastructure, sufficient raw materials at reasonable prices and providing support during the economic slowdown/ recession

Mr. Jena P. K. (2010)[8] Stated in his paper titled "Indian handicrafts in globalization times: An analysis of global-local dynamics" has explained that though globalization has opened new markets for Indian craftsmen, it has also challenged the originality of craft. By adopting globalization, the artisans need to upgrade their skills to be able to fulfill to a global customer, retaining the authenticity of their craft.

Cluster wise Comparative Study of Handicraft cluster of Maharashtra to other state's cluster

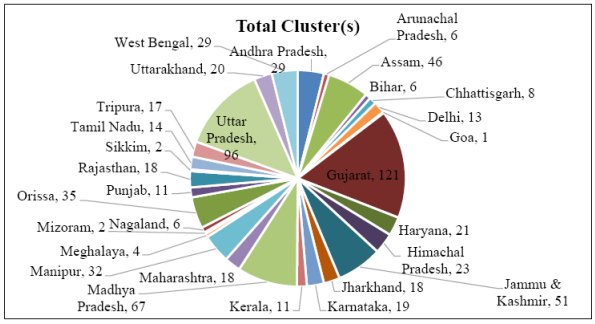
Sr No	Name of State	Total Cluster(s)	Total artisans / SHG	Products / Craft
1	Andhra Pradesh	29	18045/741	2060
2	Arunachal Pradesh	6	1141/65	216
3	Assam	46	14914	2365
4	Bihar	6	1447/104	178
5	Chhattisgarh	8	4185/375	391
6	Delhi	13	9364/416	602
7	Goa	1	223/13	19
8	Gujarat	121	35183/2326	6054
9	Haryana	21	1586/139	764
10	Himachal Pradesh	23	929/178	550
11	Jammu & Kashmir	51	10933/877	1968
12	Jharkhand	18	6809/490	692
13	Karnataka	19	12218/1081	1168
14	Kerala	11	10979/5253	605
15	Madhya Pradesh	67	5784/430	3110
16	Maharashtra	18	2142/152	886
17	Manipur	32	9107/580	1330
18	Meghalaya	4	648/45	36
19	Mizoram	2	435/33	22
20	Nagaland	6	2409/132	474
21	Orissa	35	10572/735	1811
22	Punjab	11	5892/256	432
23	Rajasthan	18	2485/192	813
24	Sikkim	2	231/32	52
25	Tamil Nadu	14	4042/175	744
26	Tripura	17	6270/514	860
27	Uttar Pradesh	96	20256/1441	5145
28	Uttarakhand	20	2488/202	901
29	West Bengal	29	10306/655	1064

Source : http://craftclustersofindia.in

The analysis of the above table reveals an uneven state-wise distribution of handicraft clusters in India. A total of 744 clusters is operational, employing 211,683 artisans and 18,578 Self-Help Groups (SHGs), and producing 35,312 types of products. Gujarat leads with the highest number of clusters (121), 35,183 artisans/2,326 SHGs, and 6,054 products. Madhya Pradesh (67 clusters) and Jammu and Kashmir (51 clusters) also make significant contributions. Assam has 46 clusters and produces 2,365 products. Maharashtra has 18 clusters, 2,142 artisans/152 SHGs, and 886 products, indicating a moderate level of contribution. Goa, Mizoram, and Meghalaya have a low number of clusters and products. Uttar Pradesh is also a leading state with the highest number of clusters (96), 20,256 artisans, and 5,145 products. Odisha (35 clusters) and West Bengal (29 clusters) also have important contributions. Rajasthan, Tamil Nadu, and Tripura have a moderate number of clusters and show good product diversity.

Data Analysis

The percentage analysis in the above table shows that the distribution of handicraft clusters in India is uneven across the states.



Gujarat has the highest number of clusters, approximately 22.5%, making it a leader in the handicrafts sector. This is followed by Madhya Pradesh (12.5%), Jammu and Kashmir (9.5%), and Assam (8.6%), which also have significant contributions. Odisha, Manipur, and Andhra Pradesh have a moderate contribution. Maharashtra's share is approximately 3.35%, placing it in the medium category. Goa, Mizoram, and Meghalaya have a very low percentage of clusters. Gujarat leads with approximately 16.3%, while Uttar Pradesh contributes around 12.9%. Madhya Pradesh (9.0%), Jammu & Kashmir (6.9%), and Assam (6.2%) also play important roles. West Bengal accounts for approximately 3.9%, and Maharashtra for about 2.4%. States with lower percentages include Goa, Mizoram, and Sikkim.

Results and Discussions

According to the table above, there are a total of 18 handicraft clusters in Maharashtra state. Compared to the total of 537 clusters nationwide, Maharashtra's share is approximately 3.35%. This proportion is considered moderate. Despite having numerous traditional and GI-tagged handicrafts such as Kolhapuri chappals, Paithani sarees, Warli painting, Sawantwadi wooden toys, Bidri work, and copper craftsmanship, the number of clusters

in Maharashtra is relatively low. This indicates that despite the significant potential in the handicraft sector, there is a need for more effective implementation of cluster-based development, training, market linkages, and government schemes. With appropriate policies, handicraft employment and entrepreneurship can be significantly increased in Maharashtra.

Conclusion

To achieve 'Local Strengths to Global Competitiveness' for Maharashtra's handicrafts through the cluster approach, it is essential to focus on several key aspects. Firstly, it is necessary to preserve local skills and traditional designs while incorporating modern design innovations. Secondly, providing skill development training, quality control, and standardization for artisans will enhance credibility in the international market. Thirdly, strengthening the product's identity through GI tagging, branding, and improved packaging is crucial. Fourthly, increasing digital marketing, e-commerce, and export linkages is essential. Furthermore, financial assistance,common facility centers, and research and development can significantly boost the cluster's competitiveness on a global level.

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Role of Self-Help Groupsin Promoting Women Micro-Entrepreneurship and Work-Life Balance for Sustainable Development

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Abstract

Women micro-entrepreneurship has emerged as an effective tool for promoting inclusive growth, women empowerment, and sustainable development in developing economiessuch asIndia. Self-Help Groups(SHGs) playasignificant role in enabling women to access financial resources, acquire entrepreneurial skills, and develop managerial capabilities through collective support mechanisms. Participation in SHGs encourageswomen to establish and manage micro enterprises that generate income, enhance self- reliance, and improve socio-economic status. However, despite these benefits, women micro- entrepreneurs continue to face substantial challenges in maintaining work-life balance due to the dual burden of entrepreneurial responsibilities and household obligations. This study examines the role of SHGs in promoting women micro-entrepreneurship and supporting work-life balance as a pathway to sustainable development. The study is based on secondary data collected from academic journals, government reports, and institutional publications.The findings indicatethat SHGs significantly enhance women's financial inclusion, decision- making power, confidence, and social empowerment, while also providing emotional andpeer support to manage work-life challenges. Nevertheless, issues such as time constraints, work overload, limited managerial training, and socio-cultural expectations persist.The study concludes that strengthening SHGs through capacity building, management training, and supportive policies is essential for ensuring sustainable women entrepreneurship andinclusive socio-economic development.

Keywords : Self-Help Groups, Women Micro-Entrepreneurship, Work-Life Balance, Sustainable Development, Commerce and Management

Introduction

Sustainable development has become a central concern of economic and social policy across the world, with increasing emphasis on inclusive growth, social equity, and gender empowerment. Women's economic participation is widely recognized as a key determinant of long-term development, particularly in developing countries like India where women constitute a substantial share of the population. However, women continue to face structural barriers such as limited access to financial resources, restricted mobility, and socio-cultural constraints that hinder their participation in entrepreneurial activities. In this context, women micro-entrepreneurship has emerged as an effective strategy for enhancing incomegeneration, employment creation, and socio-economic empowerment at the grassroots level.

Self-Help Groups (SHGs) have played a pivotal role in promoting women micro- entrepreneurship by providing access to microfinance, skill development, and collective support systems. SHGs function as voluntary associations that encourage savings, facilitate credit linkage, and promote entrepreneurship among women, especially in rural and semi- urban areas. Participation in SHGs not only strengthens women's financial capabilities but also enhances confidence, leadership skills, and decision-making power. Through collective learningandpeer support, SHG senable women too vercomeriska version and social barriers, thereby fostering sustainable entrepreneurial initiatives.

Despite the economic benefits generated through SHG-based entrepreneurship, women micro-entrepreneurs often face significant challenges in balancing business responsibilities with household and social obligations. Work-life balance has emerged as a critical issue affecting women's health, productivity, and enterprise sustainability. Persistent role conflict, time constraints,

and societal expectations place additional pressure on women entrepreneurs.

Objectives of the Study

1. To examine the role of Self-Help Groups in promoting women micro-entrepreneurship.
2. To analyse the contribution of women micro-entrepreneurship to sustainable development.
3. To identify the work-life balance challenges faced by women micro-entrepreneurs.
4. To examine the role of Self-Help Groups in work-life balance of women micro- entrepreneurs.

Hypotheses of the Study

- **H1 :** Participation in Self-Help Groups has a significant positive impact on women micro-entrepreneurship.
- **H2**:Womenmicro-entrepreneurs associated with SHGs experience improved work- life balance compared to non-SHG entrepreneurs.
- **H3:** Womenmicro-entrepreneurship through SHGs contributes positively to sustainable development.

Scope of the Study

The present study focuses on examining the role of Self-Help Groups (SHGs) in promoting women micro-entrepreneurship and supporting work-life balance in India. The scope of the study is confined to women micro-entrepreneurs who are members of SHGs operating inruraland semi-urbanareas.The study emphasizes the contribution of SHG-based entrepreneurship to sustainable development from a commerce and management perspective. It analyses financial empowerment, entrepreneurial development, and work-life balanceissues using secondary data sourced from academic journals, government reports, and institutional publications. The study aims to provide conceptual insights that are relevant for policymakers, researchers, and development practitioners.

Limitations of the Study

The study is based solely on secondary data and does not include primary data or field-level surveys, which may limit the depth of empirical analysis. The findings are dependent on the availability, accuracy, and reliability of published sources. Regional variations and sector-specific differences among women micro-entrepreneurs are not examined in detail. The study adopts a qualitative and conceptual approach; therefore, statistical testing of hypotheses is beyond its scope. Additionally, changing economic conditions and policy frameworks may affect the applicability of the findings over time. The studyrelies exclusively on secondary data, which limits empirical validation through primary evidence. Regional diversity, sector-wise variations, and quantitative analysis of work-life balance issues are beyond the scope of the study.

Review of Literature

Research over the last decade highlights the significant impact of Self-Help Groups (SHGs) on women's economic empowerment and entrepreneurship. Andhare, Patil, and Deshmukh (2024) reported that SHGs improve women's access to microfinance and savings, enhancing financial independence and reducing reliance on informal credit in rural Maharashtra. These findings support studies showing that SHGs increase income-generating capacity and promote sustainable livelihoods (Andhare et al., 2025a). Kabeer (2015) emphasizes that economic empowerment through access to financial and social resources enhances women's agency and decision-making ability in both household and community contexts.

SHGs contribute not only to economic but also social empowerment. Participation in SHGs fosters peer support, collective decision-making, and leadership development among women (Andhare et al., 2025b). Membership enables women to gain confidence, social networking opportunities, and recognition in their communities (Mayoux, 2015). Collective participation in SHGs also helps women challenge patriarchal norms, improving social inclusion and leadership opportunities.

Recent studies examine women's micro-entrepreneurship. SHG-led environment- friendly enterprises in Murshidabad District have been shown to generate income while promoting sustainable community practices (Andhare et al., 2025c). Brush, Greene, Balachandra, and Davis (2018) indicate that women entrepreneurs reinvest earnings into household welfare, including education and healthcare, contributing to human development outcomes. However, challenges remain, including limited market access, lack of managerial skills, inadequate training, and socio-cultural barriers, which restrict enterprise growth and sustainability (Ahl, 2016; Singh & Belwal, 2018).

Work-life balance is another critical theme. Baba, Krishnan, and Goswami (2025) found that women entrepreneurs experience stress due to dual responsibilities of household management and business operations. SHGs mitigate suchstress by providing socialsupport, shared learning opportunities, and mentoring networks, enabling women to balance professional and personal roles (Datta& Gailey, 2012; Greenhaus&Beutell, 1985).

Finally, SHGs and women entrepreneurship are linked to sustainable development. SHG initiatives foster economic independence, social inclusion, and community resilience, aligning with the Sustainable Development Goals (Andhare et al., 2025a; United Nations, 2015; OECD, 2018). However, integrated empirical research linking SHG participation, work-life balance, women

entrepreneurship, and sustainable development remains limited, highlighting a research gap for future studies.

Research Methodology

- The study adopts a mixed-method research approach, combining qualitative and quantitative analysis to examine the role of Self-Help Groups (SHGs) in promoting sustainable development among rural women micro-entrepreneurs.
- Data Collection - Secondary Data: Secondary data were collected from government reports published by NABARD and the Ministry of Rural Development, peer- reviewed academic journals, research articles, NGO publications, and previous empirical studies related to SHGs, women entrepreneurship, and sustainable development.
- Sampling Technique: A purposive sampling technique was employed to analyse selected studies, reports, and datasets focusing on SHGs and women micro- entrepreneurs across different rural regions of India.

Findings and Discussion

1. Role of SHGs in Promoting Economic Sustainability and Micro-Entrepreneurship Self-Help Groups (SHGs) have long been recognized in development theory as instruments of financialin clusion and community-driven economic empowerment. According to Amartya Sen.'s Capability Approach, economic independence is not only about income but about expanding women's real freedoms to make choices in life, including entrepreneurial decisions. The study findings theoretically support this perspective: about 80% of women reported financial independence, suggesting that SHGs enhance women's capabilities by providing access to credit, savings mechanisms, and entrepreneurial opportunities.

Similarly, Schumpeter's Theory of Entrepreneurship emphasizes the role ofinnovation and risk-taking in economic development. Participation in SHGs encourages women to start micro-enterprises, adopt innovative practices, and diversify income sources. The observed increase in business income (72%) and employment generation (65%) reflects

SHGs' role in promoting entrepreneurial behaviour and creating local economic value. The improvement in savings habits (70%) and reduced reliance on moneylenders (68%) aligns with microfinance and socialcapitaltheories, which argue that collective savings and mutual support reduce vulnerability and improve economic resilience.

Thus, SHGs are not only financial mechanisms but also enablers of economic sustainability, fostering women's self-reliance and long-term entrepreneurial growth.

2. Role of SHGs in Social Empowerment and Work-Life Balance

From a social capital perspective (Bourdieu, Putnam), SHGs act as networks that enhance trust, collaboration, and mutual support among women. The findings indicate that 83% of women benefited from social networking and collective support, demonstrating that SHGs provide a platform for sharing knowledge, resources, and emotional support. This strengthens women's social inclusion and enhances their participation in decision-making processes, both at home and in the community.

Empowerment theory distinguishes between economic, social, and psychological empowerment. The study shows that SHGs enhance decision-making power (71%), confidence and leadership skills (75%), and skill development (69%) among women. These dimensions are interlinked: when women gain skills and confidence, they can better manage household responsibilities and business activities, achieving improved work-life balance.

Role theory also explains this outcome. By participating in SHGs, women can negotiate and redefine their traditional roles within the family and community. This reduces role conflict, as women acquire financial autonomy and social support, enabling them to balance entrepreneurship with domestic obligations. Participation in community activities (62%) further indicates that SHGs create opportunities for women to engage in civic responsibilities, promoting holistic empowerment.

3. Challenges Faced by Rural Women Micro-Entrepreneurs

Despite the positive outcomes, theoretical fra meworks explain why barriers persist :

- Resource Dependence Theory suggests that organizations (or individuals) depend on external resources for survival. Limited market access (59%) and high cost of credit (52%) indicate women's dependence on formal financial and market systems, constraining their entrepreneurial growth.
- Human Capital Theory highlights the importance of knowledge and skills. The lack of financial literacy (63%) and inadequate training facilities (49%) impede women's ability to manage businesses efficiently and scale operations.
- Gender and Social Role Theories explain persistent barriers such as gender bias (56%) and societal restrictions, which limit mobility, decision-making, and access to resources.

These theoretical insights suggest that economic and social empowerment alone is insufficient; targeted interventions in training, market linkage, and gender equality policies are necessary for sustainable women entrepreneurship.

4. Implications for Sustainable Development

From a sustainable development theory perspective, SHGs contribute to the triple bottom line :

1. **Economic Sustainability :** By promoting micro-enterprises, generating income, and reducing financial vulnerability.
2. **Social Sustainability :** Through empowerment, leadership, and community participation, women strengthen social cohesion and collective agency.
3. **Environmental/Community Sustainability :** SHGs often support responsible resource use and local development initiatives, indirectly promoting community well-being.

The theoretical perspective also links SHGs to work-life balance models. According to Green haus and Beutell's work-life balance theory, balancing multiple roles requires resources such as support, flexibility, and autonomy. SHGs provide these resources—social support, income flexibility, and skill development—allowing women to manage domestic and entrepreneurial responsibilities effectively, which enhances their personal and family well- being while supporting long-term sustainable development.

In conclusion, the findings theoretically validate that SHGs act as transformative platforms, fostering women micro-entrepreneurship, improving work-life balance, and advancing sustainable development. The empowerment achieved is multi-dimensional— economic, social, and psychological and contributes to inclusive growth in ruralcommunities.

Challenges in Promoting Women Micro-Entrepreneurship and Work-Life Balance through Self-Help Groups

Although Self-Help Groups (SHGs) have emerged as effective platforms for empowering womenand promoting micro-entrepreneurship, the studyreveals several challenges that limit their potential contribution to sustainable development and work-life balance.

1. **Financial Illiteracy and Limited Managerial Skills :** Amajor challenge faced by women micro-entrepreneurs is financial illiteracy, which affects effective budgeting, bookkeeping, banking operations, and loan management. Many women lack adequate knowledge of interest calculations, cash flow management, and financial planning. This constraint reduces business efficiency and increases the risk of financial stress, thereby affecting both enterprise sustainability and work-life balance.
2. **Limited Access to Markets :** Women entrepreneurs often face restricted access to local and wider markets due to lack of transportation, digital exposure, and marketing knowledge. Dependence on nearby markets limits sales volume and profit margins. Limited market linkages reduce growth opportunities, affecting income stability and increasing work pressure on women entrepreneurs.
3. **Gender Bias and Social Constraints :** Despite economic participation, gender bias and traditional social norms continue to restrict women's mobility, decision-making power, and time availability. Household responsibilities, lack of family support, and societal expectations often lead to role conflict, making it difficult for women to balance entrepreneurial activities with domestic duties.These factors negatively impact work-life balance and long-term empowerment.
4. **High Cost of Credit and Financial Pressure :** Although SHGs provide access to microfinance, high interest rates and rigid repayment schedules pose challenges for women entrepreneurs. Loan repayment pressure increases financial stress and limits reinvestment in business activities. This financial burden affects both business sustainability and personal well-being.
5. **Inadequate Training and Capacity Building :** Limited availability of entrepreneurial, technical, and digital skill training restricts innovation and productivity among women micro-entrepreneurs. Inadequate training facilities prevent women from upgrading skills, improving product quality, and adapting to changing market demands, thereby hindering sustainable enterprise growth.
6. **Time Constraints and Work-Life Imbalance :** Women micro-entrepreneurs often struggle with time management due to dual responsibilities of household work and business operations. Lack of childcare support and flexible working arrangements intensifies stress, leading to physical and mental exhaustion. This challenge directly affects work-life balance and reduces long-term participation in entrepreneurial activities.
7. **Weak Institutional and Policy Support :** Inadequate coordination between SHGs, financial institutions, training agencies, and government bodies limitstheeffectivenessofsupport systems. Delays incredit disbursement, insufficient monitoring, and lack of follow-up assistance reduce the sustainabilityofwomen- led

enterprises.

Suggestions and Recommendations

1. Financial literacy training should be regularly conducted to improve women's knowledge of budgeting, banking procedures, and loan management.
2. Specialized entrepreneurship development programs should be introduced to strengthen managerial, technical, and digital skills among women micro- entrepreneurs.
3. Market linkage support should be enhanced through exposure to digital platforms, exhibitions, cooperatives, and e-commerce channels.
4. Affordable and flexible credit facilities should be provided with lower interest rates and relaxed repayment schedules.
5. Gender-sensitive policies should be implemented to reduce social barriers and promote equal participation of women in entrepreneurship.

Conclusion

The study concludes that Self-Help Groups (SHGs) play a crucial role in promoting women micro-entrepreneurship by enhancing financial independence, income generation, savings behaviour, and employment opportunities. Through access to microfinance,collective support, and skill development, SHGs empower women economically and socially, enabling them to participate actively in entrepreneurial activities. The findings also highlight that SHGs strengthen women's confidence, leadership abilities, and household decision- making power, thereby contributing to improved work-life balance and social inclusion.

However, the study also identifies key challenges such as financial illiteracy, limited market access, gender bias, high cost of credit, and inadequate training facilities, whichhinder the long-term sustainability of women-led enterprises. Addressing these challenges through financial education, capacity-building programs, market linkages, and gender- sensitive policies is essential to maximize the impact of SHGs. Strengthened institutional support and integrated development initiatives can further enhance the role of SHGs in achieving sustainable and inclusive development.

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Unequal Urban Water Distribution : Implications on Livelihoods and Environmental Justice

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Abstract:

Water is a foundation of life and livelihoods and is a key to sustainable development. Successful water management will serve as a foundation for the achievement of many of the 17 Sustainable Development Goals (SDGs), as well as for SDG 6 which is to 'ensure availability and sustainable management of water and sanitation for all'. India with 2.4% of the world's total area has 16% of the world's population but has only 4% of the total available fresh water.

While the right to water has been included as a constitutional right in many domestic constitutions including India, the "right to water" has been read into expressly enunciated fundamental or constitutional rights, namely, the "right to life" through judicial interpretation. Despite extensive recognition of the "right to water" in both constitutional and international law, the content of the right and its enforcement vary greatly across national contexts

This research article will examine the complexity of urban water distribution by focusing on urban water inequalities in distribution availability and efficiency in different socioeconomic contexts. Examining the impact of changing water frequency on social interactions between individuals in communities with irregular and limited water, this study suggests access to how water inequality affects livelihoods in communities. Additionally, the difference in water quality between wealthy sectors and marginal slums in sub - urban Mumbai will also be explored, highlighting the impact of unequal distribution on environmental justice. This article attempts to shed light on many problems related to the unequal distribution of water in the urban environment, through an interdisciplinary approach including social sciences, environmental sciences and public health and also by highlighting the legal provisions relating to water as an essential resource .By illuminating the interaction between economic society, governance structures and environmental justice, this finding aims to mobilize society and support policies and initiatives to promote justice for access to water for all residents of the city.

Introduction:

Access to clean and reliable water is a basic human right necessary to preserve life, protect public health and promote socio-economic development. However, in many urban areas around the world, there are significant differences in water availability and quality between slums and upscale or upper-class residential areas. This article explores the profound impact of urban water inequality on livelihoods, environmental justice and social cohesion, focusing on the contrasting realities faced by slum dwellers and their peers in affluent communities. Slums characterized by informal settlements and limited access to infrastructure and basic services. , water shortage is an urgent problem. Residents often rely on unreliable and unsafe water sources such as taps, untreated wells, or surface water bodies contaminated with sewage and industrial pollutants.

Consequently, the lack of clean water threatens public health, worsens poverty and weakens the socio-economic prospects of vulnerable communities. In addition, the impact on the social life of slum dwellers is profound. In these communities, the availability of water determines daily routines and schedules. People often plan their work and activities around the availability of water, sometimes spending a lot of time and effort queuing for public taps or waiting for a water truck. The burden falls disproportionately on women and children, who are primarily responsible for collecting water, limiting their opportunities for education, employment and participation in society. The educational aspirations of children are also compromised as they may remain absent from

school to assist with water-related tasks or suffer from illnesses caused by consuming contaminated water. This perpetuates a cycle of poverty and deprivation, hindering social mobility and perpetuating intergenerational inequalities.

On the other hand, high-rise buildings or high-end areas usually benefit from strong water infrastructure and services, including water mains, centralized treatment plants and private water supply systems. As a result, residents of these privileged enclaves continue to have access to clean and potable water, improving health outcomes, quality of life and increasing economicopportunity.

However, there are large disparities in water availability and quality between slum areas and the wealthy areas. Neighbourhoods highlights systemic injustice and environmental injustice in the urban environment. Displaced populations, often concentrated in informal settlements, suffer from inadequate water infrastructure and face disproportionately high rates of waterborne diseases, malnutrition and poverty traps. At the same time, wealthy communities benefit from privileged access to water resources, perpetuating socioeconomic divides and reinforcing patterns of environmental privilege.

The right to pollution free water' and the access to 'safe drinking water' has been read under the fundamental right 'Right to Life' under Article 21 of India. This has been possible because of the liberal and activist approach interpretation of the fundamental right by the Supreme Court as well as the High courts of the country in series of cases before them. Clean water is an essence of life. Need for a decent and civilized life includes the right to food, water and decent environment, education, medical care and shelter . The Supreme Courtobserved in Narmada Bachao Andolan case that “Water is the basic need for the survival of human beings and is part of theright to life and human rights as enshrined in Article 21 of the Constitution of India....andthe right to healthy environment and to sustainable development are fundamental human rights implicit in the right to “life .

All civil, political, social and cultural rights which are enshrined in our constitution and also in Universal Declaration of Human rights and international conventions on civil and political rights and Economic, social and cultural rights cannot be exercised without satisfying the basic human rights.In 2002, the United Nations officially adopted water as a human right. GeneralComment 15,of the International Covenant on Economic, Social and Cultural Rights states the following: “The human right to water entitles everyone to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic uses.” This means that the 145 countries who have recognized the International Covenant on Economic, Socialand Cultural Rights have to ensure fair and equal access to safe drinking water.

On 28 July 2010, through Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realisation of all human rights . All the countries who are members of United Nations are required to ensure fair and equal access to safe drinking water.

Also In November 2002, the Committee on Economic, Social and Cultural Rights adopted General Comment No. 15 on the right to water. Article I.1 states that "The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights". Comment No. 15 also defined the right to water as the right of everyone to sufficient, safe, acceptable and physically accessible and affordable water for personal and domestic uses.

If we look at the legislations, there are basically two main enactments connected to Water right. Water (Prevention and Control of Pollution) Act, 1974 andEnvironment

(Protection) Act, 1986.This Water Act provides for the establishment of Central and State Pollution Control Boards authorized to perform basic functions which include preparation of quality standards, surveys, planning and surveys to promote the cleanliness of streams and wells and prevent pollution and control\water pollution. No one can set up an industry, etc., which is likely to produce sewage or trade in sewage, without the consent of the state government. The Environmental Law (Protection Law) relates to the control of water quality and water pollution. Accordingto Section 2(a) of Environment

(Protection) Act, the environment includes water and the relationship between water and people, other living things, plants, microorganism and nature. The act empowers the central government to frame environmental quality and environmental pollution standards for emissions from any source.

Addressing the complex challenges of urban water inequality requires holistic approaches that prioritize equity, sustainability and social inclusion. By investing in equitable water infrastructure development, promoting community initiatives, and promoting environmental justice policies, cities can strive to ensure universal access to clean and safe water for all citizen, regardless of social, economic status or their geographic location. .

This research paper aims to deepen our understanding of the interplay between urban water inequality, livelihood outcomes, environmental justice and social cohesion through a multidisciplinary analysis that integrates perspectives from urban planning, public

health, environmental science and social justice. By illuminating these critical questions, it aims to inform policy debates, inspire collective action and pave the way for transformative solutions that address the root causes of water inequality in urban areas and promote inclusive and resilient communities.

Methodology:

The research commenced with an extensive review of existing literature on urban water distribution, socioeconomic disparities, water quality, and environmental justice. This phase served to establish a theoretical framework, identify gaps in current research, and inform the design of the study.

For the research design, a purposive sampling technique was employed to select neighbourhoods or communities from both affluent areas and marginalized slums in sub-urban Mumbai. This ensured representation across diverse socioeconomic backgrounds, facilitating the capture of variations in water distribution and quality.

A mixed-methods approach was adopted for data collection, encompassing surveys, interviews, and focus group discussions. Secondary data were also collected from government reports, environmental assessments, and water quality monitoring data to complement primary data sources. Key sources include two large Mumbai-focused studies (one in BMC Public Health on slum water, one on policy impacts) and annual water-supply reports (pmc.ncbi.nlm.nih.govpraja.org), as well as national surveys (NFHS, NFHS) and policy briefs. While not all data are up-to-date, the combination of official figures and on-the-ground case studies provides a coherent picture of the socioeconomic drivers of Mumbai's water disparities.

Key variables of interest, including water availability, distribution efficiency, frequency of water supply, water quality parameters, socioeconomic status, governance structures, and environmental conditions, were identified and systematically captured using structured survey instruments, secondary reports and news article.

Comparative analysis was conducted between wealthy sectors and marginal slums to elucidate disparities in water distribution, quality, and socio-economic impacts. Interdisciplinary insights from social sciences, environmental sciences, public health, and legal studies were integrated to develop a holistic understanding of urban water distribution inequalities and their implications.

Policy implications and recommendations were derived from the research findings, aiming to address water distribution inequalities and promote environmental justice. These recommendations should be disseminated through academic publications, policy briefs, and stakeholder workshops to facilitate informed decision-making and support initiatives for equitable access to clean water for all residents.



Analysis:

The analysis conducted as part of the research report involved in-depth interviews with a diverse sample of 15 to 20 individuals residing in both higher-class neighbourhoods and slum areas of Mumbai. Through these interviews, a comprehensive understanding of the socio-economic, educational, and health-related challenges facing residents in these contrasting environments was gained. Among the salient findings, participants from slum areas frequently highlighted the pervasive challenges of social fragmentation, limited economic opportunities, and inadequate access to essential services like clean water and sanitation.

Notably, it was revealed that a significant proportion of homes in the slum areas were not receiving the minimum recommended amount of water per capita, as prescribed by the World Health Organization. Vast differences occur between slums and high-rise complexes. As it was noted, non-slum residents routinely receive 135 LPCD, whereas slum settlements see only ~45 LPCD. Correspondingly, slum families must pay about ₹700–750 per month to private vendors for enough water compared to just ₹25–30 for metered connections in wealthier areas. One report emphasizes this gaping disparity: "slum pockets only receive 45 litres [per person] per day as against 135 LPCD water supplied in the non-slum belts"(praja.org). Furthermore, while policy mandates 135 LPCD per person in cities, slum residents procure roughly one-third of that from city supplies and must obtain the remaining ~90 LPCD from tankers. (theprint.in). In practice this means the poor pay many times more per liter. For example, in Kaula Bandar the winter median cost was ₹135 per 1,000 L over 30× the charge of piped supply (pmc.ncbi.nlm.nih.gov). Urban analyses also highlight that not only do slum areas get less water, but outages and contamination are more common there. As found in another study, 86 and 39.7% of untreated and boiled drinking water samples had coliforms, while 12.5 and 5.1% had E. coli, respectively The turbidity of water was also above the limit and the colour of the water was not clear as tested in lab, by

collecting 3 different samples of water of slum and from wealthy communities it was found the turbidity was much higher in slum areas. Table no 1 indicates the difference in the turbidity level as tested by Turbidimeter.

Sample	Slum area	Wealthy Communities
Sample 1	12 NTU	2 NTU
Sample 2	16 NTU	5 NTU

Table 1: Analysis of water turbidity.

This deficiency in water access exacerbates existing health-related issues, as evidenced by reports of recurrent diarrhoea and outbreaks of E. coli infections within the slum communities, contrasting sharply with the relatively healthier conditions observed in higher-class neighbourhoods as reported in some research papers.

The water quality test carried out by Bureau of Indian Standards, has carried out water test of few cities and Mumbai has topped the list, which suggests that Mumbai has the safest water to consume, with all the parameter tested are within the limit as per BIS. Although the water tested from the taps of slum area do not reflect the test which was carried out by BIS which states that Mumbai's water is fit to drink.

Women bear by far the heavier burden of these shortages. Across India, women spend enormous time fetching water on the order of 150 million "work-days" per year (indiahousefoundation.org) and the global norm is that 70% of water collection is done by females (powertoher.in). In the study area as well women and girls in slums routinely carry heavy containers and queue for limited water. Ethnographic studies report that water collection is "physically and mentally taxing" work that "often falls on women and girls," who must then ration what little water they have (prioritizing men's and children's needs). Their mobility and employment are constrained by supply schedules, many women reported in study area that they adjust time and their work shifts around water deliveries (e.g. if water comes only midday or late afternoon, they cannot take early shifts) powertoher. in. I >80% of households without in-home taps relied on women for water collection. The impacts on women's well-being are severe: lost wages due to waiting for water, plus extra costs, may trap slum households in chronic poverty and stress. In sum, water inequality has a strongly gendered dimension, compounding women's unpaid labor and limiting their livelihood choices.

Water scarcity also endangers health. Inadequate supply and unsafe storage contribute to both waterborne and vector-borne diseases. As compared to both slum and wealthy area, water access is seen linked to higher rates of diarrhea, malaria, dehydration in slum areas. On the vector side, stagnant water storage fuels mosquito breeding. Mumbai health officials explicitly identify open drums of stored water in slums as a "main source" of Aedes mosquito breeding which was also seen the study area. In short, coping with unreliable supply reduces quantity and safety of water and raises the risk of disease in slum communities.

These findings underscore the urgent need for targeted interventions aimed at addressing the socio-economic disparities and health inequalities prevalent in Mumbai's informal settlements. Initiatives focusing on improving access to clean water, sanitation facilities, healthcare services, and educational opportunities are imperative to fostering the well-being and holistic development of all residents, irrespective of their socio-economic status or geographical location.

Result

To quantify these disparities, we draw on the latest reports: Praja Foundation's 2024 survey of Mumbai water supply, peer-reviewed field studies, and national statistics. The Praja data are particularly telling. They confirm only one ward in Mumbai actually had 24×7 supply, while citywide average was just 5.37 hours/day. (timesofindia. indiatimes.compraja.org) . Seventy-one percent of city zones got ≤4 hrs/day, and about 15% of demand went unmet in 2024. Importantly, Praja breaks out slum vs non-slum: recommended 135 LPCD reached only richer areas, whereas slums received ~45 LPCD. These numbers align with BMC's own data.

Academic surveys reinforce these findings. In slum, household surveys (N≈600) found non-notified residents averaged far less water than notified wealthy neighbours. The poor pay ~₹700–750/month for supplemental tanker water, compared to ₹25–30 for piped service. In one, informal measurements showed daily use below 20 L per person (under WHO's hygiene threshold). Limited water correlates with more missed work, depression and poor child health in slums and also gender biasness among women. Over 80% of fetching is done by females in households lacking taps which results about ~150 million person-days/year time spent in fetching water.

Conclusion:

Water quality and availability, key factors in ensuring access to clean and safe water, profoundly affect various aspects of people's social lives, especially in marginalized communities where water scarcity and pollution are common. As a constitutional right, access to clean water is essential to fostering human dignity and promoting social equality. Poor water quality, characterized by contamination by pollutants and pathogens such as E. coli, undermines this right, posing significant health risks and disrupting daily routines. In slum areas with inadequate water infrastructure and unreliable supply

systems, residents face two challenges: access to limited amounts of water and struggle with its poor quality. This not only affects their physical health but also interferes with household chores as time and resources are spent on water-related matters instead of income-generating activities. Job opportunities may be limited due to time constraints and health problems caused by waterborne diseases. In addition, children may miss out on education because they are tasked with fetching water or become ill from contaminated water sources. The deterioration of the quality of life in slum areas is further exacerbated by social tensions resulting from competition for scarce water resources and a sense of exclusion from political decision-making processes. Addressing issues related to water quality and availability is therefore necessary not only to protect public health, but also to promote social cohesion, economic development and the realization of basic human rights for all members of society.

Mumbai's water is legally everyone's right, but in practice it is rationed by wealth and status. We find overwhelming evidence that poorer, more marginalized groups get far less water at far higher cost than affluent residents. Slums and informal settlements receive less water than WHO's threshold, while the promise of 24×7 supply remains unfulfilled. These findings underscore that water "inequality is not about water scarcity alone, but about social and legal barriers. Even if Mumbai's supply matched demand, how it is allocated would remain driven by socioeconomic hierarchies. Going forward, policies must focus on the needy extending metered connections to all settlements (irrespective of tenure), improving infrastructure in slums, and empowering women's roles in planning. Otherwise, water will continue to be rationed unequally, with the poor paying the price.

Future action

1. Implement water access requirements: Ensuring that all citizens have clean water services in informal settlements, regardless of their legal status or type of dwelling.
2. Use adaptable land tenure by implementing flexible permitting: Allow the construction of water infrastructure in informal settlements.
3. Encourage community-driven water management by providing resources and encouragement for residents to organize and implement water projects.
4. Promote partnership with informal settlements: Collaborate closely and jointly with government agencies, NGOs, community members of informal communities to design water projects and ensure that water services are responsive to the needs and priorities of slum dwellers.
5. Examine other service delivery options: Consider decentralized water distribution systems, mobile water dispensers, or prepaid water meters as alternative methods to provide access to water in informal settlements.
6. Adopt a policy that considers the legal recognition of community land rights in informal settlements to provide residents with judicial oversight over water resources.
7. Encourage participatory policy-making: Draft policies on water access and informal settlements through inclusive and participative processes that involve representatives from slum communities and ensure that their specific challenges are addressed..



Figure 2: Actions to make water available to informal community

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