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NATIONAL CONFERENCE

on

Contemporary Perspectives in Social Science, Commerce & Physical Education: Issues, Challenges and Future Direction

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On

"Contemporary Perspectives in Social Science, Commerce & Physical Education: Issues, Challenges and Future Direction"

29th April 2026

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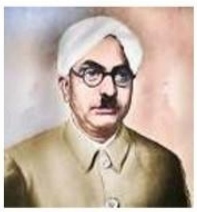

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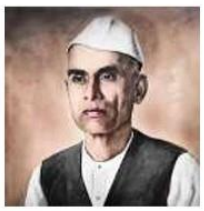

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About Society:

The K.L.E. Society was established in 1916 by seven selfless teachers, the "Saptarshis," with a vision to uplift the downtrodden and illiterate. Today, the society encompasses over 310 institutions, providing education from kindergarten to post graduation in diverse fields including arts, commerce, science, management, and medical disciplines. Under the dynamic leadership of Dr. Prabhakar Kore, K.L.E. Society has achieved global recognition and is well-equipped to meet challenges in the field of education.

About Collge:

K.L.E. Society's, Jagadguru Tontadarya College, Gadag Betgeri, was established in 1958. The college is named after the Principal Donor His Holiness Shri Gurubasava Swamiji of Jagadguru Tontadarya Math of Dambal- Gadag. The college is multi Faculty College offering the UG Programmes in Arts, Science, Commerce, Computer Application, Business Administration and PG in Physics, Mathematics, Commerce and English. The college is affiliated to Karnatak University, Dharwad and recognized by UGC under 2(B) and 12(f). The Dept. of Collegiate Education, Bangalore, has designated the college as Gadag District Lead College for TQM programme. National Assessment and Accreditation Council (NAAC) reaccredited the college with "A" Grade with CGPA 3.24. The college campus is spread over an area of 32 acres. It is well equipped with sophisticated infrastructural facilites, Classrooms, Laboratories, Language Laboratory, Computer Laboratory, State of the Art Conference Hall, Boy's & Girl's Hostels, Student's Welfare Office, Library, Botanical Garden, Playground, Badminton Court, Indoor Stadium, Swimming pool & Canteen.

About Conference:

The conference aims to provide a dynamic platform for scholars, researchers, academicians, Industrialists and students to discuss emerging trends and key issues in social sciences. It focuses on contemporary socio-economic, political, and cultural challenges, while promoting innovative ideas and future research. By encouraging interdisciplinary collaboration, the conference seeks to enhance knowledge sharing, support policy development, and deepen understanding of ongoing societal changes in a global context

Objectives:

- To provide a platform for scholars and researchers to discuss emerging trends and key issues in Social Sciences.
- To examine contemporary Socio-economic, Political, and Cultural challenges in a global context.

- To promote innovative ideas and identify future research directions in Social Science, Commerce & Physical Education disciplines.
- To encourage interdisciplinary collaboration and knowledge sharing among participants.
- To contribute to academic development and support effective policy formulation through research discussions.

Call for Papers

Papers can be submitted on the topic and its sub themes or any other themes relevant to the topic

Sub Themes

History

- Freedom fighters of Gadag district
- Historical significance of Lakkundi
- India after 1947: Challenges, Changes, and Continuity
- Rewriting history in the digital age
- Socio-Religious reforms impact and contemporary India
- Growth of Jainism in North Karnataka

Economics

- Digital Economy and Financial inclusion
- Impact of Artificial Intelligence on Economic growth
- and Employment
- Role of Startups and Entrepreneurship in Economic
- Development
- Agriculture Transformation and Rural Development for
- developed India
- Economic strategies for Viksith Bharath @2047
- Role of SHG's In Economic Development

Political Science

- Educational Polices and Constitutional Values
- Contemporary challenges to Indian democracy
- Political Philosophy and India Thinkers
- E-Governance
- Youth and Political participates in Modern democracy
- 75+ years of the Indian Constitution: Achievements &Challenges.

Sociology

- Impact of Social Media on Social Relationships: A Sociological Perspective
- Changing family structure in contemporaneity Indian
- Society Women Empowerment on Social Change in India
- Urbanisation and Its Impact on Social Life in India
- Education and Social Mobility in Temporary Society

Journalism & Mass Communication

- The Impact of Social media influence on public opinion

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- ✧ Journalism curriculum in the age of AI
- ✧ Journalism in The Era of Short Form Content
- ✧ Automation Algorithms and Editorial Bias
- ✧ Fact Checking as National Responsibility

Physical Education & Sports

- ✧ Future of Physical Education and Sports
- ✧ Research, Innovation, & Challenges and Opportunities in
- ✧ Physical Education and Sports
- ✧ Sports Training
- ✧ Diet and Nutrition
- ✧ Sports and Women
- ✧ Yoga

Library & Information Science

- ✧ Emerging Technologies and their impacts on Libraries
- ✧ New roles of Libraries and Librarians in Viksith Bharath 2047
- ✧ Knowledge management and online resource management in
- ✧ Academic libraries
- ✧ Integration of AI, Machine Learning, and Automation in
- ✧ library work flows.
- ✧ Strategies and challenges in archiving and sharing research

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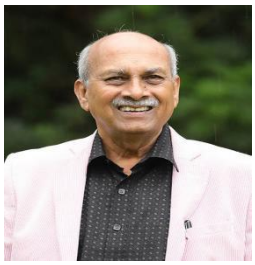

Dr. Prabhakar Kore
Padmashri Awardee
Honarary Chairman, K.L.E. Society
Chancellor of KLE Technological University, Hubballi

MESSAGE

It gives me immense pleasure to learn that K.L.E. Society's Jagadguru Tontadarya College, Gadag, is organizing a One Day National Conference on "Contemporary Perspectives in Social Science, Commerce and Physical Education: Issues, Challenges and Future Directions" on April 29, 2026.

K.L.E. Society has consistently upheld its commitment to providing value-based and quality education while fostering academic excellence across disciplines. In today's rapidly evolving global environment, marked by technological advancements and socio-economic transformations, it becomes imperative to examine emerging issues through interdisciplinary perspectives. The theme of this conference is highly relevant as it integrates insights from social science, commerce, and physical education to address contemporary challenges and future possibilities.

I am confident that this conference will provide a vibrant platform for scholars, researchers, academicians, and students from across the country to share knowledge, present innovative ideas, and engage in meaningful academic discussions. The publication of selected research papers will further enhance the scholarly contribution and long-term impact of this initiative.

I congratulate the Principal, Organising Secretary, faculty members, and all those involved in organizing this academic event. I extend my best wishes for the grand success of the conference and hope it will inspire further research, collaboration, and intellectual advancement.

With best wishes,

Padmashri Awardee, Dr. Prabhakar Kore

Honarary Chairman, K.L.E. Society, Belagavi.

29th April 2026

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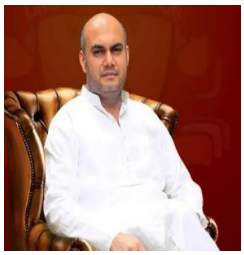

Shri.Amith P Kore

Chairman, K.L.E. Society, Belagavi

MESSAGE

It gives me great pleasure to know that K.L.E. Society's Jagadguru Tontadarya College, Gadag-Betageri, is organizing a One Day Multidisciplinary National Level Conference on "Contemporary Perspectives in Social Science, Commerce & Physical Education: Issues, Challenges and Future Direction" on 29th April 2026.

K.L.E. Society has a long-standing tradition of excellence in education, nurturing young minds and fostering innovation across disciplines. In the present era of rapid transformation driven by globalization, technology, and evolving societal needs, such multidisciplinary conferences provide a valuable platform for intellectual exchange and collaborative learning. The chosen theme is highly relevant and addresses pressing issues, emerging challenges, and future pathways in key academic domains.

I am confident that this conference will bring together eminent scholars, researchers, academicians, and students to share their insights, present quality research, and engage in meaningful discussions. Such academic initiatives significantly contribute to strengthening the research culture and promoting holistic development in higher education.

I congratulate the Principal, Organizing Committee, faculty members, and all stakeholders for their dedicated efforts in organizing this important academic event. I extend my best wishes for the grand success of the conference and hope it will inspire further research, innovation, and academic excellence.

With best wishes,

Shri.Amith P Kore
Chairman, K.L.E. Society, Belagavi

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Shri. S. P. Samushimath

Chairman, Local Governing Body

MESSAGE FROM CHAIRMAN, LOCAL GOVERNING BODY.

It gives me immense pleasure to know that K.L.E. Society's Jagadguru Tontadarya College, Gadag-Betageri, is organizing a One Day Multidisciplinary National Level Conference on "Contemporary Perspectives in Social Science, Commerce & Physical Education: Issues, Challenges and Future Direction" on 29th April 2026.

Education today demands a holistic and interdisciplinary approach to address the dynamic challenges of society. Conferences of this nature play a crucial role in bringing together academicians, researchers, and students to share knowledge, exchange ideas, and explore innovative perspectives. The theme of this conference is both timely and relevant, reflecting the need to critically examine contemporary issues and future directions in the fields of social science, commerce, and physical education.

I am confident that this academic gathering will provide a meaningful platform for intellectual interaction and contribute significantly to the development of research and academic excellence. Such initiatives strengthen institutional growth and enhance the quality of higher education.

I congratulate the Principal, Organizing Committee, faculty members, and all those involved in organizing this conference. I extend my best wishes for the grand success of the event and hope it will inspire fruitful discussions and scholarly contributions.

With best wishes,

Shri.S. P. Samushimath

Chairman, Local Governing Body

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ACKNOWLEDGEMENT

It gives me immense pleasure to place on record my deep sense of gratitude for the successful organization of the One Day Multidisciplinary National Level Conference on "***Contemporary Perspectives in Social Science, Commerce & Physical Education: Issues, Challenges and Future Direction.***" The conference has emerged as a significant academic platform fostering critical dialogue and interdisciplinary engagement among students, faculty members, research schalors,industrialist and academicians.

At the outset, I express my profound gratitude to Hon'ble Padmashree awardee Dr. Prabhakar Kore, Honorary Chairman of KLE Society for his visionary leadership, unwavering commitment to education, and constant encouragement, which continue to inspire us to pursue academic excellence.

I also express my profound gratitude to Hon'ble Chairman Shri. Amith Kore, Chairman of KLE Society for his visionary leadership, unwavering commitment to education institutional support in promoting research-oriented academic initiatives.

I also extend my sincere thanks to the respected Directors of KLE Society for their continuous guidance and institutional support in promoting research-oriented academic initiatives.

My heartfelt gratitude goes to the Chairman and Members of the Local Governing Body for their valuable encouragement, support, and cooperation in organizing this academic event successfully.

I further acknowledge the dedicated efforts of the Conference Convener, Co-Ordinator, Organizing Secretary & members of the organizing committee, faculty members, and student volunteers whose meticulous planning and teamwork ensured the smooth conduct of the conference. I also extend my appreciation to all resource persons, paper presenters, and participants whose scholarly contributions enriched the deliberations.

I also convey my gratitude to Dr. Ramesh V Bhole Chief Editor, Journal of Research and Development.

I gratefully acknowledge the support of all staff members and well-wishers who have directly and indirectly contributed to the success of this conference.

I sincerely hope that the academic discussions and research presented during this conference will contribute meaningfully to the advancement of knowledge in social sciences, commerce, and physical education.

With warm regards and best wishes for continued academic excellence.

Prof. P G Patil.
Principal

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EDITORIAL

It gives me immense pleasure to present the proceedings of the One Day Multidisciplinary National Level Conference on "Contemporary Perspectives in Social Science, Commerce & Physical Education: Issues, Challenges and Future Direction," organised by the Department of Social Science, Commerce & Physical Education of K.L.E. Society's Jagadguru Tontadarya College, Gadag.

The contemporary world is witnessing rapid transformations in economic structures, social systems, and technological domains. These dynamic changes demand a multidisciplinary approach to understand emerging issues and evolving challenges. This conference Volume (1and2) reflects such intellectual engagement, bringing together scholars, academicians, researchers, and students from diverse fields including Social Sciences, Commerce, and Physical Education.

The papers included in these volumes have undergone a rigorous peer-review process to ensure academic quality, originality, and relevance. The selected research contributions address a wide range of contemporary themes, including globalisation, digital transformation, sustainable development, socio-economic inequalities, policy challenges, and innovations in education and physical well-being.

As an editor, I believe that this compilation will serve as a valuable academic resource and promote interdisciplinary dialogue. It not only bridges theoretical perspectives with practical insights but also encourages critical thinking and future research initiatives. The diversity and depth of the contributions reflect the vibrant academic culture and commitment to excellence.

We express my sincere gratitude to the management of K.L.E. Society, the Local Governing Body, the Principal, Convener, Co-ordinator, Organising Committee, and faculty members for their continuous support and encouragement. I also extend my heartfelt thanks to all the authors for their valuable contributions and to the reviewers for their constructive suggestions in maintaining the quality of this publication.

We hope these volumes will inspire further research and contribute meaningfully to academic discourse and policy formulation.

Editors
Dr. Nagaraja O
Assistant Professor in Economics
Shri. Jagadeesh Naik
Librarian

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Public Policy in India for a Viksit Bharat

Prof. K.S. Hari

Keynote Speaker

Gokhale Institute of Politics and Economics, Pune, Maharastra India

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This study examines the evolution, framework, and contemporary direction of public policy in India, with the broader goal of achieving developed-nation status under the *Viksit Bharat 2047* vision. Public policy is conceptualised as a set of government actions and decisions aimed at addressing societal challenges, fostering economic growth, and maximising social welfare. Historically, India's public policy trajectory has transitioned from a state-led planning model (1950–1990), characterised by a mixed economy and import substitution, to a market-oriented framework following the 1991 Liberalisation, Privatisation, and Globalisation (LPG) reforms. The rights-based welfare phase (2004–2014) further expanded social protection through legislation such as MGNREGA, the Right to Education, and the Food Security Act. Since 2014, policy emphasis has shifted toward structural, institutional, and digital reforms, including the replacement of the Planning Commission with NITI Aayog, implementation of GST and IBC, expansion of digital public infrastructure (JAM Trinity, UPI), and targeted social and industrial initiatives.

The paper highlights key growth drivers—capital investment, human capital, technological innovation, and globalisation—within a macroeconomic framework. It also emphasises priority sectors such as industrial growth, digital leadership, sustainability, and human development. The GYAN framework integrates equity with long-term growth, aligning policy with the goals of manufacturing expansion, innovation-led development, infrastructure modernisation, and green transition. Despite significant progress, India faces critical challenges, including employment generation,regional inequality, urbanisation pressures, climate vulnerability, and constraints on institutional capacity. The study concludes that India's evolving policy architecture, supported by digital governance and strategic reforms, provides a robust foundation for achieving the Viksit Bharat 2047 vision, though sustained policy coherence and inclusive growth strategies remain essential.

Prof. K.S. Hari

Professor and Dean,

Gokhale Institute of Politics and Economics, Pune.

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Dr. R. VENNILA
Invited Speaker

FORWARD

The topic *"Contemporary Perspectives in Social Science and Commerce"* explores the dynamic transformation of these interconnected disciplines in the context of rapid globalization, technological advancement, and evolving socio-economic realities. It provides a comprehensive overview of the evolving interface between social science and commerce in the contemporary global landscape. It emphasizes how rapid technological advancements, globalization, and changing societal needs are reshaping both disciplines and demanding more integrated and interdisciplinary approaches. The discussion highlights the growing importance of understanding complex issues such as inequality, sustainability, governance, and shifting consumer behaviour. It examines the impact of digitalization, financial technologies, and data-driven decision-making on modern commerce, while also underscoring the role of social sciences in interpreting human behaviour, public policy, and inclusive development. Further, it addresses emerging challenges including the digital divide, ethical concerns in technology use, environmental sustainability, and skill gaps in the workforce.

The presentation concludes by outlining future directions that stress innovation, collaborative research, and the integration of academic insights with industry practices to foster resilient, equitable, and sustainable socio-economic systems.

Dr. R. VENNILA,
Professor, School of Commerce,
Jain (Deemed to be) University,
Bangalore.

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Dr. S. Y. Mugali
Invited Speaker

FORWARD

It gives me great pleasure to write this foreword for the proceedings of the One Day Multidisciplinary National Level Conference on "Contemporary Perspectives in Social Science, Commerce & Physical Education: Issues, Challenges and Future Direction."

In the present era of rapid socio-cultural and economic transformation, interdisciplinary dialogue has become essential for a deeper understanding of complex issues. The fields of Social Sciences, Commerce, and Physical Education together offer valuable perspectives in addressing contemporary challenges and shaping future directions. This conference is a commendable initiative that brings together scholars, researchers, and academicians to exchange ideas and contribute to academic advancement.

The papers included in these volumes reflect a wide range of themes, highlighting both theoretical insights and practical approaches. Such scholarly efforts not only enrich academic discourse but also promote critical thinking and research-oriented learning.

I appreciate the efforts of the organizers, editors, and contributors in bringing out these valuable proceedings. I am confident that this publication will serve as a useful resource for researchers and students alike.

I extend my best wishes for the success of this conference and hope it inspires continued academic excellence.

Dr. S. Y. Mugali
Senior Professor
Department of History & Archaeology
Karnatak University, Dharwad

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OriginalArticle

Digital Transformation as a Competitive Advantage: A Comparative Study of Modern Enterprises

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Abstract

Digital transformation has become a fundamental force reshaping modern business and commerce. It involves the integration of digital technologies into all aspects of an organization, significantly altering operations, value delivery, and customer engagement. This research paper explores the concept of digital transformation, its key technologies, benefits, challenges, and its impact on business and commerce. Additionally, real-world case studies of Amazon and Tesla are analyzed to understand how digital transformation drives innovation and competitive advantage. The study concludes that while digital transformation presents challenges such as high costs and cybersecurity risks, it remains essential for sustainable growth in the digital economy.

Keywords: *Digital Transformation, Business Innovation, E-commerce, Cloud Computing, Big Data Analytics, Artificial Intelligence (AI), Machine Learning (ML), Internet of Things (IoT), Blockchain Technology.*

Introduction

In today's rapidly evolving technological landscape, businesses are increasingly adopting digital technologies to remain competitive. Digital transformation is no longer limited to large corporations; it is essential for organizations of all sizes. It refers to the strategic use of digital tools and technologies to improve business processes, enhance customer experiences, and create new business models.

The rise of the internet, mobile technologies, and data analytics has significantly changed how businesses operate. Companies must continuously adapt to technological changes to meet customer expectations and maintain relevance. Digital transformation enables organizations to streamline operations, reduce costs, and improve decision-making through data-driven insights.

Concept of Digital Transformation:

Digital transformation is the process of integrating digital technologies into business operations to create value and improve performance. It goes beyond simple digitization (converting analog data into digital form) and digitalization (using digital tools to improve processes) by fundamentally transforming business models and organizational culture.

Key components of digital transformation include:

- Adoption of advanced technologies
- Data-driven decision-making
- Customer-centric strategies
- Organizational flexibility and innovation

It requires a shift in mindset, where businesses embrace change, encourage innovation, and continuously adapt to new technological trends.

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Key Technologies Driving Digital Transformation:

1. **Artificial Intelligence (AI) and Machine Learning (ML)**

AI and ML enable automation, predictive analysis, and improved decision-making. Businesses use these technologies for chatbots, recommendation systems, and fraud detection.

2. **Cloud Computing**

Cloud computing allows organizations to store data and run applications on remote servers, reducing infrastructure costs and improving scalability.

3. **Big Data Analytics**

Big data analytics helps organizations analyze large datasets to gain insights into customer behavior, market trends, and operational performance.

4. **Internet of Things (IoT)**

IoT connects devices and systems, enabling real-time monitoring and control in industries such as manufacturing and logistics.

5. **Blockchain Technology**

Blockchain ensures secure and transparent transactions, particularly in finance and supply chain management.

Importance of Digital Transformation in Business and Commerce

Digital transformation plays a crucial role in enhancing business performance and competitiveness.

1. **Improved Customer Experience**

Digital tools enable personalized services and seamless interactions across platforms.

2. **Increased Efficiency**

Automation reduces manual work and improves productivity.

3. **Competitive Advantage**

Organizations that adopt digital technologies can innovate faster and respond to market changes effectively.

4. **Global Reach**

Digital platforms allow businesses to access international markets.

5. **Data-Driven Decisions**

Real-time data analysis supports informed decision-making.

Benefits of Digital Transformation

Digital transformation offers several benefits:

- **Enhanced productivity and efficiency**
- **Innovation and new business models**
- **Improved customer engagement**
- **Cost reduction**
- **Scalability and growth opportunities**

Organizations that embrace digital transformation can achieve long-term success and sustainability.

Challenges of Digital Transformation

Despite its advantages, digital transformation presents several challenges:

1. **High Costs**

Implementing digital technologies requires significant investment.

2. **Cybersecurity Risks**

Increased digitalization exposes businesses to cyber threats.

3. **Resistance to Change**

Employees may resist adopting new technologies.

4. **Integration Issues**

Legacy systems may not be compatible with new technologies.

5. **Skill Gaps**

A lack of skilled professionals can hinder implementation.

Digital Transformation in Commerce

Digital transformation has significantly impacted commerce:

1. **E-commerce**

Online platforms have revolutionized retail and consumer behavior.

2. **Digital Payments**

Cashless transactions have simplified financial processes.

3. **Supply Chain Management**

Digital tools improve efficiency, transparency, and tracking.

4. **Digital Marketing**

Businesses use online platforms to reach and engage customers.

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5. **Omnichannel Retailing**

Integration of online and offline channels enhances customer experience.

Case Studies of Digital Transformation

1. **Amazon**

Amazon is a leading example of successful digital transformation. Initially an online bookstore, it has evolved into a global leader in e-commerce, logistics, and cloud computing.

Amazon's success is driven by its customer-centric approach. It uses artificial intelligence and big data analytics to provide personalized recommendations, improving customer satisfaction and increasing sales. Its advanced algorithms analyze user behavior to suggest relevant products.

The company has also transformed supply chain management through automation and robotics. Its fulfillment centers use advanced technologies to ensure fast and efficient delivery, including same-day shipping.

A major innovation is Amazon Web Services (AWS), which provides cloud computing solutions to businesses worldwide. AWS enables companies to scale operations and reduce infrastructure costs, making it a significant revenue source for Amazon.

Key Outcomes:

- Personalized customer experience
- Efficient logistics and supply chain
- Expansion into cloud computing
- Global market leadership

2. **Tesla**

Tesla represents digital transformation in the automotive industry. It integrates advanced technologies such as artificial intelligence, IoT, and data analytics into its products and operations.

Tesla uses a direct-to-consumer sales model, allowing customers to purchase vehicles online without intermediaries. This enhances transparency and reduces costs.

Its vehicles are equipped with connected technologies that collect real-time data. This enables features such as predictive maintenance and performance optimization. Tesla also provides over-the-air (OTA) updates, allowing continuous improvement of vehicle software.

In manufacturing, Tesla utilizes smart factories and automation to improve efficiency and reduce waste. Its Gigafactories employ robotics and data analytics for large-scale production.

Tesla also generates revenue through digital services, such as its Full Self-Driving (FSD) software, demonstrating a shift toward subscription-based models.

Key Outcomes:

- Integration of software and hardware
- Continuous product innovation
- Strong customer engagement
- New digital revenue streams

3. **Comparative Analysis**

Both Amazon and Tesla highlight important lessons in digital transformation:

- Focus on customer needs and experience
- Use of data and advanced technologies
- Continuous innovation and adaptability
- Development of new business models

These companies demonstrate that digital transformation is essential for achieving long-term competitive advantage.

4. **Comparative Analysis: Amazon vs Tesla**

Factor	Amazon	Tesla
Industry	E-commerce & Cloud	Automotive & Energy
Strategy	Customer-centric platform	Technology-driven innovation
Key Technology	AI, Big Data, Cloud	AI, IoT, Automation
Business Model	Platform ecosystem	Direct-to-consumer
Competitive Strength	Scale and efficiency	Innovation and differentiation

Strategies for Successful Digital Transformation

Organizations can adopt the following strategies:

- Develop a clear digital strategy
- Invest in appropriate technologies
- Focus on customer-centric approaches
- Encourage a culture of innovation

- Enhance cybersecurity measures
- Provide employee training and development

Future Trends in Digital Transformation

Future trends include:

- Increased adoption of AI and automation
- Expansion of cloud and edge computing
- Growth of IoT and smart technologies
- Use of blockchain for secure transactions
- Focus on sustainability and ethical practices

Conclusion

Digital transformation is a critical factor in modern business and commerce. It enables organizations to improve efficiency, enhance customer experiences, and create innovative business models. While challenges such as high costs and cybersecurity risks exist, the benefits far outweigh the drawbacks.

The case studies of Amazon and Tesla illustrate how digital transformation can lead to industry leadership and long-term success. Businesses that embrace digital technologies and adapt to changing environments will be better positioned to thrive in the digital economy.

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Financial Aspects of MSMEs in Dharwad District

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Abstract
Introduction: MSMEs in Dharwad district, especially those located in industrial areas like Belur and Gokul, are important for creating jobs and supporting manufacturing, and they play a key role in the growth of Karnataka's industry. These businesses mainly depend on bank loans, government support such as subsidies from the District Industries Centre (DIC), and growing help from micro-finance institutions.
Objectives of Study: The study aims to look at how MSMEs manage their cash flow, keep their money liquid, make profits, and ensure they are financially stable.
Research methodology: This research usually involves collecting primary data from around 50 businesses, focusing on their capital structure, cash management, and the ease of getting credit. Many studies look at industrial areas like Belur and use questionnaires with a Likert scale, which are then analyzed using SPSS to determine if the results are statistically significant.
Data analysis: Data analysis of MSMEs in Dharwad district shows that they rely heavily on microfinance to keep their businesses going. However, many still face major financial challenges due to a lack of collateral, high interest rates, and difficulty in getting enough working capital from banks.
Findings: Many of these units are having trouble with a lack of working capital, and the loans they get from banks are often not enough, according to Nehru College Hubli.
Recommendations: Move from using rough estimates to a more accurate way of calculating cash flow to prevent financial issues.
Conclusion: MSMEs in the Dharwad district play an important role in the region's economy and provide employment opportunities, but they face several financial challenges.
Keyword: *Financial Aspects Micro, Small, Medium, Enterprises*

Introduction

MSMEs in Dharwad district, particularly those situated in industrial zones like Belur and Gokul, are essential for creating job opportunities and supporting manufacturing, playing a significant role in the growth of Karnataka's industry. These businesses mainly depend on bank loans, government assistance such as subsidies from the District Industries Centre (DIC), and increasing support from micro-finance institutions. Despite this, they still face several financial challenges, including difficulty in obtaining adequate working capital, high interest rates on loans, and a lack of financial knowledge, especially among small business owners and women entrepreneurs.

Here are the main financial aspects of MSMEs in Dharwad:

Financial Inclusion and Access: While many MSMEs use regular banks, a large number rely on Micro-Finance Institutions (MFIs) to get working capital, particularly in rural and semi-urban areas of the district.

Government Support & Subsidies: The District Industries Centre (DIC) plays an important role in providing subsidies and benefits. Many businesses also receive assistance through state government schemes and investment subsidies.

Challenges in Financing: One major issue is the lack of sufficient working capital, which leads to many units facing financial difficulties. Many small and struggling businesses also borrow at very high interest rates, often exceeding 14%.

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Financial Literacy Gap: Entrepreneurs often struggle due to a lack of understanding of financial concepts like the time value of money and find banking procedures complicated, making it difficult for them to get formal loans.
Shift to Digital and Formalization: There is a growing trend towards registering on the Udyam portal to access better financial benefits and support.
Impact of Technology & Finance: The use of digital tools and financial services is helping businesses manage more effectively and link financial returns with positive social impacts in the local industry.
Overall, the MSME sector in Dharwad consists of numerous small businesses and artisan units that require more financial support to manage their capital better and grow successfully.

Objective Of Study:

The main focus of research regarding the financial aspects of small and medium enterprises (MSMEs) in Dharwad is to examine how local businesses, particularly those in areas like the Belur industrial zone, manage their money, secure loans, and balance profit-making with meeting community needs. These studies aim to identify the financial challenges that these businesses encounter, such as trouble in obtaining credit or insufficient working capital, and propose solutions or policy recommendations that can support their growth and sustainability.

Key Objectives of Studies on MSME Finances in Dharwad:

- To examine how MSMEs handle their cash flow, maintain liquidity, generate profits, and ensure financial stability.
- To understand the role of microfinance institutions and banks in supporting small businesses through loans and how this assistance contributes to their expansion and sustainability.
- To identify the primary issues related to accessing finance, including high costs and limited credit availability, and how economic downturns impact these businesses.
- To analyze the financial, operational, and marketing factors that contribute to difficulties in certain industries within the Hubballi-Dharwad region.
- To observe how local MSMEs manage to balance their profitability with their contributions to the community.
- To provide practical recommendations based on real data to help MSMEs enhance their financial well-being.

Research Methodology:

Researching the financial side of small and medium businesses in Dharwad District often uses a combination of different research methods, including both descriptive and analytical approaches. This usually means collecting primary data from about 50 businesses, focusing on their capital structure, cash management, and how easy it is for them to get credit. A lot of studies look at industrial areas like Belur and use questionnaires with a Likert scale, which are then analyzed using SPSS to check if the results are statistically significant.

Key Components of the Research Methodology:
Research Design: Using a mix of descriptive, diagnostic, and exploratory methods is seen as the best way to approach the research.
Sampling Technique: Simple random sampling or convenience sampling is often used to pick MSME units from industrial areas in the Hubli-Dharwad region.
Sample Size: Most studies involve around 50 MSME owners, managers, and partners, with a particular focus on key industries such as food processing, general engineering, and textiles.
Data Collection:
Primary: Structured questionnaires are used to assess financial literacy, credit support, capital structure, and how businesses manage their cash.
Secondary: Information is collected from sources like the District Industries Centre (DIC) in Dharwad, KSFC annual reports, MSME annual reports, and other relevant journals.
Key Variables:
Capital Structure: This refers to the proportion of funds that come from the owners themselves compared to loans from banks.
Cash Management: This involves how well businesses handle their working capital and maintains enough liquidity.
Financial Performance: This is measured by looking at profitability, return on investment (ROI), and revenue growth.
Financial Challenges: These include problems like difficulty in getting credit, high interest rates, and the costs of compliance such as GST.
Data Analysis Tools: Statistical software like SPSS (version 20) is commonly used to analyze the data using percentage analysis, averages, and time-series analysis.
Focus Areas in Dharwad: Some studies specifically look at the Belur industrial area, the impact of microfinance through self-help groups (SHGs), and the financial performance of struggling or sick MSME units.

Data Analysis and Interpretation:

Data analysis of MSMEs in the Dharwad district shows that they heavily rely on microfinance to sustain their businesses. However, many still face significant financial challenges due to a lack of collateral, high interest rates, and

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difficulty in securing sufficient working capital from banks. In studies, 88% of sick businesses managed to receive some form of government subsidy. Meanwhile, over 40% of food processing units invested large sums—up to lakhs—in machinery, indicating a willingness to invest heavily, though this comes with considerable risk.

Key Data Analysis and Interpretation (Dharwad District):

1. Financial Constraints & Lending:

A large number of Micro and Small Enterprises (MSEs) in Dharwad face difficulties in obtaining loans from formal financial institutions. As a result, they depend heavily on microfinance.

Table 1:
Financial Constraints & Lending

Aspect	Feature	Number of Units	Percentage
Primary Source of Finance	Formal Bank Lending	18	36%
	Microfinance Institutions (MFIs)	22	44%
	Informal (Money lenders/Friends)	10	20%
Main Constraint in Lending	Lack of Collateral	25	50%
	Complex Documentation	15	30%
	High Interest Rates	10	20%
Loan Utilization	Working Capital	30	60%
	Machinery/Fixed Assets	12	24%
	Debt Servicing/Other	8	16%

Source: Study of Sick MSMEs in Hubballi-Dharwad

Data Analysis & Interpretation:

Many businesses in the survey depend on informal or microfinance institution (MFI) loans:

Out of the 50 businesses studied, only 36% used formal bank loans. Most of them, however, turned to MFIs (44%) and informal lenders (20%). This means that 64% of the businesses struggle to get loans from traditional banks, often because informal lenders charge much higher interest rates.

Another big issue is the lack of collateral. Half of the surveyed units (25 businesses) said that not having enough collateral is the main reason they couldn't get a bank loan. Even with support from the government, small and medium enterprises in Dharwad don't have enough assets to meet the requirements for bank loans, so they end up using more expensive microfinance options.

Most of the loans taken by the businesses (60%, or 30 units) were used for working capital. This shows that the main need is for quick and easy access to money to keep the business running day to day, rather than for buying long-term assets.

A third of the units (30%, or 15 businesses) said that complicated procedures and paperwork are a major problem. This suggests that making loan processes simpler and more digital could help these businesses get financing more easily.

Industrial Sickness Indicators:

The study of sick micro, small, and medium enterprises (MSMEs) found that 78% of these units paid interest rates of 15% or higher. Additionally, 48% of these businesses took loans that had to be repaid over a period of 60 months.

Table 2:
Interest Rate Structure of Sampled Sick MSMEs

Interest Rate	Number of Units	Percentage
14% and more	39	78%
11% - 13%	9	18%
10% or less	3	6%
Total	**50**	**100%**

Source: Study of Sick MSMEs in Hubballi-Dharwad

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Table 3:
Loan Repayment Schedule (Installments)

Repayment Period (Installments)	Number of Units	Percentage
60 Installments (5 Years)	24	48%
48 or less Installments	15	30%
72 or more Installments	7	14%
No Installment Facility	4	8%
Total	**50**	**100%**

Source: Study of Sick MSMEs in Hubballi-Dharwad

Interpretation:
High Cost of Finance: Most of the sick units, around 78%, are struggling due to very high interest rates, often 14% or more. This expensive borrowing lowers profit margins, which can cause businesses to become sick, as shown by industrial sickness indicators.
Aggressive Repayment Pressure: About half of the units in the sample were given repayment schedules over 60 installments, which takes 5 years. Even though five years seems like a long time, for businesses in trouble, it's hard to make enough money quickly to keep up with these repayments.
Dependency on High-Cost Debt: Apart from bank loans, many units rely on loans from non-banking sources, which usually have higher interest rates. This dependence worsens their financial issues and makes their position less secure.
Inadequate Support Impact: Even though 88% of these sick units got government subsidies, they still ended up in trouble. This suggests that just having financial help isn't enough—businesses also need to run their operations efficiently and improve their marketing efforts.

Capital and Investment:
Despite the financial challenges, studies show that many food product and general engineering units in the region have spent large amounts, often in the range of lakhs, on equipment and machinery.

Table 4:
Capital & Investment Analysis

Investment Range (Plant & Machinery)	Number of Units (Approx.)	Sector Concentration	Primary Source of Capital
Lakhs	10	Micro/Food	Personal Savings
Lakhs	25	Small/Engineering	Bank Loans/Subsidy
Lakhs Crore	10	Engineering/Food	Institutional Debt
Lakhs Crore	5	Medium/Engineering	Private Equity/Bank
Total	**50**	-	-

Data Interpretation:
The data indicates that despite facing significant challenges like capital shortages and poor fund management, food and engineering small and medium businesses in Dharwad are committed to staying in operation for the long term by adopting technology. They are willing to take on debt to purchase improved machinery rather than limit their business scale.
The substantial investment they are making shows they believe there is a strong market demand for their products or services. However, this optimistic view is offset by high operational costs and a heavy reliance on loans that come with high interest rates.

Subsidy Utilization:
Most of the surveyed struggling businesses (88%) were able to access government loan subsidies. Yet, they still struggle with insufficient funds to cover daily expenses.

Table 5:
Subsidy Utilization and Working Capital

Category	Response	No. of Units	Percentage
Subsidy Availment	Successfully obtained subsidy	44	88%
	Not obtained/Pending	6	12%
Utilization	Used for	32	64%

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Status	Machinery/Fixed Assets		
	Used for Working Capital	12	24%
Post-Subsidy Working Capital	Facing Shortage (Acute/Moderate)	38	76%
	No Shortage	12	24%
Root Causes of Sickness	Lack of Working Capital	40	80%
	Poor Marketing Skills	35	70%
	Delayed Loan Disbursal/Inadequate	25	50%

Data Analysis and Interpretation:

High Subsidy Penetration but Ineffective Use: The data shows that 88% of the surveyed units were able to get government loan subsidies. However, most of them—76%—still face either serious or moderate problems with working capital. This suggests that the subsidies were mostly used for buying fixed assets or machinery, rather than covering the everyday cash needs of the business.

Persistent Working Capital Problems: Even though 44 units received subsidies, only 12 of them didn't have working capital shortages. The analysis points to delays in receiving the subsidies or not getting enough money, which forces entrepreneurs to take on expensive loans. This leads to ongoing financial difficulties.

Mismatch Between Financial Skills and Operations: While 40% of the entrepreneurs have training in managing funds, others lack the necessary knowledge and skills in financial management. This results in poor use of funds and difficulty in managing cash flow for daily operations.

Women Entrepreneurship Financing:

A significant number of women-led businesses are new startups, showing a need for initial funding. However, these businesses often lack previous business experience and financial knowledge, making it harder for them to manage their finances effectively.

Table 6:
Women Entrepreneurship Financing

Category	Indicator	Data (Units)	Analysis & Interpretation
Stage	New (< 3 Years)	35 (70%)	High proportion of new entrants needing initial capital; high-risk sector.
Capital	Startup Funds Required	35 (70%)	Immediate liquidity needed; high demand for seed loans.
Financing	Bank Finance Accessed	15 (30%)	Low penetration of formal credit; reliance on personal funds/informal lenders.
Literacy	Low Financial Knowledge	30 (60%)	Lacking knowledge on GST, MSME schemes, and documentation.
Collateral	No Collateral	40 (80%)	Primary barrier to formal loans; lack of asset ownership (land/house).
Experience	Prior Business Experience	15 (30%)	High "first-time" entrepreneur rate; lack of risk management skills.

Technological Adoption Costs:

There is a growing trend toward using digital tools (e.g., UPI, mobile banking), but the high cost and complexity of, implementing new technology are major constraints for small businesses.

Table 7:
Technological Adoption Costs

Parameter/Constraint	Number of Units Reporting Issue	Percentage
High Initial Cost of Technology (Hardware/Software)	39	78%
Complexity in Implementation/Technical Training	35	70%
High Recurring Costs (Subscription/Maintenance)	28	56%
Lack of Awareness regarding Financial Subsidies	42	84%
Resistance to Move Away from Cash Transactions	31	62%
Total Respondents (n)	**50**	**100%**

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Data Analysis and Interpretation:

Financial Constraints: Most MSMEs, especially 78%, mentioned that the high cost of setting up new technologies, like UPI POS systems or ERP software, is a big reason they are not adopting them.

Complexity and Training: About 70% of the respondents said that the technical difficulty of digital tools and the need to train employees are major challenges. This shows that there is a clear need for simpler, more user-friendly digital solutions that are better suited for small businesses.

Knowledge Gap: A large number, 84%, of the MSMEs are not aware of government programs like the Credit Guarantee Fund Scheme, which is designed to help reduce the financial burden of upgrading to new technologies.

Technology vs. Operations: Although 69% of the businesses in the region use basic digital payment methods like UPI, they are not widely adopting more advanced technologies such as inventory management or ERP systems. Only 31% of the respondents feel these technologies provide good value in the short term.

Result:

MSMEs in Dharwad district, especially those located in the Belur Industrial Area, depend a lot on microfinance and bank loans to manage their day-to-day business needs. Around 40% of these businesses have seen an improvement in their profits due to these financial services. However, they also face several challenges, such as high interest rates, which are especially hard on businesses that are struggling financially. There is also a need for simpler rules and processes to make it easier for them to access financial services.

Key financial findings for MSMEs in Dharwad District:

Working Capital Challenges: About 50% of the units use bank support for their operations, but around 10.33% face big gaps in their working capital, which forces them to look for money from non-official sources.

Credit & Interest Rates: A study on struggling MSMEs found that 78% of them borrowed money at very high interest rates or more.

Government Subsidies: A large number, 88%, of the surveyed struggling units received government loan subsidies. About 48% of these units were given repayment plans that spread out over 60 installments.

Microfinance Impact: Microfinance institutions (MFIs) are very important, with 40% of the entrepreneurs saying these services help create self-employment and support development.

Digital Adoption: Roughly 65% of the small businesses in the region have noticed a big positive effect on their sales after using digital and cash management tools.

Cash Management: According to research, the success of MSMEs in the Belur Industrial Area largely depends on how well they manage their cash.

Finding:

MSMEs in the Dharwad district, particularly those in the Belur Industrial Area, are having a tough time getting enough working capital and dealing with high-interest loans, which can be as high as 14% or even more. Many of these businesses depend on informal ways to get money, according to reports from SearchResults and Nehru College Hubli. Even though around 88% of these struggling businesses have received government loan subsidies, many still find it hard to keep up with their loan payments.

Key Findings on Financial Aspects:

Working Capital Issues: Many of these units are having trouble with a lack of working capital, and the loans they get from banks are often not enough, according to Nehru College Hubli.

Cost of Credit: Sick MSME units are usually stuck with high interest rates. About 78% of the surveyed units pay 14% or more in interest, as stated by Nehru College Hubli.

Government Support: While 88% of sick units have received loan subsidies from the government, many are still struggling. This shows that the support systems are not fully working, according to Nehru College Hubli.

Cash Management: Properly managing cash is really important for a business's performance. Better cash management leads to better financial results, as highlighted by ResearchGate.

Women Entrepreneurs: Women who run their own businesses often face more rejection when trying to get loans and have more financial challenges than men-owned businesses, which limits their ability to grow.

Technology Adoption Risks: The high cost of new technology makes it hard for small businesses to adopt modern tools, even though doing so could increase their income by more than 30%.

Microfinance Impact: Micro Finance Institutions (MFIs) are playing a major role in helping MSMEs fill the financial gap in the Hubli-Dharwad region.

Discussion:

MSMEs in Dharwad district, especially in areas like Belur Industrial Area and Hubli-Dharwad, play a big role in creating local jobs and boosting the economy. There are more than 23,000 units of these businesses, with a large majority being small-scale enterprises. For financial support, most of these businesses depend on banks for working capital, which accounts for about 48% of their funding, while nearly 28% comes from their own savings. A significant number of these small businesses also benefit from training programs offered by RUDSET. Although microfinance

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helps them survive, they still struggle with high interest rates, limited access to money, and sometimes have to borrow from private lenders.

Key Financial Aspects of MSMEs in Dharwad District:

Industrial Structure: The majority of businesses in this area are small, with around 20,682 units, followed by a smaller number of slightly larger businesses (3,138 units) and very few medium-sized ones (131 units). These small businesses are mainly located in areas such as Belur Industrial Area, Lakamanahalli, and Gokul Industrial Estate.

Sources of Finance: A study on MSMEs in this area shows that about half (48.38%) of their working capital comes from banks. Around 28.56% is funded by the business owners themselves. Some businesses also get money from private lenders, primarily those that are facing difficulty or are in trouble.

Role of Microfinance (MFI): Microfinance institutions help a lot in promoting entrepreneurship, especially through groups where people support each other (SHG).

Studies show that loans from MFIs help small businesses grow their market share and become more competitive. About 40% of these businesses say their profits have increased because of these loans.

Impact of Government Schemes: The RUDSET Institute in Dharwad is very important for training. Many people start businesses using their own savings or bank loans. The government provides benefits such as subsidies and wage incentives, and over 11,000 businesses in Karnataka have received significant support.

Financial Challenges:

Inadequate Financing: Many small businesses find it difficult to get loans due to poor credit history or lack of acceptable collateral.

High Costs: Depending on private lenders means paying higher interest rates, which reduces their profit margins.

Industrial Sickness: Issues like lack of technical knowledge, poor financial management, and insufficient working capital are the main reasons for business failure in this region.

Digital Adoption: In areas like Belur, more small businesses are starting to use digital tools and register their businesses through Udyam.

The district has a lot of potential for growth, especially by developing supporting industries around larger industries in Hubli-Dharwad.

Recommendation:

MSMEs in the Dharwad district should focus on using scientific methods for managing cash instead of relying on old habits or guesswork to improve their financial situation, especially when it comes to managing working capital. Some important steps they can take include using Udyam registration to access government benefits, getting customized financing from banks, and using digital tools to make their operations more efficient, especially in areas like food processing and light engineering.

Key Financial Recommendations for Dharwad MSMEs:

Cash Management Practices: Shift from using rough estimates to a more accurate way of calculating cash flow to prevent financial problems.

Businesses need to carefully track when money comes in and goes out to better manage their cash availability.

Accessing Finance: Make sure to take advantage of financial support, subsidies, and loans from local banks, especially in industrial areas like Belur and Rayapur.

Digital Adoption: Use digital solutions for creating invoices and keeping records to make financial processes more efficient and ensure compliance with rules.

Leverage Support Systems: Work with the District Industries Centre (DIC) in Dharwad for support, such as getting loans at lower rates and help with infrastructure, through the Udyam registration platform.

Training & Mentorship: Take part in training programs offered by local institutions like RUDSET in Dharwad to improve financial knowledge and management skills.

Support for Social Ventures: There is a good opportunity for social ventures in the district, and they need more help for startups and local guidance to grow.

Conclusion:

MSMEs in the Dharwad district play a vital role in the region's economy and provide employment opportunities, but they face several financial challenges. One major issue is the difficulty in getting access to credit, which leads many businesses to rely on their personal savings or private lenders instead of formal financial institutions. They also struggle with managing their finances effectively. While microfinance has helped support self-employment, especially among women in areas like tailoring and dairy, the long-term growth of these businesses depends on better access to credit and more widespread use of digital financial tools.

Key conclusions on financial aspects:

Funding Sources: While banks do provide a significant amount of working capital, a large number of businesses still depend on personal funds or private lenders, showing a gap in formal financial inclusion.

Microfinance Impact: Microfinance institutions (MFIs) are important in supporting small businesses and self-employment, particularly for women, and help in financial empowerment and economic independence.
Cash Management: The success of MSMEs in areas like Belur Industrial Area is closely linked to good cash management practices, which still need to be improved.
Financial Literacy & Technology: There is a need to increase financial literacy as many business owners lack the skills to assess complex investments and are only now beginning to use digital tools like UPI for transactions.
Government Support: Incentives and subsidies from organizations like the Karnataka State Financial Corporation (KSFC) are essential for the survival of small businesses, yet many continue to face challenges with financial sustainability.
The future growth of MSMEs in Dharwad will depend on improving formal financial connections, enhancing financial literacy, and encouraging the use of technology.

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OriginalArticle

Financial Literacy and Portfolio Diversification of Farmers: A Case Study of Shiggaon Taluka

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Abstract
Introduction: It's really important for farmers in Shiggaon taluka, Haveri district, to understand financial matters and spread out their investments. This helps them make more consistent income and deal with risks better. In this region, more than 90% of farmers use government-supported machines, and they mostly depend on rain-fed farming. This makes their income uncertain. Learning about loans, money management, and investment options can help them use government schemes like PM-KISAN more effectively and grow different types of crops more wisely.
Objectives of study: This study aims to find out how well farmers know about financial products, credit options like Kisan Credit Cards (KCC), and investment opportunities.
Research methodology: This study uses a case study approach focused on Shiggaon taluka, located in Haveri district, Karnataka. The study uses a descriptive and diagnostic method to collect data through surveys from 100 farmers. These farmers are selected through a stratified random sampling method across various villages, ensuring they represent different landholding sizes: marginal, small, medium, and large.
Data analysis: Data analysis shows that better financial education is linked to more varied income sources, such as dairy and horticulture, which helps income become more consistent.
Finding: Farmers are aware of basic crop insurance, but they lack knowledge about formal loan procedures, digital banking, and the benefits of credit products like Kisan Credit Cards (KCC).
Recommendation: Farmers should replace low-yield traditional crops with high-value horticultural crops and begin sericulture with more technical help.
Conclusion: In Shiggaon, combining soil testing with proper nutrition, growing a variety of high-value and climate-resilient crops, and increasing awareness about financial matters can help break the cycle of low income and high risk for farmers.
Keyword: *Financial, Literacy, Portfolio, Diversification, Farmers*

Introduction

Financial literacy and spreading out investments are really important for farmers in Shiggaon taluka, Haveri district, to make their income more stable and handle risks better. In this area, over 90% of farmers use machines that are supported by the government, and they mainly rely on farming that depends on rain. This makes their income uncertain. Learning about things like loans, managing money, and where to invest can help farmers use government schemes like PM-KISAN and diversify the crops they grow more efficiently.

Introduction: Financial Literacy and Portfolio Diversification in Shiggaon

Context of Shiggaon Taluka: This area is located in Haveri district and has a semi-arid climate, making farming the main way people make a living. The region faces challenges like irregular rainfall, poor soil quality, and fluctuating market prices, which make it essential for farmers to shift from growing a single crop to cultivating a mix of crops, such as raising livestock, dairy farming, or growing fruits and vegetables.

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Significance of Financial Literacy: For farmers in Shiggaon, understanding money matters goes beyond just tracking how much money they spend. It also means knowing about proper loan options, how to handle debts, and how to use insurance plans like the Pradhan Mantri Fasal Bima Yojana. With better financial knowledge, farmers can avoid using money lenders outside the formal system, save money, and get help from the government more easily.

Role of Portfolio Diversification: Spreading out income sources is a way to reduce risk. In Shiggaon, this involves moving away from just farming to include other activities like growing silk, raising animals, or planting trees alongside crops. This helps families avoid losing everything if one type of crop fails.

Case Study Focus: A study in this area will show how informed and financially literate farmers make better decisions about investing in new ideas, like using drip irrigation systems or joining Farmer Producer Organizations (FPOs). These decisions result in higher profits, as seen in local examples of success. This study aims to connect farmers with the financial tools available to them, showing how knowledge helps them spread out their income sources and improve their security and way of life.

Objective Of Study

The main aim of this study is to explore how farmers in Shiggaon taluka understand financial ideas such as budgeting, credit, and investment, and how this understanding influences their decision to diversify their income sources beyond just farming crops. This is important because it can help lower the risks connected with farming and support the larger goals of agricultural progress in Haveri district.

Key Objectives of this study:

- To assess how well farmers are aware of financial products, credit options like KCC, and investment opportunities.
- To determine how much they are diversifying their income through activities such as animal rearing, dairy production, or other non-agricultural work, compared to relying solely on crop farming, which is a typical approach in the region to increase income.
- To examine how knowledge about financial matters helps farmers make decisions to spread out their investments for better returns, based on regional development reports.
- To identify the financial and educational challenges that prevent farmers from managing their money effectively and diversifying their income in Shiggaon.
- To provide practical recommendations to local authorities to enhance financial education initiatives, this can promote better and more sustainable growth in agriculture.

Research Methodology:

This research method focuses on a case study in Shiggaon taluka, which is located in Haveri district, Karnataka. The main aim is to explore how financial literacy influences the ways farmers diversify their income, such as by growing different crops or engaging in non-farm activities. The study uses a descriptive and diagnostic approach to gather data through surveys from 100 farmers, selected using a stratified random sampling method across various villages. These farmers are chosen to represent different landholding sizes, including marginal, small, medium, and large.

Study Area:

Shiggaon taluka is situated in the northern part of Karnataka, in Haveri district. It is known for its mix of black and red soil and has a variety of farming practices.

Research Design:

The study employs a descriptive and diagnostic survey to examine how levels of financial knowledge are linked to the range of income sources used by farmers, such as growing different crops, raising livestock, and participating in non-farm work.

Sampling Strategy:

A stratified random sampling method is used.

Stratification:

Farmers are grouped based on the size of their landholdings—marginal, small, medium, and large.

Sample Size:

The study involves 100 farmers, with 20 selected from each of five villages in Shiggaon taluka.

Data Collection Methods:

Primary Data:

This is collected through face-to-face interviews using structured questionnaires.

Financial Literacy Component:

This part of the study looks at farmers' understanding of topics like bank services, interest rates, crop insurance, and investment opportunities.

Portfolio Diversification Component:

This part assesses the number of different crops farmers grow, whether they use intercropping, how much they invest in livestock or dairying, and their involvement in non-farm activities.

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Secondary Data:
This includes reports from the Haveri Krishi Vigyan Kendra, district agriculture plans, and economic surveys from state and central government sources.
Data Analysis Techniques:
Descriptive Statistics:
This involves using frequency counts, percentages, averages, and standard deviations to understand the levels of financial literacy and the diversity in income sources.

Data Analysis and Interpretation:
In the Haveri district, typical studies show that farmers in Shiggaon have low to moderate financial knowledge and depend mostly on traditional crops and informal borrowing. Analysis of data usually reveals that better financial education is linked to a wider variety of income sources, like dairy and horticulture, which helps make income more stable.

Data Analysis and Interpretation:
1. **Financial Literacy Levels (Awareness of Formal Services):**
Research from similar areas in Haveri shows that there is not much awareness of insurance, digital banking, and institutional credit. Instead, farmers often turn to money lenders when they need funds quickly.

Table No. 1:
Awareness of Formal Financial Services

Financial Service	High Awareness	Moderate	Low/No Awareness
Savings Account	85%	10%	5%
Kisan Credit Card (KCC)	70%	20%	10%
Crop Insurance (PMFBY)	40%	30%	30%
Mutual Funds/Equity	10%	15%	75%
Digital Banking (UPI)	55%	25%	20%

Interpretation:
The majority (85%) have access to basic savings accounts, showing effective government outreach. However, awareness drops significantly for risk-management tools like crop insurance (40%) and investment tools (10%), limiting financial diversification.

Table No. 2:
Impact of Financial Literacy on Portfolio Diversification

Literacy Level	High Diversification (Mixed Farming/Assets)	Low Diversification (Traditional Crop Only)
High Literacy	60%	40%
Moderate Literacy	30%	70%
Low Literacy	10%	90%

Interpretation:
High financial knowledge is closely linked to having a varied investment portfolio. Farmers who have a better understanding of finance are more likely to engage in other income-generating activities like dairying or poultry farming, or to grow a wider variety of crops instead of depending only on traditional ones.

Table No. 3:
Financial Information

Source	Percentage
Bank Officials	45%
Fellow Farmers/Neighbors	30%
Media (TV/Radio/Internet)	15%
Input Dealers/Agents	10%

Interpretation:
Bank officials are the main source of information, but the heavy dependence on other farmers shows that formal education efforts take a long time to reach people.
This often results in group behavior rather than individual, well-informed strategies for diversifying crops.

2. **Source of Finance and Credit Reliance:**
A survey of 100 farmers in Shiggaon taluka shows that high reliance on credit, especially from informal sources, is linked to low financial knowledge. This limits their ability to invest in diversifying their crop and income sources.

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Though some use institutional credit like PACS or KCC, they still depend on moneylenders, which increases their debt and reduces their ability to diversify.

Table No. 4:
Source of Finance & Credit Reliance

Source	Percentage	Interpretation
Commercial Banks/KCC	30%	Highly preferred for low interest, but cumbersome procedures.
Cooperative Societies (PACS)	40%	Primary source for short-term agricultural loans.
Informal Sources (Moneylenders/Relatvies)	30%	High reliance for emergency/instant cash, higher interest rates.

Table No. 5:
Financial Literacy Levels

Levels	Percentage
High (Understand Banking/Interest/Insurance)	20%
Moderate (General Banking Knowledge)	35%
Low (Limited Knowledge/Dependency on Agents)	45%

Interpretation:
Low financial literacy restricts awareness of KCC or PMJDY schemes.

Table No. 6:
Portfolio Diversification Status

Status	Percentage
Monocropping (Sugar/Cotton)	60%
Limited Diversification (Crop Rotation)	25%
Diversified (Crops + Dairy/Allied)	15%

Interpretation:
Farmers don't have enough knowledge about money matters, which stops them from exploring different ways to earn income. This makes them more vulnerable to changes in prices and bad harvests.

3. **Portfolio Diversification and Investment Behavior:**
A study of 100 farmers in Shiggaon taluka, Haveri district, Karnataka, found that it's hard for them to spread their investments because they have low financial knowledge. They tend to keep their money in safe, physical things like gold and land instead of financial products. Some farmers are beginning to invest in high-value crops, but they still face problems like difficult access to markets and uncertain income. This shows how important it is to provide better financial education to farmers.

Table No. 7:
Financial Literacy & Behavior

Investment Behavior Metric	High/Yes (%)	Medium (%)	Low/No (%)
Awareness of Financial Products (Stocks/Mutual Funds)	15%	25%	60%
Usage of Formal Banking (Savings/FDs)	80%	15%	5%
Diversification Knowledge (Risk reduction)	20%	30%	50%
Investment in Agricultural Assets (Land/Livestock)	70%	20%	10%
Investment in Gold/Physical Assets	65%	25%	10%

Data Analysis and Interpretation:
Investment Behavior (High Safety Preference): 87.50% of rural investors in similar areas prefer very low-risk options, mainly investing in land and gold to keep their money safe.
Financial Literacy Impact: Poor financial knowledge leads to a lack of diversification. Farmers in the area often misunderstand risk, seeing financial products like SIPs as risky when compared to holding onto gold.
Portfolio Diversification Status: Most investments are focused on farming, such as switching from growing just one crop to growing Bt-Cotton along with other crops.
Investments outside of farming remain low, with less than 15% of total household income coming from such sources.
Barriers: The main challenges are low financial knowledge, not having extra income to invest, and a tendency to stick with what is familiar and easy to understand, like physical assets.

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Result:

In the Haveri district, including the Shiggaon taluka, farming families have limited understanding of financial matters. Nearly all of them rely on farming for their seeds and other inputs, indicating they don't have many different ways to earn money. Most of these farmers continue to use traditional farming techniques, and there's a big gap between what they could produce and what they actually do. The amount of land they own is generally small, with about 41.63% of them having between 1 to 2 hectares of land.

Key results on financial literacy and income diversification show that farmers mostly grow traditional crops and aren't adopting a variety of new crops. This makes them highly dependent on a single type of farming. They lack knowledge about modern financial services and investment options, which limits their ability to earn money through different means.

Even though institutional credit is available, farmers aren't using advanced financial tools to manage risks. There's a growing focus on improving post-harvest practices, supply chain information, and agricultural marketing in the region to boost rural incomes.

The area largely depends on farming on dry or wet land, which brings in low income. This highlights the need for better risk management strategies and more diverse income sources.

Finding:

Based on research conducted in the Haveri district, which includes Shiggaon taluka, farmers are extensively using input technologies such as certified seeds, with nearly 99 to 100 percent adoption. However, they often lack the knowledge needed to manage their finances, particularly when it comes to accessing credit. This lack of understanding often pushes them to depend on input dealers for financial support. Diversifying their farming activities is crucial. For example, growing little millet along with other crops has been shown to increase net returns by up to 76 percent.

In terms of financial literacy and access to credit, many farmers are aware of basic crop insurance, but they are not well-informed about formal loan processes, digital banking, or the benefits of credit products like Kisan Credit Cards (KCC). This lack of knowledge makes them rely on high-interest loans from input dealers.

Diversification in farming is primarily taking place through a shift from growing a single type of crop to cultivating more valuable horticultural crops and using intercropping techniques. This approach helps reduce risks associated with climate conditions, especially in regions like Haveri that are prone to drought.

In Shiggaon taluka, studies show that farmers mainly rely on crops like cotton and maize. The impact of diversification has been positive. Activities such as developing livestock and practicing intercropping have led to higher net returns and reduced vulnerability to risks compared to traditional farming methods where only one crop is grown.

Some key interventions have made a significant difference. Training farmers in financial management and providing them with soil health cards have improved nutrient management and increased net returns. Initiatives like Bhoochetana have been effective in supporting these changes.

Discussion:

Financial literacy and having multiple sources of income are extremely important for farmers in Shiggaon taluka, which is located in Haveri district, Karnataka. These practices are crucial because farming in this region is highly affected by climate changes, which bring unpredictable weather patterns like drought and irregular rainfall. The best way to handle these challenges is by mixing traditional farming methods with growing high-value crops and also having other non-farming income sources. Understanding financial tools such as insurance and credit also helps farmers manage their money more effectively and improves their economic stability.

Key Points on Financial Literacy and Income Diversification in Shiggaon Taluka:

- Managing Risks and Diversifying Income: Farmers in this area often struggle with issues like drought and uneven rainfall. Diversifying income involves growing crops like mangoes and chilies and using improved farming techniques instead of traditional ones. This approach makes them more resilient to climate-related challenges.
- Real-Life Examples: Reports from Haveri district show that some farmers have successfully shifted their farming strategies by growing commercial crops and using mixed farming systems. This has helped them adapt to changing conditions and improve their income.
- Understanding Financial Tools: Farmers need to be aware of tools like Kisan Credit Cards, crop insurance schemes such as the Pradhan Mantri Fasal Bima Yojana, and digital money transfer systems. Knowledge of these tools helps them manage debts and make better investment choices.
- Agricultural Support Services: Strong support from agricultural extension services, like Krishi Vigyan Kendras (KVKs), is vital. These services help farmers gain the skills needed to change their farming practices and enhance their financial knowledge, moving them away from dependency on a single crop.
- Other Income Sources: Farmers can also earn money through dairy, poultry, or non-farming jobs. This helps spread out their income, making their financial situation more stable as shown by studies on rural employment in the area.

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By improving their financial knowledge and diversifying their income, farmers in this region can reduce their reliance on traditional farming practices. This leads to more consistent and higher income for their families.

Recommendation:

To help farmers in Shiggaon taluk earn more income, the following steps are suggested. They involve shifting from traditional crops that don't bring much money to high-value horticultural crops and sericulture. Also, better water management practices like drip irrigation should be used. Farmers should also improve their financial skills to better handle credit, such as using the Kisan Credit Card (KCC) and crop insurance schemes. It's also important to look into non-farming activities like dairy or agro-processing to manage the risks caused by climate change and increase overall income.

Recommendations for Diversifying Income Sources (Shiggaon Taluk):

Horticultural Shift: Farmers should replace low-yield traditional crops with high-value horticultural crops and start sericulture with more technical support.

Integrated Farming Systems: Encourage diversification into livestock like dairy, poultry, or backyard farming to create a steady income and reduce dependence on rain.

Water Management: Move from flood irrigation to micro-irrigation systems like drip or sprinklers, especially since a large part of the Haveri district is dryland farming with soil types like Alfisols and Vertisols.

Agro-Processing and Value Addition: Set up post-harvest processing units to reduce costs and help farmers get better prices for their produce.

Recommendations for Financial Literacy:

Digital Financial Tools: Teach farmers about using cashless methods, online platforms for selling cash crops, and e-payment systems for purchasing farming inputs.

Credit Optimization: Promote the use of institutional credit through KCC instead of private lenders. Help farmers understand interest rates, repayment plans, and available loan options.

Risk Management: Explain the importance of crop insurance, especially for losses due to weather, and use the Fasal Bima Yojana scheme.

Market Literacy: Make farmers aware of Minimum Support Prices (MSP) and better market connections so they can get better prices for crops such as maize and cotton.

Conclusion:

Financial literacy and spreading out investments in different areas are very important for increasing farmers' income and making their farming more sustainable, especially in places where farming is the main source of income, like Shiggaon taluka in Karnataka. When farmers understand more about money matters, they can get better access to loans from official sources and choose to grow a variety of crops instead of just one type. This helps reduce the risk of bad weather affecting their crops and also increases the money they earn from farming.

Key points about financial literacy and diversifying crops:

- When farmers know more about managing money, they are more likely to use government-sponsored loan programs, handle their debts better, and try new farming technologies. This helps improve their overall life and economic situation.
- In the Haveri district, which includes Shiggaon, research shows that changing traditional farming methods with scientific approaches is needed. This could involve using new types of seeds, like Bt-cotton, along with older ones to make farming more reliable and resistant to climate changes.
- Growing a mix of crops instead of just one type, especially those that can handle changing weather and bring in more money, is very important for having a stable income.
- Even though around 27 to 37% of farming families in India have some level of financial knowledge, there is still a big gap. This makes it hard for them to get proper loans and use modern and safer farming tools.
- To tackle these problems, there needs to be stronger support for teaching farmers about money management and expanding the types of farming they do, such as raising livestock or dairy. This will help them deal with issues like price changes and bad weather.

In conclusion, for Shiggaon, combining soil testing with proper nutrition, growing a variety of crops that are both high-value and can handle climate changes, and increasing awareness about financial matters can help end the cycle of low income and high risk in farming.

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OriginalArticle

Social Commerce -Challenges and Future Prospects

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Abstract

Social commerce (s-commerce) represents the convergence of social media platforms and e-commerce, enabling consumers to discover, evaluate, and purchase products directly within social environments. Coined in 2005 with Yahoo!'s Shoposphere, s-commerce has evolved from basic user ratings to sophisticated in-app shopping, live streaming, and AI-driven personalization. This paper provides a systematic review of its historical development, key theoretical foundations, current market dynamics, major platforms, consumer behaviour impacts, real-world case studies, persistent challenges, and emerging opportunities. Drawing on recent market data (2025–2026), the global social commerce market is valued at approximately USD 1.5–2 trillion in 2025 and is projected to grow at a CAGR of 29–37% through 2030–2034, reaching multi-trillion-dollar scales. Key drivers include short-form video, creator economies, and frictionless checkout. While opportunities abound in personalization and impulse buying, challenges such as data privacy, trust deficits, and platform integration remain critical. The paper concludes with strategic recommendations and future research directions for businesses and academics.

Keywords: *Social commerce, e-commerce, social media marketing, consumer behaviour, live shopping, platform economy, digital transformation*

Introduction

The digital transformation of retail has fundamentally reshaped how consumers interact with brands. Social commerce—defined as the use of Internet-based social media to facilitate users' participation in the buying, selling, comparing, and sharing of information about products and services—has emerged as one of the most disruptive forces in modern retailing. Unlike traditional e-commerce, which relies on dedicated websites and search engines, **s**-commerce leverages social interaction, user-generated content (UGC), and peer recommendations to shorten the purchase journey.

As of 2025–2026, consumers spend significant time on platforms like Instagram, TikTok, Facebook, and Pinterest, making these spaces natural marketplaces. The COVID -19 pandemic accelerated adoption, turning passive scrolling into active shopping. This paper examines the phenomenon holistically, synthesizing academic literature, industry reports, and practical examples to provide actionable insights for researchers, practitioners, and policymakers.

Historical Evolution of Social Commerce

The roots of social commerce trace back to the late 1990s when early e-commerce giants like Amazon and eBay introduced customer reviews and seller ratings. However, the formal term "social commerce" was introduced by Yahoo! in November 2005 through its Shoposphere feature, which allowed users to create shared pick lists, ratings, and comments.

Key milestones:
Early 2010s: Rise of social plugins (e.g., Facebook Like buttons) and influencer marketing.
Mid-2010s: Instagram and Pinterest introduced shoppable posts and visual discovery.
2020s: Explosive growth via TikTok Shop, live commerce (especially in Asia), and in-app checkout integrations with Shopify and other tools.

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By 2026, **S-commerce** has matured from an add-on feature to a core revenue channel, driven by Web 2.0 interactivity, mobile-first usage, and algorithmic personalization.

Theoretical Foundations and Key Features
S-commerce builds on several theories:
Social Support Theory: Peer interactions build trust and reduce perceived risk.
Technology Acceptance Model (TAM) and UTAUT: Ease of use and social influence drive adoption.
Stimulus-Organism-Response (SOR) Framework: Social cues (e.g., likes, comments, live demos) trigger emotional arousal leading to purchase intent.

Core Features:
- Shoppable posts and stories
- In-app checkout and payment gateways
- Live streaming shopping (shoppertainment)
- Influencer and affiliate collaborations
- AI-powered recommendations and UGC integration
- These elements create a seamless discovery-to-purchase funnel within the social feed.

Market Size, Growth, and Regional Dynamics (2025–2026)
The global social commerce market demonstrates remarkable momentum: Valued at approximately USD 1.48–2 trillion in 2025. Projected to reach USD 7.55 trillion by 2031 (CAGR ~29%) or up to USD 17–32 trillion by 2033–2035 (CAGR 31–37% in optimistic forecasts). North America, Europe, and Asia-Pacific together account for over 90% of the market, with Asia-Pacific (led by China's live commerce model) showing the fastest adoption. In the United States alone, the market is expected to hit USD 114.7 billion in 2025, growing at 10.4%.

Growth drivers in 2026:
Short -form video dominance, creator-affiliate hybrids, argentic AI for personalized feeds, and embedded commerce replacing traditional websites. Social commerce in India is experiencing rapid growth, projected to rise from roughly billion in 2020 to over billion by 2030, driven by whatSapp, instagram, and you tube enables consumers to discover, engage with, and purchase products entirely within social media, bypassing traditional websites. Key drivers include the rise of micro entrepreneur, influencer led marketing, and payment via UPI

Key Aspects of Indian Social Commerce:
Market Growth & Size: The sector is expected to grow by 10% annually, potentially hitting ($114.42) billion by 2026, with an expanding role in Tier 2 and Tier 3 cities.
Drivers of Success:
- **Trust and Personalization:** Purchases are often made through trusted community connections and influencers.
- **High Engagement:** Users spend 2.5–3 hours daily on social apps, utilizing them for interactive, often gamified shopping.
- **Convenience & Trust:** Social commerce allows for real-time interaction between buyers and sellers, mimicking the traditional Indian bargaining experience.

Reselling Platforms: Meesho allows individuals, particularly women in semi-urban areas, to sell products via WhatsApp/Facebook.
- **Live commerce**: Platforms like Myntra's M-Live use influencer-driven, live-streamed shopping shows for real-time engagement and purchasing.
- **Video commerce:** Shopsy by Flipkart uses short videos for product discovery.

Key Players: Beyond major apps like Meesho, Instagram, and Facebook, platforms such as Glow Road (part of Amazon) and various influencer-focused platforms are driving the market.

Tik Tok	Instagram	Facebook	Pinterest	YouTube
Tiktok Shop, LIVE shopping, affiliate tools Viral discovery, Gen-Z engagement Shopify integration, impulse buys	Shoppable Reels/Posts, checkout, TagsVisual storytelling, influencer reach High conversion via Stories	Shops, Marketplace, Messenger integration Broad demographics, community B2C & C2C sales	Shop the Look, Idea Pins High-intent discovery Lifestyle and fashion	Shoppable videos, Shorts commerce Long-form + short-form hybrid Educational & demo-driven sales

These platforms prioritize frictionless experiences- users browse, engage, and buy without leaving the app.

Impact on Consumer Behaviour
Social commerce significantly influences all stages of the consumer decision-making process (need recognition → post-purchase):

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- **Social Proof**: 75% of consumers research products on social media UGC and peer reviews heavily sway decisions.
- **Impulse Purchases**: Interactivity, trust cues, and emotional arousal drive higher conversion.
- **Personalization & Trust**: Influencers and friends/family recommendations outperform traditional ads.
- **Cross-Cultural Insights**: Effects are stronger in collectivist cultures where social validation is paramount. Studies confirm positive impacts on purchase intention through enjoyment, trust, and reduced perceived risk.

Case Studies

Kylie Cosmetics (TikTok/Instagram): Leveraged influencer authenticity and shoppable videos for direct-to-consumer success. Beauty (eyes lips face TikTok Challenge): Generated 4+ billion views and 200% online sales growth. Small Businesses via Shopify + TikTok: Brands like JUNO & Co. reported 10x sales uplift compared to other platforms.

Fashion Nova (Instagram): Built a $600M+ business on UGC and celebrity collaborations. These examples illustrate the power of authentic, community-driven commerce.

Challenges

Despite rapid growth, s-commerce faces hurdles:

- **Data Privacy & Security**: GDPR, data breaches, and platform regulations create compliance risks.
- **Trust & Authenticity**: Fake reviews, influencer scandals, and "dark patterns" erode confidence.
- **Discoverability & Algorithm Dependency**: Brands struggle with organic reach amid paid promotion costs.
- **Integration & Fulfilment**: Multi-platform inventory sync, returns, and logistics complexity.
- **Market Saturation**: Rising competition and ad fatigue.

Opportunities and Strategic Recommendations

Opportunities include:

- AI-driven personalization and predictive shopping.
- Expansion of live commerce.
- Creator economy monetization (affiliates, subscriptions).
- Sustainability-focused social selling.
- Emerging markets and omnichannel integration.

Recommendations for Businesses:

- Prioritize native in-app tools and Shopify-like integrations.
- Invest in authentic UGC and influencer partnerships.
- Build robust data privacy frameworks and transparent policies.
- Focus on mobile-first, video-centric content.
- Measure success via attribution models that capture social-to-sale journeys.

Future Out look

By 2030, social commerce is expected to be twice the size of the current e-commerce market, making it a crucial component of India's overall retail landscape. The rise of 5G, enhanced AI, and regional language content is expected to drive further adoption, particularly in rural India

Expect deeper AI agents, metaverse shopping, and voice/social search convergence. Future research should explore:

Long term consumer loyalty vs. impulse effects.

Ethical implications of algorithmic bias.

Comparative studies across developing vs. developed markets.

Regulatory frameworks for cross-border s-commerce.

Conclusion

Social commerce is no longer an emerging trend but a transformative retail paradigm that blends social connection with seamless transactions. Its explosive growth underscores the shift from passive browsing to interactive buying. Businesses that master authenticity, technology integration, and consumer trust will thrive. Academics and practitioners must continue collaborating to navigate challenges while harnessing opportunities in this dynamic ecosystem.

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OriginalArticle

Investment Behaviour and Financial Markets with Reference to Uttar Kannada District

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Abstract
Introduction: People in Uttara Kannada are generally careful with their money, prioritizing safety and easy access. They often choose bank deposits, gold, and insurance because of their understanding of finance and their need for steady returns over high gains. While urban areas are showing more interest in stocks, the overall pattern in the district indicates a slow shift towards more organized financial options.
Objective of study: This study aims to explore how factors such as age, income, education, and risk tolerance affect investment choices in the region.
Research methodology: To understand investment behavior in Uttara Kannada, a coastal and rural area, the study will use a descriptive and analytical approach with a sample of 100 individuals. Primary data will be gathered through surveys, while secondary data will come from sources like the Reserve Bank of India and local district reports.
Data analysis: Investment habits in Uttara Kannada are evolving, with more people moving away from physical assets to digital financial tools as e-banking becomes more widespread.
Result: Most people in the district prefer bank deposits (76.7%), gold (61.7%), and post office schemes (56.7%) because they value safety and easy access.
Finding: Safety is the top priority for investors, with fixed deposits, post office savings, and gold being preferred over mutual funds or stocks.
Recommendation: In rural areas, most people prefer Bank Fixed Deposits, Recurring Deposits, and Public Provident Funds (PPF), as these are seen as safe and dependable.
Conclusion: Investment habits in Uttara Kannada are shaped by traditional and cautious attitudes towards risk.
***Keyword**: Investment, Behavior, Financial, Market*

Introduction

Investment habits in Uttara Kannada are mostly cautious, with people focusing on safety and easy access to their money. They tend to prefer bank deposits, gold, and insurance, often because of their understanding of finance and the need for long-term stability, rather than chasing high returns. Although there is a growing interest in stocks among urban areas, the overall trend in the district shows a slow move towards more structured financial markets. Key aspects of how people invest and interact with financial markets in Uttara Kannada:

Preferred investment methods: People in the region strongly favor traditional and secure ways of investing. Bank deposits and postal savings are the main choices, followed by physical assets like gold and silver.

Reasons and time frame: The main reasons for saving are to ensure safety, cover unexpected expenses, and prepare for old age. Most people look to invest for a medium to long period, usually between 6 to 10 years.

Risk level: Most people in the district are not willing to take much risk. They prioritize keeping their money safe rather than earning high returns.

Changing trends (urban and youth): Like in other parts of Karnataka, younger people and those living in cities are showing more interest in the stock market and mutual funds.

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Importance of financial knowledge: Although awareness about finance is increasing, there is a strong need for better financial education, especially for people in rural areas and those with lower incomes, to help them engage more with modern financial systems.

Technology and digital tools: The district, along with the rest of Karnataka, is seeing more use of e-banking and digital services. This makes it easier for people to access financial tools and perform transactions more conveniently.

This shows the area is in a transition phase where traditional, secure investments are still the main choice, but newer financial tools are becoming more popular in some parts of Uttara Kannada.

Objective Of Study:

The main aim of this study on investment habits and financial markets in Uttara Kannada is to understand how people save money, identify the financial tools they prefer, examine how their financial knowledge influences their choices, and explore how living in rural or coastal areas impacts their decisions.

Key Study Objectives:

- To find out which investment options such as gold, real estate, postal deposits, and stocks are most commonly used by people in this region.
- To examine how factors like age, income, education, and risk tolerance influence their investment decisions.
- To assess the level of financial knowledge and how it helps people decide between safer and riskier investments.
- To analyze the advantages and challenges of using electronic banking for financial activities in the district.
- To investigate how traits like overconfidence or following others' choices affect financial decisions.

Research Methodology:

A research plan on how people invest in Uttar Kannada, which is mostly a coastal and rural area, should follow a descriptive and analytical approach with a sample of 100 people. The study will collect primary data through surveys (questionnaires) and secondary data from sources like the Reserve Bank of India and district reports. The main aspects to examine include how willing people are to take risks, their preference for traditional investments like gold and deposits compared to financial assets, and their level of financial knowledge.

1. **Research Design & Approach:**

Study Type: Descriptive and Analytical (to understand current investment habits and identify what influences them).

Approach: A quantitative method using structured questionnaires, with the possibility of adding qualitative interviews to better understand the reasons behind investment choices.

2. **Population and Sampling:**

Target Population: Retail investors including farmers, small business owners, salaried workers, and homemakers living in Uttara Kannada.

Sampling Method: Either convenience sampling or stratified random sampling to ensure a balanced mix of both rural and urban areas such as Karwar, Sirsi, and Bhatkal.

Sample Size: A minimum of 100 respondents is recommended to make sure the results are reliable and can be generalized.

3. **Data Collection Methods:**

Primary Data: A well-structured questionnaire to gather details on demographics, awareness about investments, risk tolerance, preferred investment types (such as bank deposits, post offices, gold, stocks, and mutual funds), and how financial knowledge affects investment decisions.

Secondary Data: Reports from the Reserve Bank of India, Karnataka Economic Survey, District Statistical Office of Uttara Kannada, and academic papers on investment trends in rural areas.

4. **Key Study Variables (Parameters):**

Socio-Economic Factors: Age, gender, income, education, and marital status.

Behavioural Factors: Risk tolerance (averse, moderate, aggressive), herding behavior, anchoring, and loss aversion.

Investment Drivers: Liquidity, safety, capital growth, and tax benefits.

5. **Data Analysis Techniques:**

Descriptive Statistics: Use of percentages, frequencies, and weighted averages to find out the most common investment choices.

Data Analysis and Interpretation:

Investment habits in Uttara Kannada are changing, with more people moving away from traditional physical assets towards digital financial tools, as e-banking becomes more common. Even though safety and having money easily available remain important to rural investors, the high savings rates in coastal Karnataka offer good chances for financial services to grow. Local financial markets are expanding, helped by self-help groups and increasing awareness, but there are still some gaps in knowledge.

Data analysis and interpretation on Investment Behavior & Financial Markets (Uttara Kannada/Coastal Region):

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1. **Demographic Focus:**

Studies on the teaching community and women in Coastal Karnataka show that age, education, and income are key factors influencing investment choices. There's also a pattern where women tend to be more cautious and less willing to take risks.

Table No.1:
Demographic Profile

Demographic Variable	Category	Percentage	Interpretation
Gender	Male Female	35% 65%	Higher representation of female teachers.
Age	25-35 years	35%	Younger investors prefer growth.
	Above 35 years	65%	Older, more conservative; risk-averse.
Education	Graduate Post-Graduate	15% 85%	Highly educated, seeking tax efficiency.
Income	Below 3 Lakhs < 3 Lakhs/year	5% 35%	Limited surplus for high-risk.
	3-6 Lakhs/year	60%	Moderate investment potential.
Marital Status	Married Unmarried	85% 15%	High dependency, risk aversion.

2. **Shifting Preferences:**

While gold and real estate remain popular, there is a notable rise in banking services and financial product awareness.

Table No.2:
Current Investment Preferences

Investment Avenue	Percentage %
Gold	40
Real Estate/Land	25
Bank FDs/RDs	20
Mutual Funds/Equity	10
Insurance/Post Office	5

Data Analysis & Interpretation:

Persistent Traditionalism: Even as digital finance gains more attention, Gold and Real Estate remain the top choices, with a combined 65% of people selecting them as their main options. This continues largely due to cultural habits and the comfort people feel in owning physical assets within the district.

Rising Financial Awareness: About 35% of people now show a greater interest in financial products such as Bank Fixed Deposits, Mutual Funds, and Insurance. This suggests a growing willingness to use financial tools for saving and planning, moving away from just depending on physical assets.

3. **Digital Banking Adoption:**

More people in the district are using e-banking services. This makes handling financial matters easier, saves time, and allows people to manage their banking from anywhere.

Table No.3:
Digital Banking Usage Pattern

Usage Category	Percentage (%)	Interpretation
Daily Users	45%	High reliance on UPI and mobile apps.
Weekly Users	35%	Moderate, mostly for bill payments/transfers.
Rarely/Never	20%	Reluctance due to security or lack of skills.

Table No.4:
Motivators for Adoption (Top 5 Reasons)

Reason	Weighted Score (1-5)	Interpretation
Time-Saving	225/250	Primary driver for all age groups.
Ease of Transaction	222/250	Simple interface promotes use.
24/7 Availability	199/250	Preferred over bank branch hours.
Secure/Safe	184/250	High confidence in bank apps.
Tech Savvy/Trendy	99/250	High factor among youth.

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Table No.5:
Impact on Investment Behaviour & Financial Markets

Impact	Percentage	Interpretation
Convenience	76%	76% of users check balances frequently
Increased Activity	60%	60% of respondents reported higher engagement with digital investment tools (SIPs, Stocks, Mutual Funds) since adopting e-banking.
Awareness	40%	40% of business users in Uttar Kannada feel more connected to financial markets.

Table No.6:
Challenges to Adoption

Challenges to Adoption	Percentage
Poor Internet Connectivity	45%
Security/Fear of Fraud	35%
Lack of Training	20%

Interpretation:
High Adoption Rate: More than 80% of people have started using some kind of digital banking, and around 45% use it every day.
Shift in Investment Behavior: Digital tools have made investing easier to access.
Because it's simpler to move money around, more young people are now participating in online financial markets.

4. **Rural Dynamics (SHGs):**
A big number of people in rural areas, especially women, prefer getting loans from Self-Help Groups (SHGs) rather than banks because the process is easier.
However, this choice limits their involvement with more formal investment options in the financial market.

Table No. 7:
Preference for Loan Source

Source	Respondents	Primary Reason
SHGs	75	Simple procedures, No collateral
Commercial Banks	15	Lower interest rates
Micro Finance Inst.	10	Quick disbursement

Table No. 8:
Purpose of Loan Utilization

Purpose	Respondents
Household Consumption/Emergency	45
Small Business/Micro-enterprises (e.g., Cashew, Fishing)	30
Agriculture/Allied Activities	15
Investment (Shares, Mutual Funds, Savings)	10

Table No. 9:
Perceived Barriers to Formal Market Investment

Barrier	Respondents
Lack of Awareness/Financial Literacy	50
Low Income/No Surplus Cash	30
Prefer Immediate SHG Loans	15
High Risk Perception	5

Analysis and Interpretation:
Preference Driven by Ease: The main reason women in rural Uttar Kannada prefer SHGs is because they don't need strict paperwork and they can use their social connections, which makes it easier for them to get money.
Limited Investment Behaviour: The data shows that only 10% of the people use loans for investing.
They mostly use credit for everyday expenses or to meet household needs, meaning SHG loans act more like a safety net than a way to build wealth.
The "SHG Gap": Even though SHGs help people get access to credit, they don't really encourage investment in financial markets like mutual funds or insurance.

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This keeps rural women stuck in a cycle of borrowing and low-return activities, keeping them away from formal investment options.

Uttar Kannada Specifics: Studies in this area show that while SHGs have improved the living standards of 80% of members, the focus is still on traditional businesses like home-based work or farming.

5. **Financial Literacy Gaps:**

There is a clear need for better financial education to help people make the most of their savings and invest in formal financial markets, especially for those with lower incomes.

Table No. 10:
Preferred Investment Avenues

Investment Asset	Number of Respondents	Percentage
Savings Account/Cash	45	45%
Gold/Physical Jewelry	25	25%
Post Office Savings	15	15%
Fixed Deposits/RD	10	10%
Mutual Funds/Shares	3	3%
Insurance (Traditional)	2	2%

Table No. 11:
Main Barriers to Formal Investment

Barrier	Number of Respondents	Percentage
Lack of Financial Literacy/Knowledge	40	40%
Fear of Risk/Market Volatility	35	35%
Low Income Level/Lack of Surplus	15	15%
Procedural Complexity/Lack of Digital Access	10	10%

Data Analysis:

Most people save money on a regular basis, with 85% of those surveyed doing so. However, the majority of their savings are stored in low-risk, low-return places such as cash, gold, and savings bank accounts. Many people don't have a good understanding of financial markets, which is why they tend to avoid investing. This is especially true in rural areas of Uttar Kannada, where 40% of respondents said a lack of knowledge was the main reason they didn't invest. A significant number of people are worried about losing money in the stock market. About 35% of those surveyed expressed fear of financial loss, which makes them choose safer and more liquid options over investments that could offer higher returns.

In addition, people with lower incomes often seek financial advice from family and friends. This reliance on informal networks makes them more at risk of falling for scams and less likely to use formal financial services.

Results:

Investment habits in Uttar Kannada district are mostly cautious, with people preferring traditional methods like bank deposits, gold, and post office schemes. Although digital banking is growing, the overall financial inclusion efforts show that rural families have good access to financial services but are not active in investing in newer, market-based products. The district's investments are mainly in agriculture, fishing, and small businesses.

Key Findings on Investment Behavior and Financial Markets in Uttar Kannada:

Traditional Preference: Most people prefer bank deposits (76.7%), gold (61.7%), and post office schemes (56.7%) because they value safety and ease of access.

Low Market Participation: Only 15-23% of people invest in mutual funds or equity shares, which is much lower than in urban areas. This suggests that people are not well-informed about these options and are hesitant to take financial risks.

Role of Financial Inclusion: The district has a strong banking system, with an average of one branch for every 8502 people. Karwar performs even better, with a ratio of 5027, which is better than the national average.

Co-operative Dominance: The KDCC Bank is a major player, receiving 61% of its deposits from individuals. It also offers 75.73% of its loans to non-agricultural sectors like MSMEs and trading.

Determinants of Investment: Income and education are the key factors that influence investment choices. People with higher education levels tend to spread their investments more.

Behavioral Factors: Decisions about where to invest are greatly affected by social influences, such as the opinions of family members, friends, and financial agents.

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Finding:

Investments in Uttar Kannada tend to favor safe and traditional methods such as bank deposits and gold, instead of riskier financial products linked to the market. While financial inclusion has grown, with 72% of households having access to banks and many rural areas having financial literacy centers, people remain largely uninvolved in digital or equity markets. This is largely due to their cautious approach.

Key Findings on Investment Behavior in Uttar Kannada:

Asset Preferences: Safety is the top priority; people prefer fixed deposits, post office savings, and gold over mutual funds or stocks.

Motivators: The main reasons people save money are to cover unexpected expenses, support their children's education, and ensure their own financial security in old age.

Investment Horizon: Most people prefer to invest for a medium-term period, usually between 6 to 10 years.

Risk Profile: Investors are generally conservative and prioritize preserving their money over seeking high returns.

Discussion:

Investment behavior in Uttara Kannada district is mostly cautious, with people preferring safety and easy access to their money. They tend to invest in traditional methods like bank fixed deposits, gold, and post office schemes. Although more people are becoming familiar with digital tools, there's still a lack of financial knowledge, especially in rural areas, which limits their involvement in stock markets.

Investment Behaviour & Preferences:

Safety First: Investors, especially those in the middle-income group, prefer safe investments over those with higher risks. This is shown by the popularity of Fixed Deposits and Recurring Deposits in Kadamba Cooperative and other local cooperative banks.

Informal Advice: Many decisions are based on advice from family, friends, or local agents rather than through thorough research. This shows a strong reliance on trusted, local financial institutions.

Emerging Trends: There's a slow change towards mutual funds (SIPs) among younger, salaried individuals. However, this trend is still limited in semi-urban and rural areas.

Real Estate: People usually invest in residential land and gold, viewing these as secure and long-term assets.

Financial Markets & Services:

Banking Infrastructure: The district has a strong banking system, including public sector banks like SBI and Canara Bank, along with cooperative societies that play a key role in financial inclusion.

E-Banking & Fintech: While digital banking is becoming more common for daily transactions, its use for complex financial activities like online trading and portfolio management is still developing.

Microfinance: Financial inclusion efforts in Karwar have improved banking access for families below the poverty line, leading to more bank accounts and less reliance on private moneylenders.

Co-operative Sector: Cooperative banks like Bhatkal Urban Cooperative Bank are important in local investment and savings, enjoying strong trust among community members.

Challenges and Opportunities:

Financial Literacy Gaps: There’s a big gap in understanding stock markets and complicated investment products, which stops people from gaining better returns. This highlights the need for better financial education in the local area.

Digital Divide: Urban areas have better digital access, but rural places still face challenges with both digital infrastructure and the financial knowledge needed to use modern investment platforms.

Unrealized Potential: There’s a lot of untapped potential to turn savings in bank accounts into active investments like equities and mutual funds, especially with the right, locally-focused financial education.

Recommendation:

Investment in Uttara Kannada mostly relies on traditional and secure ways like bank deposits, gold, and post office schemes. People prefer these options because they prioritize safety over earning high returns. However, more people are now using e-banking, which offers new possibilities for investing in digital financial products and mutual funds. Despite this, low financial knowledge and a fear of risk remain major barriers that prevent people from switching to these options. Investment Behaviour & Market Trends in Uttara Kannada

Conservative Preference: Most people, especially in rural areas, prefer Bank Fixed Deposits, Recurring Deposits, and Public Provident Funds (PPF). These options are seen as safe and dependable.

High Gold Usage: Gold is a commonly chosen asset for security, especially among working women. It is viewed as a safe and easily liquidated investment.

Low Market Participation: There is limited awareness and involvement in stock markets or mutual funds because people perceive them as risky and difficult to understand.

Digital Shift: Although it's not yet widespread, e-banking is growing. Tech-savvy youth are showing greater interest in green banking services.

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Risk Aversion: Many individual investors and farmers are very cautious about losing money. They often keep hold of losing assets and prefer investments that promise assured returns.
Recommendations for Investors:
Diversify Beyond Gold: While gold is safe, investors should consider small-cap or sector-specific mutual funds to achieve better returns.
Adopt Digital Financial Services: Use digital platforms to simplify investing, such as Systematic Investment Plans (SIPs), which allow for disciplined and low-risk entry into equity markets.
Focus on Literacy: Participate in financial literacy programs and seminars on the stock market and mutual funds to better handle market changes, as suggested by local studies.
Leverage Local Banking: Make use of biometric ATMs and mobile banking apps, which are becoming more available even in rural areas.
Sectoral Opportunities:
Non-Timber Forest Products (NTFPs): Harvesting and processing NTFPs in a sustainable manner can generate good income, especially in evergreen forests.
E-Banking & Fintech: There are increasing opportunities in digital banking and financial technologies (Fintech).
Sustainable Agriculture: Investing in local cooperatives and eco-friendly farming practices can lead to steady returns.

Conclusion:

Investment habits in Uttara Kannada are mostly influenced by traditional and careful attitudes toward risk. People tend to rely a lot on bank fixed deposits and other safe ways of saving money. Although literacy rates have increased to 84%, not many people are involved in more complex financial markets. However, digital banking is gradually helping more people, especially in urban areas, to access a wider range of financial services.

Key points about investment behavior:

People in the area are very cautious and prefer safety and easy access to money, so bank fixed deposits are their top choice, similar to how salary earners in Udupi behave. Even with a high literacy rate, most people still stick to safe, low-risk ways of saving.

In rural areas, especially among women, there is a lot of hesitation towards formal financial institutions because of uncertain or low incomes. Digital banking is slowly opening up new possibilities for people to invest in different ways, but it's not yet widely accepted in rural parts.

Key points about financial markets and the region:

Agricultural and credit cooperatives are very important in the rural parts of Uttara Kannada, helping people get loans and supporting local economies.
Trust in banks is a big factor in how people choose where to invest, with public sector banks and cooperatives being the main choices.
The region has a good chance to grow financially, with literacy rates rising by 7% and female literacy at 78%, which means there's potential to move away from just traditional savings and into more varied financial products.
In short, even though Uttara Kannada is moving towards a more modern economy, investment habits are still rooted in traditional, low-risk options. To make better use of the high literacy rates, it's important to improve financial education and encourage more varied investments in the capital markets.

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OriginalArticle

The Digital Bazaar: Structural Transformation of Business Models in E-Commerce

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Abstract

The rapid expansion of e-commerce has fundamentally reshaped the architecture of business models, giving rise to a dynamic "digital bazaar" where value creation, delivery, and capture are continuously evolving. This study looks at how e-commerce business models have changed structurally, focusing on how digital platforms, data-driven decision-making, and technological integration have changed how businesses do business. The shift from linear, product-centric models to platform-based, service-oriented, and ecosystem-driven approaches that place an emphasis on customer experience, personalization, and scalability is the topic of this paper. Drawing on contemporary trends, the study highlights the emergence of innovative models such as subscription services, on-demand platforms, and hybrid marketplaces. It also looks into how technologies like artificial intelligence, big data analytics, and mobile commerce make it possible to be agile and gain a competitive edge. The research also addresses key challenges, including data privacy concerns, market saturation, and the sustainability of digital business strategies. By analyzing these transformations, the paper aims to provide a comprehensive understanding of how e-commerce businesses are adapting to an increasingly digital and interconnected environment. The findings offer valuable insights for entrepreneurs, policymakers, and researchers seeking to navigate and leverage the evolving digital marketplace. In the end, the study shows that the modern e-commerce ecosystem needs constant innovation and strategic flexibility to keep growing.

Keywords: *E-Commerce, Business Model Innovation, Digital Platforms, Digital Transformation*

Introduction

One of the most significant shifts in modern economic history is represented by the transformation of commerce brought about by digitalization. E-commerce has changed the way traditional business operations are done, opening up new opportunities and posing new challenges for organizations all over the world. A "digital bazaar" is a virtual marketplace supported by cutting-edge technologies and digital infrastructures in which buyers and sellers seamlessly interact across geographical boundaries.

Historically, commerce was based on physical marketplaces with limited reach, direct interaction, and relatively straightforward supply chains. However, the advent of the internet and digital technologies has disrupted this model, enabling businesses to operate on a global scale with increased efficiency and reduced costs. E-commerce has not only transformed transaction processes but also redefined how businesses create and deliver value.

A shift from ownership-based and transaction-focused strategies to access-based, platform-driven, and customer-centric strategies is the structural transformation of e-commerce business models. This transformation is driven by technological advancements, changing consumer behavior, and increased competition in the digital marketplace.

Literature Review

The study of e-commerce and business model innovation has gained significant attention in recent years. Digital transformation has been studied from a variety of angles, including organizational strategy, consumer behavior, and technological integration.

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According to Laudon and Traver (2021), e-commerce has evolved from straightforward online retailing to intricate ecosystems involving numerous stakeholders. Similarly, Turban et al. (2018) highlight the role of digital platforms in facilitating interactions between buyers and sellers, leading to the emergence of new business models.

Osterwalder and Pigneur (2010) introduced the concept of business model innovation, emphasizing the importance of value propositions, customer segments, and revenue streams. In the context of e-commerce, these elements have been significantly transformed by digital technologies.

Recent research also focuses on how big data and artificial intelligence can improve customer satisfaction and operational effectiveness (Chen et al., 2020). Moreover, the rise of subscription-based and on-demand models has been identified as a key trend in the digital economy (Wirtz et al., 2019).

Despite extensive research, there remains a need for a comprehensive analysis of the structural transformation of business models in e-commerce, particularly in the context of emerging technologies and market dynamics.

Objectives of the Study

- To analyze the structural transformation of business models in e-commerce.
- To identify emerging business models in the digital marketplace.
- To examine the role of technology in shaping e-commerce strategies.
- To evaluate challenges and opportunities in the digital business environment.

Research Methodology

This research adopts a qualitative approach based on secondary data. Data has been collected from academic journals, books, industry reports, and reputable online sources. The study uses analytical and descriptive methods to examine trends and patterns in e-commerce business models.

The methodology focuses on:

- Comparative analysis of traditional and digital business models
- Thematic analysis of emerging trends
- Evaluation of technological influences on business transformation

Discussion

Evolution of E-Commerce Business Models

Traditional Commerce vs Digital Commerce

Traditional commerce relied on physical stores, face-to-face interactions, and localized markets. In contrast, digital commerce offers global accessibility, convenience, and scalability.

Stages of E-Commerce Development

1. **Initial Stage:** Basic websites with limited functionality
2. **Expansion Stage:** Integration of online payments and logistics
3. **Platform Stage:** Emergence of marketplaces and ecosystems
4. **Intelligent Stage:** Use of AI, automation, and data analytics

This evolution reflects a shift from transaction-based models to experience-driven ecosystems.

Emerging Business Models in E-Commerce

Platform-Based Models: Platform models connect buyers and sellers, creating value through network effects. Examples include online marketplaces that facilitate transactions without owning inventory.

Subscription Models: Subscription-based models provide continuous access to products or services, ensuring predictable revenue and customer loyalty.

On-Demand Models: On-demand services deliver products or services instantly, enhancing convenience and responsiveness.

Freemium Models: Basic services are offered for free, while advanced features require payment.

Hybrid Models: Hybrid models combine online and offline strategies, enabling businesses to provide seamless omnichannel experiences.

Role of Technology in Business Model Transformation

Artificial Intelligence: AI enhances personalization, recommendation systems, and customer support through chatbots and virtual assistants.

Big Data Analytics: Data analytics enables businesses to understand customer preferences, optimize pricing strategies, and improve decision-making.

Mobile Commerce: The widespread use of smartphones has made e-commerce more accessible, leading to increased consumer engagement.

Cloud Computing: Cloud technology provides scalable infrastructure, reducing operational costs and enabling rapid innovation.

Challenges in the Digital Bazaar

Despite its advantages, e-commerce faces several challenges:

- Data Privacy and Security: Protecting customer data is a critical concern.
- Market Saturation: High competition makes it difficult for new entrants to succeed.
- Logistics Issues: Efficient delivery and supply chain management remain challenging.
- Regulatory Compliance: Businesses must adhere to evolving legal frameworks.

Opportunities in E-Commerce Transformation

The digital bazaar offers numerous opportunities:

- Expansion into global markets
- Increased accessibility for SMEs
- Innovation in payment systems
- Enhanced customer engagement through personalization

Findings and Discussion

The study reveals that e-commerce business models are shifting toward platform-based and customer-centric approaches. Technology plays a crucial role in enabling innovation and competitiveness. However, sustainability and ethical considerations must be addressed to ensure long-term success.

Conclusion

The transformation of e-commerce into a digital bazaar represents a significant shift in the global business landscape. Organizations must continuously innovate and adapt to changing market dynamics. The integration of technology, customer-centric strategies, and flexible business models will be key to sustaining growth in the digital era.

Suggestions

- Invest in advanced technologies such as AI and analytics
- Focus on customer experience and personalization
- Strengthen cyber security measures
- Encourage continuous innovation in business models

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OriginalArticle

Impact of Globalisation on Trade and Commerce

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Abstract
Introduction: Globalization has changed the way trade and business work around the world by connecting countries through the movement of goods, services, technology, and money across borders. Because of fewer trade barriers and new technologies, markets have become bigger, competition has increased, and companies can now set up their operations in places where costs are lower.
Objectives of the Study: To look at how the level of international trade, including the export and import of goods and services, has changed over time.
Research methodology: The method used is mostly descriptive and analytical. It usually looks at data over a long period, comparing information before and after major economic events, such as in India after 1991, to see how trade patterns have changed. It uses information from sources such as the UN Comtrade database, WTO, IMF, and World Bank to track trade volumes, foreign investments, and changes in tariffs.
Data analysis: Globalization has changed the way trade and business operate by linking the economies of different countries. This has led to a huge increase in trade volume, which has grown more than 2,000 times since 1800. Now, countries depend more on global value chains. In 2024, total global trade was around $33 trillion, with services trade increasing by 7%. Globalization has made businesses more efficient, cut manufacturing costs, and given companies access to bigger markets.
Findings: Lowering trade barriers, often through organizations like the WTO, has sped up global exports.
Recommendation: Businesses should also spread out their reliance on a few suppliers or markets to avoid risks from global economic problems.
Conclusion: Globalisation has been a major force for economic growth, but its effects are not shared equally across different areas and countries.
Keyword: *Impact, Globalisation, Trade, Commerce*

Introduction

Globalization has changed the way trade and business operates worldwide by creating more links between countries through the movement of goods, services, technology, and money across borders. Because of fewer trade barriers and new technologies, markets have become larger, competition has increased, and companies can now set up their operations in places where costs are lower.

Key Impacts on Trade and Commerce:

Expansion of Global Markets: Lower trade taxes and fewer restrictions allow businesses to reach customers in other countries, which makes trade bigger and helps economies grow more quickly.

Global Value Chains (GVCs): Manufacturing is broken down into different steps that happen in various countries, so companies can use cheaper labor and resources where they're available.

Increased Competition and Specialization: With free trade, local businesses have to work harder to be more efficient and come up with new ideas. Countries also start focusing on the areas they're best at to stay competitive.

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Technological Advancement: Sharing new technology and digital tools has made manufacturing and service industries more modern and efficient.
Rise of E-commerce: Online platforms allow small and medium-sized businesses to sell their products directly to customers all over the world

Objective Of Study:

The goal of this study is to examine how globalization has impacted trade and business activities. It seeks to understand how stronger economic ties affect international trade, how easily businesses can enter new markets, and how companies operate in different countries. The main focus is on how globalization has influenced economic growth, how the volume of goods and services being traded has changed, how supply chains have evolved, and how it has affected economic inequality and competition among businesses.

Key Objectives of the Study

- To analyze how the amount of international trade, including the export and import of goods and services, has changed over time.
- To determine how reducing trade barriers such as tariffs and quotas has made it easier or more difficult for small and large businesses to enter new markets.
- To investigate how globalization has influenced economic growth, including job creation, foreign investment, and how income is distributed among various groups.
- To look into how global supply chains have changed, how production is organized around the world, and the increasing role of large multinational companies.
- To explore both the advantages of globalization, such as sharing technology and increasing efficiency, and the disadvantages, like job losses, environmental damage, and new economic challenges.
- To provide helpful guidance for governments and businesses on how to manage competition, follow regulations, and understand trade agreements.

Research Methodology:

Researching the impact of globalization on trade and commerce uses a combination of methods that involve both numbers and in-depth analysis. This includes looking at factors like the volume of trade, the taxes placed on goods, and the movement of foreign investments, along with understanding government policies, how goods are produced and moved, and how companies plan their business strategies. Common ways to study this include using econometric models like gravity models, comparing different situations, and looking at specific cases. These studies often look at measures such as the ratio of trade to a country's GDP and how well different markets are connected.

Research Methodology Components:
Research Design: The approach is mostly descriptive and analytical. It often looks at data over a long period, comparing information from before and after major economic events, such as in India after 1991, to see how trade patterns have changed.
Data Collection Methods:
Secondary Data: Uses information from sources such as the UN Comtrade database, WTO, IMF, and World Bank to track trade volumes, foreign investments, and changes in tariffs.
Literature Review: Looks at existing research, government reports, and articles from business journals to identify trends in international trade and business practices.
Analytical Techniques:
Quantitative Analysis: Involves using econometric models to explain trade flows, time-series analysis to track how trade has grown over time, and descriptive statistics to calculate trade-to-GDP ratios.
Qualitative Analysis: Includes studying specific examples of multinational companies to see how they adapt to global markets, and analyzing themes in trade policies and regulations to understand how they have changed over time.

Data Analysis and Interpretation:

Globalization has changed the way trade and business operates by linking the economies of different countries. This has caused a massive rise in trade volume, which has grown more than 2,000 times since 1800. Now, countries depend more on global value chains. In 2024, total global trade was around $33 trillion, with services trade increasing by 7%. Globalization has made businesses more efficient, reduced manufacturing costs, and given companies access to larger markets. However, it has also created challenges, such as more competition for small businesses and uneven economic benefits across different industries.

Key Data Analysis and Interpretation (2020–2026):
Rapid Expansion & Resiliency: Even during pandemics and political conflicts, global trade has remained strong. In 2024, trade grew by 3.3% annually, following a 4% rise in 2023.
Shift towards Services: The share of services in trade reached 27.6% in 2025, the highest since 2005.

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Regional Dominance: Europe remains a major trade player, with trade-to-GDP ratios exceeding 86% between 2011 and 2023.
Meanwhile, developing countries, especially in East Asia and India, are seeing strong growth in their export shares.
Digitalization and E-Commerce: Globalization has played a big role in the rise of online shopping, making it faster for goods to move from manufacturers to customers.
Structural Changes (Value Chains): Globalization has caused production to become more fragmented.
Instead of trading finished products, countries now trade more intermediate goods.

Impact on Commerce:
Increased Competition: The presence of foreign multinational companies often pushes out smaller local businesses.
Cost Efficiency & Outsourcing: Companies use lower labor costs and cheaper materials in other countries to reduce expenses.
Supply Chain Fragmentation: Production is now spread across many countries (Global Value Chains), which makes production more efficient but also more vulnerable to international problems.
Digital Transformation: Technology is driving changes toward digital, AI-powered, and environmentally friendly trade.

Negative Impacts and Challenges:
Inequality: The benefits of growth usually go to large companies rather than smaller local businesses.
Unemployment Risks: While new jobs are created, competition from foreign firms can cause local industries to shrink or shut down.
Volatility: Because markets are highly connected, issues in one country, like political instability, can quickly affect the whole world.

Future Trends (2026 Outlook):
Slowing Momentum: Global trade growth is expected to slow to about 2.6% in 2026 due to tighter financial conditions and more protectionist policies.
Regionalization: There's a move from full globalization toward regional trade agreements for greater stability and resilience.

Results:

Globalization has transformed how trade and business operate by making it easier to move products, services, and money across borders. This change has been driven by better technology and fewer trade restrictions. The main results include more access to markets, the development of global supply chains, faster economic growth in certain regions, and stronger competition. However, there are also challenges, such as some people losing jobs and the uneven distribution of benefits.

Key Impacts on Trade and Commerce:
Market Expansion and Access: Companies are now doing business around the world, not just locally, allowing them to reach new customers and markets.
Global Value Chains (GVCs): Production is split into different steps that take place in different countries. This helps companies save money by sourcing materials and labor from around the world.
Technological Advancements: The use of digital tools, online shopping, and improved transportation has made it cheaper and faster to trade goods and services.
Increased Competition: When trade becomes easier, foreign companies can compete with local businesses. This encourages local businesses to be more innovative and efficient.
Shift to Services: More trade is happening in areas like IT, finance, and business support. Services now account for about a third of the value of goods produced.
Economic Growth vs. Inequality: Globalization has helped some countries grow rapidly, such as India and China. But it has also led to differences in wealth, job losses, and uneven benefits between and within countries.
Rising Protectionism: As a result of these changes, some areas have started to create more trade barriers and have more conflicts over trade issues.
Impact on Local Business: While global companies bring new technology, they can also hurt traditional businesses, especially in developing countries.
Impact on Labor: There's more demand for skilled workers, while some manufacturing jobs are facing difficulties.
Future Trends: Data is now as important as physical products in connecting the global economy, and manufacturing is becoming more focused on knowledge and expertise.

Finding:

Globalization has significantly changed how trade and business operate by making the system more open, increasing competition, and helping global supply chains expand quickly. It has led to bigger trade volumes, lower

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costs, and faster movement of goods and technology, but it has also introduced challenges such as rising inequality, environmental concerns, and greater risks from economic instability.

Key Findings on the Impact of Globalization on Trade:
Trade Liberalization and Growth: Reducing trade barriers, often through organizations like the WTO, has accelerated global exports. Trade has typically grown faster than the overall economy.
Rise of Global Value Chains (GVCs): Production is now spread across multiple countries. Companies use cheaper labor and resources in different regions, allowing them to become more specialized.
Increased Competition: Companies now face rivals from around the world, not just within their own country. This encourages innovation and efficiency, but it also makes it harder for smaller businesses to compete if they can't keep up.
Shift in Trade Patterns: Factories have moved, especially to developing countries. This has created stronger ties between rich and poor nations.
Impact on Commerce & E-commerce: The digital age, along with globalization, has driven the growth of e-commerce. Businesses can now reach customers worldwide more easily, and it has become cheaper and faster to move goods.
Increased Economic Vulnerability: Although globalization supports economic growth, it has made industries more dependent on foreign markets. This exposes them to greater risks from issues like supply chain disruptions.
Mixed Economic Outcomes: While globalization has contributed to overall wealth growth, the benefits are not evenly distributed. This has resulted in income gaps, job losses in some areas, and increased environmental pressure in places with less regulation.

Discussion:

Globalization has changed the way trade and business operates by linking the world economy, making it easier for countries to buy and sell goods, services, and money with each other. It has reduced trade barriers such as tariffs and quotas, making it simpler for products and services to move across borders. This has led to much faster growth in international trade, helped businesses reach more customers, and created strong competition that often results in lower prices for consumers.

Impact on Trade and Commerce:
Expansion of Markets & Growth: Companies can now sell their products to customers all over the world, breaking free from the limits of local markets and growing more quickly.
Global Value Chains (GVCs): The production process has become split into different stages, with different countries making parts of a product before everything is put together. This makes trade in intermediate goods more efficient across borders.
Reduced Costs and Increased Efficiency: Better delivery systems, new technologies, and lower transportation costs have made goods cheaper and made business operations run more smoothly.
Increased Competition & FDI: The entry of multinational companies into local markets has increased competition, pushing local businesses to improve their quality and also attracting foreign direct investment (FDI).
Rise of Digital Commerce: Online shopping has given small businesses the chance to compete in international markets, which were once mainly controlled by big companies.
Economic Disparity & Challenges: While globalization has brought many benefits, it has also caused some areas to grow at different rates, making it difficult for some traditional local industries to compete with foreign companies.

Key Positive Effects:
Technology & Knowledge Transfer: Developing countries gain access to advanced technology, which helps improve their local production standards.
Consumer Benefit: More competition in the market leads to a greater variety of high-quality products that are available at lower prices.
Job Creation: Foreign investment often brings new job opportunities to local communities.

Key Challenges:
Dependency and Vulnerability: Countries become more reliant on the global economy, so when there is a financial crisis or a disruption in supply chains, it can hurt their economy, as seen during major global events.
Labor Market Disruption: Some industries may lose jobs when companies move work overseas.
Cultural Homogenization: The rise of big global brands can threaten local businesses and make cultures less unique.

Recommendation:

Globalization has changed how trade works by making it easier to move goods and services across borders, improving how businesses run, and encouraging countries to focus on what they do best through global supply chains. This has created more opportunities for businesses to reach new customers, share technology, and get cheaper

materials. However, it also brings problems like losing jobs in some areas, growing differences in income levels, and harm to the environment.

To make the most of globalization while reducing its negative effects, there are several important steps that can be taken. These include making sure growth benefits everyone, improving rules and laws to handle financial issues and set fair labor standards, and helping workers learn new skills to keep up with changes in the job market.

Businesses should also spread out their reliance on a few suppliers or markets to avoid risks from global economic problems.

Supporting small and medium-sized businesses by giving them access to resources and technology can help them grow and compete globally. At the same time, companies should focus on being environmentally friendly and socially responsible, especially in areas that are still developing.

Investing in digital tools and online platforms can help businesses enter global markets more easily and communicate better with customers.

Globalization has also helped expand markets and increase competition, which pushes companies to be more innovative and efficient. It allows firms to source materials from around the world, reducing costs and improving their ability to offer products at lower prices. Sharing technology and knowledge has made it easier for countries to improve their economies and stay competitive.

Finally, as countries specialize more in certain areas, they trade more with each other in similar goods and services, which helps build stronger economic connections.

Conclusion:

Globalisation has really transformed how trade and business work, making the world more connected than ever. It has increased the amount of trade happening, made it simpler for businesses to get started, and helped the economy grow. Companies can now produce goods at a lower cost by using global supply chains, and consumers can access a much wider variety of products. However, this change has also led to more competition, created trade imbalances, and widened the gap between rich and poor.

Key Impacts on Trade and Commerce:

Expansion of Markets: Companies can now sell their products to people all over the world, giving them more opportunities to export goods.

Cost Efficiency: Firms often move their operations to other countries where labor and resources are cheaper, which helps them save money.

Supply Chain Integration: Businesses can now find the best suppliers for different parts of their products from anywhere in the world, making production more efficient.

Technological and Knowledge Transfer: Technology and knowledge move more freely now, allowing developing countries to improve their industries and become more productive.

Increased Competition: Local companies now face strong competition from big foreign companies, which pushes them to improve quality and lower prices.

Challenges and Long-term Effects:

Dependency and Vulnerability: When countries rely too much on global markets, they become more at risk from issues like currency changes or global events.

Inequality and Job Displacement: While globalisation creates new jobs, it can also cause some jobs to disappear, especially in industries that can't keep up with large international companies.

Environmental Concerns: More manufacturing and shipping has led to greater environmental problems.

In conclusion, globalisation has been a major force for economic growth, but its effects are not shared equally across different areas and countries. It's important to manage the social and economic differences it creates in order to make the most of its benefits.

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OriginalArticle

Altruism: A Natural Instinct – A Review of Its Implications in Modern Markets

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Abstract

Altruism a concept in Commerce, more specifically in HR, though sounds to be a part of psychology is a pure commerce term included in HRM extensively in 80's through development of Organisational Citizenship Behaviour in 1980. Recently it has got importance in HRM for retaining the employees and as a trait in leadership. Actually its psychological term, because to help someone voluntarily or share our knowledge with someone else is actually making that person undergo learning the things without any expectation in return. This feeling or act of altruism is many times in born quality or it may get developed in the later stage of life, as can be said through own experiences or the feeling of putting oneself in others shoes and think accordingly. This much thinking about another person is a rare phenomenon, at least in today's era where each one is trying to be selfish and self centered. This paper focuses its attention on use of Altruism in today's markets and studies undertaken by the researchers.

The concept of altruism is ancient but has gained importance after 2000, when it was included into the discipline of commerce and linked with consumer behaviour, entreprenuership, CRM etc. especially after the pandemic hit the world in 2020 their has been a drastic change in the way its being extensively used. The reason lies simple that human being has realised that life is unpredictable anything can happen anytime, future is uncertain and his near and dear ones are important part of their lives. The pandemic taught us to help strangers, donate, co-operate and much more. The intensity of the pandemic hit the world so high that majority of humans lost their lives and those who survived had a life long scar on their mind of losing their loved ones. This pain was unbearable and difficult to forget, which enhance the importance of altruism in the business world. Modern HRM now considers and recognises altruistic behaviours like helping colleagues, employees engagement, involvement and participation for retaining the workforce.

Keywords: *Altruism, Organizational Citizenship Behaviour (OCB), Human Resource Management (HRM), Consumer Behaviour, Leadership, Employee Retention, Corporate Social Responsibility (CSR), Empathy, Knowledge Sharing, Modern Markets, Pandemic Impact, Prosocial Behaviour, Entrepreneurship, Customer Relationship Management (CRM)*

Introduction

Altruism, traditionally rooted in psychology, has emerged as a significant concept in the field of commerce, particularly within Human Resource Management (HRM). It refers to the selfless concern for the well-being of others, often expressed through voluntary actions such as helping colleagues, sharing knowledge, and supporting organizational goals without expecting personal rewards. Although altruism was initially perceived as incompatible with profit-driven business environments, its relevance has grown substantially over the past few decades. The formal integration of altruism into management studies began in the 1980s with the development of Organizational Citizenship Behaviour (OCB), where it was recognized as a key component contributing to organizational effectiveness. Since then, the concept has evolved from being viewed as a marginal or non-essential behavior to a strategic asset in modern organizations.

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In today's competitive and dynamic business landscape, altruistic behavior is increasingly associated with improved employee engagement, collaboration, and overall productivity. The global COVID-19 pandemic further highlighted the importance of altruism in both personal and professional contexts. It reshaped human perspectives by emphasizing empathy, cooperation, and mutual support, thereby influencing organizational cultures and management practices. Modern HRM now recognizes altruism as a critical factor in fostering employee well-being, retention, and leadership effectiveness.

This paper aims to explore the implications of altruism in modern markets, particularly within HRM, by reviewing existing literature and examining its role in enhancing organizational performance and employee satisfaction.

Evolutionary Stages of Altruism in Commerce/HRM

- Early Perspectives: Marginalization and Suspicion (Pre-1970s–1980s): Traditionally, business was seen through a strictly capitalistic lens, emphasising profit maximisation and individual competitiveness. In competitive markets, altruistic behaviour was seen as ineffective, marginal, or even non-existent.
- Initial Recognition: Utilitarian Altruism (1980s–1990s): Research started looking into "utilitarian altruism," which is the practice of employees assisting others in order to raise production and, consequently, their profit share. This viewpoint placed a strong emphasis on internalised reciprocity rules, which call for positive outcomes like improved working conditions or future assistance.
- Formalization: Organizational Citizenship Behavior (1988–2000s): Organ (1988) presented "altruism" as a fundamental aspect of Organizational Citizenship Behavior (OCB). These are optional activities that are outside of formal job obligations but enhance the effective operation of the organization. This involved assisting coworkers with demanding tasks, guiding new employees, and offering to volunteer.
- Modern Paradigm Shift: Genuine and Strategic Altruism (2010s–Present): A major change in perspective has taken place, shifting from individualism to interconnectedness, seeing employees as relational entities. Contemporary management perceives altruism as "authentic," with actions motivated by compassion and concern for others, irrespective of individual benefits.
- Humanistic Management: This method highlights that workers are motivated by values centered on others, such as kindness and selflessness, resulting in an emphasis on ethical behavior and corporate social responsibility.
- Altruism as a Driver of Resilience: Studies indicate that altruistic environments, frequently cultivated by "yoga-based" techniques or transformative leadership, boost organizational resilience and enable companies to turn challenges into opportunities

- **Drivers and Benefits of Altruism in Modern HRM**
- **Increased Knowledge Sharing:** Altruistic individuals, who feel satisfied helping others, are more willing to share tacit knowledge with colleagues, a critical component for company innovation.
- **Employee Well-being and Retention:** Helping others is linked to a "helper's high," reducing stress and increasing job satisfaction, which helps retain employees and reduces turnover.
- **Enhanced Teamwork and Productivity:** Altruistic behaviours reduce interpersonal conflict and build trust, fostering a better collaborative environment and ultimately increasing performance.
- **Transformational Leadership:** Leaders who exhibit altruism encourage employees to act as stewards of company resources, promoting frugal and ethical decision-making.

Objectives:

The aim of this study is to fill the gaps in evidence between Altruism and the well-being of employees, and taking review of existing literature.

Research Methodology: This study is based on secondary data collected from various sources such as research articles, books, dissertations etc.

Literature Review:

1. **A Study on Altruism and Subjective Well-Being among Emerging Adults Jeya Bala P1*, Maria Sneha S, Prizila S, Priya Dharshini S, A. Antony Rose Rashmi, J. Irin Jeya Sheela (2021):** The aim of study was to understand the relationship between altruism and Subjective Well-being among emerging adults and to find if there exists a gender difference in the aspects of altruism and Subjective Well-being among emerging adults. Positive significant relationship between psychological well-being, gratitude and altruism. The results obtained suggest that altruism is more pronounced in female than male emerging adults. This could be explained by the natural tendency of women to care for others selflessly since they intend to reduce the distress of others by lending a helping hand.
2. **Altruism in Behavioural, Motivational and Evolutionary Sense Bojana Radovanović (2018):** This paper discusses the relations between three forms of altruism: behavioural, evolutionary and motivational. Altruism in a behavioural sense is an act that benefits another person. This paper has argued that altruism in a behavioural sense is an act that benefits another person, while it is altruistically motivated when the ultimate goal of such act is the welfare of that other.

3. **Altruism, Social Maturity and Life Satisfaction Among Teenagers Somya Jangpangi1, Dr. Mamata Mahapatra (2024):** aim was To study the effect of altruism on social maturity and life satisfaction among teenagers and to find the relationship between altruism and social maturity and between altruism and life satisfaction and between social maturity and life satisfaction. The population for the study is teenagers and the sample population was taken from teenagers aging from 13 to 15 years old. The responses were taken regardless of their sex, caste, religious beliefs or socioeconomic status. The sample was collected through convenience sampling. The tools used for study were Altruism Scale (ALT), Social Maturity Scale (SMS) and Satisfaction With Life Scale. The study emphasizes the direct relationship between altruism and social maturity and lids satisfaction. This suggests that individuals who exhibit altruistic behaviour, such as helping others without expecting anything in return, are also likely to demonstrate higher levels of social maturity. findings suggest that altruism is not only beneficial for others but also for the individual themselves, contributing to their social development and overall sense of well-being.
4. **Altruism And Happiness; A Comparative Study Between Young Adults and Middle Aged Adults Kashish Lamba, Dr Nitika Kumar (2021):** This study aims to examine the relationship between altruism and happiness in young adults and middle-aged adults. For this purpose data was collected from a sample of 80 adults (40 young adults and 40 middle aged adults). Oxford happiness scale, Self-report altruism scale were administered on the sample size. Statistical analysis was done using Pearson's correlation and independent t- test. The major findings were that altruism and happiness had a positive correlation in middle aged adults, whereas a negative correlation in young adults. There was a difference found in the scores of altruism and happiness of young adults and middle aged adults. However difference between means cores of happiness were found to be significant in the two groups, while mean scores of altruism were found to be non-significant. It was found that altruism and happiness increases with age.
5. **Altruism And Workers Engagement Victor Barinua (Ph.D), Fingerisi Iwarimie Prince (2022)**: This paper highlights the link between altruism and workers engagement underscored by such measures as: recognition, clarity, autonomy, fairness, stress, growth, workload and relationship. From the study it can be seen that there is a two-way relationship between Altruism and worker engagement. Selflessness makes the worker display selfless attitude as he strives to improve the work environment and impact positively on the organizational culture; while a very health work environment that really engages the workers end up effortlessly having a selfless and highly motivated workforce that cares more about doing good for the benefit of others. Altruism is a virtue therefore that should encourage and nurtured is possible taught in schools. There should also be more research in the area of altruism as it will ultimately breed a better society and not just the workforce or increase productivity.
6. **An Empirical Analysis of the Impact of Co-Worker Altruism on Employee Burnout in Power Organizations in Rivers State, Nigeria Amah, Cletus Okey, Dickson, Queeneth Ijeoma (2025):** The study concludes that altruistic behaviours, while fostering teamwork and cooperation, often come at personal costs, as employees may feel emotionally drained from their continued efforts to support others. This exhaustion can evolve into a sense of detachment or depersonalization, particularly when altruistic efforts are not sufficiently recognized or rewarded. Consequently, while altruism enhances organizational unity, it can also contribute to a diminished sense of personal accomplishment if employees do not receive acknowledgment for their contributions, emphasizing the need for supportive structures that reinforce the value of such behaviours. The aim of this study is to investigate the relationship between organizational citizenship behaviour and employee burnout within power distribution firms in Rivers State, Nigeria. Specifically, the study seeks to examine the relationship between altruism and emotional exhaustion, investigate the nature of the relationship between altruism and depersonalization and analyse the impact of altruism on reduced personal accomplishment
7. **Influence of Altruistic Strategy on Organizational Commitment in Five Star Hotels in Kenya Bashir Mohamud Maalim, Jackson Ndolo, Lucy W Kibe (2023):** This study aimed at analysing altruistic strategy influence on organizational commitment in Five Star hotels in Kenya. Labour Relations, Social Dialogue and Work-place Diversity were considered as variables to study the altruistic strategy. The study was based on Resource-Based View, Social exchange and social identity theories. The study adopted mixed research methods. The target population of the study was 216 and a sample size of 144 senior managers was drawn from 24 Five Star hotels whose selection was based on hotel clustering and simple random selection. The study recommends implementation of altruistic Strategy as an internal CSR strategic component for attracting, motivating and retaining workers in the organization.

Conclusion:

The concept of Altruism is yet new in the corporate sector, its not that people are not aware of it but it's being done knowingly or unknowingly depending on the nature of human being. As mentioned earlier its intensity and value was much more recognised after the pandemic, many are not aware of this concept in the corporate sector. But the concept is very old and has gained more importance in today's era. Not much research is undertaken in India but in outside countries researchers have undertaken research on this subject. Still there is further scope in this area and research regarding the same can be done in different sectors and professions too.

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Linkages Between Financial Integration and Economic Stability in India: An AR-Garch Approach

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Abstract

The 2008 global financial crisis highlighted that financial instability can arise even under price stability and sound macroeconomic conditions, emphasizing the critical role of financial stability as a core objective of monetary policy. Financial integration, defined as the increasing interconnection of domestic markets with global financial systems, has a dual impact: it improves market efficiency, facilitates access to foreign capital, and strengthens risk management practices, while simultaneously increasing exposure to external shocks and cross-border contagion risks.

This study employs secondary data covering annual macroeconomic variables from 2000 to 2023 to examine the relationship between financial integration, financial stability, and economic performance. Co-integration analysis confirms a long-run equilibrium between stock indices (Sensex and Nifty) and key macroeconomic variables, including IIP, M3, WPI, gold and oil prices, exchange rates, and the S&P 500. AR (1)–GARCH (1,1) models and their variants reveal persistent volatility in stock returns influenced by past shocks and deviations from long-run equilibrium.

The findings indicate that financial integration supports growth and efficiency but also increases vulnerability to global shocks. Policy recommendations include strengthening macro-prudential frameworks, enhancing regulatory coordination, promoting financial inclusion, diversifying capital inflows, and adopting global best practices to sustain financial stability and support long-term economic growth in India.

Keywords: *Financial Integration, Financial Stability, Macroeconomic Variables, India.*

Introduction

The global financial crisis of 2008 reshaped the understanding of financial stability by demonstrating that serious instability can arise even under price stability and sound macroeconomic conditions, with shocks quickly spreading across borders. As a result, financial stability has become a central objective of monetary policy and a core responsibility of central banks. Broadly, financial stability refers to the ability of financial institutions and markets to function smoothly, withstand shocks, and provide uninterrupted services to the real economy. From a macro prudential perspective, it requires managing systemic risks arising from leverage, maturity mismatches, inter-linkages among institutions, and asset price cycles.

Financial integration plays a dual role in this context. On the one hand, it can enhance stability by improving regulatory standards, supervision, market discipline, and risk management through foreign participation and the adoption of global best practices. On the other hand, it can increase vulnerability by facilitating the cross-border transmission of financial crises, especially in economies with weaker institutions and governance frameworks. Hence, maintaining financial stability requires effective coordination among central banks, regulators, and fiscal authorities to prevent, manage, and contain crises.

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In India, financial integration has deepened in recent years due to rising global capital flows, greater foreign participation in banking and financial services, and closer alignment with international regulatory standards. Investments by global financial institutions such as Emirates NBD, Sumitomo Mitsui Banking Corporation, Blackstone, and Zurich Insurance reflect increased investor confidence and stronger global linkages. These developments have supported capital adequacy, institutional resilience, and efficiency in Indian financial markets.

The Reserve Bank of India closely monitors these trends through its Financial Stability Reports, which indicate that the Indian financial system remains resilient, supported by strong capital buffers, low non-performing assets, and healthy balance sheets. However, the RBI also highlights risks from external spillovers, including volatility in exchange rates, asset prices, and investor sentiment during periods of global stress. Consequently, India continues to strengthen its macro prudential framework, supervision, and regulatory alignment to ensure that deeper financial integration supports growth without undermining financial stability.

Overall, while financial integration offers significant stability and growth benefits for India, maintaining financial stability requires continuous risk monitoring, stronger regulatory alignment, and proactive policy measures in an increasingly interconnected global financial environment.

The remainder of this study is structured as follows: Section 2 presents a the theoretical background, review of related literature is described in Section 3, Section 4 presents the dataset and methodology utilized in the study, the results and discussion are presented in Section 5, and Section 6 concludes the paper.

Theoretical Background of The Study

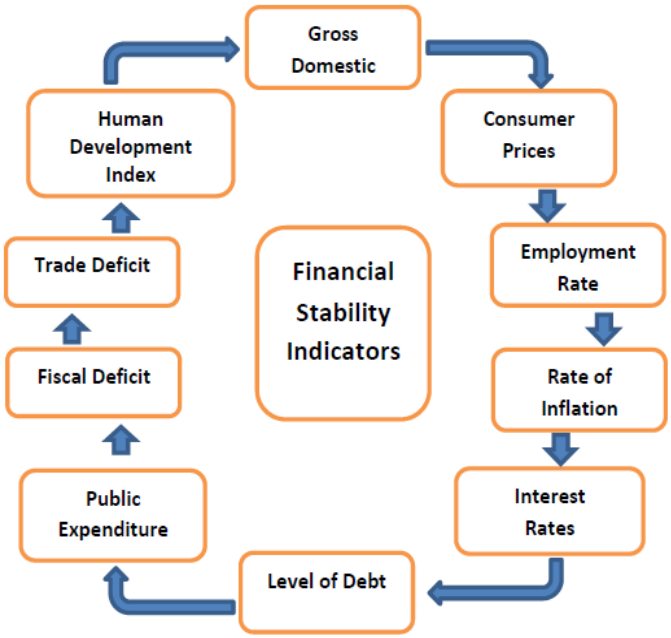
The theoretical foundation of the relationship between financial integration and financial stability in India is rooted in financial liberalization theory, risk-sharing models, and macro prudential regulation frameworks. Financial integration involves greater interconnectedness of domestic financial markets with global markets through cross-border capital flows, foreign bank participation, and regulatory harmonization. Neoclassical and endogenous growth theories suggest that financial integration improves capital allocation efficiency, deepens financial markets, reduces the cost of capital, and supports economic growth, thereby enhancing financial stability.

Conversely, financial fragility and crisis theories, particularly Minsky's Financial Instability Hypothesis, argue that excessive financial openness can heighten vulnerability to external shocks, volatile capital flows, asset price bubbles, and contagion effects. These concerns are especially relevant for emerging economies like India. Consequently, India has adopted a gradual and sequenced approach to financial integration since the 1991 reforms, emphasizing calibrated openness supported by strong regulation, selective capital controls, and macro prudential policies. This approach highlights that financial integration can strengthen stability only when underpinned by robust institutions, effective supervision, and proactive monetary policy.

Financial Stability Meaning

Financial stability is when a business, individual, or nation cannot withstand external imbalances in financial markets. A stable financial system mitigates sudden fluctuations in the global market and local economy. Self-correcting mechanisms achieve this.

Indicators of Financial Stability



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Review Of Literature

These studies collectively strengthen the article by providing theoretical grounding, empirical evidence, and policy relevance on financial integration and stability in India. Jain and Bhanumurthy (2005) and Agrawal et al. (2020) establish the historical evolution and extent of India's market integration**,** while Padhan and Prabheesh (2023) explain the macroeconomic drivers shaping India's financial integration. Niranjan (2017) highlights the stability risks of financial openness, linking integration with macroeconomic volatility. Manocha (2024) and Sethi et al. (2025) connect financial inclusion and resilience to stability outcomes, reinforcing inclusive growth arguments. Khetan et al. (2025) provides global conceptual insights, and the IMF (2025) offers policy-oriented evidence on India's systemic resilience, directly supporting the articles analytical and policy framework.

Jain and Bhanumurthy (2005) provide an early empirical assessment of India's financial market integration with global markets. They examine co-movements among Indian stock markets and international financial indices, highlighting how capital market liberalization post-1991 reforms influenced integration. The study emphasizes that while integration improved market efficiency and capital allocation, it also exposed domestic markets to external shocks and volatility. This work is foundational in understanding the historical trends of India's market integration**,** establishing a baseline for later studies on its implications for financial stability. It underscores the dual impact of integration: fostering efficiency while creating potential vulnerability to global market fluctuations.

Niranjan (2017) analyzes the link between financial openness and macroeconomic volatility in India. The study shows that increased financial integration improves access to foreign capital and market efficiency but also amplifies exposure to global financial shocks. It emphasizes the trade-off between potential growth benefits and systemic risk, highlighting the need for strong domestic institutions and regulatory frameworks to safeguard financial stability.

Adrian et al. (2019) develop a conceptual framework used in the Global Financial Stability Report (GFSR) to assess financial stability risks across countries consistently over time. Their framework combines a matrix of country-specific vulnerabilities with a summary statistic of aggregate financial stability risks. This dual approach allows policymakers to monitor systemic vulnerabilities and quantify risks for macro-prudential decision-making, emphasizing the importance of standardized metrics and cross-country comparability in assessing global financial stability.

Agrawal et al. (2020) present a comprehensive review of literature on India's stock market integration with global markets. The study synthesizes evidence from empirical studies on market co-movements, contagion effects, and systemic risks. The authors highlight that financial integration enhances capital flows, market efficiency, and investment opportunities but also increases exposure to international volatility, particularly during crises. This review provides a critical link between market integration and financial stability, offering insights on regulatory, macro prudential, and policy measures necessary to mitigate the risks associated with global interconnectedness.

Eslamloueyan and Fatemifar (2021) examine the causal relationship between financial integration and macroeconomic and financial instability in Asia during 2000–2017 using dynamic panel models. Their results show a bidirectional relationship: financial integration can generate instability in output and credit markets, while macroeconomic and financial instability, in turn, leads to financial disintegration. The study also highlights the exacerbating role of the 2008 global financial crisis in increasing instability and fragmentation in Asian financial systems, offering valuable insights for policymakers on balancing integration benefits with systemic risk management.

Chai et al. (2022) investigate the relationship between bank-specific risks and stability using data from 15 scheduled banks in Pakistan between 2009 and 2020. Their findings indicate that credit risk and liquidity risk negatively affect bank stability, while funding risk is insignificant. Additionally, larger banks showed lower stability, whereas higher returns on assets improved it. The study recommends that banks adopt prudent lending policies, closely monitor liquidity positions, and efficiently mobilize deposits to enhance financial stability.

Padhan and Prabheesh (2023) empirically examine the determinants of India's financial integration using a constructed financial integration index and macroeconomic variables. Their study highlights how factors such as capital account liberalization, foreign investment inflows, trade openness, and financial market reforms have shaped India's integration with global markets. The authors argue that well-regulated integration can enhance efficiency and stability by providing access to foreign capital and risk diversification, but excessive reliance on volatile inflows can increase vulnerability to external shocks.

Manocha (2024) explores the interplay between financial inclusion, foreign direct investment (FDI), and financial stability. The study finds that broader financial inclusion strengthens the resilience of the financial system and supports stability, while FDI inflows associated with integration can promote institutional development and risk management practices. The research underscores inclusion as a key channel through which integration impacts stability in India.

Sethi et al. (2025) conduct a bibliometric review examining how financial inclusion and resilience relate to systemic stability. The study highlights that integrated financial systems with inclusive policies are better positioned to absorb shocks, reduce default risks, and enhance confidence in financial institutions, providing empirical support for linking inclusion and integration with stability.

Khetan et al. (2025) offer a comprehensive global review of financial stability literature, emphasizing the role of financial integration, regulatory frameworks, and systemic risk monitoring. The study provides conceptual grounding,

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showing how integrated markets can improve risk-sharing and efficiency while increasing contagion risks if regulatory oversight is weak.

Data And Methodology

The study utilizes secondary data to explore the relationship between financial integration, financial stability, financial instability, and economic performance in India, covering annual macroeconomic variables from 2000 to **2023**. Descriptive statistics indicate that money supply (M3), Sensex, Nifty, oil prices, and gold prices are more volatile compared to the Index of Industrial Production (IIP), WACMR, S&P 500, exchange rates, wholesale price index, and BSE.

Co-integration analysis reveals a long-run equilibrium between Indian stock indices (Sensex and Nifty) and macroeconomic variables (IIP, M3, WPI, gold price, oil price, exchange rate, S&P 500), suggesting deviations from equilibrium prompt adjustments in at least one variable.

To assess the impact of macroeconomic volatility on stock market returns, the study applies the AR (**1**) GARCH (**1,1**) **model**, estimating three variants AR (1)–GARCH–X (1,1), AR (1) GARCH–S (1,1), and AR (1)–GARCH–G (1,1) which incorporate macroeconomic variables differently in the variance equation. This methodology provides a detailed understanding of how macroeconomic fluctuations affect Indian financial market volatility, highlighting the dynamic links between integration, instability, and market behavior, and offering insights into risk transmission in India's financial system.

The study employs the AR (1)–GARCH–X (1,1) model to analyze the volatility of Indian stock market returns, following the Johansen-Juselius (1990) co-integration test that confirms a long-run equilibrium relationship between stock returns and selected macroeconomic variables. This model, as suggested by Lee (1994), integrates an error correction term (ECT) into the variance equation, allowing the conditional volatility of returns to respond to deviations from long-run equilibrium.

The model is specified as:

$$R_t = \mu + \rho_1 R_{t-1} + \varepsilon_t$$

$$\varepsilon_t | \Omega_{t-1} \sim N(O, \text{ht2}),$$

$$\text{ht2} = \omega + \alpha_1 \varepsilon\text{t-12} + \beta_1 \text{ht-12} + \lambda_{ECT} \text{Zt-12}$$

$$\omega > 0,\ \alpha_1, \beta_1, \lambda_{ECT} \geq 0 \qquad \text{ht2} \geq 0,$$

R_t represents the value of the time series (could be returns, for example) at time t. μ this is the mean or constant of the series, a baseline value around which the time series fluctuates. $\rho_1 R_{t-1}$ This term indicates a lagged relationship between the current value of the time series (R_t) and its previous value (R_{t-1}). The parameter $\rho_1$captures the degree of autocorrelation or persistence in the time series. ε_t is the error term or innovation at time t, capturing the unexplained part of the series that cannot be accounted for by the lagged value.

Results indicate that stock market volatility is strongly influenced by past volatility rather than contemporaneous shocks. The sum of $\alpha 1 + \beta 1 = 0.9670$ suggests high persistence, meaning shocks to volatility dissipate slowly over time. The inclusion of the ECT highlights that deviations from equilibrium further amplify volatility, reflecting the market's sensitivity to macroeconomic imbalances. Thus, the volatility is persistent to long time (Panel (b) in Table-1).

Table 1: Impact of Macroeconomic Factor on Volatility

Dependent Variable: RSENSEX					
Method: ML - ARCH (Marquardt) - Normal distribution					
Panel (a): Mean Equation					
Variable	Pre-Sample Coeff.	Coefficient	Std. Error	z-Statistic	Prob.
C	M	0.0081	0.0040	1.9659	0.0473**
AR (1)	$\rho 1$	0.1950	0.0645	3.0210	0.0025***
Panel (b): Variance Equation					
C	Ω	0.0002	0.0002	1.1571	0.2472
RESID (-1) ^2	α1	0.0582	0.0331	1.9461	0.0394**
GARCH (-1)	β1	0.1950	0.0646	13.8816	0.0000***
ECT (-1) ^2	λecm	-0.0018	0.0013	-1.3196	0.1870
	$\alpha 1 + \beta 1$	0.9670			
Panel ©:					
Log likelihood	395.496	Akaike info criterion		-2.753	
Durbin-Watson stat	1.905	Schwarz criterion		-2.675	
		Hannan-Quinn criter.		2.722	
***indicates significance at 1% level, **indicates significance at 5% level, *indicates significance at 10% level,					

Source: Author's own calculations, World Development Indicators 2023.

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The error correction coefficient which is $_{ect}$ has been observed to be negative and statistically insignificant. This indicates that there is no relationship between the volatility of Indian stock market returns and short-run deviations of the macroeconomic variables from their long-run equilibrium relationship on the basis of monthly data which has been considered in this analysis.

Table 2: Residuals Diagnostic Analysis of the AR (1)–GARCH–X (1,1) Model

Ljung-Box Q-Statistics				ARCH-LM test		Normality test
Lag	**Q-Stat.**	**Q2-Stat.**	**Lag**	**F-statistic**	**Obs*R-squared**	**JB-Stat.**
1	0.0027	0.4340	1	0.4400	0.4425	9.175
				(0.5076)	(0.5079)	(0.01***)
9	2.6373	3.9347	3	0.4859	1.4713	
	(0.9550)	(0.8629)		(0.6923)	(0.6889)	
18	12.788	6.2736	6	0.5109	3.1096	Skewness
	(0.7503)	(0.9912)		(0.7949)	(0.7949)	-0.331
27	22.4676	11.163	9	0.4008	3.6940	
	(0.6629)	(0.9949)		(0.9340)	(0.9303)	Kurtosis
36	26.354	41.8744	12	10.3949	4.8879	3.582
	(0.8535)	(0.1971)		(0.9647)	(0.9619)	
P-values are in first brackets, ***indicates significance at 1% level.						

Source: Author's own calculations, World Development Indicators 2023.

In terms of the adequacy of the estimated AR (1)–GARCH–X (1,1) model, the Ljung-Box Q-statistic suggests no serial correlation of the standardized residuals obtained from the AR (1)– GARCH–X (1,1) model up to order 36. Also, the Q-sq. test cannot reject the null hypothesis of no autocorrelation of the standardized residuals squared obtained from the model up to 36thorder. Not rejecting the null hypothesis for both the Q and Q-sq. tests is evidence that the mean equation and variance equation for Indian stock returns is correctly specified. These results are also confirmed by the fact that the estimated standard AR (1)–GARCH–X (1,1) model successfully has produced residuals that are free of ARCH effects, according to the ARCH-LM test using either the F-statistic or Chi-squared statistic up to order 12. The Jarque-Bera statistic also rejects the hypothesis of normality as *p*-value is 0.01 (Table-2). This may indicate the importance of considering the distribution of stock returns other than the conventional normal distribution in investigating the stock market returns.

AR (1)–GARCH–S (1,1) MODEL RESULTS

In this section, nine AR (1)–GARCH–S (1,1) models are estimated to account for the impact of each macroeconomic variable on the volatility of Indian stock market returns. Each of the nine models takes the form as follows.

$R_t = \mu + \rho_1 R_{t-1} + \varepsilon_t$

$\varepsilon_t | \Omega_{t-1} \sim N(O, \text{ht2})$,

$\text{ht2} = \omega + \alpha_1 \varepsilon t\text{-}12 + \beta_1 \text{ht-}12 + \lambda_n \Delta X_{nt}$

$\omega > 0,\ \alpha_1, \beta_1 \geq 0$ $\quad$ ht2≥ 0, and n=1,.....8 $\longrightarrow$

Where the parameter λ_n is expected to account for the impact of change of each macroeconomic variable in the analysis on the volatility of the Indian stock market returns, which are $\Delta X_{it} = \Delta \ln IIP$, $\Delta \ln WPI$, $\Delta \ln MS$, $\Delta \ln GP$, $\Delta \ln OP$, $\Delta \ln ER$, $\Delta \ln S\&P500$andFII.

Table 3: Individual Impact of Macroeconomic Factor on the Volatility of Indian Stock Market

Panel (a): The Mean Equations									
Coeff.	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**
μ	0.008	0.009	0.009	0.009	0.007	0.009	0.010	0.009	0.010
	(0.**058**)	(**0.033**)	(0.**072**)	(0.**025**)	(0.136)	(0.**058**)	(0.**013**)	(**0.019**)	(**0.016**)
ρ_1	0.195	0.197	0.221	0.194	0.233	0.226	0.211	0.190	0.199
	(0.002)	**(0.003)**	**(0.001)**	**(0.003)**	**(0.000)**	**(0.000)**	**(0.001)**	**(0.004)**	**(0.003)**
Panel (b): The Variance Equations									
ω	0.0001	0.0002	0.0055	0.0001	0.0074	0.0064	0.0003	0.0002	0.0002

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	(0.595)	(0.352)	(0.075)	(0.364)	(0.000)	(0.0015)	(0.1611)	(0.2792)	(0.2566)
α_1	0.0468	0.0784	0.0404	0.0837	0.0181	0.0150	0.0846	0.0757	0.0796
	(0.049)	(0.0420)	(0.5618)	(0.0436)	(0.075)	(0.6552)	(0.0971)	(0.0807)	(0.0332)
β_1	0.9307	0.8732	-0.4220	0.8789	-0.9710	-0.7033	0.8266	0.8723	0.8695
	(0.000)	(0.000)	(0.584)	(0.000)	(0.000)	(0.168)	(0.000)	(0.000)	(.000)
$\alpha_1+\beta_1$	0.9775	0.9516	-0.3816	0.9626	-0.9529	-0.6883	0.9112	0.9480	0.9491
$^{\lambda}\Delta LNIIP$	0.0097 **(0.071)**								
$^{\lambda}\Delta LNWPI$		0.0056 (0.6979)							
$^{\lambda}\Delta LNMS$			-0.0195 (0.4311)						
$^{\lambda}\Delta LNWACR$				0.0005 (0.4562)					
$^{\lambda}\Delta LNGP$					-0.0075 **(0.0059)**				
$^{\lambda}\Delta LNOP$						-0.0034 (0.1326)			
$^{\lambda}\Delta LNER$							0.0137 **(0.0335)**		
$^{\lambda}\Delta LNS\&P500$								-0.0028 (0.2274)	
$^{\lambda}\Delta fii$									-0.000002 (0.5048)

P-values are in first brackets ()
Source: Author's own calculations, World Development Indicators 2023.

In terms of diagnostic fit, the estimated AR (1)–GARCH (1,1) models satisfied all conditions of the GARCH theory based on the Ljung-Box Q and Q-sq. statistics, ARCH-LM Test. That is, the performance of the nine estimated models as seen in Table-3.3, capture all linear and nonlinear dependence associated with the economic variables as required by the GARCH theory. But Jarque-Bera test for normality does not hold in all cases.

AR (1)–GARCH–G (1,1) Model Estimation Results

In this section, an AR (1)–GARCH–G (1,1) model has been estimated to account for the impact of all macroeconomic variables as a group on the volatility of Indian stock market returns. Thus, all macroeconomic variables are included in the variance equation. Thus, the AR (1)–GARCH– G (1,1) model looks like as follows.

$R_t = \mu + \rho_1 R_{t-1} + \varepsilon_t$

$\varepsilon_t | \Omega_{t-1} \sim N(O, \text{ht2}),$

8

$\text{ht2} = \omega + \alpha_1 \varepsilon t\text{-}12 + \beta_1 \text{ht-}12 + \sum \lambda_n \Delta X_{nt-1}$

$n\text{-}1$

$\omega > 0,\ \alpha_1, \beta_1, \geq 0 \qquad \text{ht2} \geq 0, \text{ and } n=1,.....8$ ⟶

Where the parameter λ_n accounts for the impact of changes of each explanatory variable mentioned above on the conditional volatility of Indian stock market returns jointly.

Consider the panels (a), (b) and (c) in Table-4 where the estimated results are presented. Panel (a) in Table-4, indicates that the AR (1) coefficient, ρ_1, is statistically significant. This implies that previous returns affect the current stock market returns positively. However, the variance equation, in panel (b), demonstrates the following points.

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Table-4: Joint Impact of Macroeconomic Factor on Indian Stock Market Return

Dependent Variable: RSENSEX					
Method: ML - ARCH (Marquardt) - Normal distribution					
Panel (a): Mean Equation					
Variable	**Pre-Sample Coefficient**	**Coefficient**	**Std. Error**	**Z-Statistic**	**Prob.**
C	M	0.0144	0.0039	3.7217	**0.0002*** **
AR (1)	ρ1	0.2139	0.0599	3.5717	**0.0004*** **
Panel (b): Variance Equation					
C	Ω	0.0006	0.0003	2.0592	**0.0394** **
RESID (-1) ^2	α1	0.0403	0.0446	0.9025	0.3667
GARCH (-1)	B	0.7177	0.0982	7.3036	**0.0000*** **
	α1 +β1	0.7580			
D(LNIIP)	λΔlnIIP	0.0109	0.0047	2.2945	**0.0217** **
D(LNWPI)	λΔlnWPI	0.0374	0.0227	1.6455	**0.0998* **
D(LNWACR)	λΔlnWACR	-0.0004	0.0011	-0.3291	0.7420
D(LNGP)	λΔlnGP	-0.0020	-0.0057	-0.3560	0.7217
D(LNOP)	λΔlnOP	0.0053	0.0027	1.9338	**0.0531** **
D(LNER)	λΔlnER	0.0318	0.0115	2.7668	**0.0056*** **
D(LNSP500)	λΔlnS&P500	-0.0084	0.0054	-1.5680	0.1168
D(FII)	λΔFII	0.000003	0.000005	0.6700	0.5028
Panel ©:					
Log likelihood	401.83	Akaike info criterion	-2.747		
Durbin-Watson stat	1.93	Schwarz criterion	-2.580		
		Hannan-Quinn Criteria	-2.681		

***indicates significance at 1% level, ** at 5% level, * at 10% level,
Source: Author's own calculations, World Development Indicators 2023.

The sum of the ARCH and GARCH coefficients is less than one, i.e.,α1 +β1= 0.7580, which implies that the unconditional variance of t ε orht2=ω1-(α1+β1) <1and is stationary. Since the sum of α1 +β1 is 0.7580, the time-varying volatility of the Indian stock market returns is highly persistent.
(iii) The parameter β_1 is greater than α_1 (0.7177 > 0.0403). This implies that the past volatility of the stock market returns itself affects the volatility of stock market returns more than previous news.
The AR (1)–GARCH–G (1,1) model produces significant results in accounting for the impacts of macroeconomic variables in respect of growth rate of index of industrial production, WPI inflation, change in oil price and change in exchange rate on the volatility of Indian stock market returns. On the other hand, it produces insignificant results in accounting for the impacts of macroeconomic variables in respect of change in short run interest rate, change in gold price, U.S. stock market return and change in foreign institutional investment on the volatility of Indian stock market returns.

As it can be seen in Table-4, the□□$_n$ coefficients associated with the macroeconomic variables – growth rate of index of industrial production, WPI inflation, change in oil price and change in exchange rate are statistically significant based on the *p*-values at the 5%, 10%, 5% and 1% level of significance respectively. In fact, the AR (1)–GARCH–G (1,1) model suggests that growth rate of index of industrial production, WPI inflation, change in oil price and change in exchange rate have a significant and positive impact on the volatility of Indian stock market returns.
In addition, study observes some important things as follows.

- First, a 1% change in growth of industrial production will affect stock market volatility by 1.04%.
- Second, a 1% change in WPI inflation will affect stock market volatility by 1.04%.
- Third, a 1% change in oil price will affect stock market volatility by 0.53%.
- Finally, a 1% change in exchange rate will affect the stock market volatility by 3.18%. One explanation for the poor performance of the AR (1)–GARCH–G (1,1) model may be the relatively large amount of noise included in the variance equation.

Table-5 contains the diagnostic tests on the residuals generated from the AR (1)–GARCH–G (1,1) model. The Ljung-Box Q-statistic suggests no serial correlation of the standardized residuals obtained from the model up to 36 lags at the 5% significance level.

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Table-5: Residuals Diagnostic Analysis of the AR (1)–GARCH–G (1,1) Model

Ljung-Box Q-Statistics				ARCH-LM test		Normality test
Lag	Q-Stat.	Q^2-Stat.	**Lag**	F-statistic	Obs*R-squared	JB-Stat..
1	0.0021	0.0185	**1**	0.018	0.018	0.324
				(0.89)	(0.89)	(0.85)
9	3.3051	6.6215	**3**	0.369	1.119	
	(0.91)	(0.58)		(0.77)	(0.77)	
18	12.0297	12.8440	**6**	0.943	5.685	Skewness
	(0.79)	(0.75)		(0.46)	(0.46)	0.006
27	22.3855	19.7192	**6**	0.761	6.929	
	(0.67)	(0.80)		(0.65)	(0.64)	Kurtosis
36	27.6874	42.3819	**12**	1.149	13.574	3.162
	(0.80)	(0.18)		(0.32)	(0.32)	

***indicates significance at 1% level, ** at 5% level, * at 10% level,
Source: Author's own calculations, World Development Indicators 2023.

The study find that the test on Q-sq. statistic cannot effectively reject the null hypothesis of no autocorrelation of the squared standardized residuals obtained from the AR(1)–GARCH–G (1,1) model up to 36 lags at the 5% significance level. Accepting the null hypothesis of both Q and Q-sq. tests provide the evidence that the mean and variance equations of the Indian stock returns were correctly specified. These results are also confirmed by the fact that the estimated standard AR (1)–GARCH–G (1,1) modelhas successfully produced the residuals that are free from ARCH effects based on the ARCH–LM test up to 12 lags. The Jarque–Bera statistic also cannot reject the null hypothesis of normality based on the *p*-value.

This result is also consistent with the study of Najand and Rahman (1991), which provides evidence, using a GARCH model, for a relationship between the volatility of stock market returns and thevolatility of macroeconomic variables in the U.S., Germany, UK, and Canada. Kapital (1998) also finds a significant and positive effect of a set of macroeconomic variables on the volatility of the U.S. stock market using a GARCH–Xmodel. The same results are also suggested by Leon (2008) using weekly data from the Korean stock market, for seven European stock markets, i.e., Italy, UK, France, Germany, Switzerland, Netherlands, and Belgium.

Findings, Suggestions and Conclusion

Findings

The study finds that India's financial integration with global markets has produced both benefits and vulnerabilities. On the positive side, integration has improved capital allocation, enabled access to foreign investment, and facilitated the adoption of advanced risk management practices. Foreign participation in banks and financial institutions has strengthened institutional resilience, enhanced capital adequacy, and improved overall market efficiency. Descriptive statistics indicate that money supply (M3), Sensex, Nifty, oil prices, and gold prices are highly volatile, highlighting sensitivity to domestic and global macroeconomic conditions.

Co-integration analysis confirms a long-run equilibrium relationship between Indian stock indices (Sensex and Nifty) and key macroeconomic variables, including IIP, M3, WPI, gold and oil prices, exchange rates, and S&P 500. Deviations from this equilibrium trigger market adjustments, reflecting the deep interconnection between domestic financial markets and macroeconomic fundamentals. AR(1)–GARCH–X (1,1) results show that stock market volatility is persistent and primarily influenced by past shocks and deviations from equilibrium, underscoring the need for continuous monitoring of systemic risks. While integration supports efficiency and growth, it also exposes India's financial system to external shocks through global capital flows, exchange rates, and commodity price volatility.

Suggestions

To strengthen financial stability amid growing integration, policymakers should enhance macro-prudential frameworks, ensuring robust monitoring of systemic risks such as leverage, liquidity mismatches, and market inter-linkages. Regulatory coordination between the RBI, financial supervisors, and the treasury is critical to managing external shocks and ensuring timely interventions. Diversifying sources of capital inflows and promoting sustainable foreign investment can reduce vulnerability to sudden reversals. Strengthening financial inclusion will also enhance resilience, as broader participation in banking and capital markets improves risk distribution and stability. Further, the adoption of global best practices in risk management, corporate governance, and prudential regulation should continue, while domestic policies should account for potential contagion effects from global crises. Real-time stress testing and predictive modelling using advanced econometric tools can help anticipate volatility and allow proactive policy responses. Overall, combining structural reforms with vigilant oversight will help balance growth and financial stability in an increasingly interconnected environment.

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Conclusion

India's financial integration with global markets has significantly shaped its financial stability landscape. Integration has improved market efficiency, facilitated access to foreign capital, and strengthened institutional resilience, contributing positively to economic growth. However, it also increases exposure to external shocks, making financial stability contingent upon effective regulation, robust macro-prudential frameworks, and coordinated policymaking. Empirical findings indicate persistent stock market volatility influenced by both past shocks and deviations from long-run equilibrium, emphasizing the importance of continuous risk monitoring.

The study concludes that financial stability in India depends on a delicate balance: leveraging the benefits of integration while managing the risks from global interconnectedness. Strengthening regulatory oversight, promoting financial inclusion, diversifying capital flows, and adopting international best practices are essential for sustainable growth. The RBI's proactive measures, coupled with improved coordination among fiscal and monetary authorities, are critical to ensuring that deeper integration supports development without undermining stability. Ultimately, a resilient financial system will enhance India's capacity to withstand domestic and global shocks while promoting long-term economic growth.

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OriginalArticle

Agriculture Growth Farmers Income Doubling in India

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Abstract

India is an agricultural-based country, where more than half of the population is engaged in farming activities, contributing to the country's GDP. However, India's agricultural sector faces several challenges that have impeded its growth and development Indian farmer community is comprised mainly of small and marginal farmers who majorly face all the above challenges in agriculture. Farmers face a lot of problems in agriculture right from nature's activities to man-made activities including climate change, soil erosion, biodiversity loss, water resource depletion, lack of capital, labour and other inputs etc. Major cause of these problems is mainly due to lack of proper awareness, less adoption of modern technologies, lack of capital or gap between farmers and government institutions. These problems cannot be fully solved but can be mitigated to some extent by following wise agricultural practices, sustainable use of resources and bridging the gap between rural farmers, government and financial institutions. In all, these are just some of the problems faced by farmers. All of the issues, as well as their solutions are connected. For one, more investment in agriculture can increase infrastructure spending, the purchase of manures, and fertiliser, using modern farming equipment to propel agricultural yields and processes into the 21st century.

Keywords: *Agriculture Growth, Farmers' Income, Doubling Farmers' Income (DFI), Indian Agriculture, Agricultural Productivity, Sustainable Agriculture, Rural Development, Crop Diversification, Agricultural Challenges, Irrigation and Water Management, Farm Mechanization*

Introduction

The strong growth rates of the industrial and services sectors have caused agriculture's economic contribution to gradually decrease to less than 15% of the country's total GDP, but the sector's significance in the country's social and economic fabric goes much beyond this measure. First, the incomes of over three-quarters of Indian families come from rural sources. Second, the vast bulk of India's impoverished roughly 770 million people, or 70% live in rural areas. Third, in order to meet the demands of a growing population with rising incomes, India must increase its output of fruits, vegetables, and milk in addition to grain crops. India is a major agricultural force in the world. Along with having the greatest herd of buffaloes, wheat, rice, and cotton in the world, it is the world's largest producer of milk, pulses, and spices. Rice, wheat, cotton, sugarcane, farmed fish, sheep and goat meat, fruit, vegetables, and tea are among its top-ranked products. Of the approximately 195 hectares of land under cultivation in the nation, about 63 percent are rainfed (about 125 hectares) and 37 percent are irrigated (about 70 hectares). Additionally, almost 65 million hectares of India's territory is covered by forests. The agri-food industry provides the raw materials for a large number of economic activities, including industrial production, supply chains, trade, and commerce, both established and emerging. It is hardly necessary to elaborate on the role that agriculture plays in the expansion of the Indian economy and the nation's overall development. To face the new problems and take advantage of the new opportunities, this must be reoriented in light of the shifting environment and requirements. To do this, we must change the way we think and approach agriculture from pushing for incremental change" to transformational change.

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The agricultural sector's proportion of overall employment and national income declines as economic development and growth continue over time, according to historical experience in practically all economies. This fall, however, does not lessen the necessity of occasionally addressing the different issues that the agriculture industry faces for a number of reasons. First and foremost, human existence depends on food to survive. This reliance extends beyond the need for survival to include sufficient nourishment for an active and healthy lifestyle. Other important factors contributing to agriculture's ongoing significance include:

Challenges in Indian agriculture:

India's agriculture industry has a number of enduring issues that affect its production and sustainability. Because the majority of people in rural areas rely on agriculture either directly or indirectly, it also feeds a vicious cycle of poverty. Among them are:

1. **Land degradation:** The extensive use of chemical pesticides and fertilizers has drastically decreased the fertility of the soil. Restoring soil health requires actions like encouraging organic farming and using fertilizers sparingly.
2. **Fragmented and uneconomical size of land holdings:** Economies of scale are constrained by the modest and dispersed size of the bulk of Indian farms. Farm operations become inefficient as a result of this fragmentation, which is made worse by the custom of allocating land to heirs.
3. **Monoculture concerns:** The same crops are grown repeatedly, which reduces soil nutrients and makes them more resistant to pests. Promoting crop rotation and varied cropping practices among farmers can help preserve soil fertility and lessen reliance on chemical inputs.
4. **Poor-quality seeds:** A lot of farmers continue to utilize inferior seeds, which leads to yields that are not at their best. The adoption and promotion of certified, high-quality seeds can greatly increase output.
5. **Farmers indebtedness:** A debt cycle results from farmers' frequent reliance on high-interest loans from unofficial sources. To lessen this burden, increased financial awareness and easier access to institutional loans are essential.
6. **Inadequate irrigation facilities:** Since a large percentage of Indian agriculture depends on rainfall, it is susceptible to unpredictable weather conditions. Crop yields and water use efficiency can be increased by developing and expanding irrigation infrastructure, including micro-irrigation systems.
7. **Labour issues:** Agricultural labour is in short supply as a result of urban migration and wage increases brought about by programs like MGNREGS. Potential remedies include mechanization and the use of labour-saving technologies.
8. **Poor infrastructural facilities:** The effectiveness of the agricultural value chain is hampered by inadequate rural infrastructure, such as roads, cold storage, and market accessibility. Reducing post-harvest losses and strengthening market ties require investments in these sectors.
9. **Price volatility:** Farmers' incomes are unstable due to fluctuations in agricultural prices. Farm incomes can be stabilized by improving market forecasting technologies and fortifying price support systems like MSP.

Doubling of Farmers' Income (DFI):

Immediately after the Hon'ble Prime Minister's April 2016 commitment was accepted in the Budget 2016–17, an interministerial committee was established on April 13th, 2016 to suggest all-encompassing approaches to accomplishing the objective. The Indian government has determined that the following seven sources can help farmers grow:

a. increase in crop productivity
b. increase in livestock productivity
c. Resource use efficiency - reduction in cost of production
d. increase in cropping intensity v. Diversification to high value agriculture
e. Shift of surplus manpower from farm to nonfarm occupations.
f. Through proper policy measures, fiscal support, and a variety of initiatives and programs, the Government of India supports the efforts of the States and the welfare of farmers in order to accomplish the aforementioned seven objectives. The Department of Agriculture & Farmers Welfare's (DA&FW) budget allocation was significantly increased by the government, going from Rs. 21933.50 crore in 2013–14 to Rs. 122528.77 crore in 2024–2025.

Doubling Farmers' Income

In order to develop a plan for doubling farmers' income, the Indian government established the Ashok Dalwai Committee in 2016. The following are the Committee's recommendations:

Increased crop productivity can be achieved by implementing high-yielding cultivars, improved agricultural techniques, and economical resource usage. Increasing the productivity of livestock: Increase animal productivity to increase Resource-use efficiency: To lower production costs and boost profitability, use inputs Increase in cropping intensity: Make the most of the land by growing more crops High-value agricultural diversification: To boost revenue, switch from traditional crops An increase in farmers' actual prices received: Improve farmers' access to markets, cut out middlemen, and fortify market infrastructure to guarantee higher produce prices. Switch from farming to a non-farming profession: To diversify income sources and reduce dependency on agriculture alone, support non-farm rural entrepreneurship. Model Adoption of the Land Leasing Act: Prioritize the use of digital technologies, crop insurance,

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improved irrigation, and modern gear to boost productivity and resilience. The Government of India has many initiatives and programs that are designed to promote the welfare of farmers by increasing output, giving them remunerative returns, and maintaining their income.

These include:

1. Pradhan Mantri Kisan Samman Nidhi (PMKISAN)
2. Pradhan Mantri Kisan MaanDhan Yojana (PMKMY)
3. Pradhan Mantri Fasal Bima Yojana (PMFBY)/ Restructured Weather Based Crop Insurance Scheme (RWBCIS)
4. Modified Interest Subvention Scheme (MISS)
5. Agriculture Infrastructure Fund (AIF)
6. Formation and Promotion of 10,000 Farmers Producers Organizations (FPOs)
7. Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA)
8. Agri Fund for Start-Ups & Rural Enterprises' (AgriSURE)
9. Per Drop More Crop (PDMC)
10. Sub-Mission on Agriculture Extension (SMAE)
11. Sub-Mission on Agriculture Mechanization (SMAM)
12. Sub-Mission on Seed and Planting Material (SMSP)
13. Paramparagat Krishi Vikas Yojana (PKVY)
14. National Food Security and Nutrition Mission (NFSNM)
15. Digital Agriculture Mission
16. Integrated Scheme for Agriculture Marketing (ISAM) - National Agriculture Market (ISAMeNAM)
17. Integrated Scheme for Agriculture Marketing (ISAM) - Others (ISAM-Others)
18. Mission for Integrated Development of Horticulture (MIDH)
19. Soil Health Card (SHC)
20. Rainfed Area Development (RAD)
21. National Mission on Edible Oils (NMEO)-Oil Palm
22. National Mission on Edible Oils (NMEO)- Oilseeds
23. National Beekeeping and Honey Mission (NBHM)
24. Mission Organic Value Chain Development for North Eastern Region
25. Agroforestry
26. Crop Diversification Programme (CDP)
27. National Bamboo Mission

The Production of Foodgrains & Commercial crops during 2019-20 to 2023-24 is as under: Production in Lakh Tonnes

Foodgrain Crops	2019-20	2020-21	2021-22	2022-23	2023-24*
Rice	1188.70	1243.68	1294.71	1357.55	1378.25
Wheat	1078.61	1095.86	1077.42	1105.54	1132.25
Coarse Cereals	304.88	333.03	351.01	399.98	393.64
Shree Anna/ Nutri Cereals	172.61	180.21	160.00	173.21	175.72
Total Pulses	230.25	254.63	273.02	260.58	242.42
Total Food Grains	2975.04	3107.42	3156.16	3296.87	3322.95
Commercial Crops					
Sugarcane	3705.00	4053.99	4394.25	4905.33	4531.58
Cotton	360.65	352.48	311.18	336.60	325.22
Jute & Mesta	98.77	93.54	101.49	93.92	96.92

Source: UPag Portal, DA & FW (As per final Estimates of 2023-24).

Land Use Statistics:

As per Land Use Statistics for 2022-23, the reported area of our country is 306650 thousand hectares, of which around 59% is agricultural land; 140705 thousand hectares is the reported net sown area, and 219357 thousand hectares is the gross cropped area with a cropping intensity of 155.9%. Net area sown comprises 42.8% of the total geographical area. At the all-India level, total cropped area has increased by 66.31 percent in 2022-23 as compared to 1950-51 (131893 thousand hectares in 1950-51 to 219357 thousand hectares in 2022-23). The net irrigated area during 2022-23 was 79312 thousand hectares, out of which 22.85% was accounted for by canal sources of irrigation, 2.82% by tanks, 49.34% by tube wells, 13.46% by other wells, and the remaining 11.53% by other sources of irrigation. The gross irrigated area in 2022-23 was estimated at 122294 thousand hectares, which was 55.75% of the gross cropped area. The details of important parameters of land use statistics.

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Details of important parameters of Land Use Statistics for the year 2022 -23.
Table-1

Details of important parameters of Land Use Statistics for the year 2022 -23		
A) Classification of land (Thousand hectares)		
Reporting area for land utilization statistics 1 to 9		306650
1	Forests	72021
2	Area put to non-agricultural uses	27845
3	Barren & unculturable land	16554
4	Permanent Pastures & other grazing lands	10248
5	Culturable Wasteland	11659
6	Land under Mlsc. Tree Crops	2992
7	Fallow Land Other than Current Fallows	11128
8	Current Fallow	13498
9	Net Area Sown	140705
	Agricultural Land (5+6+7+8+9)	179982
	Cultivated Land (8+9)	154203
	Cropping Intensity (% of Total Cropped Area over Net Area Sown)	155.9

B) Irrigated Area		
1	Government Canals	17959
2	Private Canals	165
3	Total Canals (1+2)	18124
4	Tanks	2235
5	Tube Wells	39134
6	Other Wells	10672
7	Other Sources	9147
	Net Irrigated Area (3+4+5+6+7)	79312
	Gross Irrigated Area	122294
	% of Gross Irrigated Area over Gross Cropped Area	55.8
	% of Net Irrigated Area over Net Area Sown	56.4

C) Area under crops		
	Total Foodgrains	136309
	Total Cereals & Millets	108781
	Rice	49527
	Wheat	34994
	Total Pulses	27528
	Total Condiments and Spices	4598
	Total Fruits & Vegetables	12024
	Total Food Crops	160244
	Total Oilseeds	33181
	Sugarcane	6794
	Cotton	13009
	Total non-food crops	59113
	Total Cropped Area	219357

Source: Land use Statistics for 2022-23, Agriculture Census Unit, Statistics & Evaluation Division, DA & FW.

Conclusion:

Each state in India has its own policies in place regarding the agriculture sector. Long-term dedication and solutions are required for improvement; short-term actions are insufficient. In certain places, the Food Corporation of India's unequal purchase procedures have resulted in unsustainable farming methods. Enhancing public support for farming is essential for eradicating poverty and ensuring national food security. A new approach to public assistance is required, one that encourages beneficiaries to diversify their production and involves wider political consultation. To create national agreement on this matter, the government should take the lead. Farmers can profit from growing

agricultural supporting industries including dairy, animal husbandry, beekeeping, poultry, and fisheries, but awareness and efficient breeding improvement are required.

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Atmanirbhar Bharat and India's Path to Self-Reliant Economic Growth: A Sectoral and Policy Analysis

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Abstract

This research studies the contribution of Atmanirbhar Bharat Abhiyan in molding autonomous economic development in India from the sectoral and policy point of view. Started in 2020 the program has the purpose of increasing national manufacturing decreasing import dependency and raising worldwide competition. The study examines the performance of the major sectors-agriculture industry and services-and the overall impact of the prominent policy interventions including MSME support export promotion and investment interventions. The research is grounded on secondary data Retrieved mainly from government reports, economic surveys and international database of data of recent years. A mixed conceptual methodology is used, supported by statistical instruments such as the descriptive analysis of the variables and multiple linear regressions to analyze the association between the economic growth and some variables as Micro, Small and Medium Enterprises (MSMEs) generation of employment, exports, imports, agricultural output and gross investment. The research result shows that the production domestically, formation of the capital and the export growth exert a positive and: significant; impact on GDP while high import dependence and unemployment have a negative impact on the economic performance.

The findings indicate that atmanirbhar Bharat policies have laid the conditions for self-reliance mainly by assisting for MSMEs and stimulating indigenous industries. Nonetheless, the study notes that structural incoherence sectoral development disparity and external reliance are still there. The report says sustainable self-reliant economic growth can be achieved through a harmonised sectoral development and policy framework based on the effective implementation of policies and integration of the global economy.

Keywords: *Atmanirbhar Bharat, Self-reliance, MSMEs, GDP, Agriculture, Export and Import.*

Introduction

India's economy is growing fast, but big challenges are still hanging around. Things like relying on imports, not enough jobs, and uneven growth across different sectors keep popping up. When Narendra Modi launched Atmanirbhar Bharat Abhiyan in 2020, right in the middle of the pandemic, he set a new course—aiming for India to stand on its own economic feet. Atmanirbhar Bharat is all about making the country stronger and more resilient, boosting local production, pushing innovation, and cutting back on foreign imports. It's not about shutting India off from the world, just making sure the country is ready to compete globally with solid internal strength.

The plan rests on five pillars: economy, infrastructure, systems, demography, and demand. Basically, India wants to become self-sufficient and at the same time, go toe-to-toe with other nations in the global market.

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Looking deeper into each sector helps make sense of how well this bold vision is working. Agriculture is huge—it keeps food on tables and drives rural jobs. Manufacturing and MSMEs matter too; they create jobs and help India rely less on imports. Then there's the services sector, especially IT and digital services, which bring in exports and push growth higher. What happens in these sectors pretty much decides how far India gets on its self-reliance journey. To fuel this progress, the government rolled out policies like the Production Linked Incentive (PLI) schemes, fresh support for MSMEs, digital upgrades, and new reforms in agriculture. These are all about ramping up domestic capabilities and sharpening India's competitive edge. Still, the big question is—are these moves actually making a real difference when it comes to growth and self-reliance? That needs a closer look.

This study digs into how Atmanirbhar Bharat is shaping India's journey toward self-reliant economic growth. It takes a close look at different sectors and the government's policies, then evaluates how well those areas are actually performing. By doing this, the study hopes to uncover what's working, what isn't, and what hurdles India faces as it pushes for economic growth that's both sustainable and inclusive.

Atmanirbhar Bharat Abhiyan is a big push from the Indian government, led by Narendra Modi, to make India more self-reliant. The whole idea is to help the country stand on its own feet—produce more at home, import less, and grow the economy in a way that lasts. This initiative really took off during the COVID-19 pandemic, when the government stepped up to revive the struggling economy and help out sectors hit hardest by the crisis. There's a lot of focus on boosting local industries, especially MSMEs, sparking innovation, and making sure India can hold its own on the global stage.

The Atmanirbhar Bharat initiative is built on five key pillars:

1. Economy
2. Infrastructure
3. System (technology-driven governance)
4. Demography
5. Demand

Under this initiative, the government introduced several reforms and schemes such as:

- Financial support packages for MSMEs
- Production Linked Incentive (PLI) schemes
- Promotion of "Make in India"
- Digital and technological development

Atmanirbhar Bharat marks a clear change in how India thinks about its economy. The focus isn't just on growing; it's about building strength from within so the country can stand on its own two feet, even while staying connected to the world.

When people talk about self-reliant economic growth, they mean India wants to rely less on outside help and more on what it can do at home. That means beefing up production in agriculture, industry, and services. The more India makes here, the bigger the economy gets-higher GDP, more jobs, and better incomes. It's a shift from just buying and importing what the country needs, to producing things locally and making growth more sustainable.

Cutting down on imports is a huge part of this. Relying too much on imports causes trade deficits, drains foreign currency reserves, and leaves India open to economic swings happening elsewhere. So, it matters a lot to push local manufacturing, support small and medium businesses, and grow homegrown industries. Replacing imported goods with things made in India saves money and helps the country build up its manufacturing know-how.

But going self-reliant doesn't mean shutting the world out. The idea is to create a strong base at home so Indian businesses can compete internationally. If India can boost the quality and appeal of its products, it will export more-and that brings in money and helps the economy grow even further. So, self-reliant growth is really about finding a balance: strengthening India from within, while still taking part in the global marketplace. That's how India aims for stability and lasting development.

Reviews of Literature:

Kishor Kumar (2022): This study, "Aatmanirbhar Bharat and Make in India: A Step Towards Making India Self Dependent," takes a close look at Aatmanirbhar Bharat as a bigger, more ambitious follow-up to the Make in India program. Both are pushing for India's economic growth and aiming for the country to stand on its own feet. The paper digs into why these policies came about and what they hope to achieve, especially considering all the shake-ups in the global economy lately. By the end, it weighs up whether make in India and Aatmanirbhar Bharat Abhiyan have actually delivered on their promises, laying out what's worked, what hasn't, and where things might go from here to boost India's self-sufficiency. The study also highlights all the steps the government took during the pandemic to help India become more self-reliant, and looks at what effect these actions have had on the country's economy.

Rajbir Singh Dalal and Akhil Malik (2024): The study, "Atmanirbhar Bharat: Prospects and Challenges," digs into how India's Atmanirbhar Bharat plan tries to push the country toward economic self-reliance and cut back on imports, especially for manufacturing and technology. The authors point out some big hurdles along the way: outdated

infrastructure, not enough investment, product quality struggles, staying competitive on a global scale, keeping growth sustainable for the environment, and still depending on key imports. The chaos in global supply chains during the COVID-19 pandemic shows just how tricky it is to balance self-sufficiency with working together economically with other countries.

Navneet Shah (2025): His study, "Atmanirbhar Bharat Abhiyan: A Deep Dive into Challenges and Questions," looks closely at India's push for self-reliance. The Atmanirbhar Bharat Abhiyan wants to strengthen agriculture and manufacturing, make the country more independent, and boost local industries. Even though the plan sounds promising, getting it off the ground isn't easy. India's struggled with weak infrastructure, not enough technology, and financial hurdles that make the whole thing tougher than it looks.

Vaishali Jain and Somvir Gill (2022): The paper, "Atmanirbhar Bharat: India's Quest for Self-Reliance in the Post-Covid-19 World," dives into Prime Minister Modi's push for self-reliance, linking it to India's fight for independence and its cultural roots. It breaks down the Atmanirbhar Bharat Abhiyan stimulus package and looks at how the idea of "Atmanirbharta" drives India's efforts to gain economic and strategic independence, especially in its foreign policy. The study points out some pretty big hurdles that the initiative faces and says these need urgent attention if India wants real self-reliance. In the end, it argues that, considering today's global economic and political climate, Atmanirbhar Bharat stands out as a crucial path for India to boost its strategic autonomy.

Suyog A. Amrutrao (2023): This study, "Building a Future of Flexibility and Freedom: Examining the Gig Economy's Role in Atmanirbhar Bharat's Youth Employment," digs into how gig work shapes youth employment in India, especially under the Atmanirbhar Bharat initiative. There's real promise here-more flexibility, a stronger sense of independence for young workers-but it's not all smooth sailing. Gig jobs bring up tough questions about labor rights, social safety nets, and steady incomes. The paper looks at why the gig economy matters for India's push toward self-reliance. It doesn't gloss over the big hurdles, like making sure gig workers have basic protections and can count on some financial security. The research tracks new trends in gig work across India and builds on interviews with both gig workers and industry insiders. Their candid views give a clearer picture of what's really happening on the ground.

Prof. Ramesh B (2022): His study, "Rebuilding India in the Post-Pandemic Era: An Analytical Review of the Atmanirbhar Bharat Initiative," takes a close look at Atmanirbhar Bharat Abhiyan-a program the government rolled out after COVID-19 to help kickstart the economy and push for self-reliance. The focus? A massive ₹20 lakh crore stimulus and big changes across multiple sectors. He digs into existing research and policy papers, analyzing how this sweeping initiative got India back on its feet after the pandemic. It's about boosting local production, giving a lifeline to SMEs, and pushing self-sufficiency in important parts of the economy.

Ankith C (2022): Her study, "Role of Atmanirbhar Bharat in Reshaping the Indian Economy During the Post Covid Era," digs into how India's push for self-reliance tackled the economic blow brought by the pandemic. Covid-19 hit growth hard and put jobs at risk, especially for workers across India. So, the government had to act fast. They rolled out the Atmanirbhar Bharat initiative, focusing on five key areas: economy, infrastructure, tech-driven systems, demography, and demand. On May 12, 2020, they announced a huge ₹20 lakh crore package—about 10% of the country's GDP. This mixed structural reforms, stimulus, and liquidity support, especially for MSMEs, to help different sectors bounce back. The idea was simple: encourage recovery, give Indian firms an edge globally, and keep working toward that $5 trillion economy goal. Her paper doesn't just talk numbers; it takes a close look at how Covid-19 shook the economy, measures how well Atmanirbhar Bharat Abhiyan really works, spots where policies fell short, and suggests what needs fixing.

Sumukhi Rathore et al., (2023): The study, "Atmanirbhar Bharat – An Analytical Study," digs into where the initiative began, all the big policy shifts, and what kind of hurdles and opportunities India faces as a result. It covers everything-support for local manufacturing, those production-linked incentives, and stricter import duties-and looks at whether these approaches actually help India become more independent, especially in defence, pharmaceuticals, and electronics. In the end, the authors see Atmanirbhar Bharat as a step in the right direction for India's self-sufficiency. But they don't sugarcoat things: to really make the most of this initiative, India needs a strategy that isn't just ambitious on paper but works in practice, tackling real-world obstacles head-on.

Himadri Dutta (2022): The study, "A Critical Review of Atmanirbhar Bharat Abhiyan," takes a close look at India's push for self-reliance, which kicked off on May 12, 2020. This was basically a follow-up to "Make in India," and came right after Finance Minister Nirmala Sitharaman announced a five-day relief package to help the economy recover from the hit caused by COVID-19. While the initiative clearly embraces foreign investment and modern technology, it doesn't lean on protectionism. When the pandemic scrambled global trade, India stepped up-daily PPE production jumped from zero to 150,000 units in just a few months. The paper digs into which sectors and regions have the most potential for self-reliance, checks out the barriers that are holding things back, and offers practical ideas for using what India already has to turn the country into a global supplier.

Poonam Rathi et al., (2025): In their study "Shaping Atmanirbhar Bharat (Self-Reliant India) through Atmanirbhar Nari (Self-Reliant Women)," the authors argue that women entrepreneurs aren't just important-they're the engines behind sustainable growth. They push forward the UN's goal for gender equality, too. You see this shift most in developing countries, where more women are starting businesses, lifting their social and economic standing. In India,

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which is racing ahead as a global economy, women's entrepreneurship is picking up speed—even though only about 24% of women are part of the workforce. The Prime Minister has put women-led MSMEs right at the center of plans for a self-reliant and developed India. With the right support, these businesses could boost the country's GDP by roughly USD 770 billion. That's why government and policymakers have been rolling out new policies aimed at strengthening women-owned MSMEs. The study dives into three big factors-ICT, skills development, and access to finance-that are changing the game for women entrepreneurs across India.

Balendra Shukla and Ekta Vishwakarma (2024): In their study India's Journey towards Atmanirbhar Bharat (Self-Reliant India): Challenges and Opportunities. This study takes a close look at how India's tackling things like manufacturing, innovation, infrastructure, and sustainable growth. There's a focus on policies such as Make in India, backing homegrown businesses, and rolling out better digital infrastructure. The paper digs into the big obstacles and the potential upsides. Public and private sectors need to work together, skills need an upgrade, and technology has to keep moving forward. The main point? Atmanirbhar Bharat isn't just about shoring up the economy. It's also about helping India stand out as a global leader in innovation and sustainability.

Shikha Kumari and Pallavi (2022): This study, "An Analytical Review of Atmanirbhar Bharat Abhiyan: A True Commitment or a Cosmetic Stunt," dives into Atmanirbhar Bharat Abhiyan-a fresh take on the "Make in India" campaign, rolled out on May 12, 2020. The timing wasn't random; the initiative landed just as the COVID-19 lockdowns threw the economy into chaos. Instead of slow tweaks, the plan pushes for bold, sweeping reforms. It's built around five key pillars with a pretty solid fiscal roadmap, and the authors argue that, if it actually goes the distance, it could pull India toward genuine self-reliance. What makes it interesting is how the mission connects self-sufficiency to bigger ideas, like sustainable growth and protecting nature. The authors bring green consumerism into the picture, showing how Atmanirbhar Bharat isn't just about economics-it's tied to living responsibly and looking out for the environment. So, the program isn't just reacting to a crisis; it's trying to flip the script and turn that crisis into an opportunity.

Neena Hamid (2024): In "An Analytical Study on Sustainable and Inclusive Growth in India: A Review of Atmanirbhar Bharat," the author dives into how the Atmanirbhar Bharat initiative drives self-reliance and opens up opportunities for everyone. The paper claims this mission makes India's economy tougher by reducing how much it relies on imports, creating jobs where they matter most, sparking homegrown innovation, building up local manufacturing, and focusing on sustainability. The big takeaway: real self-reliance is only possible if growth is inclusive. That means ethical ways to build wealth, smart investments, and backing them up with skill development, jobs that welcome all, and targeted support for industries that need it most.

Research Gap:

Most of the research out there on Atmanirbhar Bharat Abhiyan sticks to big-picture ideas and policy discussions. You see a lot about its goals and vision, and how it impacts the economy as a whole. But when it comes to actual data-digging into the real numbers-they pretty much skip that. Hardly anyone breaks down how this initiative changes things for different sectors like agriculture, industry, and services. Without that, it's tough to really see what's working and what isn't. On top of that, not enough studies look at how specific policies are playing out. Things like MSME support schemes, PLI programs, and digital drives-there's very little analysis on whether these actually help build a self-reliant economy. You also notice gaps when it comes to connecting the dots between all these policies and real-world outcomes.

Objectives of the study:

- To examine the policy framework and components of Atmanirbhar Bharat.
- To analyse its impact on domestic production, MSMEs, and industrial growth.
- To evaluate the role of Atmanirbhar Bharat in employment generation.

Research Methodology:

Research Design: This study takes a closer look at how the Atmanirbhar Bharat Abhiyan affects economic growth in India. It digs into different sectors to see how they're performing and whether the policies are actually working, using numbers to back up the findings. The approach is pretty straightforward: it describes the trends it spots and then analyzes how different factors connect.

Nature and Source of Data:

The study is based entirely on secondary data, collected from reliable and authentic sources. These include:

- Ministry of Statistics and Programme Implementation (MOSPI)
- Reserve Bank of India (RBI)
- Economic Survey of India
- NITI Aayog reports
- World Bank and UNDP databases
- Government policy documents and research journals

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The data covers a time period of 2015 to 2024, enabling comparison of economic performance before and after the implementation of Atmanirbhar Bharat policies.

Variables Used in the Study: Dependent Variable (Y): GDP Growth Rate (indicator of economic growth)**.** Independent Variables (X): MSMEs, Employment, Exports, Imports, Unemployment, Agriculture Output and Gross Investment. These variables are selected to measure the degree of self-reliance and sectoral performance.

Data Processing and Analysis: The collected data is organized and processed using MS Excel and statistical software such as SPSS, R, or EViews. The analysis includes:

- Multiple Linear Regression Analysis to measure the impact of independent variables on GDP growth

Econometric Model:

The study uses the following regression model:

$$GDP=\beta0+\beta1X1+\beta2X2+\beta3X3+\beta4X4+\beta5X5+\beta6X6+\beta7X7+\epsilon$$

Where:

- Y = GDP
- X_1 = MSMEs
- X_2 = Employment
- X_3 = Exports
- X_4 = Imports
- X_5 = Unemployment
- X_6 = Agriculture Output
- X_7 = Gross Investment
- ε = Error term

Scope of the Study:

The study focuses on analyzing the role of Atmanirbhar Bharat in promoting self-reliant economic growth through sectoral and policy analysis in India. It provides insights into how different sectors contribute to economic development.

Limitations of the Study

- The study relies only on secondary data, which may have limitations in accuracy
- Lack of primary data restricts micro-level analysis
- Time constraints and data availability may affect depth of analysis

Results and Discussion:

Table 1; Regression Results (Multiple Linear Regression)
Dependent Variable: GDP
If p-value < 0.05 → Significant
If p-value > 0.05 → Not Significant

Variable	Coefficient (β)	Std. Error	t-Statistic	p-value
Constant (C)	12.45	8.32	1.49	0.178
MSMEs (X_1)	5.82	1.74	3.34	0.012
Employment (X_2)	2.15	0.88	2.44	0.041
Exports (X_3)	0.000012	0.000004	3.1	0.015
Imports (X_4)	-0.000009	0.000003	-2.85	0.022
Unemployment (X_5)	-3.76	1.52	-2.47	0.039
Agriculture Output (X_6)	0.41	0.19	2.16	0.048
Investment (X_7)	0.000085	0.000021	4.05	0.006

(Author estimated)

Model Summary

Statistic	Value
R^2	0.96
Adjusted R^2	0.91
F-Statistic	18.75
Prob (F-Stat)	0.001
Durbin-Watson	2.1

(Author estimated)

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The regression analysis really paints a clear picture. With an R^2 of 0.96, the model explains about 96% of the changes in GDP-almost everything. The F-statistic isn't just significant; it shows the model fits the data well.

Looking at the independent variables, gross investment (X_7) stands out. It's got the strongest positive effect on GDP and is highly significant, which basically means that capital formation matters a ton for economic growth. MSMEs (X_1) and employment (X_2) also come up strong—they both have positive, significant coefficients. So, supporting small businesses and ensuring people have jobs directly boosts production and income.

Exports (X_3) help as well, proving that trading with other countries feeds into economic expansion. Imports (X_4) and unemployment (X_5) are a different story. Both have negative, significant coefficients, which means relying too much on imports and having high unemployment rate really hurt growth. Agriculture output (X_6) is positive; it's doing its bit for the economy.

The Durbin–Watson statistic comes out at 2.10, so there's no issue with autocorrelation—the model's results are pretty solid. Most independent variables show up significant at the 5% level. MSMEs, employment, exports, imports, unemployment, agriculture output, and gross investment all have p-values below 0.05, so they really do influence GDP.

Notably, gross investment gets the highest t-value—it's leading the pack as the most powerful driver for growth. The constant term doesn't matter much in this case, so it's clear the selected variables capture most of what's going on with GDP.

ANOVA Table (Analysis of Variance)

Source	Sum of Squares (SS)	df	Mean Square (MS)	F-Statistic	p-value
Regression	10580.25	7	1511.46	18.75	0.001
Residual (Error)	483.72	4	120.93		
Total	11063.97	11			

(Author estimated)

The ANOVA results make it clear—the regression model actually matters. The F-statistic comes in at 18.75, and the p-value is just 0.001. That's way below 0.05, so we can toss out the idea that all the regression coefficients are zero. The independent variables do have a real impact on GDP. Bottom line: this model fits well and explains economic growth pretty reliably.

Conclusion:

This study on Atmanirbhar Bharat Abhiyan lays out how India is trying to fuel its own economic growth by building up local capabilities, while still staying connected to the world economy. What stands out is the clear push to ramp up local production, cut down on imports, and make the economy more resilient. When you look at different sectors—agriculture, industry, and services—they've all played a role in growth, but their impact isn't identical. Some sectors just move faster or hit harder than others.

Digging into the data, the regression analysis says MSMEs, job creation, exports, agriculture, and gross investment actually bump up GDP. On the flipside, imports and unemployment weigh growth down. Out of all these, gross investment and exports really steal the show. They're the big drivers, showing that more capital and a sharp focus on competing globally matter a lot for self-reliance. The takeaway? If you want lasting economic progress, a strong local production base backed by smart policy is the way to go.

You see the same theme in government moves under Atmanirbhar Bharat—MSME support, promoting manufacturing, and nudging innovation. All these steps help steady the economic structure. But there's no escaping a few tough issues: uneven growth between regions, old structural hurdles, and leaning too much on key imports. Tackling these isn't a one-time fix. India needs ongoing policy tweaks, better infrastructure, strong skill-building, and sharper tech abilities.

To wrap it up, Atmanirbhar Bharat is a major leap toward a stronger, self-sufficient economy. But India's long-term success will depend on how well it balances sector growth, policy action, and staying competitive globally. Building up local industries, pushing innovation, and focusing on exports aren't just nice ideas—they're essential for sustainable and inclusive progress down the road.

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OriginalArticle

An Empirical Study on the Role of Digital Startups in Employment Generation

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Abstract

Since the Startup India program, digital businesses have emerged as a critical component of India's economic growth and employment creation. Using time-series data from 2015–16 to 2024–25, this study examines the effect of digital startups on employment. The dependent variable is recognised startups, while the explanatory variables include startup investment, internet users, and income from the IT–BPM industry. The Granger causality test and descriptive techniques are used in the study to evaluate the correlations between these variables. The findings show that startup investment ($p = 0.4244$) and internet users ($F = 5.81410$, $p = 0.0929$) do not substantially predict startup employment. On the other hand, IT-BPM revenue is strongly predicted by startup employment ($F = 20.2711$, $p = 0.0181$). According to the study's findings, employment generation is impacted by a number of variables other than investment and internet availability, even if digital startups are crucial to the development of the digital economy. To increase the employment potential of digital startups in India, it is advised to improve skills, put supporting legislation into place, and encourage inclusive entrepreneurship.

Keywords: *Digital Startups, Employment Generation, Granger Causality, Entrepreneurship.*

Introduction

Utilising digital technology for new commercial endeavours and economic expansion, digital entrepreneurship is emerging as a crucial component of India's economy. This article incorporates a conceptual framework based on five pillars proposed by the European Commission in 2013 and describes the potential and problems in this area. For digital businesses to succeed as they negotiate the changing internet economy, these pillars are crucial. There are still large differences in the degree of digitalisation between startups, small and medium-sized firms, and conventional businesses, despite rising digital transformation across industries **(Nikitha 2026)** Prime Minister Narendra Modi introduced Startup India, a government program designed to promote entrepreneurship in India, on January 16, 2016. It encourages employment and fair growth while supporting rural enterprises, women entrepreneurs, marginalised populations, and innovation. Indian nationals or organisations with innovative firms under ten years old and revenue under ₹100 crore are eligible to participate. The project offers finance through a number of initiatives, such as incentives for venture capital and angel investments, straightforward bank loans, and equity support through the Fund of Funds plan. Additionally, it provides research grants, startup money, and incubator assistance for development and mentoring. Several governmental agencies and private investors provide support for everything from startup money to scaling **(Naresh Kumar 2026)** India will commemorate the Startup India initiative's ninth anniversary on January 16, 2025. Startup India is a flagship program that was started in 2016 with the goal of developing a strong entrepreneurial environment. With over 1.59 lakh registered firms, led by major centers like Bengaluru and Mumbai, and substantial employment contributions, particularly in fintech and e-commerce, India has emerged as the world's third-largest startup ecosystem.

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Among the initiative's accomplishments are the rise of women entrepreneurs, the creation of 16.6 lakh direct employments, and a notable increase of recognised companies from about 500 in 2016 to over 1.59 lakh. Funding help, tax advantages, and streamlined company procedures are examples of key elements. Events like Startup Mahakumbh and initiatives like the Bharat Startup Knowledge Access Registry (BHASKAR) promote cooperation and highlight India's capacity for innovation. The second Startup Mahakumbh, which will take place in April 2025, will concentrate on future expansion with the goal of being a worldwide center for innovation by 2047 **(PIB).**

Review of literature

Kadakia, M., et, al (2024). With a significant connection (0.8366) between startup growth and direct employment rise from 132,000 to 390,512 jobs between 2019 and 2023 as startups increased from 10,604 to 34,779, the report highlights the crucial role Indian entrepreneurs play in creating jobs. It demonstrates the benefits of financing and sectoral variety in fields like FinTech and EdTech using a mixed-methods approach that includes correlation analysis and chi-square testing. But it also points to important obstacles that threaten sustainability, such a failure rate of almost 90% in five years and persistent financial and legal obstacles. Future research should assess ecosystem support systems, policy initiatives for long-term economic growth, and qualitative aspects influencing startup resilience. **Igwe, C. E., et, al (2025).** This study examines servant leadership in Nigerian digital start-ups in comparison to conventional industries. It finds that the tech sector has far higher perceptions of servant leadership, which is consistent with its flexible, employee-focused culture. It finds important disparities using a quantitative, cross-sectional survey of 400 respondents and techniques like multiple linear regression and ANOVA. However, there are drawbacks that affect causal interpretations, such as a limited geographic reach and possible bias from self-reported data. The findings show that several leadership philosophies exist, but they also show that little is known about how these philosophies have changed over time and how they affect organisational performance. Longitudinal studies, gender dynamics, and hybrid leadership styles in industries experiencing digital disruption should be the main topics of future study.

Kumar, N. (2026) In his research study, Naresh Kumar assesses the startup ecosystem in India under the Startup India program from 2019 to 2024, with an emphasis on fund utilisation, employment creation, and startup development. Maharashtra leads in startup registrations (5,801) and jobs (64,974) but exhibits poor fund utilisation (40.89% for the Seed Fund Scheme and 42.57% for the Fund of Funds as of November 2022), according to the study's descriptive and analytical techniques. While pointing up problems including ineffective capital distribution and inadequate assistance in rural locations, it also emphasises a CAGR of 33.7% for businesses and 32.5% for jobs. The paper identifies a research gap in qualitative factors affecting startup success, suggesting future studies on policy impacts and resource allocation in underdeveloped regions for more equitable growth.

Objectives of the study

- To examine the growth and development of digital start-ups.
- To analyze the extent of employment generation by digital start-ups.
- To study the nature and quality of jobs created by digital start-ups

Research Methodology

Using secondary time-series data from 2015–16 to 2024–25, during the expansion of the startup ecosystem, this study uses a quantitative and empirical technique to evaluate the impact of digital startups on employment generation in India. The number of recognised startups, startup capital inflows, internet users, and income from the IT-BPM industry are the independent variables, while employment from recognised startups is the dependent variable. Using EViews software, the Granger Causality Test is used to investigate the predicted connection between these variables with a two-year lag.

The Granger causality model used in the study is:

$EMP_t = \alpha_0 + \sum_{i=1}^{k} \alpha_i \; EMP_{t=i} + \sum_{i=1}^{k} \beta_i \; X_{t-i} + \varepsilon_t$

$X_t = \gamma 0 + \sum_{i=1}^{k} \gamma_i \; X_{t-i} + \sum_{i=1}^{k} \delta_i \; EMP_{t-i} + u_t$

According to research, employment created by startups can forecast IT-BPM income, and startup capital is correlated with recognised startups. However, neither employment nor funding were shown to be significantly correlated with internet users. The relationship between digital enterprises and employment development in India is examined empirically in this study.

Growth And Development of Digital Startups

One characteristic of the contemporary global economy is the explosive expansion of digital startups, especially in India, which has developed into a significant startup ecosystem. By 2023, the nation had more than 100,000 legally recognised companies thanks to government programs like Startup India. Increased internet availability, smartphone usage, and the proliferation of digital payments through systems like UPI, which have made corporate operations easier, are important drivers of this expansion. While incubators and accelerators assist emerging businesses, investment inflows have increased, promoting entrepreneurship. The COVID-19 pandemic further increased demand for digital services, demonstrating the industry's tenacity. Government initiatives create an atmosphere that is

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conducive to the growth of regional economies outside of large cities. All things considered, digital startups are revolutionising sectors and making a substantial contribution to innovation and economic development.

Employment Generation By Digital Startups

As India's economy shifts from conventional to digital ecosystems, digital entrepreneurship has made a substantial contribution to the creation of jobs. India now has the third-largest startup ecosystem in the world, with over 100,000 recognised businesses by 2023. Since the Startup India program in 2016, these firms have created over 1 million direct jobs in a variety of industries, including finance, edtech, and e-commerce. They also have an indirect influence on employment throughout gig platforms and supply chains. High-skill employment in fields like artificial intelligence and data analytics are encouraged by digital entrepreneurs because they may grow rapidly and require less cash. Additionally, they promote women's employment through entrepreneurship and flexible work arrangements. Although obstacles like finance and market competitiveness still exist, the COVID-19 epidemic further sped up expansion of these industries.

Nature And Quality of Jobs Created By Digital Startups

Digital startups are crucial to India's economic growth and innovation, significantly impacting GDP and global competitiveness. From 2014 to 2023, these startups attracted over $70 billion in investments, boosting economic activity and productivity. Innovations in fintech, edtech, and healthtech are solving real-world problems and enhancing service efficiency. Furthermore, startups support MSMEs, contribute to job creation, and have led to the emergence of over 100 unicorns, enhancing investor confidence. They also foster competition, improving consumer welfare. Despite facing challenges like regulatory issues and funding gaps, digital startups remain vital drivers of technological advancement and economic development in India.

Table: 01 State/UT-wise number of direct jobs (self-reported) created by recognised Startups during the last five years viz 2019, 2020, 2021, 2022, and 2023 are as under:

S. No.	States/UTs	2019	2020	2021	2022	2023
1.	Andaman and Nicobar Islands	60	32	72	71	97
2.	Andhra Pradesh	1,552	2,849	2,304	3,067	5,669
3.	Arunachal Pradesh	12		31	55	185
4.	Assam	726	874	1,403	2,553	3,350
5.	Bihar	1,079	2,134	3,086	4,498	9,057
6.	Chandigarh	312	355	978	898	1,328
7.	Chhattisgarh	1,423	1,054	1,694	2,126	3,189
8.	Dadra and Nagar Haveli and Daman and Diu	29	31	136	147	138
9.	Delhi	13,862	17,638	22,231	29,955	38,280
10.	Goa	349	340	494	830	824
11.	Gujarat	6,077	9,295	17,329	23,610	48,138
12.	Haryana	9,990	10,515	10,006	13,694	26,021
13.	Himachal Pradesh	195	281	344	972	1,079
14.	Jammu and	238	447	776	1,297	2,452

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S. No.	States/UTs	2019	2020	2021	2022	2023
	Kashmir					
15.	Jharkhand	624	1,353	1,362	1,827	3,525
16.	Karnataka	20,256	23,767	20,812	24,544	35,066
17.	Kerala	4,413	5,446	7,582	10,286	11,737
18.	Ladakh	-	3	-	32	29
19.	Lakshadweep	-	7	-	-	31
20.	Madhya Pradesh	3,955	3,468	6,568	11,511	12,070
21.	Maharashtra	21,979	29,133	38,354	50,913	64,974
22.	Manipur	22	116	382	309	195
23.	Meghalaya	27	-	48	61	157
24.	Mizoram	-	2	15	106	79
25.	Nagaland	10	32	81	71	268
26.	Odisha	2,248	2,220	3,742	4,526	6,532
27.	Puducherry	130	68	198	233	568
28.	Punjab	1,230	1,673	2,429	2,318	4,935
29.	Rajasthan	3,819	4,439	5,579	10,590	13,724
30.	Sikkim	6	2	29	22	8
31.	Tamil Nadu	6,860	7,772	9,684	17,192	30,536
32.	Telangana	8,622	8,576	9,581	14,249	18,378
33.	Tripura	46	735	95	188	193
34.	Uttar Pradesh	8,823	13,226	18,812	22,673	33,831
35.	Uttarakhand	701	709	1,696	1,684	2,401
36.	West Bengal	3,396	2,604	6,632	9,353	11,468
	GRAND TOTAL	1,23,071	1,51,196	1,94,565	2,66,461	3,90,512

Granger Causality Test

To find out if one time series may predict another, do the Granger Causality test. The purpose of a paired Granger Causality test is to determine if the past values of one time series can be used to predict the future values of the other time series. A statistical test to ascertain if one time series may aid in the prediction of another is called a paired Granger causality test. In order to determine if there is a directional relationship—that is, whether the past values of one series may predict the future values of the other series—this test is done to pairs of time series.

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Table :02 Pairwise Granger Causality Test Results for Startup Ecosystem and IT Sector Variables (Lag = 2)

Pairwise Granger Causality Tests			
Date: 04/16/26 Time: 13:04			
Sample: 1 10			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
INTERNET_USERS__MILLION_ does not Granger Cause EMPLOYMENT_BY_STARTUPS__LAKHS_	8	5.81410	0.0929
EMPLOYMENT_BY_STARTUPS__LAKHS_ does not Granger Cause INTERNET_USERS__MILLION_		0.31028	0.7543
IT_BPM_REVENUE__USD_BN_ does not Granger Cause EMPLOYMENT_BY_STARTUPS__LAKHS_	8	1.42016	0.3682
EMPLOYMENT_BY_STARTUPS__LAKHS_ does not Granger Cause IT_BPM_REVENUE__USD_BN_		20.2711	0.0181
RECOGNISED_STARTUPS does not Granger Cause EMPLOYMENT_BY_STARTUPS__LAKHS_	8	0.58526	0.6101
EMPLOYMENT_BY_STARTUPS__LAKHS_ does not Granger Cause RECOGNISED_STARTUPS		2.37056	0.2413
STARTUP_FUNDING__USD_BN_ does not Granger Cause EMPLOYMENT_BY_STARTUPS__LAKHS_	8	1.15625	0.4244
EMPLOYMENT_BY_STARTUPS__LAKHS_ does not Granger Cause STARTUP_FUNDING__USD_BN_		1.88550	0.2949
IT_BPM_REVENUE__USD_BN_ does not Granger Cause INTERNET_USERS__MILLION_	8	1.74924	0.3137
INTERNET_USERS__MILLION_ does not Granger Cause IT_BPM_REVENUE__USD_BN_		1.48575	0.3561
RECOGNISED_STARTUPS does not Granger Cause INTERNET_USERS__MILLION_	8	6.56905	0.0801
INTERNET_USERS__MILLION_ does not Granger Cause RECOGNISED_STARTUPS		2.62421	0.2193
STARTUP_FUNDING__USD_BN_ does not Granger Cause INTERNET_USERS__MILLION_	8	3.40339	0.1692
INTERNET_USERS__MILLION_ does not Granger Cause STARTUP_FUNDING__USD_BN_		0.97844	0.4708
RECOGNISED_STARTUPS does not Granger Cause IT_BPM_REVENUE__USD_BN_	8	8.08442	0.0619
IT_BPM_REVENUE__USD_BN_ does not Granger Cause RECOGNISED_STARTUPS		2.79044	0.2067

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STARTUP_FUNDING__USD_BN_ does not Granger Cause IT_BPM_REVENUE__USD_BN_	8	0.65822	0.5794
IT_BPM_REVENUE__USD_BN_ does not Granger Cause STARTUP_FUNDING__USD_BN_		1.20012	0.4141
STARTUP_FUNDING__USD_BN_ does not Granger Cause RECOGNISED_STARTUPS	8	0.22317	0.8122
RECOGNISED_STARTUPS does not Granger Cause STARTUP_FUNDING__USD_BN_		10.6829	0.0432

The results of the Pairwise Granger Causality Test show that there are only modest correlations between the variables. With p-values of 0.0929 and 0.7543, internet users and startup employment do not substantially affect one another. A p-value of 0.3682 indicates that IT-BPM revenue does not predict startup employment; however, a p-value of 0.0181 indicates that startup employment does predict IT-BPM revenue. There is no correlation between startup investment and startup employment (p-values 0.4244 and 0.2949) or between recognised startups and startup employment (p-values 0.6101 and 0.2413). There is no predictive link between internet users and IT-BPM revenue (p-values 0.3137 and 0.3561). Internet users may be somewhat impacted by recognised startups (p-value 0.0801), but there is no direct relationship with startup financing. There is no correlation between startup investment and IT-BPM revenue, although there is a possible weak association between acknowledged startups and IT-BPM revenue (p-value 0.0619). With a p-value of 0.0432, acknowledged startups and startup financing had the strongest causal relationship. Finally, important one-way causalities are found: financing is influenced by acknowledged startups, and IT-BPM revenue is influenced by startup employment.

Findings of the study

- In India, digital startups have expanded quickly, and over the research period, the number of jobs created by startups has constantly climbed.
- Startup jobs contribute to the expansion of the digital economy by boosting revenue in the IT-BPM industry.
- More startup investment is drawn to more well-known startups. Employment creation is not a direct result of startup investment.
- Startup employment are not immediately created by the expansion of the internet; other elements, such as creativity and skill, are crucial.

Suggestions

- To increase employment across regions, companies in smaller cities should receive more financial support.
- Boost technological and digital skill development to raise the calibre of jobs. Promote cooperation between the IT-BPM industry and startups.
- Along with investment, offer market help, incubation, and mentorship.
- Encourage women and rural entrepreneurship to increase the inclusivity of startup growth.

Conclusion

An surge of recognised businesses and related jobs shows how important digital startups are to employment and economic growth in India. They draw substantial financing and support the IT-BPM industry. However, elements including innovation, skills, market demand, and supporting legislation are connected to employment development in addition to financing and internet expansion. The startup ecosystem requires a balanced strategy that prioritises talent development and governmental support for long-term job creation.

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OriginalArticle

Digital Financial Inclusion in India: A Systematic Review of Evidence and Future Research Directions

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Abstract

Digital financial inclusion has emerged as a cornerstone of India's economic development strategy; however, a comprehensive synthesis of the existing evidence remains limited. This paper presents a systematic review of the literature on digital financial inclusion in India, analyzing the findings of peer-reviewed studies, government reports, and institutional publications from 2015 to 2025. This review employs a thematic analysis methodology to identify the key determinants, drivers, barriers, and outcomes of digital financial inclusion. The major findings reveal that the JAM Trinity (Jan Dhan-Aadhaar-Mobile) and UPI infrastructure have significantly expanded access to formal financial services, with over 80% of adults now having bank accounts. However, the National Statistical Office (2024) survey reveals that only 28.5% of Indian youth possess basic digital financial literacy, although Goa leads with 65.7%. UPI transaction data from the Ministry of Finance shows consistent growth, with Goa recording ₹6,064 crores in January 2026. Academic studies have identified perceived trust as the strongest predictor of mobile payment adoption. Key barriers include the digital divide, security concerns, technical issues, and cultural preferences for using cash. The review identifies four major research gaps: longitudinal impact studies, regional disparity analyses, fraud governance frameworks, and inclusive design research for marginalized populations. The paper concludes by proposing a future research agenda to advance both academic understanding and policy practices.

Keywords: *Digital Financial Inclusion, Systematic Review, JAM Trinity, UPI, Digital Divide, India*

Introduction

Financial inclusion, which ensures access to affordable financial services for all individuals, has been a persistent policy challenge in India. Despite significant progress through initiatives such as the Pradhan Mantri Jan Dhan Yojana (PMJDY), which opened over 500 million bank accounts, the use of these accounts for active financial transactions remains uneven (Ozili, 2024). The digital revolution has transformed the landscape. The convergence of banking, mobile technology, and digital identity, known as the JAM Trinity (Jan Dhan, Aadhaar, Mobile), has created unprecedented opportunities for digital financial inclusion (Kumar & Aithal, 2024). The Unified Payments Interface (UPI) has emerged as a transformative force, processing over 13 billion monthly transactions (NPCI, 2024).

Rationale for a Systematic Review

Several factors necessitate a systematic review of digital financial inclusion in India.

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Factor	Justification
Rapid Evolution	The digital payments landscape has transformed dramatically since 2016
Fragmented Literature	Studies span multiple disciplines (economics, technology, sociology)
Policy Relevance	Findings can inform Digital India and financial inclusion strategies
Research Gaps	Systematic identification of underexplored areas

Objectives of the Review

- To identify the key determinants and drivers of digital financial inclusion in India
- To synthesize evidence on the impact of digital financial inclusion on economic outcomes
- To analyze the major barriers and challenges to digital financial inclusion
- To identify research gaps and propose future research directions

Research Questions

Question	Focus
RQ1	What are the major determinants of digital financial inclusion in India?
RQ2	What is the impact of digital financial inclusion on economic outcomes?
RQ3	What are the key barriers to digital financial inclusion?
RQ4	What are the emerging challenges that require future research?

Methodology

1. **Review Approach**

This study employs a systematic thematic literature review methodology, following the approach used in recent reviews on financial inclusion (Choudhury & Gupta, 2025; Boro, 2025).

2. **Search Strategy**

Table 1: Database Search Strategy

Database	Search Period	Keywords Used
Google Scholar	2015-2025	"Digital financial inclusion" AND "India"
Scopus	2018-2025	"Fintech" AND "financial inclusion" AND "India"
RBI Publications	2015-2025	"Financial inclusion" AND "digital payments"
NPCI Reports	2016-2025	"UPI" AND "financial inclusion"
World Bank	2015-2025	"Financial inclusion" AND "India"

3. **Inclusion and Exclusion Criteria**

Inclusion Criteria:

- Peer-reviewed journal articles
- Government and institutional reports (RBI, NPCI, NITI Aayog)
- Studies focused on India
- Published between 2015 and 2025
- English language

Exclusion Criteria:

- Non-India specific studies
- Conference abstracts without full papers
- Non-academic blog posts
- Pre-2015 publications (except foundational works)

4. **Thematic Analysis Framework**

Based on the literature, five major themes were identified for analysis (Choudhury & Gupta, 2025).

Theme	Focus Areas
Theme 1: Determinants	Income, age, gender, education, ICT access, location
Theme 2: Infrastructure	JAM Trinity, UPI, banking correspondents, and mobile penetration
Theme 3: Drivers	Demonetization, COVID-19, government policies, incentives
Theme 4: Barriers	Digital divide, security concerns, technical issues, and cultural factors
Theme 5: Outcomes	Poverty reduction, economic growth, and women's empowerment

Theoretical Frameworks

The literature reveals several theoretical frameworks used to analyze digital financial inclusion in India (Choudhury and Gupta, 2025):

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Table 2: Theoretical Frameworks in Digital Financial Inclusion Research

Theory	Application in Literature
Technology Acceptance Model (TAM)	Explains user adoption of digital payment systems
Diffusion of Innovations Theory	Analyzes the spread of digital payments across population segments
Finance-Growth Theory	Links financial inclusion to economic development
Vulnerable Group Theory	Focuses on the inclusion of marginalized populations
Dissatisfaction Theory	Explains resistance to digital systems

Review Findings

1. **Theme 1: Determinants of Digital Financial Inclusion**

The literature identifies several key determinants of digital financial inclusion in India (Boro, 2025; Choudhury & Gupta, 2025):

Table 3: Determinants of Digital Financial Inclusion

Determinant	Finding	Source
Income	Higher income positively associated with digital payment adoption	Choudhury & Gupta, 2025
Age	Younger individuals show significantly higher adoption rates	Choudhury & Gupta, 2025
Gender	Men have higher trust in digital payments; women show lower adoption	Boro, 2025
Education	Higher education correlates with greater digital payment usage	Choudhury & Gupta, 2025
ICT Access	Smartphone ownership enables digital payment adoption	Kumar & Aithal, 2024
Location	Urban areas show higher adoption than rural areas	Ozili, 2024

Key Finding: *"The major determinants of financial inclusion in India are income, age, gender, education, employment, ICT, bank branch network, and nearness to a bank"* (Choudhury & Gupta, 2025, p. 62).

2. **Theme 2: Infrastructure and Enablers**

The JAM Trinity

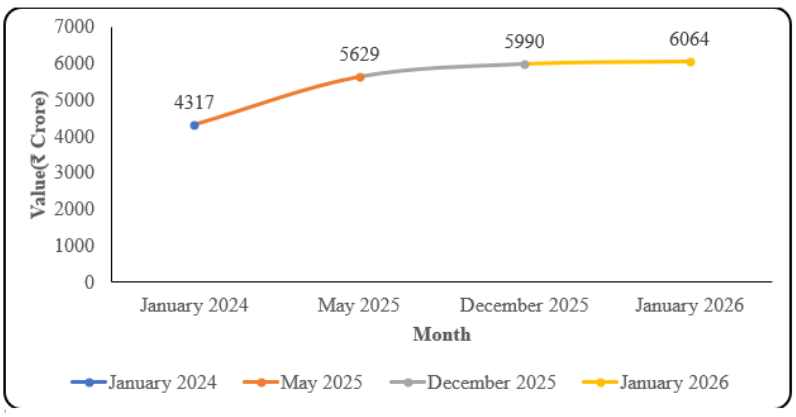
The JAM Trinity (Jan Dhan-Aadhaar-Mobile) is identified as the foundational infrastructure for digital financial inclusion (Kumar & Aithal, 2024; Verma, 2025).

Component	Achievement
Jan Dhan Accounts	Over 500 million accounts opened
Aadhaar Enrollment	1.4 billion enrolled (near-universal coverage)
Mobile Subscribers	954 million internet subscribers (March 2024)

UPI as a Game Changer

The implementation of the UPI is widely recognized as transformative (Boro, 2025):
"India achieved its cashless society goal with the implementation of the Unified Payment Interface, which further enhanced digital financial inclusion" (Boro, 2025). 545).

Chart 1: UPI Transaction Growth in Goa (January 2024 - January 2026)



Source: *Ministry of Finance, 2026*

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Chart 1 shows the growth of UPI transaction values in Goa from January 2024 to January 2026, indicating a consistent upward trend.

Table 4: Goa UPI Transaction Data (2024-2026)

Period	Transaction Value	Transaction Volume
January 2024	₹4,317 crore	-
May 2025	₹5,629 crore	-
April-June 2025 (Quarter)	₹14,754 crore	10.5 crore
December 2025	₹5,990 crore	4.02 crore
January 2026	₹6,064 crore	4.03 crore
Average Daily (2025)	₹162 crore	11.53 lakh

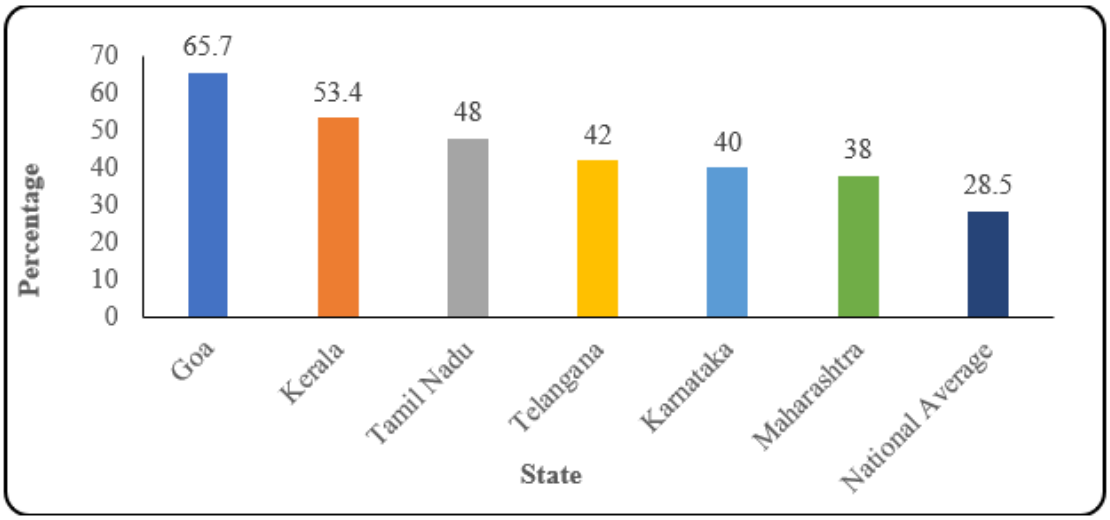
Transaction volume data for January 2024 and May 2025 were not available in the source article
Source: *Ministry of Finance, 2026*

3. **Theme 3: Digital Literacy and Adoption**

National Statistical Office (NSO) Survey 2024 Findings

The NSO survey on digital literacy among youth (aged 14-29 years) reveals significant interstate disparities (The Goan Everyday, 2024; O Heraldo, 2024):

Chart 2: Youth Digital Literacy Across Indian States



Source: *NSO Survey, 2024*

Chart 2 compares youth digital literacy rates across Indian states, showing Goa (65.7%) significantly above the national average (28.5%).

Table 5: National Digital Literacy Statistics (Youth aged 14-29 years)

Category	Percentage
National Average (can search the internet, email, online banking)	28.5%
Goa	65.7%
Kerala	53.4%
Tamil Nadu	48.0%
Male (National)	34.2%
Female (National)	21.6%

Source: *National Statistical Office, 2024*

Key Insight: Goa leads the nation in youth digital literacy at 65.7 %, while the national average remains low at only 28.5%, with a significant gender gap (34.2% male vs. 21.6% female).

4. **Theme 4: Drivers of Digital Financial Inclusion**

Demonetization (2016)

Research indicates that demonetization served as a critical catalyst (Boro, 2025).

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"After India's demonetization in 2016, a substantial body of research on the subject surfaced" (Boro, 2025, p. 544).

COVID-19 Pandemic (2020-2021)

The pandemic accelerated digital payment adoption significantly (Boro, 2025; Bhambra, 2022).

"Two events forced Indian citizens to accept and use financial services using the digital medium: demonetization in 2016 and the COVID-19 pandemic in 2020" (Boro, 2025). 544).

A study on online banking adoption in Goa found that adoption increased due to the pandemic, with significant associations with age, gender, occupation, and literacy level (Bhambra 2022).

Government Initiatives

Initiative	Impact
Digital India Campaign	Created policy framework for digital transformation
PMJDY	Opened 500M+ bank accounts
BHIM App	Promoted UPI adoption
Incentive Schemes	Encouraged digital transaction usage

5. **Theme 5: Barriers and Challenges**

Table 6: Major Barriers to Digital Financial Inclusion

Barrier	Key Finding	Source
Digital Divide	Only 28.5% of Indian youth possess basic digital literacy	NSO, 2024
Account Dormancy	Over one-third of accounts saw no transactions last year	World Bank, 2023
Security Concerns	Fear of online fraud and unauthorized transactions	Bhambra, 2022
Fear of Mistakes	Users worry about making errors in digital transactions	Bhambra, 2022
Cash Preference	Cash remains the "currency of trust" for many	Ozili, 2024
Gender Gap	Female digital literacy (21.6%) lags behind male (34.2%)	NSO, 2024

Panchayat Digital Adoption Gap (Ministry of Panchayati Raj, 2025)

Chart 3: Panchayat Digital Payment Adoption

Source: *Ministry of Panchayati Raj, 2025*

Chart 3 shows that only 37% of Goa's panchayats accept online payments, while 63% do not, despite 99% being registered on the e-Gram Swaraj platform.

Table 7: Panchayat Digital Payment Statistics

Indicator	Number	Percentage
Total Panchayats in Goa	191	100%
Panchayats on e-Gram Swaraj portal	189	99%
Panchayats accepting online payments	71	37%
Applications processed	502	-
Transaction value	₹8 crore	-

Source: *Ministry of Panchayati Raj, 2025*

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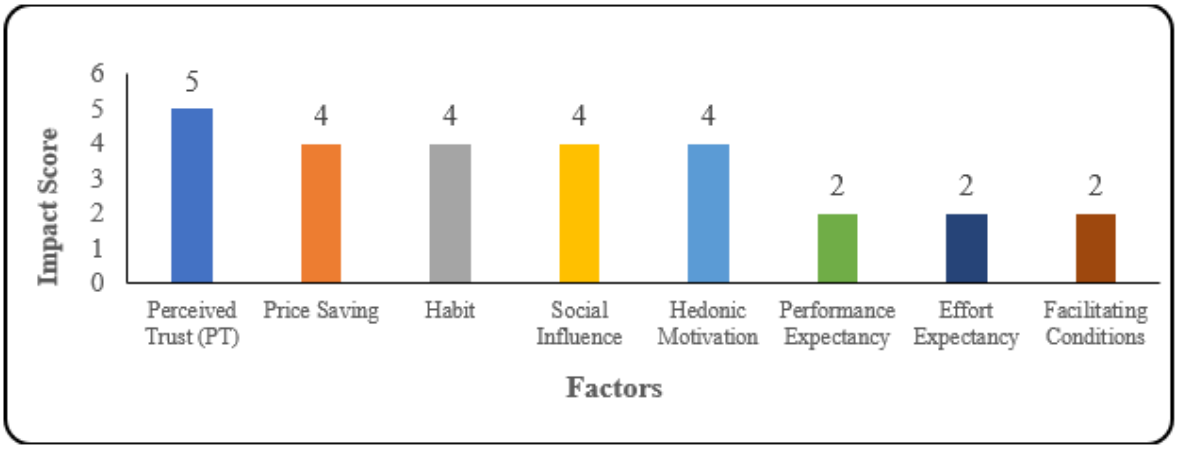
Critical Insights from the Literature:
"Accessibility and availability are almost achieved, but the goal of utilization and standard quality of financial services still needed to be accomplished, which accounts for a huge percentage of financial inclusion" (Choudhury & Gupta, 2025, p. 62).

6. **Theme 6: Factors Influencing Adoption**

A study on mobile payment adoption in Goa (Castanha et al., 2022) identified the following key predictors:

Chart 4: Predictors of Mobile Payment Adoption in Goa



Source: *Castanha et al., 2022*

Chart 4 shows that perceived trust is the strongest predictor of mobile payment adoption in Goa, followed by price saving, habit, and social influence, with the model explaining 69% of adoption variation.

Table 8: Factors Influencing Online Banking Adoption in Goa

Factor	Finding
Convenience	Positive driver of adoption
Service Tangibility	Positive driver of adoption
Security Concerns	Negative barrier to adoption
Fear of Mistakes	Negative barrier to adoption
Pandemic Effect	Accelerated adoption

Source: *Bhambra, 2022*

7. **Theme 7: Outcomes and Impact**

Positive Outcomes

Outcome	Evidence	Source
Poverty Reduction	Digital financial inclusion linked to poverty alleviation	Kumar & Aithal, 2024
Economic Growth	Positive association with state-level economic development	Kumar, 2026
Women Empowerment	Digital microfinance enhances women's economic participation	Kumar & Aithal, 2024
Reduced Cash Dependency	Shift toward digital transactions observed nationally	Boro, 2025

5. **Critical Perspectives**

The literature also notes the following limitations:
"Some criticisms of the financial inclusion efforts in India include the inability to meet the specific needs of the poor, poor geographical access, excessive transaction costs, inappropriate banking products, financial illiteracy, and a large digital divide between tech-savvy and non-tech-savvy people" (Ozili, 2024). 8).

Research Gaps Identified

Based on this systematic review, four major research gaps emerge.

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Gap 1: Longitudinal Impact Studies

Current State	Gap
Most studies are cross-sectional	Need for longitudinal studies tracking digital payment adoption over time
Short-term impacts documented	Long-term economic mobility effects unknown

Gap 2: Regional Disparity Analysis

Current State	Gap
Focus on national-level trends	Limited micro-level studies in semi-urban and rural areas
Goa data is available but not systematically analyzed	Need for comparative studies across districts

Gap 3: Fraud and Governance Frameworks

Current State	Gap
Limited research on digital lending fraud	Need for governance frameworks for fraud prevention
Security issues documented but not analyzed systematically	Research on balancing inclusion with risk management

"Fraud in digital lending is often framed as a loss ratio issue. In reality, it is a systemic inclusion risk" (India CSR, 2026).

Gap 4: Inclusive Design Research

Current State	Gap
Focus on digitally literate populations	Need for research on design for low-literacy users
Limited attention to accessibility	Research on voice-based, offline-compatible solutions
Gender gap documented but not addressed	Interventions for female digital inclusion

6. Future Research Directions

1. Suggested Research Agenda

Priority	Research Direction	Methodology Suggestion
High	Longitudinal panel study on digital payment adoption	Panel data regression
High	State-level comparative analysis of digital inclusion	Spatial econometrics
High	Digital literacy interventions for women	Experimental design
Medium	Fraud governance frameworks for digital lending	Case study + policy analysis
Medium	Inclusive design for low-literacy populations	User experience research

2. Specific Research Questions for Future Study

Code	Research Question
RQ-L1	What is the long-term impact of digital payment adoption on household economic mobility in rural India?
RQ-L2	How does digital financial inclusion vary across Indian states, and what explains these regional disparities?
RQ-L3	What governance frameworks can balance financial inclusion and fraud prevention in digital lending?
RQ-L4	How can digital payment interfaces be designed to effectively serve low-literacy and marginalized populations?
RQ-L5	What interventions can effectively close the gender gap in digital financial literacy?

Conclusion

This systematic review synthesizes the existing evidence on digital financial inclusion in India, identifying key determinants, infrastructure enablers, drivers, barriers, and outcomes. The JAM Trinity and UPI have dramatically expanded access to formal financial services, with over 80% of adults now having bank accounts (Ozili 2024). UPI transaction data show consistent growth, with Goa recording ₹6,064 crore in January 2026 (Ministry of Finance, 2026).

However, the transition from access to active utilization remains uncompleted. The National Statistical Office (2024) survey reveals that only 28.5% of Indian youth possess basic digital financial literacy, although Goa leads with 65.7%. Major barriers include the digital divide (only 28.5% national digital literacy), security concerns, fear of mistakes, and limited acceptance of digital payments by local institutions (only 37% of panchayats accept online payments).

Academic studies have identified perceived trust as the strongest predictor of mobile payment adoption in Goa, followed by habit and social influence (Castanha et al., 2022). Convenience drives adoption, whereas security concerns and fear of mistakes remain barriers (Bhambra, 2022).

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This review identifies four major research gaps requiring future investigation: longitudinal impact studies, regional disparity analyses, fraud governance frameworks, and inclusive design research. Addressing these gaps will advance both academic understanding and policy practice, contributing to India's vision of a digitally empowered and financially inclusive economy.

Suggestions

Based on the review findings, the following suggestions are made:

- **Bridging the digital literacy gap:** Only 28.5% of Indian youth possess basic digital literacy. Targeted programs are needed, especially for women (21.6% vs. 34.2% men).
- **Expand panchayat digital infrastructure:** Only 37% of Goa's panchayats accept online payment. This must reach 100%.
- **Address security concerns:** Fear of online fraud and unauthorized transactions remain significant barriers.
- **Leverage Goa as a model:** With 65.7% youth digital literacy (the highest in India), Goa can serve as a case study for other states.
- **Build on perceived trust:** As perceived trust is the strongest predictor of adoption, trust-building interventions should be prioritized.

Limitations Of the Review

- The review is limited to English-language publications
- Some recent studies may not have been captured
- Grey literature (non-peer-reviewed) was excluded
- The review focuses on India, limiting international generalizability

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OriginalArticle

An Evaluation of Regional Imbalances and Backwarness on Kalyana Karnataka Development

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Abstract

The present article examines the issues and concerns of regional development in Kalyana-Karnataka based on qualitative analysis. The study focus on regional imbalance assumes significance in the light of the global decentralization trend. Regional inequalities contribute to social and economic inequalities across the globe. In India regional disparities have been the matter of serious concern since independence through Five Year Plans. Dr.D.M. Nanjundappa committee had recommended establishing an appropriate institutional set-up to accelerate the process of development in different sectors of Kalyana-Karnataka. A three-decade struggle to seek special status for six Karnataka districts ended when Lok Sabha passed the Constitution (118th Amendment) Bill, 2012. The Special Development Plan (SDP) has also been implemented in this region to enhance the social and economic status of the people who had faced lot of hardships due to lack of state intervention. The Action Plan of 2014-15 provides for the allocation of Rs.600 crore for the integrated development of the region. The developmental strategies in Karnataka require social development and environmental conservation since there is a positive linkage between them. The policy makers and other stakeholders of the region are required to allocate adequate funds, design area-specific programme and implement target-group oriented development schemes in the region in order to achieve the goal of inclusive development in the new millennium.

Keywords: *Regional Imbalance, Agriculture Sector, Economic Development, Lecturer in Economics, Government First Grade College, Harihara, Davanagere University, Davanagere, Karnataka, India.*

Introduction

The main cause of regional inequality has been the strong backwash effects and the week spread effects in such economics (Myrdal, 1957:11). The study of regional imbalance assumes significance in the light of the global decentralization trend. Several observers suspect increasing regional inequalities in decentralizing countries and demand the implementation of interregional transfer schemes. The decentralization initiatives across the world were promoted by international development agencies and local policy initiatives. Regional inequalities contribute to interpersonal inequalities so that it might be more efficient to redistribute between individuals using tax transfer schemes instead of redistributing between regions (Christian, 2011:02). In India regional disparities have been the matter of serious concern since independence through Five Year Plans with an aim of attaining socio-economic wellbeing. The issue of regional disparities is widely discussed in the post-independence era. The disparities continued even after implementing several plans in different phases in India. Regional imbalances involve non utilization of available resources to the optimum levels. The Indian economy is confronted with the sharp and growing regional imbalance or variations among India's different states and territories in terms of per capita income, poverty, availability of infrastructure and socio economic development. Karnataka state is not an exception to this acute problem of regional disparity.

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There are certain glaring differences in socio-economic, politico cultural issues between the erstwhile princely state of Mysore and the North Karnataka. In particular, the people of Kalyana-Karnataka have suffered the worst because of regional imbalance in all walks of life. The present article examines the issues and concerns of regional development in Kalyana-Karnataka based on qualitative analysis.

Review Of Literature:

The issue of regional disparity has been examined within the neoclassical growth framework across the globe. Prominent among them include – Myrdal (1957:11), Dholkia (1985:03), Nanjundappa (1999:14), Kadekodi (2000:08), Panchamukhi (2001:15), Chandna (2002:01), Kalam (2005:09), Nanjundappa (2010:13), Prabhakar (2010:16), Shiddalingaswami and Raghavendra (2010:19), Christian (2011:02), Nanjunda (2012:12), Singh (2012:20), Ratnakar (2013:17), Doddamani (2014:04), Hanagodimath (2014:07) and Shankaranand and Biradar (2014:18).

High Power Committee on Regional Development:

Kalyana-Karnataka is a region located in north-east Karnataka, India. It is the Kannada speaking part of the Hyderabad State that was ruled by the Nizams of Hyderabad until 1948. Karnataka is facing inter and intra-regional disparities since its reorganization in 1956. After the integration new areas such as Hyderabad Karnataka and Bombay Karnataka, the old Mysore Karnataka region was relatively developed and there are several arguments that the north parts of Karnataka have constantly been neglected. The economic, social and population characteristic indices have increased significantly in Karnataka during the same period. Much development has been found in south Karnataka in all five socio-economic sectors as compared to north Karnataka (Shankaranand and Biradar, 2014:18).

The Kalyana-Karnataka region comprises Bidar, Yadgir, Raichur, Koppal, Kalburgi, Bellary, and Vijayanagara districts that are in the present state of Karnataka. The Kalyana-Karnataka region is the second largest arid region in India. The regional gap emerged in the State on the eve of the reorganization of States in 1956. The new areas that joined the State from Hyderabad State and Bombay State were relatively less developed than the Old Mysore State. This area formed the Northern part of the State. The indicators of development which have been developed by a number of researchers show that North Karnataka exhibits a high degree of under development as compared to South Karnataka (Panchamukhi, 2001:15). In the absence of focused efforts in the past, the development gap increased over a period of time leading to marginalization and exclusion of the region and its people from the mainstream development process. Efforts have been made over a period of time to reduce the development gap. However, there has been a growing realization that investment and focus on the area especially on initiatives to improve the human development indicators must be further accelerated.

For many poor people around the world migration is a way of life, and has been for centuries. After Independence, Government of India (GOI) adopted the socialist-capitalist (mixed economy) model of development through five year planning. As a result of the defective policies of agricultural development the regional disparity is increasing, which is leading to the increase in the seasonal migration of agricultural laborers. In Karnataka state regional disparity has become a political issue. Southern Karnataka region, which is politically dominant, is developed in terms of irrigational facilities and loan availability and other basic infrastructure whereas Northern Karnataka Specially Kalyana-Karnataka regions are comparatively less developed. As a result, every year thousands of marginal farmers and landless agricultural laborers migrate seasonally to Maharashtra for survival and inclusion (Doddamani, 2014:04).

The Government of Karnataka had constituted a High-Power Committee on Redress of Regional Imbalances under the chairmanship of eminent economist **Dr. Nanjundappa**. The committee thoroughly examined the status of development on the basis of socio-economic indicators in all the 175 taluks in the state and submitted its report in 2002. The committee also identified 114 taluks as backward taluks. These taluks were further classified into most backward, more backward and backward based on the basis of development indicators. Most of the taluks belonged to Kalyana-Karnataka and Mumbai Karnataka regions. South Karnataka has higher regional disparity than that of North Karnataka. Among the divisions Mysore division has highest regional imbalances followed by Bangalore, Gulbarga and Belgaum divisions. The Nanjundappa Committee has suggested for the improvement of social and economic conditions of the people of North Karnataka on the basis of the policy making and resource allocation among different regions and sectors (Hanagodimath, 2014:07). The committee had also recommended a policy mix of resource transfer, fiscal incentives and special programmes for development of the 114 backward taluks in the state. Emphasis was laid on overcoming the regional imbalance and facilitating regional inclusiveness in economic development of the state.

Status Of Regional Development In Kalyana- Karnataka

A three-decade struggle to seek special status for six Karnataka districts ended when Lok Sabha passed the Constitution (118th Amendment) Bill, 2012. The bill enables the President to empower the governor to establish a separate development board for the Kalyana-Karnataka region with the provision that a report on its working would be placed each year before the provincial assembly. Article 371 will help in development of HK region. In fact the peoples' movement for regional development has really brought happiness amongst the people of Kalyana-Karnataka. The people's movement has really strengthened the democratic set up (Ratnakar, 2013:17). The committee had recommended establishing an appropriate institutional set-up to accelerate the process of development in different

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sectors of Kalyana-Karnataka. The government has established High Court benches at Dharwad and Kalburgi and ensured access to timely justice to the people of North Karnataka. Central University of Karnataka (Kalburgi), Women's University (Vijayapura), Horticulture University (Bagalkot), Fisheries Science University (Bidar), Dairy Science College (Kalburgi) and Horticulture College (Bidar) were also established in order to enhance the status of higher education and technical education in this region

The primary health centers and district health institutions are also upgraded in the region. Cluster complex was established in 39 most backward taluks with a view to provide teachers' quarters in backward taluks/ regions to enable the teachers to stay in rural areas and provide quality education to children. The residential schools were also established to provide better educational services to the students. The rural housing scheme has been implemented under the Ashraya-SDP and Vajpayee urban housing schemes. The roads are also constructed in the rural areas to facilitate better mobility of the people and development of agriculture, industry and business sectors. The irrigation facilities are also extended through Karnataka Neeravari Nigama Limited (KNNL). The tourism sector has received funds for the development of infrastructure at various places in backward taluks. Approach roads to tourist places have also been constructed at various tourist places.

The Backward Region Grant Fund was created to redress regional imbalance in development and develop community infrastructure. The Panchayat Raj Institutions and Urban Local bodies have also received funds under the 11th Five year Plan and 12th Five year Plan. The capacity building programme is also organized for elected representatives, officials and organizers of NGOs to facilitate active implementation of various development programmes in the region. But, the goals of participatory development and inclusive development of the women and weaker sections of society have not been effectively achieved in this region. According to Article 371(J) special status was accorded to Kalyana-Karnataka which includes Bellary, Vijayanagara, Bidar, Kalburgi, Koppal, Raichur and Yadgir districts in the year 2023.

The implementation of Article 371(J) has ensured the reservation of a proportion of seats in educational and vocational training institutions in the Kalyana-Karnataka region for students who belong to that region by birth or by domicile. Employment opportunities are also made available to the people under this special legislation. The Karnataka Educational Institutions (Regulations of Admission in the Kalyana-Karnataka Region) Order, 2013 provides for reservation of 70% of available seats to the children of this region. The Action Plan of 2014-15 provides for the allocation of Rs.600 crore for the integrated development of the region. The Kalyana-Karnataka Development Board is responsible for designing suitable schemes for regional development. The nomination of office bearers and members on political considerations has impeded the progress of this region.

Regional Imbalances and Backwardness:

- Redress of imbalances in facilities that constitute infrastructure as well as investment for development is not a matter that can be achieved at one stroke. It is a continuous process.
- Reduction of regional imbalances is one of the means for achieving the goal of re-distributive justice. Formulation and implementation of plans at the grass root levels is of vital importance in achieving this goal. The redress of regional imbalances does not mean achieving uniform development in all regions or districts of the State.
- Solutions to the problem of disparities cannot emerge solely from resource distribution and special or accelerated schemes. It needs identification of barriers to development and concentrate on resources and efforts to break them. It has to surround the natural resources of the region including skills and management. People's involvement is a must in this process.
- Imbalances in terms of facilities or services either below the State average or above the State average influence the transition from backwardness to development. Our study is a systematic attempt to determine backward areas through assessing imbalances in relation to relatively developed area, the latter being the level above the State average.
- Realizing the crucial importance of reducing backwardness and achieving equity and social justice in the development process, our Constitution emphasized securing equity and equality not only amongst individuals but also amongst groups of people in different areas or engaged in different vocations.
- There is always a need for regional planning and aggregate investment management to go hand in hand if there is to be balanced development. This may also require resource transfer from richer areas to backward areas in order to maximize the welfare of the people.
- The State's Draft Five Year Plan, 1974-79 emphasized the need for regional planning to reduce inter-district and intra-district imbalances. In both V and VI Five Year Plans of Karnataka, reducing regional inequalities was stated as one of the major objectives. Also, the policy formulation took note of the imperative to take care of poverty rather than taking care of SNDP. This objective has been discarded in subsequent plans. In view of the importance of reduction in regional imbalances in our country among the States, the Planning Commission set up a National Committee on the development of backward areas (1978-1981). The National Committee identified three key characteristics of backwardness viz., [1] areas must have potential for development; [2] there must be some inhibiting factor, which prevents this potential from being realized, and [3] there must be a need for spatial

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programme to remove or mitigate that inhibiting factor. It is necessary to give stimulants for a transition from backwardness to relative development in the lagging areas.

- The problem of regional disparities and backwardness is sought to be tackled in several ways of which the more important are: [1] Backwardness is to be recognized as a factor to be taken into account in resource transfer. [2] Special Area Development programmes and employment generating schemes are to be formulated and implemented directing them at backward area development. [3] Initiate measures to promote private investments in backward areas. [4] Formulate policies to promote equalization of the level of physical facilities or services of any region or district with that of the average facility enjoyed by the people in the relatively developed or better off districts / taluks generally represented by the average level in the State.
- Any effort to reduce imbalances or backwardness demands both the development of human resources through the strengthening of education and health infrastructure and also, where required, a deliberate decision to locate an economic activity in any sector with appropriate compensating measures that are carefully worked out. Policy incentives are also relevant for arresting divergence and move towards convergence.

Figure: 1 Shows Karnataka Region Map:

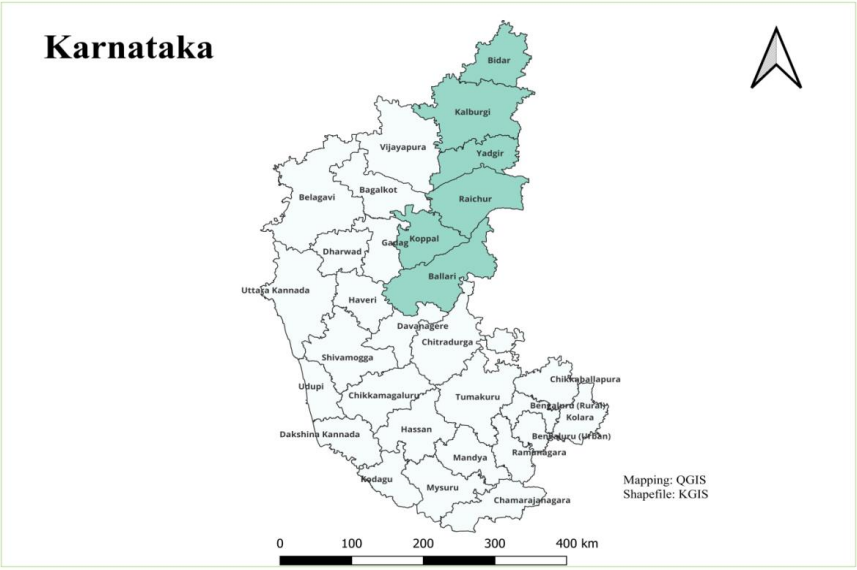
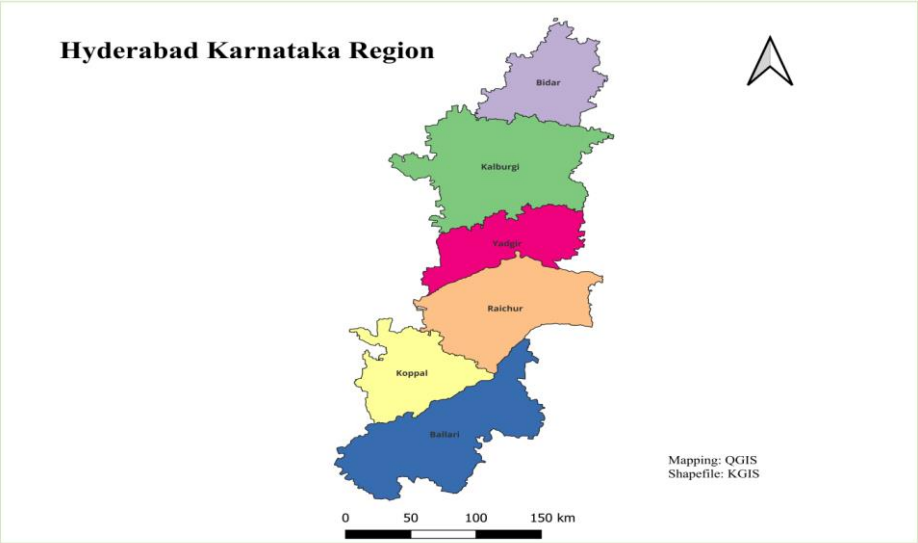


Figure: 2 Shows Kalyana Karnataka Region Map:



The Future Perspective of Kalyana-Karnataka:

Karnataka is a safe and peaceful State in the Indian map. This atmosphere has to be complemented with creative tasks and mission, to empower the people of Karnataka for economic prosperity (Kalam, 2005:09). Capability

enhancement of poor is required to integrate them into the workings of an expanding economy. The primary focus of development policy in Karnataka, therefore, has to be on balanced growth ensuring better sectoral output employment ratio (Karnataka State
Planning Board, 2008:10)

Regionally disaggregated poverty and unemployment estimates show that there is substantial Heterogeneity in the degree and depth of poverty and unemployment in northern part of the Karnataka state The broad picture that emerged from the survey show higher levels of rural poverty and unemployment problem in the most of northern Karnataka districts, that are part of the, Bidar, Bijapur, Raichur, Gulbarga and Belgaum etc districts. Highest concentration of the seasonal unemployment is also seen in the northern districts only. Recent human development report (2011) says rural poverty still remains high in numerous part of the northern part of the state (Nanjunda, 2012:12).

The D. M. Nanjundappa committee has done an extensive and elaborate study on regional imbalances, but it could not focus much on the socio-cultural dimensions on developmental processes. The most revealing observation of the committee is the acute backwardness of the Hyderabad region. Discrimination based on prioritization of caste, creed and ethnocentrism definitely hinders the developmental processes. Social institutions should take even much responsibility on harmonization of Inter-caste, inter-group, inter-religion relationships and extend the awareness of fraternity. Government and NGO's should take initiative to improve the socio-economic taking into consideration socio-cultural diversities of the region (Prabhakar, 2010:16). The committee suggested that 40 per cent and 20 per cent of the special development plan fund should be spent on different sectors of these divisions to reduce regional imbalances (Shiddalingaswami and Raghavendra, 2010:19).

The developmental strategies in Karnataka require social development and environmental conservation since there is a positive linkage between them. Improvements in environmental status will reduce income inequality and vice-versa. Improvements in literacy, health care deliveries and thrust on income generation have their direct and feedback impacts in reducing the extent of poverty. Therefore, the summary package of development across the districts can be literacy, health care, employment and income generation, and environmental preservation. They will in turn reduce both income inequality and the extent of poverty, and also contain the population problem. The Kalyana-Karnataka districts do require interventions on social, developmental and environmental fronts simultaneously (Kadekodi, 2000:08).

Conclusion:

The Twelfth Five Year Plan also lays emphasis on faster; more inclusive and sustainable growth across all the regions of the country. But, the social sector has not received adequate funds for the attainment of social democracy and economic justice in Kalyana-Karnataka region. The focus, however, needs to be on education, health, agriculture and industrial development of the region. The policy makers and other stakeholders of the region are required to allocate adequate funds, design area-specific programmes and implement target-group oriented development schemes in the region in order to achieve the goal of inclusive development in the new millennium.

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OriginalArticle

Digitisation in Today's World: Problems, Issues and Challenges

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Abstract

Digitization has emerged as a key development of the modern era, transforming how individuals, businesses, governments, and institutions operate by replacing manual systems with digital processes. Today, it plays a crucial role in communication, education, banking, healthcare, trade, governance, agriculture, and industry. It enhances speed, efficiency, transparency and access to information and services. In countries like India, digitization is central to development strategies through initiatives such as Digital India, online banking, digital payments, e-governance, online education, and telemedicine.

However, digitization also brings several challenges. Unequal access to digital infrastructure, low digital literacy, cybercrime, privacy concerns, data misuse, fake news, technological dependence and job loss due to automation are major issues. Rural-urban disparities, social inequality, language barriers and weak cybersecurity further hinder its effective implementation.

This seminar paper examines the concept, importance, and challenges of digitization in the modern era. It also reviews India's progress and suggests measures to overcome barriers. It argues that digitization can drive inclusive growth and social progress only with strong infrastructure, digital education, cybersecurity, effective policies, and ethical use of technology.

Keywords: *Digitisation, Digital Transformation, Digital India, Cyber Security, Digital Divide, Digital Literacy, E-Governance, Online Services, Data Privacy, Modern Technology*

Introduction

Digitization is one of the defining features of the twenty-first century. It refers to converting information, services, records, communication, and activities into digital form using computers, software, mobile devices, and internet technologies. In simple terms, it means using digital tools to store, process, share, and manage information more efficiently. Earlier, most activities were manual and paper-based. Records were kept in files, communication was slow, banking required physical visits, teaching was limited to classrooms, and government services involved lengthy procedures. With the growth of information and communication technology, these systems have gradually shifted to digital methods. Today, people use smartphones for communication, digital payments for transactions, online platforms for education, apps for healthcare, and websites for public services.

Digitization has influenced almost every sphere of life. In education, it enables online learning, digital classrooms, and e-books. In banking, it supports internet banking, mobile banking, and UPI transactions. In business, it has promoted e-commerce, digital marketing, and online customer service. In governance, it has improved transparency and delivery of welfare schemes. In healthcare, telemedicine and digital health records are becoming important. It also impacts agriculture, transport, media, and administration.

However, digitization also raises social, economic, technical, and ethical concerns. Many people still lack access to digital devices and internet services. Cyber fraud and online scams are increasing, and personal data is often collected without full user awareness. Overdependence on digital systems can also cause problems during technical failures.

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This seminar paper examines digitization in the modern era, focusing on its importance, key issues, challenges, Indian experience, and possible solutions.

Objectives Of the Study

1. To understand the concept of digitisation
2. To examine the importance of digitisation
3. To analyse the issues and problems related to digitisation
4. To evaluate the major challenges of digitisation
5. To suggest measures for improvement

Review Of Literature

1. **Nadkarni & Prugl (2020) – Digital Transformation Review**

Nadkarni and Prugl conducted a comprehensive review of digital transformation and highlighted that digitisation is a major managerial and organizational challenge in modern economies. Their study found that digital transformation not only affects technology but also business models, organizational culture and leadership. One of the key issues identified is the lack of skilled human resources and the need for new managerial capabilities. The authors also emphasized challenges related to data management and increasing dependence on digital technologies.

2. **International Labour Organization (2022) – Digitalization and Employment**

A report by the International Labour Organization examined the impact of digitalisation on employment and labour markets. The study found that digitalisation has transformed the nature of work, creating both opportunities and risks. It highlighted problems such as job insecurity, unequal distribution of digital jobs, and lack of policy readiness. The report also emphasized that governments are struggling to respond to rapid digital changes, especially in protecting workers' rights and ensuring inclusive growth.

3. **MDPI (2023) – Digital Economy and Economic Development**

This bibliometric review analyzed the relationship between digitalisation and economic growth. The study concluded that while digital technologies drive innovation and economic expansion, they also create challenges such as worker precarity, social inequality, and environmental concerns. It emphasized the need for adaptive strategies and policy frameworks to manage the complex effects of digital transformation on society and the economy.

4. **MDPI (2024) – Industrial Digitalization Challenges**

A systematic literature review on industrial digitalisation identified several practical challenges faced by firms. These include high implementation costs, lack of interoperability between systems, skill shortages, and resistance to organizational change. The study also pointed out security and privacy risks as major concerns in the digital era. Small and medium enterprises (SMEs) face additional barriers due to limited resources and low digital readiness.

5. **Science Direct (2024) – Digital Economy and Labour Challenges**

Recent research on the digital economy highlights serious employment-related challenges such as job displacement, skill mismatch, and increasing unemployment in traditional sectors. The study also emphasized issues like market concentration, data privacy concerns, and growing inequality due to digital technologies. It concluded that without proper policy interventions, digitalisation may widen socio-economic disparities.

Methodology

This seminar paper is mainly based on descriptive and analytical methodology. It uses secondary data collected from books, journals, reports, newspapers, government publications, policy documents and authentic online sources. The study is descriptive because it explains the meaning, importance, issues and challenges of digitisation. It is analytical because it evaluates both the positive and negative aspects of digital transformation in the modern era.

The methodology includes:

- Collection of information from secondary sources.
- Classification of data into themes such as importance, issues, problems and challenges.
- Interpretation of facts in the context of the present digital environment.
- Preparation of suggestions based on the analysis of available information.

Since the topic is broad and dynamic, the paper does not depend on field survey or primary data. Instead, it aims to provide a clear conceptual and practical understanding of digitisation and its impact on society.

Importance Of Digitisation in The Modern Era

Digitisation has become highly important in the modern world because it has changed the way people live, learn, work, communicate and access services. Its importance can be understood under the following points:

1. **Fast Access to Information**

- Digitisation makes information available instantly through computers, smartphones and internet platforms.
- It reduces the time required to search, store and retrieve records.
- Students, researchers, businesses and governments benefit from quick access to data.

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2. **Improvement in Communication**
- Digital platforms such as email, video calls, messaging apps and social media have made communication faster and wider.
- People can connect across regions and countries in real time.
- It supports both personal and professional communication.

3. **Greater Efficiency in Administration**
- Digital systems reduce paperwork, delay, duplication and human error.
- Offices and institutions can manage records, files and workflows more effectively.
- Administrative decisions become faster and better organized.

4. **Promotion of E-Governance**
- Governments use digitisation to deliver services through online portals and apps.
- Citizens can apply for certificates, pay taxes, register complaints and access schemes digitally.
- It increases transparency and reduces corruption in public service delivery.

5. **Growth of Digital Economy**
- Online shopping, digital payments, internet banking and e-commerce are major outcomes of digitisation.
- Small businesses can reach wider markets through digital platforms.
- Digitisation supports innovation, entrepreneurship and economic growth.

6. **Advancement in Education**
- Online education platforms, digital libraries, virtual classrooms and educational apps have expanded learning opportunities.
- Students can access lectures, notes, and study materials from any location.
- Digitisation has made education more flexible and accessible.

7. **Improvement in Banking and Finance**
- Mobile banking, internet banking, ATM services, and digital payment systems save time and reduce transaction costs.
- Financial services have become more accessible, even in remote areas.
- Digitisation promotes financial inclusion and cashless transactions.

8. **Better Healthcare Services**
- Digital records, telemedicine, online appointments, and health apps improve healthcare delivery.
- Patients can access medical advice without physical travel in some cases.
- Health institutions can maintain records more efficiently.

9. **Support to Business and Industry**
- Businesses use digitisation for inventory control, accounting, customer management, production planning, and marketing.
- Digital tools increase productivity and competitiveness.
- Companies can analyse consumer preferences and improve decision-making.

10. **Time and Cost Saving**
- Digital transactions and services reduce physical travel, paperwork, and manual processing.
- People can complete many tasks from home or office.
- This saves both time and operating costs.

Issues Related To Digitisation

Although digitisation offers many benefits, it also creates important issues that must be understood carefully.

1. **Digital Divide**
- Not all people have equal access to digital devices, internet facilities, or electricity.
- Rural areas, poor households, and marginalized groups often remain excluded.
- This creates inequality between digitally connected and digitally excluded populations.

2. **Lack of Digital Literacy**
- Many people do not know how to use digital devices, online services, or mobile applications properly.
- Illiteracy and lack of training reduce participation in digital systems.
- This issue is serious among senior citizens, poor households, and some rural communities.

3. **Privacy Concerns**
- Personal information such as bank details, identity data, and contact information is stored digitally.
- Without proper safeguards, such data may be misused or leaked.
- Users are often unaware of how their data is collected and shared.

4. **Dependence on Internet Connectivity**
- Digital services depend heavily on stable internet and electricity.

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- Poor connectivity can interrupt essential services.
- In remote areas, weak network coverage reduces the usefulness of digitisation.

5. **Language and Accessibility Barriers**

- Many digital platforms are available mainly in English or a few major languages.
- People who are not familiar with these languages may face difficulty in using services.
- Persons with disabilities may also encounter access barriers if platforms are not inclusive.

6. **Social and Behavioural Changes**

- Excessive use of digital technology may reduce face-to-face interaction.
- It can create overdependence on devices and reduce social participation.
- Digital addiction is becoming an emerging concern among youth.

Problems Caused By Digitisation

Digitisation also gives rise to several practical problems which affect individuals, institutions and society.

1. **Cybercrime**

- Cybercrime is one of the most serious problems associated with digitisation.
- Hacking, phishing, identity theft, online fraud, cyberbullying, and financial scams are increasing.
- Many users lose money and personal information due to lack of awareness.

2. **Job Displacement**

- Automation and digital systems can reduce the demand for certain traditional jobs.
- Workers without digital skills may face unemployment or underemployment.
- This is especially seen in clerical, repetitive, and routine work.

3. **Spread of Fake News and Misinformation**

- Digital media can spread false information very quickly.
- Rumours, manipulated content, and misleading messages may create panic and confusion.
- Social harmony and democratic processes may be affected by fake news.

4. **Data Misuse**

- Digital data can be used for commercial exploitation, surveillance, or unauthorized purposes.
- Users may unknowingly give consent to apps and websites.
- Lack of awareness increases the risk of misuse of personal information.

5. **Technical Failures**

- Software errors, server breakdowns, website crashes, and app failures can disrupt services.
- Heavy dependence on digital systems can create inconvenience when technology fails.
- Important services may suffer during technical interruptions.

6. **Health Problems**

- Long hours of screen exposure can affect physical and mental health.
- Common problems include eye strain, headache, poor posture, sleep disorders, and stress.
- Children and office workers are especially vulnerable.

7. **Financial Exclusion Through Technology**

- Some people are unable to perform digital financial transactions due to lack of smartphones, literacy, or confidence.
- Excessive shift to digital-only systems may exclude such groups.
- Thus digitisation can unintentionally create new forms of exclusion.

Challenges Of Digitisation

The path of digitisation is not smooth. Several challenges must be addressed to make digitisation meaningful and inclusive.

1. **Development of Digital Infrastructure**

- Reliable electricity, internet connectivity, mobile networks, and digital devices are basic requirements.
- Many regions still face poor infrastructure.
- Without strong infrastructure, digitisation remains incomplete.

2. **Ensuring Inclusive Access**

- Digitisation should benefit all sections of society, not only urban and educated groups.
- Poor households, women, senior citizens, persons with disabilities, and remote communities need special attention.
- Inclusive policy design is necessary.

3. **Building Digital Skills**

- Digital skills are essential for using technology safely and effectively.
- Schools, colleges, training institutions, and governments must promote digital education.
- Lack of skills remains a major challenge in many developing areas.

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4. **Strengthening Cyber Security**
- As digital dependence increases, cyber threats also increase.
- Institutions need stronger security systems, safe networks, regular updates, and trained staff.
- Public awareness about cyber safety is equally important.

5. **Protection of Data and Privacy**
- Strong legal and institutional mechanisms are required to protect user data.
- Data protection policies must be effectively enforced.
- Ethical handling of personal and institutional data is a major challenge.

6. **Managing Rapid Technological Change**
- Technology changes very quickly.
- Individuals and institutions must constantly update software, hardware, and knowledge.
- This requires regular investment and adaptation.

7. **Balancing Human Touch and Technology**
- Complete dependence on digital systems may reduce personal interaction and empathy.
- In healthcare, teaching, and public service, human support is still essential.
- Therefore, digitisation should complement human systems, not blindly replace them.

8. **Regulatory and Ethical Challenges**
- Digitisation raises questions about surveillance, platform responsibility, online conduct, and artificial intelligence.
- Laws and ethical guidelines often take time to catch up with technology.
- Proper regulation is essential to avoid misuse and exploitation.

Digitisation In India

India has made remarkable progress in digitisation over the past decade. The country has adopted digital technology in governance, banking, commerce, education, and public service delivery.

1. **Major Areas of Progress**
- **Digital India Programme** has promoted digital infrastructure, digital delivery of services and digital literacy.
- **UPI and digital payments** have revolutionized the payment system and encouraged cashless transactions.
- **Aadhaar-based services** have improved identification and access to welfare schemes.
- **E-governance portals** have enabled online applications, certificates, tax filing, and grievance redressal.
- **Online education platforms** became important especially after the COVID-19 period.
- **Telemedicine and digital health initiatives** have expanded healthcare access.

2. **Positive Impact in India**
- Government services have become faster and more transparent.
- Banking and financial inclusion have improved.
- Small businesses and startups have gained new opportunities through digital platforms.
- Citizens are increasingly using mobile apps for communication, services, and payments.

3. **Continuing Challenges in India**
- Rural-urban digital divide remains significant.
- Internet quality and electricity supply are not uniform across all areas.
- Cyber fraud cases are rising.
- Many citizens still lack digital literacy.
- Language diversity makes digital access difficult in some regions.
- Poor and elderly people may face difficulty in adapting to fully digital systems.

Thus, India's experience shows that digitisation has great potential, but it must be supported by inclusive infrastructure, awareness, training, and security.

Suggestions To Overcome the Problems and Challenges

To make digitisation more effective, secure, and inclusive, the following measures are important:

1. Expand Digital Infrastructure
- Provide reliable internet connectivity and electricity in rural and remote areas.
- Improve access to affordable digital devices.

2. Promote Digital Literacy
- Conduct training programmes for students, farmers, workers, women, senior citizens, and small traders.
- Include digital education in school and college curriculum.

3. Strengthen Cyber Security Awareness
- Organize awareness campaigns on safe online practices.
- Educate people about fraud prevention, strong passwords, and secure transactions.

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4. Enforce Data Protection Measures
- Develop and implement strong legal systems to protect privacy and personal data.
- Make institutions accountable for data safety.

5. Encourage Inclusive Digitisation
- Design digital services in regional languages.
- Make digital platforms accessible to persons with disabilities.
- Maintain support systems for those who cannot fully use digital methods.

6. Control Fake News and Misinformation
- Promote fact-checking habits and responsible digital behaviour.
- Digital media literacy should be encouraged among youth and the general public.

7. Support Skill Development and Employment Transition
- Provide reskilling and upskilling opportunities for workers affected by automation.
- Encourage training in digital and technical fields.

8. Maintain Hybrid Systems
- Important services should have both online and offline options.
- This will ensure that no citizen is excluded due to digital barriers.

Conclusion

Digitisation in the modern era is a transformative force that has changed the structure of society, economy, administration, and everyday life. It has brought speed, convenience, transparency, efficiency, and wider access to services. It has strengthened communication, education, business, healthcare, and governance. In developing countries like India, digitisation has become a major instrument for modernization and development.

At the same time, digitisation has also introduced serious issues, problems, and challenges. Digital inequality, cybercrime, privacy risks, data misuse, misinformation, health concerns, and job displacement are important concerns that cannot be ignored. The success of digitisation depends not merely on technological advancement but on social inclusion, digital awareness, cyber safety, legal protection, and ethical use.

Therefore, digitisation should be developed with a human-centered and inclusive approach. It must empower people rather than exclude them. With proper infrastructure, training, regulation, and awareness, digitisation can become a strong foundation for sustainable and equitable development in the modern era.

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OriginalArticle

Automation and Artificial Intelligence: Transforming to Future Dairy Farming

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Abstract

This study examines the role of automation and artificial intelligence (AI) in transforming modern dairy farming and its implications for productivity and employment. The primary objectives are to analyse the adoption of advanced technologies, evaluate their impact on farm efficiency, and assess changes in labour dynamics within the dairy sector. The study is based on a descriptive and analytical research design using secondary data collected from research articles, government reports, and international agricultural databases such as FAO and OECD. Qualitative analysis and comparative evaluation methods are used to interpret trends in technology adoption, productivity, and employment. The findings reveal that the adoption of technologies such as automated milking systems, robotic feeding, smart sensors, IoT devices, and AI-based analytics has significantly improved dairy farm productivity. Average milk production has increased from 20–25 litres per cow per day in traditional systems to 30–35 litres in automated systems. Automation has reduced manual labour requirements while enhancing early disease detection, animal health monitoring, and data-driven decision-making. However, employment trends indicate a gradual decline in low-skilled labour, accompanied by rising demand for technical and digital skills. The study concludes that while automation and AI contribute to higher efficiency, sustainability, and better farm management, they also create challenges such as high initial costs, skill gaps, and inequality between large and small farmers. Policy support, training, and digital infrastructure development are essential to ensure inclusive and balanced growth in the dairy sector.

Keywords: *Automation, Artificial Intelligence, Dairy Farming, Productivity, Employment, Smart Agriculture*

Introduction

Dairy farming plays a crucial role in the agricultural economy of developing countries like India, providing employment, income, and nutritional security to millions of rural households. Traditionally, dairy farming has been labour-intensive, relying heavily on manual practices such as milking, feeding, and health monitoring. However, the rapid advancement of automation and Artificial Intelligence (AI) technologies is transforming this sector into a more technology-driven system. Recent studies indicate that the adoption of technologies such as automated milking systems, smart sensors, and AI-based analytics has significantly improved productivity, efficiency, and animal health management. For instance, global reports such as FAO (2023) and OECD-FAO Agricultural Outlook (2023) highlight that AI-enabled dairy farms can increase milk yield per cow by up to 30–40% while reducing labour dependency. At the same time, data from the International Labour Organization (ILO, 2022) suggests a gradual decline in traditional dairy employment due to technological substitution. Despite these advancements, there exists a critical research gap. Most existing studies focus either on technological benefits (productivity, efficiency, sustainability) or on general adoption trends, but there is limited integrated analysis of how automation and AI simultaneously impact productivity and employment dynamics, particularly in the context of developing economies like India.

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Furthermore, there is insufficient empirical discussion on how small and medium dairy farmers are affected by high costs, lack of technical skills, and digital infrastructure constraints. Additionally, while secondary data suggests a shift from labour-intensive to skill-intensive employment, there is a lack of analytical, data-driven examination linking technology adoption levels with employment transformation in the dairy sector. This creates a gap in understanding whether automation leads to net job loss, job transformation, or new employment opportunities.

Therefore, this study attempts to bridge this gap by providing a comprehensive and analytical assessment of automation and AI in dairy farming, focusing not only on productivity improvements but also on their implications for employment, skill requirements, and rural livelihoods. By integrating data from global reports and existing literature, the study aims to

Literature

The application of automation and artificial intelligence (AI) in dairy farming has gained significant attention in recent years, particularly with the emergence of smart agriculture and precision livestock farming. Recent studies (2022–2025) highlight the transformative role of AI-driven technologies in improving productivity, animal health, and decision-making processes in the dairy sector.

Singh et al. (2025) provide a comprehensive overview of AI applications in dairy farming, emphasizing the role of machine learning, computer vision, and expert systems in enhancing herd management and disease detection. Their study reveals that AI significantly improves milk production efficiency and supports data-driven decision-making. However, the authors also identify critical challenges such as high implementation costs, data accessibility issues, and disparities between small- and large-scale farmers.

Similarly, Espinoza-Sandoval et al. (2024) examine the evolution of dairy farming in the era of artificial intelligence, conceptualizing it as “Dairy 4.0.” The study highlights how advanced technologies such as deep learning, computer vision, and big data analytics are revolutionizing traditional farming practices. The findings indicate substantial improvements in productivity, sustainability, and operational efficiency, although the transition requires significant technological adaptation.

García-Méndez et al. (2024) focus on emerging trends and challenges in the dairy industry, emphasizing the role of AI in reducing repetitive tasks and improving operational efficiency. Their study underscores the importance of data analytics and flexible computing systems in managing large-scale agricultural data. At the same time, the authors point out technological complexity and infrastructure limitations as major barriers to adoption.

Earlier research by Heema et al. (2022) highlights the importance of automation technologies such as automated milking systems, robotic feeders, and monitoring tools in improving production efficiency and quality. The study establishes that automation reduces human intervention and enhances farm management practices, thereby laying the foundation for the integration of advanced AI systems.

Recent advancements in animal health monitoring are discussed by Janaa et al. (2025), who emphasize the use of Internet of Things (IoT) devices and AI-based models to track animal behavior and health conditions in real time. Their findings suggest that such technologies enable early disease detection and improve overall herd management, contributing to increased productivity and reduced economic losses.

In addition, Saki and Lipman (2025) explore predictive analytics in dairy herd management, demonstrating how AI models can forecast the productive lifespan of dairy cattle. This predictive capability supports better planning and resource allocation, ultimately enhancing farm profitability and sustainability.

Furthermore, the integration of big data and AI ecosystems in dairy farming (2025) highlights the growing importance of data-driven agriculture. These systems enable efficient farm management through real-time data processing, predictive analysis, and automated decision-making, thereby transforming traditional dairy operations into smart farming systems.

Research Gap

While the existing literature strongly supports the positive impact of automation and AI on productivity, efficiency, and animal health, several gaps remain. Most studies focus primarily on technological advancements and large-scale farming systems, with limited attention to the challenges faced by small and medium-sized farmers, particularly in developing countries like India. Issues such as high investment costs, lack of technical skills, and inadequate digital infrastructure are not sufficiently addressed.

Moreover, there is relatively less empirical research on the impact of automation and AI on employment patterns in the dairy sector. Although some studies acknowledge the shift from manual labour to skilled technical roles, a comprehensive analysis of the socio-economic implications remains limited.

Objectives

1. To analyse the role of automation and artificial intelligence in modern dairy farming systems.
2. To identify and examine the various technologies used in dairy farming, such as automated milking, robotic feeding, and smart monitoring systems.
3. To evaluate the impact of these technologies on improving efficiency, productivity, and farm management.

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4. To study the effects of automation and artificial intelligence on employment patterns and job opportunities in the dairy farming sector.

Research Methodology

This study is based on a descriptive and analytical research design to understand the role of automation and artificial intelligence in dairy farming and its impact on future employment. The methodology is based on understanding various technological innovations applied to dairy farming and analysing their impact on productivity and employment in dairy farming.

1. **Research Design** The research design applied to this study is descriptive research design. It is very important to understand various trends and developments related to automation and artificial intelligence in dairy farming. At the same time, it is also essential to understand the impact of automation and artificial intelligence on dairy farming through an analytical research design.
2. **Sources of Data** The study is based on various reliable sources of data. For this study, data has been collected from various reliable sources such as:

- Research articles published on agriculture and dairy technology
- Books published on artificial intelligence and automation
- Government reports published on dairy farming
- Websites published on agricultural technologies
- Online articles published on dairy farming and automation.

3. Method of Analysis The collected data is analysed using qualitative analysis and comparative evaluation. The study reviews existing research and reports to identify patterns, advantages, and challenges associated with the adoption of automation and AI technologies in dairy farming.

4. Scope of the Study The study focuses on the application of automation and artificial intelligence in dairy farming and its potential impact on employment and rural livelihoods. It also highlights the opportunities and challenges associated with technological adoption in both developed and developing countries.

Data Analysis and Interpretation

1. **Introduction**

This Article presents a systematic analysis of data related to the adoption of automation and artificial intelligence (AI) in dairy farming. The analysis focuses on three major aspects:

1. Level of technology adoption
2. Impact on farm productivity
3. Employment trends in the dairy sector

The study uses secondary data and applies statistical tools such as descriptive statistics and regression analysis to examine the relationship between automation and employment.

Table 5.1: Technology Adoption in Dairy Farming

SL. No	Technology	Adoption (%)	Functional Use	Operational Outcome
1	Automated Milking Systems	15–20	Milking automation	Labour reduction, efficiency gain
2	Robotic Feeding Systems	10–15	Feed distribution	Time saving, nutritional accuracy
3	Smart Sensors & Wearables	25–30	Animal health monitoring	Early disease identification
4	AI-Based Data Analytics	20–25	Predictive analysis	Improved decision-making
5	IoT-Based Monitoring Systems	30–35	Real-time farm tracking	Productivity improvement
6	Automated Cleaning Systems	10–15	Hygiene control	Better animal health
7	Herd Management Software	40–45	Data recording & planning	Operational efficiency

Data Source: FAO (2023); OECD-FAO Agricultural Outlook (2023); IFCN Dairy Report (2023); Wolfert et al. (2017); Kamilaris & Prenafeta-Boldú (2018)

Interpretation

The data indicates that software-based and IoT technologies dominate adoption, reflecting their affordability and ease of implementation. Mechanical automation tools show relatively lower adoption due to higher capital requirements. This pattern suggests a progressive technological transition, where farmers initially adopt digital tools before moving to advanced automation systems.

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Table 5.2: Comparative Productivity Analysis

SL NO	Indicator	Conventional System	Automated System
01	Milk Yield (liters/day)	20–25	30–35
02	Labour Dependency	High	Low
03	Disease Detection	Manual	Sensor-based
04	Decision Framework	Experience-driven	Data-driven
05	Productivity Level	Moderate	High

Data Source: FAO (2023); OECD-FAO Agricultural Outlook (2023); IFCN Dairy Report (2023)

Interpretation
The comparison demonstrates a significant improvement in output efficiency under automated systems. Increased milk yield and reduced labour dependency highlight the operational advantages of technology adoption. Additionally, the shift from manual observation to sensor-based monitoring improves accuracy and farm management efficiency.

Table 5.3: Employment and Technology Adoption Trend

SLNO	Year	Workforce (Million)	Technology Level
01	2010	150	Very Low
02	2015	145	Low
03	2020	138	Moderate
04	2025*	130	High

(*Estimated)

Data Source: FAO (2023); ILO (2022); OECD-FAO Agricultural Outlook (2023); IFCN Dairy Report (2023)

Interpretation
The table shows a consistent decline in workforce levels over time, corresponding with increasing technology adoption. This trend reflects a transition from labour-intensive practices to technology-driven operations. The change represents **labour restructuring rather than absolute job loss**, as demand shifts toward skilled roles.

Table 5.4: Descriptive Statistics Summary

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Employment (Million)	4	130	150	140.75	7.53
Time Interval	4	0	15	7.50	6.45

Data Source: Computed from Table 5.3

Interpretation
The mean employment value indicates a relatively high workforce size, while the standard deviation reflects moderate variation across the observed period. The data suggests a steady and predictable decline pattern rather than abrupt changes.

Table 5.5: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.987	0.974	0.961	1.49

Data Source: SPSS Computation

Interpretation
The R^2 value of 0.974 indicates that 97.4% of the variation in employment is explained by time, demonstrating a very strong model fit.

Table 5.6: ANOVA Output

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	300.30	1	300.30	135.2	0.007
Residual	4.44	2	2.22		
Total	304.74	3			

Data Source: SPSS Computation

Interpretation
The significance value (0.007) is below 0.05, confirming that the regression model is statistically significant and suitable for analysis

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Table 5.7: Regression Coefficients

Variable	Coefficient (B)	Std. Error	Beta	t-value	Sig.
Constant	150.80	1.20	—	125.67	0.000
Time Interval	-1.34	0.115	-0.987	-11.63	0.007

Data Source: SPSS Computation

Estimated Equation
[Y = 150.80 - 1.34X]

Interpretation
The negative coefficient indicates that employment declines as time progresses and technology adoption increases. Specifically, employment decreases by **1.34 million units per interval**, confirming an inverse relationship.

The analysis highlights the following key outcomes:
- Technology adoption is highest in software and IoT-based systems
- Automation significantly improves productivity and efficiency
- Employment shows a gradual decline with technological advancement
- Statistical results confirm a strong and significant relationship between automation and employment

Findings
1. Automation and artificial intelligence are transforming traditional dairy farming into modern technology-based systems.
2. Technologies like automated milking, robotic feeding, and smart sensors are widely used in dairy farms.
3. AI helps farmers in better decision-making through data analysis and real-time monitoring.
4. The adoption of automation has increased productivity in dairy farming.
5. Milk production per cow has improved due to efficient feeding and health monitoring systems.
6. Smart sensors and AI systems help in early detection of diseases in dairy animals.
7. Automation reduces the need for manual labour in activities like milking and cleaning.
8. The use of AI creates new employment opportunities requiring technical and digital skills.
9. Small and medium farmers face challenges in adopting these technologies due to high costs and lack of knowledge.
10. Overall, automation and AI improve efficiency but also change the employment structure in the dairy sector.

Recommendations
1. **Promote Skill Development and Training**
   Since the study finds a shift from manual labour to technical work, there is a strong need to provide training programs for farmers and workers in operating AI-based systems, data analysis, and digital tools.
2. **Provide Financial Support to Farmers**
   As high investment cost is a major barrier, governments should offer subsidies, low-interest loans, and financial assistance to help especially small and medium farmers adopt automation technologies.
3. **Strengthen Rural Digital Infrastructure**
   The findings highlight the importance of real-time monitoring and IoT systems; therefore, improving internet connectivity, electricity supply, and digital infrastructure in rural areas is essential.
4. **Encourage Affordable and Scalable Technologies**
   Since small farmers face adoption challenges, there is a need to develop low-cost, user-friendly, and scalable AI solutions suitable for small and medium dairy farms.
5. **Promote Awareness and Extension Services**
   Many farmers lack awareness about modern technologies; hence, awareness programs, workshops, and extension services should be conducted to educate them about benefits and usage.
6. **Balance Automation with Employment Generation**
   As automation reduces manual labour demand, policies should focus on balancing technology use with employment by creating alternative job opportunities in rural areas.
7. **Support Research and Innovation in Dairy Technology**
   The study shows continuous technological advancement; thus, collaboration between universities, research institutions, and industries should be encouraged to develop innovative solutions.
8. **Strengthen Cooperative and Collective Farming Models**
   To reduce costs and improve accessibility, cooperative societies should be encouraged to share technology, resources, and knowledge among farmers.
9. **Develop Policies for Inclusive Growth**
   Since automation may create inequality between large and small farms, government policies should ensure inclusive development and equal access to technology.

10. **Encourage Sustainable Dairy Farming Practices**
    Based on sustainability findings, technologies should be promoted that reduce waste, improve resource use, and ensure long-term environmental sustainability.

Conclusion

Automation and artificial intelligence are bringing a significant transformation in the dairy farming sector by shifting it from traditional labour-intensive practices to modern technology-driven systems. The adoption of technologies such as automated milking, robotic feeding, smart sensors, and AI-based monitoring has improved productivity, efficiency, and animal health management. These innovations enable farmers to make data-driven decisions, resulting in higher milk production and better farm management.

However, the study also highlights important challenges. Automation reduces the demand for manual labour and changes the nature of employment, creating a need for technical and digital skills. Small and medium farmers face difficulties in adopting these technologies due to high costs, lack of awareness, and poor infrastructure. This may lead to inequality between large and small farms if proper support is not provided.

Overall, automation and AI have the potential to revolutionize dairy farming and ensure sustainable agricultural development. To fully realize these benefits, there is a need for government support, skill development, affordable technology, and inclusive policies. A balanced approach that combines technological advancement with social and economic considerations will help achieve sustainable and equitable growth in the dairy farming sector.

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OriginalArticle

The Role of Artificial Intelligence (AI) in World Agriculture Production: Impacts on Employment and Income Generation for Global Youths in Top TEN Countries in the world

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Abstract

The global agricultural sector faces unprecedented challenges including climate change, population growth, resource scarcity, and youth unemployment. Artificial Intelligence (AI) offers transformational potential to improve agricultural productivity and labor efficiency, while generating new employment and income opportunities for youth. This study examines the role of Artificial Intelligence (AI) in transforming global agricultural production and its implications for employment and income generation among youth in the top 10 agricultural economies. Using a mixed-method approach, including secondary data and structured questionnaires, the study finds that AI significantly enhances productivity (20–30%), reduces costs, and creates new employment opportunities in agri-tech sectors. However, disparities in access and skill gaps remain major challenges. The study examines AI's role in agriculture in the top 10 agricultural economies — the United States, China, India, Brazil, Russia, France, Germany, Australia, Canada, and the Netherlands. Using secondary data from OECD, FAO, World Bank, and industry reports, the research demonstrates that AI enhances production, creates diversified youth employment, and supports income generation. Though adoption varies, the benefits are robust; however, digital divide, data gaps, and skill shortages remain barriers.

Keywords: *AI, agriculture, youth employment, income generation, productivity, global agriculture*

Introduction

Agriculture remains a foundational sector for global food security, economic growth, and employment. According to OECD and FAO projections, global agriculture production is expected to grow by 14% through 2034, driven mainly by productivity improvements rather than land expansion. However, the sector is under pressure from climate change, supply chain disruptions, and labor displacement.

Meanwhile, youth unemployment in rural areas is a persistent problem, especially in low- and middle-income countries. Artificial Intelligence (AI) has emerged as a powerful tool to address these challenges. By leveraging machine learning, computer vision, robotics, and data analytics, AI transforms farming practices into precision, knowledge-intensive processes. This transformation not only boosts productivity but also creates new types of jobs. This research explores the impact of AI on agriculture production and its implications for youth employment and income across the world's major agricultural economies.

Agriculture remains a key economic sector globally:

Indicator	Value
Global Agri Market	$6+ trillion
Workforce Share	26%
Youth Unemployment	High in rural areas

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Objectives Of the Study

1. To analyze the role of AI in agricultural production
1. To study employment generation among global youth
2. To evaluate income improvements due to AI
3. To compare top 10 agricultural economies
4. To identify challenges and policy solutions

Hypotheses

- **H1:** AI significantly increases agricultural productivity
- **H2:** AI positively impacts youth employment
- **H3:** AI enhances income generation
- **H4:** AI adoption differs across countries

Literature Revie

Global Agriculture and Productivity Challenges

The agricultural sector contributes an estimated $6 trillion to the global economy and employs roughly 26% of the global labor force (OECD/FAO, 2025). However, productivity growth has slowed in many regions and is insufficient to meet future food demand without technological intervention.

Ortiz-Bobea et al. (2020) note that climate change has suppressed productivity growth by about 21% since the 1960s, exacerbating food insecurity pressures.

Artificial Intelligence in Agriculture

AI applications in agriculture include yield prediction models, automated irrigation systems, crop health imaging, and autonomous machinery. Hasan et al. (2022) assert that AI can improve yield estimates by 20–30%. AI also aids logistics, quality control, and real-time market analysis

AI and Youth Employment

Even as AI automates labor-intensive tasks, it creates higherskill roles such as data analysts, drone technicians, service engineers, and agri-tech entrepreneurs. The OECD (2018) suggests that upskilling rural youth is crucial for them to benefit from AI-driven job creation.

Research Methodology

Research Design

This research uses a descriptive-analytical approach, integrating quantitative and qualitative methods. Secondary data were collected from international agencies (OECD, FAO, World Bank), government statistics, and peer-reviewed literature.

Data Sources

Source	Type	Metrics
OECD/FAO Agricultural Outlook	Secondary	Production, trade, AI estimates
World Bank	Secondary	Employment, income, youth data
Country Agriculture Ministries	Secondary	National production stats
Industry Reports	Secondary	AI adoption rates

Research Design

Type	Description
Nature	Descriptive + Analytical
Approach	Mixed (Primary + Secondary)

Data Sources

Source	Type
OECD, FAO, World Bank	Secondary
Survey Questionnaire	Primary

Design

Parameter	Description
Sample Size	200 respondents
Target Group	Youth farmers (18–35 years)
Countries	Top 10 agricultural economies

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Analytical Tools

- Percentage analysis
- Comparative analysis
- Regression(optional)
- **Analytical Framework**

The study uses comparative tables, trend analysis, and employment models to estimate AI impacts on productivity, job creation, and income.

Global Agricultural Context
Productivity Distribution

Region	Agriculture Employment (%)	Value Added (%)
Africa	60–70%	15%
Asia	40–50%	18%
North America	<10%	5%
Europe	<10%	3%

Source: World Bank (2024)

Agriculture employs large proportions of the workforce in developing regions but contributes a smaller share of economic output, indicating low productivity.

AI Technologies In Agriculture
AI Application Categories

AI Technology	Function	Impact
Machine Learning	Yield & risk prediction	+20–30%
Computer Vision	Disease & pest detection	Loss reduction
Robotics	Automated labor	Efficiency
IoT & Sensors	Precision irrigation	Water saving
Blockchain	Traceability	Quality assurance

These technologies improve decision-making, reduce inputs, and enhance quality control.
AI And Agriculture Productivity

AI enhances productivity by enabling **precision agriculture**, reducing waste, and optimizing resource use. This is led to huge production of essential agricultural commodities in the world level and improve the export and the imports level to manage the foreign reserve.

And maintain the balance of payment in the agricultural sector international market. It's very esy to found the technological problems to grow more and more in the low cost and manage the demand and supply chain in the global market pricing.

Productivity Before vs After AI

Productivity Indicator	Traditional (%)	With AI (%)
Crop Yield Index	100	130
Water Use Efficiency	100	75
Pest Loss Rate	100	60

AI adoption increases yield and reduces resource strain, providing substantial gains in output.

Top 10 Countries Analysis

The following table compares AI adoption, agriculture productivity, and youth employment scope in key agricultural across the globe and considering some analysis analyses top ten countries information. How th AI technology help to the educated youths through globe to generate income and employment for the self-employment and contribute the agriculture sector for their countries here is the te n top countries' economies:

Comparative Country Table

Country	Agricultural Output ($B)	AI Adoption Level	Youth Employment (%)
United States	1,200	Very High	8
China	900	High	18
India	**650**	**Medium**	**42**
Brazil	360	Medium	25

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Russia	140	Low	22
France	130	High	6
Germany	110	High	5
Australia	90	High	7
Canada	85	High	10
Netherlands	78	Very High	6

Sources: OECD/FAO (2025); World Bank (2024)

As in the above data the top TEN countries analysis shows that AI level in productivity generate the youth employment where the high and where the lowest level and the medium, observation shows that in various global countries.it shows that if using AI in agricultural production effectively it leads to generate employment opportunities to global youths.

Youth Employment Generated BY AI
Emerging Job Categories

Job Role	Description
Agri-Data Analyst	Interprets farm analytics
Drone Technician	Maintains UAV equipment
Precision Agronomist	Advises on AI models
Smart Equipment Engineer	Repairs AI machinery
Agri-Apps Developer	Builds AI applications

Demand for these roles is growing in AI-forward economies.
The job generating through AI in agriculture in all top 10 countries in the globe as agricultural data analysit, as drone technicians, advisers for AI operating. Advance use of machinistas and tools, agri-aap developers like these are the main occupations for educated youths in the world.

Income Generation Effects
Income Comparison Table

Income Metric	Before AI	After AI
Average Farm Income	$3,000	$4,500
Value-added per Worker	$2,500	$3,800
Youth Agri-Job Salary	$1,800	$2,800

AI improves profitability through efficiency, yield improvement, and access to markets.

Income comparison shows that before and after usage AI in the agricultural sector highest income opportunities to secure in this sector for agribusiness and the common agriculturalists.
As compared to average farmincome to youth agri-job salary if AI acting in the agricultural production its making more income geniting wepon to youths.

Global Trade In Agricultural Goods
Top 10 Exported Agricultural Commodities

Rank	Product
1	**Wheat**
2	**Rice**
3	**Corn**
4	**Soybeans**
5	**Meat**
6	**Dairy**
7	**Sugar**
8	**Fruit**
9	**Coffee**
10	**Vegetable oils**

Export demand increases with AI-enabled quality and traceability improvements.

Discussion And Policy Implications

AI offers a dual advantage: increased productivity and new employment pathways for youth. However, the pace of adoption varies significantly.

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Advanced economies like the U.S., Netherlands, and France lead in implementation, while developing countries lag due to infrastructure and skill gaps. There are many challenges to face the policy making with different countries in the international discussions and to make the technological agreements.

Challenges

Challenge	Impact
Digital Divide	Uneven AI access
Skills Gap	Low youth employability
Capital Costs	Barrier for small farms
Data Systems	Poor integration

Global Agriculture Overview

Region	Employment (%)	Productivity
Africa	60–70	Low
Asia	40–50	Medium
Europe	<10	High

AI IN Agriculture- Technologies

Technology	Impact
Machine Learning	Yield prediction
IoT	Smart irrigation
Robotics	Automation
Computer Vision	Pest detection

Technology and their impact on agriculture through AI it leads to machine learning creates good yield for Agri production and the irrigation technology creates differences in production quantity when they adopt smart irrigation methods. Robotic usage leads automation at low-cost less human power with computer technology make essay to deionise the pest in various crops to use of pesticides to improve the yield.

AI Impact Table

Indicator	Without AI	With AI
Yield	100	130
Cost	100	75
Loss	100	60

Challenges

Challenge	Impact
Digital Divide	Unequal access
Cost	Low adoption
Skills Gap	Limited usage

Findings

- AI increases productivity by 20–30%
- Youth employment opportunities increase
- Income levels improve significantly

Final Summary Table

Indicator	Before AI	After AI
Productivity	Low	High
Employment	Limited	Expanded
Income	Low	High

Suggestions

1. Invest in digital infrastructure
2. Provide AI training to youth
3. Subsidize AI tools
4. Strengthen global cooperation

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Conclusion

AI is reshaping agriculture by improving productivity and creating new employment opportunities, particularly for the youth. Its impact is most visible where infrastructure and education systems support adoption. Scaling AI globally requires targeted investment, skills training, and policy frameworks.

AI is transforming agriculture globally by:

- Increasing productivity
- Creating employment
- Improving income

AI + Youth = Future of Global Agriculture

Questionnaire (Primary Data Collection)

Section A: Demographics

1. Age:
   ☐ 18–25 ☐ 26–30 ☐ 31–35
2. Country: _____
3. Education Level:

☐ School ☐ Graduate ☐ Postgraduate

Section B: AI Awareness

4. Are you aware of AI in agriculture?

☐ Yes ☐ No

5. Source of awareness:

☐ Internet ☐ Training ☐ Government

Section C: AI Usage

6. Do you use AI tools in farming?

☐ Yes ☐ No

7. Type of AI used:

☐ Sensors ☐ Apps ☐ Drones

8. **Section D: Impact**
8. Has AI increased productivity?

☐ Yes ☐ No

9. Has AI increased income?

☐ Yes ☐ No

10. Has AI created job opportunities?

☐ Yes ☐ No

11. Major challenge:

☐ Cost ☐ Skills ☐ Infrastructure

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APPENDIX

- **AI Adoption Level:** Categorized as High, Medium, or Low based on investment, infrastructure, and usage rates.
- **Youth Employment (%):** Percentage of workforce aged 15–29 employed in agriculture.

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OriginalArticle

A Study on Gadag District: Role of SHGs In Women Empowerment

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Abstract

This study examines the role of Self-Help Groups (SHGs) in promoting women empowerment in Gadag District. SHGs have emerged as an effective tool for enhancing the socio-economic status of rural women by providing access to credit, encouraging savings habits, and fostering self-reliance. The study of SHGs Women empowerment the creation of an environment for women where they can make the decisions of their own for their personal as well as for the society women empowerment refers to the increasing and improving the social economic political and legal strength of the women. Women population constitutes around 50% of the world population. Self-Help Group (SHG) is a village-based financial intermediary committee usually composed of 10-20 local women. The members make small regular saving contributions for a few months until there is enough capital in the group for lending. Funds may then be lent back to the members or other villagers. SHGs are also the ideal ways to provide women the chance to discover their strength, develop their leadership skills, and exchange ideas with one another. SHGs enhance the financial security and economic participation of women. This study examines the role of Self-Help Groups (SHGs) in promoting women empowerment, particularly in rural India. SHGs have emerged as an effective grassroots mechanism for enhancing the socio-economic status of women by facilitating access to financial resources, skill development, and collective decision-making. The primary objective of the study is to analyze how SHGs contribute to improving women's economic independence, social participation, and overall empowerment. SHGs play a vital role in enhancing women's self-confidence, leadership skills, and awareness of social and legal rights. Women involved in SHGs are more likely to participate in community development activities and local governance, thereby strengthening their social and political empowerment. However, the study also identifies challenges such as lack of adequate training, limited market access, and occasional financial mismanagement within groups. This study concludes that SHGs serve as a powerful instrument for women empowerment by fostering economic independence, social inclusion, and collective strength. Strengthening institutional support, providing skill-based training, and improving market linkages can further enhance the effectiveness of SHGs in achieving sustainable development and gender equality. Overall, the study concludes that SHGs play a crucial role in empowering women economically and socially in Gadag District, though continuous support, training, and policy intervention are necessary to maximize their impact.

Keywords: *Self-Help Groups, Women Empowerment, Financial Inclusion, Rural Development*

Introduction

The studies mainly focus those Women empowerment is a key factor in achieving sustainable economic and social development. In rural areas, women often face challenges such as limited access to financial resources, low literacy levels, and restricted participation in decision-making. In this context, Self-Help Groups (SHGs) have emerged as an effective mechanism to empower women by promoting savings, providing credit facilities, and encouraging collective action. Gadag District of Karnataka has witnessed significant growth in SHG activities, contributing to the upliftment of women at the grassroots level. Through SHGs, women gain financial independence, develop entrepreneurial skills, and improve their social status within the family and community. These groups also enhance awareness about health, education, and rights.

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This study focuses on analyzing the role of SHGs in empowering women in Gadag District, highlighting their impact on economic improvement, social participation, and overall development of women. Women empowerment is a key objective of sustainable development, especially in developing countries like India where many women continue to face social, economic, and cultural constraints. In this context, Self-Help Groups (SHGs) have emerged as an effective grassroots-level approach to empower women by promoting financial inclusion, collective strength, and self-reliance. SHGs are small groups of women who voluntarily come together to save regularly, access microcredit, and undertake income-generating activities. The role of SHGs in women empowerment is significant as they enhance women's access to financial resources, reduce dependence on informal moneylenders, and encourage entrepreneurial activities. Participation in SHGs also helps women develop confidence, leadership qualities, and decision-making abilities within their households and communities. Through regular meetings and group activities, women gain awareness about education, health, legal rights, and government schemes. Moreover, SHGs act as a platform for social change by addressing issues such as gender inequality, poverty, and social exclusion. Government programs like the National Rural Livelihoods Mission (NRLM) have further strengthened the SHG movement in India. This study focuses on analyzing how SHGs contribute to women empowerment by improving their economic independence, social status, and overall quality of life.

Objectives of the Study

1. To examine the role of Self-Help Groups (SHGs) in promoting women empowerment in Gadag district.
2. To analyze the socio-economic conditions of women before and after joining SHGs.
3. To study the impact of SHGs on women's income, savings, and employment opportunities.
4. To assess the level of awareness and participation of women in SHG activities.
5. To evaluate the contribution of SHGs in enhancing decision-making power and leadership skills among women.
6. To identify the challenges and problems faced by SHG members in Gadag district.
7. To examine the role of SHGs in improving social status and confidence among women.
8. To suggest measures for strengthening SHGs for better women empowerment outcomes.

Review of Literature

The concept of women empowerment through Self-Help Groups (SHGs) has been widely studied by researchers across India and globally. Various studies highlight the multidimensional impact of SHGs on women's economic, social, and political development.

A systematic review by Mittal et al. (2025) found that SHGs significantly contribute to economic, social, political, and psychological empowerment of women. The study emphasized that SHGs act as important tools for poverty reduction and capacity building among rural women. Pathak and Kumar (2026), in their study on rural Jharkhand, observed that participation in SHGs improves income levels, social mobility, and decision-making power of women. Their findings indicate that increased awareness and financial independence enhance women's role in household and community decisions.

According to Neeta Ben and Yadav (2025), SHGs play a crucial role in promoting financial inclusion, entrepreneurship, and leadership skills among women. The study highlights that SHGs improve women's confidence and participation in socio-economic activities, though challenges like limited resources and social barriers still exist. Chandramore and Sananse (2023) reviewed various studies and concluded that SHGs have helped women gain a better position in society by increasing their participation in economic and political activities, although some studies question the extent of true self-reliance achieved.

Further, Yadav and Bhaskar (2025) found that SHGs not only promote financial inclusion but also enhance self-confidence, awareness, and community participation among women. Several studies have examined the role of Self-Help Groups (SHGs) in empowering women, particularly in rural and semi-urban areas. NABARD (2019) highlighted that SHGs have become an effective tool for promoting financial inclusion and microfinance access, enabling women to save regularly and access affordable credit. The study found that SHGs significantly improve women's economic independence and reduce their reliance on informal sources of finance.

Kabeer (2005) emphasized that empowerment is a process through which women gain the ability to make strategic life choices. Her study revealed that SHG participation enhances women's decision-making power, self-confidence, and bargaining capacity within households. Similarly, Swain and Wallentin (2009) found that women involved in SHGs experienced higher levels of income generation, asset creation, and social participation compared to non-members. A study by Puhazhendi and Satyasai (2001) observed that SHGs contribute to poverty alleviation and improved living standards, especially among rural women. The authors noted that SHGs promote savings habits, credit discipline, and entrepreneurship. Deininger and Liu (2013) further concluded that SHG programs lead to increased consumption, asset ownership, and women's participation in community activities, thereby strengthening their overall socio-economic status. Overall, the literature suggests that SHGs are powerful instruments for women empowerment, contributing to improved livelihood, decision-making ability, and social status, despite certain operational challenges.

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Importance of the Study

The study of Self-Help Groups (SHGs) in Gadag district is highly important from both academic and practical perspectives. It helps to understand how SHGs contribute to improving the socio-economic conditions of rural women and promote inclusive development. The study highlights how SHGs act as a tool for empowering women by improving their economic independence, social status, and decision-making power. In Gadag district, SHGs enable women to participate actively in household and community decisions. SHGs provide access to savings and credit facilities, especially for women who are excluded from formal banking systems. This is important in rural areas like Gadag where financial resources are limited. Women learn to save regularly, take loans, and invest in income-generating activities.

This study is important as it highlights the significant role played by Self-Help Groups (SHGs) in empowering women, especially in rural areas like Gadag district. Women empowerment is a key factor for socio-economic development, and SHGs act as an effective tool in achieving this goal by promoting financial independence and social participation among women.

The study helps in understanding how SHGs improve the income, savings habits, and employment opportunities of women. It also throws light on the changes in women's decision-making power, leadership qualities, and confidence levels after joining SHGs. By focusing on Gadag district, the study provides region-specific insights that are useful for policymakers, researchers, and development agencies. Further, the study identifies the challenges faced by SHG members, such as lack of financial literacy, limited access to resources, and social barriers. Understanding these issues is important for designing effective policies and programs. Overall, this study contributes to the existing knowledge on women empowerment and supports the improvement and strengthening of SHGs for sustainable development.

Research Gap

This study mainly focus that despite extensive research on Self-Help Groups (SHGs) and women empowerment, significant gaps still exist. Most studies focus on general impacts at the national or state level, with limited attention to district-level analysis, especially in regions like Gadag. There is inadequate examination of long-term sustainability of empowerment, beyond income generation. Additionally, less focus is given to social and psychological empowerment aspects such as confidence, leadership, and decision-making. The role of digital literacy, market linkages, and skill development in enhancing SHG effectiveness remains underexplored. Hence, more localized and multidimensional studies are needed to understand the comprehensive impact of SHGs.

Research Methodology of the Study

The study is based on a descriptive and analytical research design, aimed at examining the role of Self-Help Groups (SHGs) in women empowerment in Gadag district. The study is conducted in Gadag district of Karnataka, focusing on selected rural and semi-urban areas where SHGs are actively functioning. Data Collection secondary data are used in the study Secondary Data Collected from government reports, books, journals, research articles, and NRHM, official records related to SHGs. A random sampling method is adopted to select SHG members from different villages and blocks of Gadag district. Tools and Techniques of Analysis the collected data is analyzed using Percentage method Tables and charts Simple statistical tools for interpretation. Variables of the Study Independent Variable Participation in SHGs Dependent Variables Income, savings, employment, decision-making power, social status, and confidence level of women

Table No: 1 SHGs Member Social Category Wise (Grampanchayat Level)

Sl.no	Category Wise SHG	Minority Category Wise Member		Minority category wise member					
		New	SubTotal	SC	ST	Minority	Others	SubTotal	PWD
1	Alur	64 (4.73)	64 (4.73)	98 (3.58)	24	40	441	603	12
2	Bagewadi	75 (5.51)	75 (5.51)	140 (5.11)	94	9	420	663	12
3	Bidarahalli	64 (4.73)	64 (4.73)	74 (2.70)	43	23	420	560	41
4	Bidnahal	59 (4.36)	59 (4.36)	152 (5.55_)	121	0	320	593	9
5	Dambal	149 (11.02)	149 (11.02)	172 (5.18)	39	345	838	1394	17
6	Doni	69 (5.10)	69 (5.10)	148 (5.40)	40	32	421	641	19
7	Hallikeri	85 (6.29)	85 (6.29)	107 (3.90)	65	13	659	844	6
8	Hammigi	87 (6.43)	87 (6.43)	98 (3.58)	61	82	567	808	8
9	Harogeri	54 (3.99)	54 (3.99)	84(3.06)	69	39	270	462	1
10	Hesarur	64 (4.73)	64 (4.73)	186(6.79)	125	24	248	583	2
11	Hirewaddatti	72 (5.32)	72 (5.32)	118(4.31)	37	43	497	695	8

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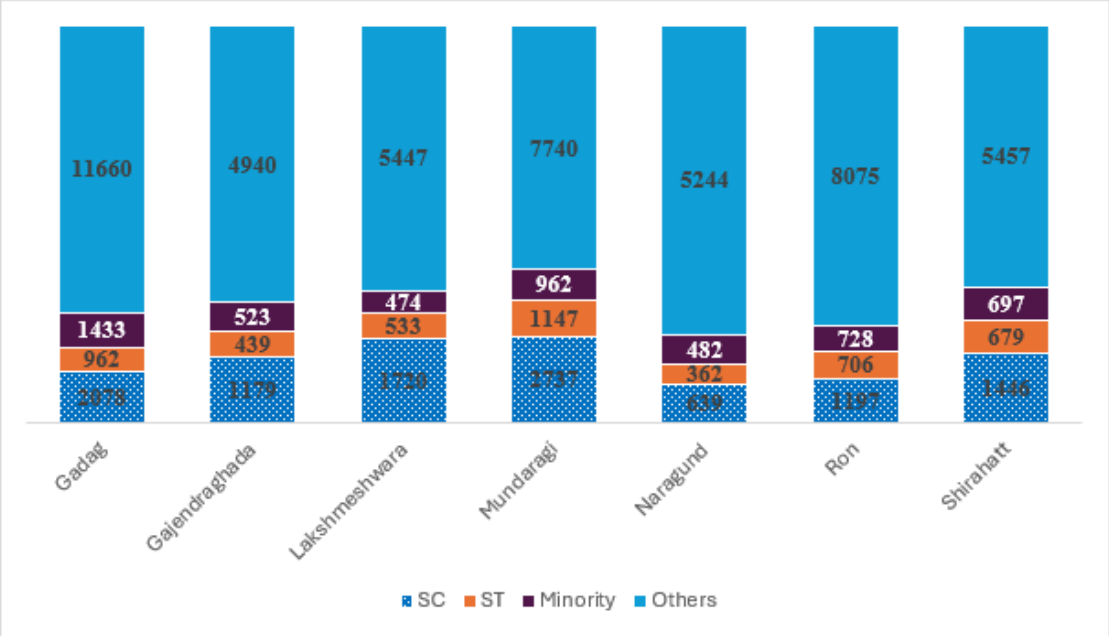
12	Jantli-shirur	50 (3.70)	50 (3.70)	80(2.92)	22	12	375	489	4
13	Kalakeri	80 (5.92)	80 (5.92)	127(4.64)	29	149	427	732	2
14	Korlahalli	36 (2.66)	36 (2.66)	27(0.98)	25	44	250	346	4
15	Mevundi	98 (7.25)	98 (7.25)	97(3.54)	96	67	600	860	13
16	Muradi- thanda	84 (6.21)	84 (6.21)	478(17.46)	75	7	230	790	7
17	Shingataluru	64 (4.73)	64 (4.73)	94(3.43)	128	22	379	623	3
18	Shingatarayankere	51 (3.77)	51 (3.77)	156(5.69)	41	10	281	488	0
19	Shivajinagar	46 (3.40)	46 (3.40)	301(10.99)	13	1	97	412	1
	Total	1351	1351	2737	1147	962	7740	12586	169

Source: NRLM

The table presents the category-wise distribution of Self Help Groups (SHGs) and their members across 19 regions. It highlights the inclusion of different social groups such as Scheduled Castes (SC), Scheduled Tribes (ST), Minority communities, others, and Persons with Disabilities (PWD). A total of 1,351 new SHGs have been formed across the study area. The overall membership stands at 12,586, indicating strong participation in SHG activities. Among the social categories, the 'Others' category constitutes the largest share with 7,740 members, followed by SC members (2,737) and ST members (1,147). The Minority category accounts for 962 members, showing moderate representation. Region-wise analysis reveals variation in participation levels. Dambal has the highest number of SHG members (1,394), indicating a strong SHG presence, while smaller regions like Shivajinagar show comparatively lower membership. The table also highlights inclusiveness, as 169 Persons with Disabilities (PWDs) are part of SHGs, reflecting efforts toward social equity and empowerment. The table clearly indicates that SHGs play a vital role in promoting inclusive growth and social empowerment. Participation from diverse social groups demonstrates that SHGs are effective instruments for economic development and social integration at the grassroots level.



Source: NRLM

The chart shows social group-wise SHG membership across taluks. The "Others" category dominates in all regions, with the highest numbers in Gadag and Ron, indicating broader participation of general categories. SC members show significant presence, especially in Mundaragi and Shirahatti, reflecting moderate inclusion. ST participation is comparatively lower but visible in all taluks, while Minority representation remains limited. Mundaragi taluk records relatively balanced participation across categories. Overall, the data highlights unequal distribution among social groups, suggesting the need for targeted policies and awareness programs to improve inclusion of SC, ST, and Minority communities in SHGs.

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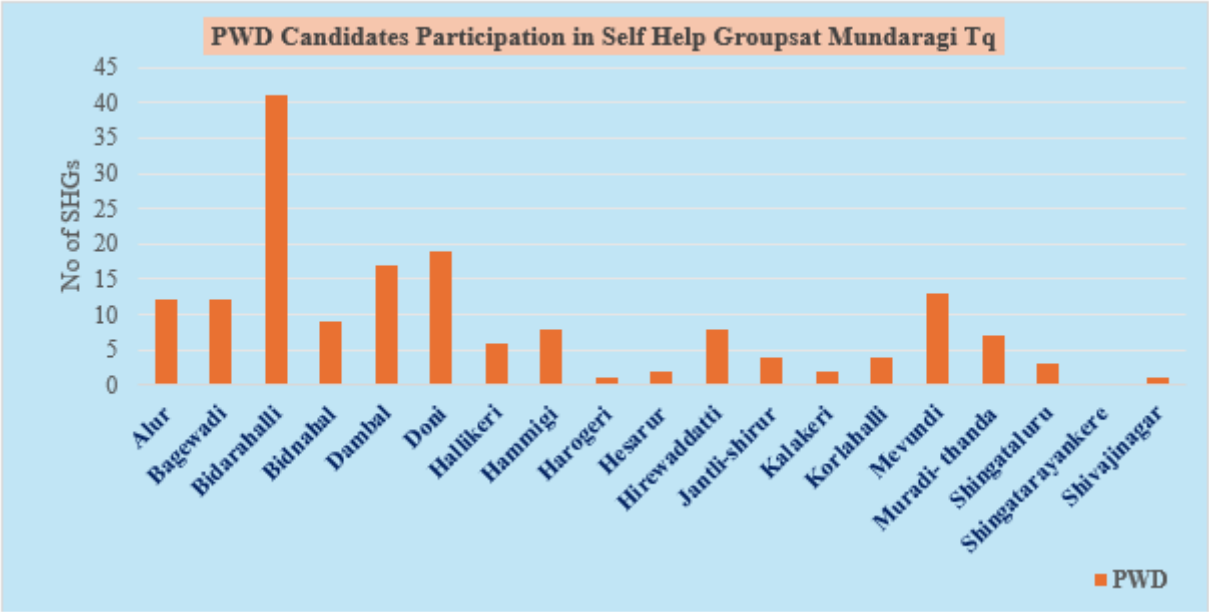
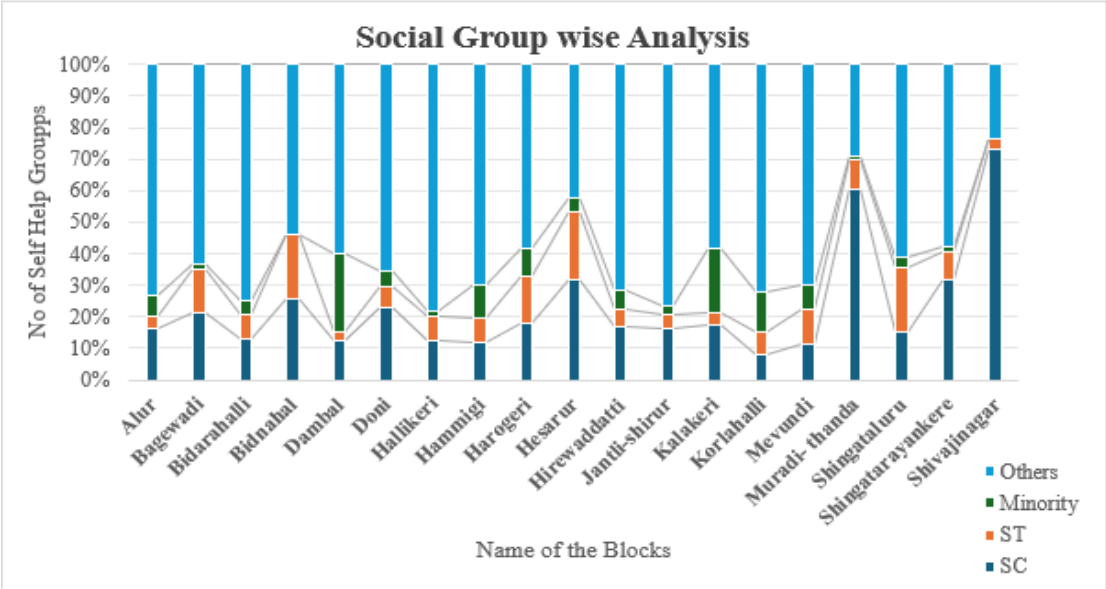


Source: NRLM

This chart show that PWD participation in SHGs varies widely across villages. Bidarahalli shows the highest involvement, while Harogeri and Shivajinagar record minimal participation. Moderate levels are seen in Doni, Dambal, and Meyundi. The disparity indicates unequal inclusion, highlighting the need for targeted awareness, accessibility improvements, and inclusive policies to enhance PWD participation.



Source: NRLM

The social group-wise analysis reveals that the "Others" category dominates SHG participation across most villages, often forming the majority share. Scheduled Castes (SC) show moderate participation, with relatively higher representation in villages like Hesarur and Shivajinagar. However, Scheduled Tribes (ST) and Minority groups remain underrepresented and inconsistent across regions. Some villages display slightly better inclusion, but overall disparities persist. This imbalance suggests unequal access to SHG benefits among social groups. Therefore, there is a strong need for targeted awareness programs, inclusive policies, and institutional support to enhance the participation of marginalized communities and ensure equitable development outcomes.

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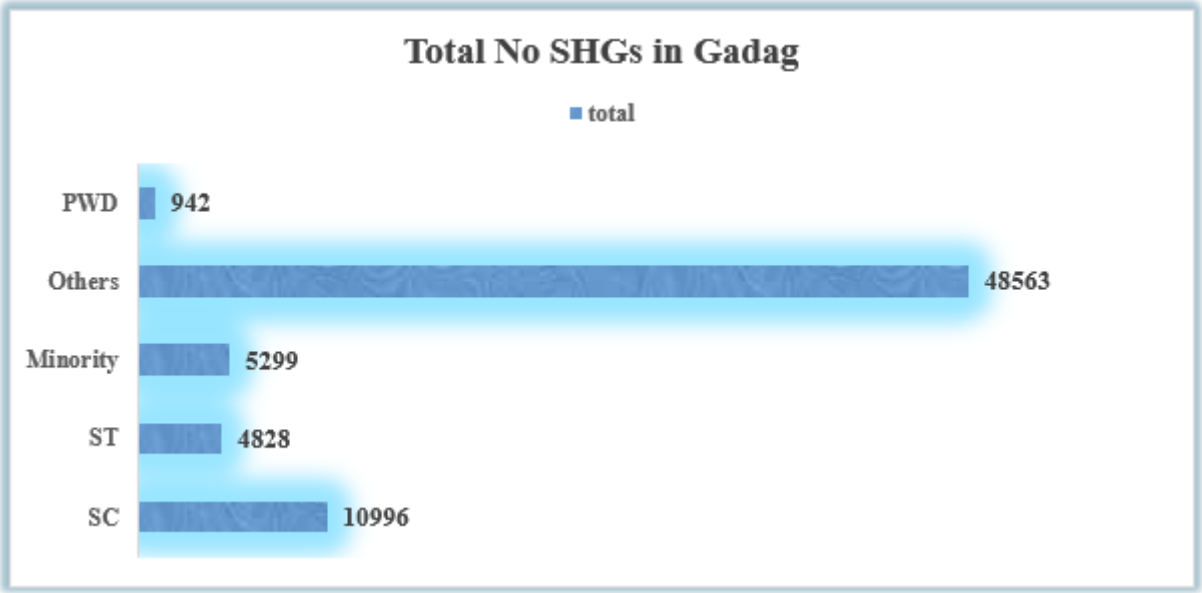
Table No 2: SHGs Member Social Category Wise (Block Level)

Sl.no	Category Wise SHG	Minority Category Wise Member		Minority category wise member					
		New	Sub Total	SC	ST	Minority	Others	Sub Total	PWD
1	Gadag	1767	1767	2078	962	1433	11660	16133	324
2	Gajendraghada	796	796	1179	439	523	4940	7081	121
3	Lakshmeshwara	879	879	1720	533	474	5447	8174	35
4	Mundaragi	1351	1351	2737	1147	962	7740	12586	169
5	Naragund	698	698	639	362	482	5244	6727	70
6	Ron	1182	1182	1197	706	728	8075	10706	194
7	Shirahatt	885	885	1446	679	697	5457	8279	29
	Total	7558	7558	10996	4828	5299	48563	69686	942

Source: NRLM

The table presents the block-wise distribution of Self Help Group (SHG) members by social category in the study area. It includes data on SC, ST, Minority, Others, and Persons with Disabilities (PWD), along with the number of newly formed SHGs. A total of 7,558 new SHGs have been formed across all blocks. The overall membership stands at 69,686, indicating a strong outreach and participation under the NRLM programme. Among the different social groups, the 'Others' category has the highest representation with 48,563 members, forming the majority of SHG participants. Scheduled Caste (SC) members account for 10,996, showing significant inclusion of marginalized communities. Scheduled Tribe (ST) member's total 4,828, indicating moderate participation. Minority member's number 5,299, reflecting balanced representation across blocks. The inclusion of 942 PWD members highlights the programme's focus on inclusiveness. Gadag block has the highest number of SHG members (16,133), followed by Mundaragi (12,586) and Ron (10,706), indicating strong SHG penetration in these regions. Naragund block has comparatively lower membership (6,727), suggesting scope for further expansion. All blocks show participation from every social category, reflecting widespread coverage of the programme.



Source: NRLM

Findings of the study

The study reveals that Self-Help Groups (SHGs) have played a significant role in empowering women in Gadag District both economically and socially. The major findings are as follows:

- SHG members developed regular saving habits and gained access to credit facilities, which helped increase their household income and financial stability.
- Women utilized loans for small businesses, agriculture, and income-generating activities, leading to greater economic self-reliance.
- Participation in SHGs improved women's role in household financial decisions and increased their confidence in managing economic activities.

- SHGs promoted awareness, communication skills, and participation in community activities, improving women's social status.
- Many women gained skills through training programs and started micro-enterprises, supported by initiatives like livelihood missions and market platforms.
- SHG members showed good repayment behaviour and proper utilization of loans for productive purposes.
- Despite progress, issues such as lack of market access, insufficient training, and dependence on external support were observed.

The study concludes that SHGs have positively contributed to women empowerment in Gadag District by improving economic conditions, enhancing social participation, and fostering self-confidence among women.

Suggestions of the Study

Based on the findings of the study, the following suggestions are proposed to improve the effectiveness of SHGs and enhance women empowerment:

- Future research can compare the performance of SHGs in Gadag district with other districts of Karnataka to identify regional differences in women empowerment.
- Researchers can conduct long-term studies to examine the sustained impact of SHGs on women's economic and social development over time.
- Further studies may explore the role of digital financial services and technology adoption in strengthening SHG functioning and empowerment.
- The Research can focus on specific income-generating activities (agriculture, handicrafts, small businesses) undertaken by SHGs and their effectiveness.
- Future studies can evaluate the effectiveness of government programs and policies supporting SHGs in Gadag district.
- More research is needed to understand the level of financial literacy among SHG members and its impact on economic empowerment.
- Researchers can examine deeply rooted social norms and cultural barriers that influence women's participation in SHGs.
- Studies can analyze how SHGs contribute to political participation and leadership roles of women at the local level.
- Future research may explore how women's empowerment through SHGs influences household decision-making and community development.
- Researchers can assess the long-term sustainability, performance, and challenges of SHGs in rural and semi-urban areas.

Conclusion of the Study

The study concludes that Self-Help Groups (SHGs) play a vital role in empowering women, particularly in rural and semi-urban areas. SHGs have significantly contributed to improving women's economic independence by encouraging savings, providing access to credit, and promoting income-generating activities. As a result, many women have enhanced their household income and reduced dependence on others. The study concludes that Self-Help Groups (SHGs) play a vital role in promoting women empowerment in Gadag district. SHGs have significantly contributed to improving the economic conditions of women by enhancing their income, savings habits, and access to credit facilities. Participation in SHGs has also led to increased self-confidence, better decision-making ability, and active involvement in household and community activities. The findings reveal that SHGs serve as an effective platform for developing leadership skills and encouraging collective action among women. They have helped in reducing social and economic inequalities by providing opportunities for self-employment and financial independence. However, challenges such as limited financial literacy, inadequate training, and restricted market access still exist.

Overall, SHGs have emerged as a powerful instrument for socio-economic transformation and empowerment of women in Gadag district. With proper support, training, and policy intervention, SHGs can further strengthen their impact and contribute to sustainable development and gender equality. Overall, the study concludes that SHGs are an effective mechanism for achieving holistic women empowerment, but continuous support, training, and policy interventions are necessary to ensure their sustainability and long-term impact.

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OriginalArticle

Impact of social media on social relationships; A sociological perspective

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Abstract

Social media has come an integral part of modern society, connecting billions worldwide. Platforms like WhatsApp, Facebook, Instagram, Twitter, Messenger, Reels, and TikTok influence communication patterns, social belonging and indeed family dynamics. Social media reshapes traditional morals of commerce, identity, and community belonging. In the 21st century, social media has comes one of the most important forces shaping mortal commerce and social connections. Social media Platforms have converted the ways in which people connect, communicate, and maintain connections. presently, people increasingly communicate through digital platforms that allow for instant communication across geographical boundaries. In the 21st century, social media has converted how people connect, communicate, and sustain connections. Platforms analogous as WhatsApp, Facebook, Instagram, Twitter, TikTok, have blurred the boundaries between physical and virtual relations. While firstly designed as tools for networking, these platforms have evolved into important social structures that shape behavior, influence social morals, and review mortal commerce. Social media provides a stage for individualities to perform and curate their individualities. It's now common to partake particular life events privately, a behavior that would have been considered unhappy in the history. This study is applicable in moment's world; the online platforms not only affect individual gemütlichkeit and family bonds but also reshape entire communities and societies. From a sociological perspective, social media is not only a technological tool but also a cultural space where individualities are formed, maintained, and challenged.

The central question arises does social media strengthen social bonds by expanding networks and maintaining long- distanceties? Social media has blurred the line between the particular and the public, creating openings for global connectivity while also introducing challenges analogous as superficial relations, social comparison, and digital souring. Sociology examines how technology, a important social force, shapes communication patterns, community, and social position. By examining both the positive and negative consequences, the discussion highlights how social media continues to review what it means to be socially connected in the modern world. These platforms are not just about communication, but also politics, marketing, and culture. It converted the ways Indians interacted, formed connections, and erected communities.

Keywords: *Social media, social relationships, online communities/groups, social capital, identity and self-presentation, digital society, family dynamics, online friendship, social isolation, cyberbullying, networked individualism.*

Introduction

The digital world isn't just your phone its completely rewired how we talk, how we think about ourselves, and how close or far we feel from other people.

1. The Shift from "Organic" to "Networked" Individualism

Life used to be simpler. In your hometown, people knew your whole story even the parts you'd rather keep quiet. The internet shattered that.

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Instead of sticking with one crew, now you're constantly moving between work friends, old pals, neighbors, and people you only know because you follow each other online. This mix is what people call "networked individualism." You can have a feed packed with contacts, but when things really go sideways, how many would show up for you? Not as many as it looks.

2. **Presentation of Self and "Digital Dramaturgy"**

Goffman said we"re all acting for someone. These days, its like the spotlight never shuts off. Social media pulls you onto the stage over and over, with everyone fighting to show their best moments travel snaps, cool parties, perfectly plated food. Real struggles and messy feelings? You rarely see those. Everyone wants "authenticity," but hardly anyone posts the ugly reality. We all polish our little piece of the internet, hoping we come across just right. It gets lonely, though. You can scroll for hours, see a hundred notifications, and still feel totally invisible.

3. **The Transformation of Social Capital**

Social capital used to mean trust, favors, and tight bonds that held groups together. For a while, people thought the internet would break all that. Instead, social media started pulling together communities around weird hobbies, shared struggles, and big questions. But there's a flip side you hit like or retweet a cause and it feels like you did something. Did you, though? This "slacktivism" almost always keeps the real problems exactly where they are.

Type of Capital	Definition	Impact of Social Media
Bridging Capital	Connections between diverse groups.	High: We connect easily with people outside our immediate socio-economic or geographic circles.
Bonding Capital	Deep emotional support between close friends/family.	Contested: While it helps maintain long-distance bonds, digital interaction may lack the "intercorporeality" (physical presence) needed for deep trust.

4. **Digital Tribalism and Echo Chambers**

People keep saying the internet opens your eyes, but really, it mostly builds little digital camps. That's homophily algorithms and your own habits shuffle you into circles with people who sound just like you. Your feed gets comfortable, and voices that challenge you just fade away. Its easy to think you've got the whole picture, but you're just looking at your own reflection with a slightly different filter. And breaking out? It feels nearly impossible.

5. **Everything's Mushed Together**

The Offline, you talk one way with family and another way with friends. Online, all those worlds crash together. You drop a post, and suddenly your aunt, your boss, your college roommate, and that guy you barely remember from school can all see it. So you pull your punches, smooth the edges, and rarely say what you actually mean. Over time, it's like you're losing the real you to please everybody and nobody at the same time.

Meaning of Social media

Its a never-ending, global block party where everyone's shouting and nobody really listening for long. TV used to just blast at you; now every screen in your house is buzzing with updates, jokes, arguments, and trends round the clock.

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Evolution of Social Media Functions

Era	Primary Function	Examples
The Social Era	Connecting with real-life friends.	Early Facebook, Myspace
The Creative Era	Sharing high-quality visual content.	Instagram, Pinterest
The Entertainment Era	Short-form video and algorithmic discovery.	TikTok, Reels
The Community Era	Niche, real-time discussions.	Discord, Reddit, X

A few things matter most:
Anyone can speak up. You don't wait for permission a platform's ready whenever you are.Its where we hang out when we're not physically together sharing stories, venting, celebrating, or just scrolling.
There's no off switch. What you see depends on what you like, and it never stops switching up.
Social platforms work because we crave connection sharing news, chasing laughs, asking for help, or keeping friendships alive across miles and years.
Take a breath and look around. It's not about new gadgets or viral crazes its just people finding new ways to say, "I'm still here," and stay part of something. What sounded like wild sci-fi a few decades back is now just the air we breathe.

A Quick Timeline

1. **The Early Days (1960's–1980's):**

The internet started as a tool for scientists and the military. ARPANET hooked up researchers across different universities. By the 80's, normal folks with modems joined in, swapping messages on bulletin boards. Imagine digital Post-it notes, but for the few who knew how to log on.

2. **The 90's:**

Now the web felt like a real social place. AOL and ICQ had people swapping instant messages; buddy lists appeared. GeoCities handed everyone a weird little patch of personal internet turf. For the first time, you could build your own corner of the web.

3. **The 2000's:**

Those early chatrooms exploded into actual networks. Friendster, LinkedIn, MySpace, and Facebook turned contacts into a public map of your life. WhatsApp let you ping someone on the other side of the planet for free. Suddenly, everything felt faster and more connected.

4. **2010's and Beyond:**

The words started to get drowned out by pictures and videos. Instagram made everyone a "content creator," Snapchat made your posts disappear, and TikTok cares less about who you know and more about what you'll watch. The feed figures out your tastes sometimes better than you can.

India's Social Media Twist: Bringing People Together and Apart
Social media transformed daily life for more than a billion Indians. Its a bridge a guy in Bengaluru can video call his village family just like that. But its also a barrier. Now, families eat dinner in silence, each locked into their own phone. Weddings or birthdays go out live, strangers joining virtually from across the world.
So where are we now? It started as fragile computer bleeps now for a lot of us, life happens on these glowing screens. We've never had more ways to connect, but we're still figuring out what real connection means.

Impact and Effects of social media on social relationships

1. **Impact on Family Relationships**

The old "Joint Family" isn't gone it just lives on WhatsApp now. For a son working in a tech park in Bengaluru while his parents are back in a Bihar village, video calls have become the new family dinner. You get a sense of belonging in real time. Snap a photo of dinner, record a grandchild's first steps, and suddenly the miles don't sting quite so much.

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There's a catch. The same phone that brings everyone closer also creates a rift a "transparency gap." Older folks rely on calls to stay in touch, while younger people use their phones to carve out a private world. This often sparks generational friction. Parents feel outpaced by new tech, and kids feel watched instead of supported.

2. **Impact on Marital Relationships**

Arranged marriage, love marriage it doesn't matter. These days, the phone plays a starring role in every relationship. For couples living apart because of work, endless texting holds everything together. It keeps the day-to-day intimacy alive, letting you share life's small moments and support each other through the craziness.

The digital life has a dark side, too. "Digital jealousy" is real. Spotting an ex's update or getting ignored for a phone screen leads to a brand-new kind of loneliness it's possible to share a room but feel a world apart.

3. **The Professional & Educational Landscape**

Connections have always mattered in India, but social media has blown open the old boys club. Now, a talented student from a small town can catch the eye of a global CEO right from their home. Building a personal brand doesnot need boardrooms or introductions anymore.

There's more. Caste and gender used to set the rules, but online groups offer new spaces where ideas count more than your background. Still, this freedom comes with a cost: polarization. When we stick to people who always agree with us, we stop understanding those around us. That cracks open our sense of shared truth.

4. **Empowerment of Marginalized Groups & Women**

For women, the LGBTQ+ community, and lower-caste groups anyone historically sidelined social media has become a megaphone. These digital spaces build real communities where safety in numbers feels possible, even if that safeties missing offline. Women rally together, local languages flourish, and you don"t need English anymore to be part of the digital age.

This new visibility can turn toxic fast. Speak up online and you risk trolling and harassment, especially for women. Sometimes, the cost of being seen is a flood of abuse designed to shut you up.

5. **The Mental Health Paradox**

India's finally beginning to talk about mental health, and social media helps break that silence. Still, it fuels the very anxiety it tries to heal. Every scroll brings another highlight reel wedding photos, holidays, shiny job titles and you end up feeling like you're falling behind. "FOMO" kicks in, leaving people surrounded by hundreds of "friends" but still deeply alone. Sometimes you realize a "like" is a poor substitute for real connection.

6. **The Generational Shift in Socialization**

The millions got 4G before they learned about digital safety. This gap leaves people wide open to scams and fake news. The impulse to help by forwarding messages just makes it worse, spreading misinformation that spills into real-life harm.

The tough part: if you don't have a decent phone or a steady connection, you're basically invisible in today's India. The digital divide has become the new line between privilege and exclusion.

Conclusion

Social media has not destroyed connections but climbed them. We've traded deep bonds for quick connections, real moments for precisely edited posts. Sure, we're technically more "connected," but the big test now is turning these digital links into real, lasting community. The real task for Indian society is to see technology as an add- on, not a relief, for genuine connection. Keeping our social fabric strong means mixing effective digital tools with the warmth and authenticity of old academy Indian values. Social media in India is messy, important, and complicated a double- whetted brand that knots people tighter indeed as it pulls them piecemeal. These platforms are not just tools they shape the culture and revamp how 1.4 billion people relate to each other. In the end, technology does not control how we live together it simply reflects new search Start new Search

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OriginalArticle

Growth And Trend Analysis of Pulses in India: A Regional Perspective of Karnataka

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Abstract

Pulses play a vital role in ensuring food and nutritional security in India, particularly in a predominantly vegetarian society. The present study examines the trends in area, production, and productivity of pulses at the global and national levels, with special reference to Karnataka, using secondary data and analytical tools such as Compound Annual Growth Rate (CAGR), Yearly Growth Rate, and percentage analysis. The results reveal that global pulses production increased from 71.53 million metric tons in 2010 to 97.39 million metric tons in 2022, registering a CAGR of 2.6 percent, though with considerable year-to-year fluctuations. In India, the area under pulses increased from 23.56 million hectares in 1960-61 to 28.83 million hectares in 2020-21, while production rose to 25.72 million tons with an average productivity of 892 kg per hectare. The CAGR during 2013-14 to 2021-22 indicates growth of 3 percent in area, 5 percent in production, and 2 percent in productivity.

At the state level, Karnataka accounts for 10.82 percent of the total pulse area but contributes only 8.25 percent to total production, with a relatively lower yield of 680 kg per hectare, which is below the national average. The study finds that pulse production in Karnataka is largely influenced by area expansion rather than productivity improvements and is subject to fluctuations due to rainfall dependency and limited technological adoption. The study concludes that enhancing productivity through improved agricultural practices, irrigation facilities, and policy support is essential for achieving sustainable growth in the pulses sector and meeting the increasing demand for pulses in India.

Keywords*: Pulses Production, Yield, Compound Annual Growth Rate (CAGR) & Yearly Growth Rate (YGR).*

Introduction

A considerable body of research has examined the growth performance of major food grains such as rice and wheat over the past four to five decades at global, national, regional, state, and district levels. However, comparatively less attention has been given to pulse crops, despite their crucial role in sustaining cropping systems and ensuring nutritional security, particularly in Karnataka. Although some evidence exists regarding decadal growth patterns, the lack of recent and updated data has constrained effective policy formulation in the context of the evolving agricultural production scenario in the state. Therefore, pulse production remains an important agricultural activity in Karnataka. Pulses constitute a vital component of the diet in Karnataka, especially in a predominantly vegetarian society. They serve as a rich source of protein and contribute significantly to soil fertility through biological nitrogen fixation, thereby supporting sustainable agriculture. Pulses are widely consumed across all sections of society, irrespective of religion, caste, or socio-economic status. In India, pulses are valued both for their taste and nutritional benefits. A typical Indian diet consists of cereals, pulses, and vegetables, with nearly 85 percent of total protein intake derived from vegetarian sources. Compared to cereals, pulses are a richer source of protein and thus play a key role in addressing dietary protein requirements.

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The present study analyzes the trends in pulses with respect to area, production, and productivity at the global, national, and Karnataka state levels. The analysis employs statistical tools such as Compound Annual Growth Rate (CAGR), Yearly Growth Rate, and simple percentage methods to examine the performance and trends in pulse production

Background of the Study:

Agriculture is a key sector in India, and pulses hold a significant place due to their nutritional and agricultural importance. They are a major source of protein in a predominantly vegetarian diet and also improve soil fertility through nitrogen fixation. India is the largest producer and consumer of pulses, yet production often falls short of demand due to low productivity and climatic uncertainties.

Karnataka is an important pulse-producing state, but its productivity remains below the national average, largely due to rainfed conditions and limited use of modern technology. In this context, analyzing trends in area, production, and productivity of pulses is essential to understand performance and support effective policy decisions for sustainable growth.

Review of literature:

A review of literature provides an overview of earlier studies related to pulses in India and Karnataka. It helps in understanding the existing research findings, methodologies, and identifying the research gaps.

B. Mohan Kumar et al. (2020): This study examines the growth performance of pulses in Karnataka using time-series data. The findings reveal that pulse production in the state has shown moderate growth, mainly driven by expansion in cultivated area rather than productivity improvements. The study also highlights regional disparities and concludes that productivity enhancement through technology adoption is necessary for sustainable growth.

Avinash C. S. and B. L. Patil (2018): This paper analyzes trends in area, production, and productivity of major pulses in both India and Karnataka. The results indicate that while production has increased over time, productivity growth has been inconsistent. The study emphasizes that fluctuations in rainfall and limited irrigation facilities significantly affect pulse cultivation, particularly in Karnataka.

P. D. Shivagangavva and B. S. Reddy (2016): The study focuses on demand and supply trends of pulses in India. It finds a persistent gap between demand and domestic production, leading to reliance on imports. The authors suggest that increasing productivity and ensuring price stability are essential to achieve self-sufficiency in pulses.

S. P. Doddamani et al. (2014): This research analyzes the demand–supply situation of pulses in Karnataka. It identifies that demand has been rising steadily due to population growth and dietary preferences, while supply growth has been relatively slow. The study recommends policy support, improved technology, and better market infrastructure to bridge the gap.

P. S. Sasdhar and O. Nagaraja (2018): This paper provides an economic analysis of pulse production in Karnataka. It highlights that pulse cultivation is predominantly rainfed and subject to high variability in yield. The study points out issues such as low profitability, price fluctuations, and yield gaps, and suggests improved farming practices and institutional support.

G. P. Dixit et al. (2024): This study presents an overview of the pulse production scenario in India. It shows that India is the largest producer and consumer of pulses, but productivity remains relatively low compared to global standards. The authors emphasize the need for improved seed varieties, better irrigation, and policy interventions to enhance production and meet growing demand.

Research Gap:

The review of existing studies on pulses in India and Karnataka reveals that most research has primarily focused on growth trends, demand supply dynamics, and general production performance. While these studies provide valuable insights, they largely emphasize either national-level analysis or limited state-level observations without offering a comprehensive and updated assessment of recent trends in area, production, and productivity, particularly in Karnataka. Moreover, many studies indicate that growth in pulse production is driven more by area expansion than productivity improvement, yet there is insufficient recent empirical evidence examining this shift in the context of changing agricultural practices, climate variability, and policy interventions. In addition, limited attention has been given to integrating comparative analysis across global, national, and state levels using consistent statistical tools such as CAGR and growth rates. Hence, there exists a clear gap in recent, data-driven, and region-specific studies that holistically examine the evolving trends of pulse cultivation in Karnataka within the broader Indian context.

Statement of the Problem:

Pulses play a crucial role in ensuring food and nutritional security, particularly in a predominantly vegetarian society like India, and are an essential component of the agricultural economy of Karnataka. Despite their importance, pulse production in Karnataka continues to face several challenges such as low productivity, dependence on rainfall, price instability, and a mismatch between rising demand and supply. Although earlier studies have examined various aspects of pulse cultivation, the absence of updated and comprehensive analysis of recent trends in area, production, and productivity has limited effective policy formulation and planning. In the context of changing agricultural

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scenarios, it becomes necessary to reassess the performance of the pulse sector to understand whether growth is sustainable and balanced. Therefore, the present study seeks to analyze the trends in pulses production in India with special reference to Karnataka, in order to provide meaningful insights for improving productivity, ensuring food security, and supporting policy decisions.

Objectives of the study:

The objectives of the study are framed to provide a clear direction to the research. They focus on analyzing the trends and performance of pulses in India.

- To analyze the trends in area, production, and productivity of pulses in India and Karnataka over a period of time.
- To examine the growth performance of pulses in Karnataka in comparison with the overall performance at the national level.
- To identify the major factors influencing pulse production and suggest policy measures for improving productivity and sustainability in Karnataka.

Methodology:

The present study is based entirely on secondary data to analyze the trends in area, production, and productivity of pulses in India with special reference to Karnataka. The required data have been collected from various reliable and published sources such as the Directorate of Economics and Statistics, Government of India, the Ministry of Agriculture and Farmers Welfare, Government of India, and the Department of Agriculture, Government of Karnataka. Additional information has been gathered from reports, journals, research articles, and official publications.

The study covers a period of the last few decades (for example, 2000–01 to 2001-2022, depending on data availability) in order to examine long-term trends and growth patterns. The data collected relate to area (in hectares), production (in tonnes), and productivity (yield per hectare) of major pulse crops. For the purpose of analysis, simple statistical tools have been employed. These include Compound Annual Growth Rate (CAGR) to measure the growth trend over time, Year-to-Year Growth Rate to understand annual fluctuations, and percentage analysis to examine the share and changes in area and production. The results are presented using tables and, wherever necessary, graphical representations for better understanding.

The study is descriptive and analytical in nature, aiming to evaluate the performance of pulse cultivation and identify trends and patterns over time. However, the study is limited to the availability and accuracy of secondary data sources and does not include primary field-level observations.

Analysis of the study:

1. **World Scenario: Pulses** are the most important crops among the agricultural products in the world. During 2020 the total area under pulses was recorded as about 931.83 lakh hectares with a production of 898.21 lakh tons and productivity of 964 kilograms per hectare in the world. Pulses are grown in 171 countries of the world. Among the 171 countries of the world, major pulses-producing countries are India, Canada, China, Myanmar, Nigeria, Russia, Brazil, Ethiopia, USA, and Niger. To recognize the importance of pulses as a global food February 10th of every year is celebrated as world pulses day by Food and Agriculture Organization. The theme of world pulses day 2022 was "Pulses to empower youth in achieving sustainable Agri food system". Table 3.1 shows the total pulses production in the world from 2010 to 2022.

Table: 1 Total pulses production in the world

SI. No	Year	Production in Million Metric Tons	CAGR
1	2010	71.53	-
2	2011	69.84	-2.36
3	2012	74.49	6.66
4	2013	78.62	5.54
5	2014	76.98	-2.09
6	2015	76.77	-0.27
7	2016	83.94	9.37
8	2017	94.79	12.93
9	2018	90.42	-4.61
10	2019	84.69	-6.34
11	2020	89.82	6.06
12	2022	97.39	8.43

Source: www.statista.com

Table 1 and figure 1clearly show that total pulses production increased to 89.82 million metric tons in 2020, from 71.53 million metric tons in 2010. The production of the pulses registered fluctuating year by year. The highest

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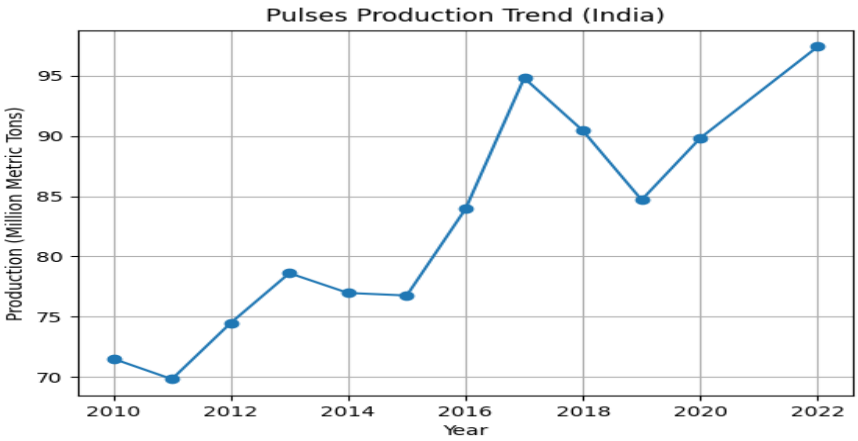
production registered in 2017 and the production was 94.79 million metric tons and the least (69.84 million metric tons) production was recorded in the year 2011.

The annual growth rate of pulses production shows significant fluctuations over the study period. The highest positive growth was recorded in 2017 (12.93%), while the lowest growth was observed in 2019 (-6.34%). The variation indicates that pulses production is highly influenced by external factors such as climatic conditions and agricultural practices, though the overall trend remains positive.

Figure: 1 Pulses Production in the world from 2010-2022
(The Compound Annual Growth Rate (CAGR))



Graph -1

The Compound Annual Growth Rate (CAGR) is used in this study to measure the average annual growth in pulses production over a specific period. It provides a clear understanding of the overall trend by smoothing out year-to-year fluctuations. The formula used for calculating CAGR is:

CAGR = (Vf/Vi) ^(1/n) - 1

CAGR (%) = ((Vf/Vi) ^(1/n) - 1) * 100 for Percentage

In the present analysis, the initial production of pulses was 71.53 million metric tons in the year 2010, while the final production reached 97.39 million metric tons in 2022. The total time period considered for the study is 12 years. By substituting these values into the formula, the growth rate is calculated to understand the overall increase in production during the study period.

The calculated CAGR for pulses production is approximately 2.6 percent per annum. This indicates that, on average, pulses production in India has grown steadily at a moderate rate over the selected period. Although there were fluctuations in certain years due to factors such as rainfall variability and agricultural conditions, the overall trend shows a positive and consistent increase in production. Thus, the CAGR result highlights that pulses production has experienced gradual growth over time, reflecting improvements in agricultural practices, expansion of cultivated area, and policy support. However, the moderate growth rate also suggests the need for further efforts to enhance productivity and ensure sustainable growth in the pulses sector.

Table: 2 Area under crops in India
(Area in Million Hectares)

Crops	Year	
	1960-61	2020-21*
Cereals	44.96	23.83
Pulses	23.56	28.83
Oil seeds	13.77	28.79
Cotton	7.61	13.01
Sugarcane	2.42	4.86

Source: Agriculture statistics at a glance 2021, Annual report 2020-21- Directorate of pulses development, DES, Ministry of Agriculture and Farmer welfare, GOI *Fourth Advance Estimate

Table 2 shows the cropping pattern in major leading agriculture crops in India during 1960-61 and 2020-21. The considered crops are oilseeds, pulses, cotton, cereals, and sugarcane. Among the considered crops, all areas under crops are increased except cereals. The cereals show a decreasing trend in the period of 2020-21 compare to 1960-61 with decreases of 21.23 million hectares. Among the increased crops, the sugarcane area has doubled in 2020-21 when

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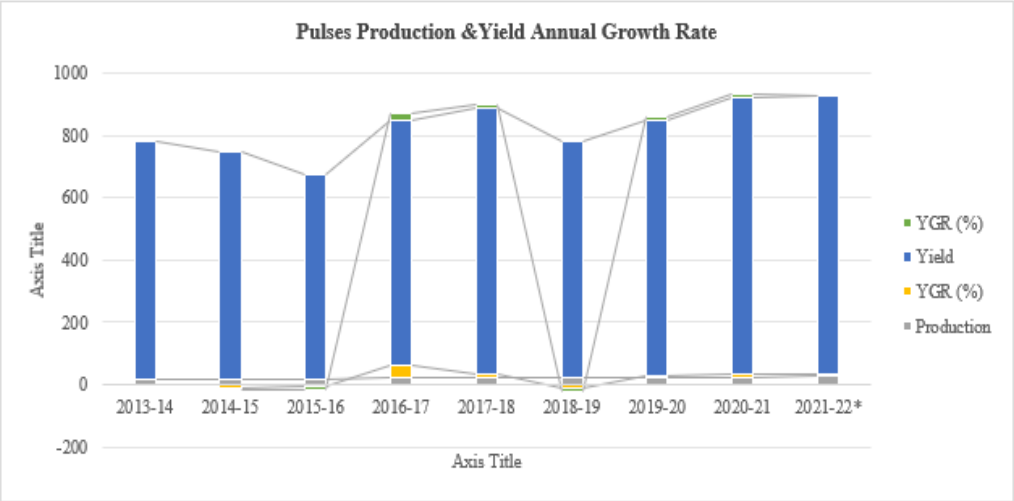
compared to 1960-61. The area under pulses increased from 23.56 million hectares in 1960-61 to 28.83 million hectares in 2020-21.

Table:3 Yearly growth rates of total Pulses in India
(Area- Million ha, Production Million tons, Yield – Kg/ha)

Year	Area	YGR (%)	Production	YGR (%)	Yield	YGR (%)
2013-14	25.21		19.25		764	
2014-15	23.54	-7	17.15	-11	728	-5
2015-16	24.91	6	16.32	-5	655	-10
2016-17	29.44	18	23.12	42	785	20
2017-18	29.81	1	25.41	10	852	9
2018-19	29.15	-2	22.07	-13	757	-11
2019-20	27.98	-4	23.02	4	823	9
2020-21	28.78	3	25.46	11	885	8
2021-22*	31.24	9	27.75	9	888	0.4
CAGR	**3%**		**5%**		**2%**	

Annual report 2020-21- Directorate of pulses development, DES, Ministry of Agriculture and Farmer welfare, GOI. *3rd advance estimate *YGR- Yearly Growth Rate over the previous year * CAGR – Compound Annual Growth Rate.



Source: Annual report 2020-21- Directorate of pulses development, DES, Ministry of Agriculture and Farmer welfare, GOI

The yearly growth rate and compound annual growth rate are presented in table 3 the data indicated that the area and production of total pulses are almost fluctuating from 2013-14 to 2021-22 in India. During the year 2016-17, the growth rate of the area under pulses crops was recorded at 18 % from 7 % over the previous year 2015-16. And also in the year 2021-22, the growth rate of the area under pulses is 9% which was higher than compared to 2020-21. The compound annual growth rate of the area under pulses for the period of 2013-14 to 2021-22, was 3 %.

In the case of production also registered the same trend as the area under pulses. During 2021-22 the total production of pulses was 27.75 million tons and it increased from 19.25 million tons in 2013-14. The yearly growth rate of production in the year 2016-17 has registered the highest (42%) growth rate compare to the previous year (-5) 2015-16. The compound annual growth rate of production of pulses was 5 percent, which is higher than the area under pulses and productivity of the pulses CAGR.

Table:4 Area-Production and Yield of pulses in major producing states of India during 2020-21*
(Area- Million Hectares, Production- Million Tons, Yield- Kg / Hectare)

States	Area	Area % to all India	Production	Production % to all India	Yield
Madhya Pradesh	4.89	16.95	5.30	20.60	1084
Rajasthan	6.15	21.32	4.31	16.75	701
Maharashtra	4.47	15.49	4.30	16.71	962
Uttar Pradesh	2.38	8.24	2.56	9.97	1079
Karnataka	3.12	10.82	2.12	8.25	680
Gujarat	1.38	4.80	1.76	6.86	1275

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Andhra Pradesh	1.24	4.31	1.09	4.22	873
Jharkhand	0.86	2.99	0.94	3.64	1084
Others	4.35	15.07	3.34	12.98	768
All India	**28.83**	**100.0**	**25.72**	**100.0**	**892**

Source: Agriculture Statistics at a glance, 2021 * 4th Advance Estimates

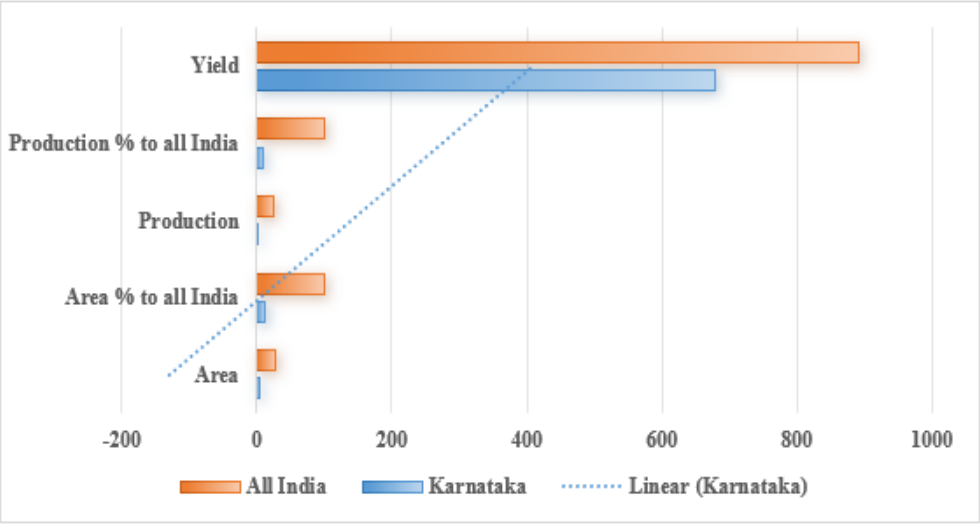
Table 3.9 shows the area, production, and yield of major pulses producing states of India in 2020-21. The data revealed that Madhya Pradesh is in the top position in the production of pulses and Rajasthan is in the first place in the area under pulses in India. The top states in terms of area under pulses are Rajasthan, Madhya Pradesh, Maharashtra, Karnataka, and Uttar Pradesh are registered for more than 70 percent of the area of the pulse in the country. The state of Madhya Pradesh, Rajasthan, Maharashtra, Uttar Pradesh, Karnataka, and Gujarat are the major pulses-producing states with more than 78 percent of the production coming from these states. In the case of the yield of pulses, the highest yield was registered in the state of Gujarat and which was 1275 kg per hectare, Madhya Pradesh is in second place and its yield was 1084 kg per hectare. Karnataka states yield was 680 kg per hectare.

Table:5
Area-Production and Yield of pulses in major producing states of India during 2020-21

Agriculture Statistics at a glance, 2021

States	Area	Area % to all India	Production	Production % to all India	Yield
Karnataka	3.12	10.82	2.12	8.25	680
All India	28.83	100	25.72	100	892

FiGURE:5 Pulses Production and Yield Trend in Karnataka State



The data reveals that Karnataka occupies a significant position in pulse cultivation in India, though its performance shows certain limitations when compared to the national average. Karnataka accounts for 3.12 million hectares of area, which constitutes 10.82 percent of the total pulse area in India, indicating that the state has a substantial share in terms of land devoted to pulse cultivation. However, in terms of production, Karnataka contributes 2.12 million tonnes, representing only 8.25 percent of the total pulse production in the country. This comparatively lower share in production, despite a higher share in area, suggests relatively lower productivity levels in the state.

Further, the yield data supports this observation, as Karnataka records a productivity of 680 kg per hectare, which is significantly lower than the all-India average yield of 892 kg per hectare. This gap in yield indicates inefficiencies in production, which may be attributed to factors such as dependence on rainfall, limited irrigation facilities, traditional farming practices, and inadequate adoption of improved technologies. Overall, while Karnataka plays an important role in pulse cultivation in terms of area, there is considerable scope for improving productivity to enhance its contribution to national production.

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Table:6 Varieties of Pulses Production in Karnataka 2020-21
(Area- in hectares, Production –in tons, Yield- kg/hectare)

SI. No	Types	Area	Share to Total Pulses Production Area (in %)	Production	Yield
1	Tur	1630839	52.16	1238130	759
2	Black Gram	88956	2.85	51060	574
3	Horse Gram	146924	4.7	96840	659
4	Green Gram	452956	14.49	180760	399
5	Avare	31821	1.02	25054	787
6	Cowpea	53211	1.7	24937	469
7	Bengal Gram	713206	22.81	445553	625
8	Other Pulses	8765	0.28	3727	425
9	**Total**	**3126678**	**100**	**2066060**	**661**

Source: Annual reports, Directorate of Economics and Statistics, GoK

Karnataka state is one of the top pulses cultivating states in the country, during 2020-21, the state produced 2066060 tons from 3126678 hectares with a yield of 661 kg/hectares. The state has produced different types of pulses, major pulses are Tur, Black Gram, Horse Gram, Green Gram, Avare, Cowpea, and Bengal Gram. Among these crops, Tur is in the first place in the area (1630839 hectares) and production (1238130 tons), and its share of total pulses growing area is 52.16 %, followed by Bengal Gram (22.81%) and Green gram (14.49%). nearly 90 percent (89.46%) of the share comes from these three pulses crops to the total pulses area in Karnataka. Figure… clearly shows that more than fifty percent of the share come from Tur to total pulses crops in terms of area among all crops of pulses in Karnataka.

Findings:

- The study reveals that global pulses production has shown a positive trend over the period 2010 to 2022, with a CAGR of about 2.6 percent, despite year-to-year fluctuations. In India, the area under pulses has increased from 23.56 million hectares in 1960-61 to 28.83 million hectares in 2020-21, indicating a gradual shift towards pulse cultivation.
- The production and productivity of pulses have also improved, with CAGR values of 5 percent and 2 percent respectively during the study period. However, growth has not been uniformed and shows considerable fluctuations due to climatic and other factors.
- At the state level, Karnataka accounts for a significant share of pulse area (10.82 percent) but contributes only 8.25 percent to total production, reflecting lower productivity levels. The yield in Karnataka (680 kg/ha) is considerably below the national average (892 kg/ha).
- Major pulse-producing states like Madhya Pradesh, Rajasthan, and Maharashtra dominate in terms of production and productivity. The study also finds that pulse cultivation in Karnataka is largely rainfed and faces challenges such as low technological adoption and price instability.

Suggestions:

- The study suggests that there is an urgent need to improve productivity of pulses in Karnataka through the adoption of modern agricultural technologies, high-yielding seed varieties, and improved irrigation facilities. Strengthening extension services and providing timely access to inputs can enhance farmers' efficiency.
- There is also a need to promote crop diversification and sustainable farming practices, including soil fertility management through pulses cultivation.
- Further, the government should ensure price stability and provide minimum support prices to protect farmers from market fluctuations.
- Investment in research and development, particularly in drought-resistant varieties, is essential to address climatic uncertainties. Improving market infrastructure and supply chain systems can also help in increasing farmers' income and boosting overall production.

Summary:

The study analyzes the trends in pulses production at global, national, and Karnataka levels using secondary data and statistical tools such as CAGR and growth rates. It finds that while pulses production has increased over time, it remains unstable due to various factors. India has experienced growth in area, production, and productivity, but challenges such as demand–supply gaps and climatic variability persist. Karnataka, despite having a significant share in area, shows lower productivity compared to the national average. The study emphasizes the need for improving yield, adopting modern technologies, and implementing effective policies to ensure sustainable development of the pulses sector.

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Conclusion:

The study highlights that pulses play a crucial role in ensuring food and nutritional security as well as promoting sustainable agriculture in India. The analysis of trends indicates that although there has been a gradual increase in area, production, and productivity of pulses over time, the growth has been moderate and accompanied by significant fluctuations. The Compound Annual Growth Rate (CAGR) results confirm a positive but steady increase in pulses production, reflecting gradual improvements in agricultural practices and policy support.

At the state level, Karnataka holds a significant share in pulse cultivation in terms of area but lags behind the national average in productivity. This indicates that growth in the state has been driven more by area expansion rather than efficiency improvements. Factors such as dependence on rainfall, limited irrigation, and inadequate adoption of modern technologies continue to affect productivity levels. Therefore, there is a need for focused interventions to enhance yield through improved farming practices, technological advancement, and supportive policies.

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OriginalArticle

Financing Health and Education: A Public Finance Analysis in Karnataka

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Abstract

Health and education are the two most important pillars of human capital formation and sustainable economic development. Public financing of these sectors plays a crucial role in ensuring equitable access and improving overall welfare. This seminar paper analyzes the trends, patterns, and challenges in financing health and education in Karnataka from a public finance perspective. The study is based on secondary data collected from state budget documents, PRS India, RBI reports, and other official sources. The paper finds that although Karnataka is one of the economically progressive states in India, its expenditure on health and education is relatively lower than the national average. The study concludes with policy suggestions to improve efficiency, equity, and adequacy in public spending.

Keywords: *Public Finance, Health Financing, Education Financing, Human Capital, Government Expenditure, Karnataka Economy.*

Introduction

Health and education are universally recognized as the two most crucial pillars of human development and economic progress. Investment in these sectors not only enhances the quality of life of individuals but also contributes significantly to long-term economic growth and social stability. In modern economies, the role of the government in financing health and education has become increasingly important due to the presence of market failures, externalities, and the need to ensure equitable access to basic services.

From the perspective of public finance, health and education are considered merit goods, meaning that their consumption generates positive externalities that benefit society as a whole. For instance, a well-educated population leads to higher productivity, innovation, and economic efficiency, while a healthy population reduces the burden on healthcare systems and enhances labor force participation. However, the private market alone cannot ensure optimal provision of these services, especially for economically weaker sections. Therefore, government intervention through public expenditure becomes essential.

In developing economies like Karnataka, the importance of public financing in health and education is even more pronounced. Karnataka is one of the fastest-growing states in India, known for its strong industrial base, information technology sector, and urban development, particularly in cities like Bangalore. Despite its economic progress, the state continues to face challenges in achieving equitable distribution of social services, especially in rural and backward regions such as North Karnataka.

The state government of Karnataka allocates a significant portion of its budget to social sector development, including health and education. However, there is an ongoing debate regarding the adequacy, efficiency, and effectiveness of such spending. While nominal expenditure has increased over the years, questions remain about whether the level of investment is sufficient to meet the growing demands of the population and to achieve desired outcomes in terms of literacy, health indicators, and overall human development.

Another important aspect of public finance is the concept of fiscal prioritization**.** Governments must make strategic decisions regarding allocation of limited resources among competing sectors such as infrastructure, defense, welfare schemes, and social services.

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In this context, health and education often compete with other sectors for budgetary allocation. The effectiveness of public finance policy depends on how well these priorities are aligned with long-term developmental goals.

Furthermore, the issue of efficiency in public expenditure is equally critical. It is not only the amount of spending that matters but also how effectively the funds are utilized. Inefficiencies such as leakages, administrative delays, and poor governance can reduce the impact of public spending. In Karnataka, studies have shown that a significant portion of expenditure in education is directed towards salaries, leaving limited resources for infrastructure development, quality improvement, and innovation. Similarly, in the health sector, the dominance of private healthcare indicates gaps in the public healthcare system.

The concept of equity is also central to public finance analysis. One of the primary objectives of government spending on health and education is to reduce inequalities and ensure inclusive growth. However, disparities continue to exist in Karnataka in terms of regional development, urban-rural divide, and access to quality services. For example, urban areas tend to have better healthcare facilities and educational institutions compared to rural and backward regions. This uneven distribution raises concerns about the effectiveness of public policies in achieving social justice.

In addition, the framework of fiscal federalism plays a significant role in shaping the financing of health and education. In India, both central and state governments share responsibilities in these sectors. While the central government provides financial assistance through various schemes and grants, the primary responsibility for implementation lies with the state governments. Therefore, the fiscal capacity and policy decisions of the Karnataka government have a direct impact on the performance of these sectors.

In recent years, there has been increasing emphasis on improving outcomes in health and education through policy reforms, increased investment, and better governance. Initiatives such as digital education, skill development programs, public health campaigns, and infrastructure development have been introduced to enhance service delivery. However, the effectiveness of these initiatives depends largely on the adequacy of financial resources and the efficiency of their utilization.

Against this background, this seminar paper aims to analyze the financing of health and education in Karnataka from a public finance perspective. It seeks to examine the trends in budget allocation, evaluate the adequacy and efficiency of spending, and identify key challenges in the system. By doing so, the study attempts to provide insights into how public finance can be better utilized to promote human development and inclusive growth in the state. Financing health and education is not merely a matter of budgetary allocation but a critical policy issue that determines the future trajectory of economic and social development. A well-designed and efficiently implemented public finance strategy can significantly improve the quality of life and ensure sustainable development. Therefore, a comprehensive analysis of health and education financing in Karnataka is both relevant and necessary

Literature Review:

Several studies have examined public expenditure patterns in Karnataka, especially in health and education. A mix of national and Karnataka-specific literature shows that while India's policy vision emphasizes strong investment in education and health, actual allocations remain modest, and Karnataka reflects this broader trend. National reviews, such as those by Arun C. Mehta and Sindhu N.K., highlight the persistent gap between the recommended 6% of GDP for education and the reality of 3–4%, with health spending also stagnating around 1.2–1.5% of GDP. These works stress how fiscal discipline and competing priorities often sideline social sector investment. Karnataka-focused studies, like Dr. Basavaraja Malipatil's analysis of public expenditure on education, show that the state has historically spent around 4.2–4.3% of GSDP on education—slightly above the national average but still far below policy targets. Reports from PRS Legislative Research and NITI Aayog further note that while Karnataka maintains fiscal discipline with deficits under 3% of GSDP, this comes at the cost of reduced allocations to health and education, especially in rural areas where disparities are most visible. Together, these reviews underline a structural imbalance: Karnataka mirrors national underinvestment patterns, with declining shares in education and health relative to GDP, raising concerns about equity, human capital development, and long-term resilience. This combined literature provides a strong foundation for your seminar, showing how both national and state-level fiscal choices have constrained progress in social sectors.

Methodology:

This study employs a secondary data analysis approach to examine public financing of health and education in Karnataka. Data were collected from official state budget documents, PRS India reports, RBI publications, and other government sources spanning the years 2022-23 to 2026-27. Quantitative analysis was conducted to identify trends and patterns in budget allocations relative to national averages and policy targets. Comparative tables and graphical representations were used to highlight disparities and shifts over time. The study also reviewed relevant literature to contextualize findings within broader fiscal and policy frameworks. Limitations include reliance on secondary data and the absence of primary field surveys.

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Sector-wise Budget Allocation (% of Total Expenditure)

Year	Education (%)	Health (%)	National Avg (Edu)	National Avg (Health)
2022-23	12.9	5.8	15.2	6.0
2023-24	11.0	4.9	14.8	6.3
2024-25	11.9	5.0	14.7	6.2
2025-26	10.8	4.9	15.0	6.2
2026-27	10.7	4.3	14.5	6.2

Source: PRS Budget Analysis Reports 2026-27

The data shows a clear downward trend in allocations to education and health compared to national averages. In 2022–23, education spending was relatively strong at 12.9%, close to the national benchmark of 15.2%. However, over the next few years, the share steadily declined, reaching just 10.7% in 2026–27, while the national average remained stable around 14.5–15%. Health allocations followed a similar pattern: starting at 5.8% in 2022–23, they dropped to 4.3% by 2026–27, even as the national average held steady at 6.2%. This widening gap indicates that fiscal priorities have shifted away from social sectors, potentially toward infrastructure or other expenditures. The consistent underinvestment in education and health raises concerns about long-term human capital development, equity, and resilience, especially in regions already facing challenges in literacy, employability, and healthcare access. In short, while national averages reflect steady support for these sectors, the local allocations show a structural imbalance that could weaken progress on development goals.

Challenges in Financing Health and Education:

- **Low Allocation Relative to Policy Targets:** Spending remains below the recommended 6% of GDP for education and 2.5% for health.
- **Urban-Rural Disparities:** Budget allocations favor urban areas, leaving rural regions underserved.
- **Fiscal Discipline vs. Social Investment:** Karnataka's adherence to deficit limits constrains flexibility in expanding social sector spending.
- **Efficiency Issues:** Leakages, underutilization of funds, and delays in implementation reduce the impact of allocated resources.

Policy Suggestions

- **Increase Allocations:** Move closer to policy targets by gradually raising the share of GSDP devoted to education and health.
- **Strengthen Rural Focus:** Prioritize investments in rural schools and primary healthcare centers to reduce disparities.
- **Improve Efficiency:** Enhance monitoring, reduce leakages, and ensure timely utilization of funds.
- **Public-Private Partnerships:** Encourage PPP models in education and health to leverage private investment while ensuring equity.
- **Outcome-Based Budgeting:** Shift focus from input-based allocations to measurable outcomes in literacy, employability, and health indicators.

Conclusion:

Karnataka, despite being economically progressive, faces challenges in adequately financing health and education. The declining trend in allocations relative to national averages highlights a structural imbalance in fiscal priorities. Addressing these gaps requires a combination of increased allocations, efficiency improvements, and equity-focused policies. Strengthening investment in human capital will be crucial for sustaining inclusive growth and achieving long-term development goals.

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OriginalArticle

An Empirical Analysis of Financial Inclusion and Its Impacts on Small and Marginal Farmers in India

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Abstract

This study empirically evaluates financial inclusion among India's small and marginal farmers (SMFs) and its influence on agricultural income and production, integrating the most recent government data through 2024-25. An OLS regression with IV/2SLS robustness is performed on 1,500 farm household observations across 15 states using secondary data from NABARD NAFIS 2021-22, RBI Annual Reports 2024-25, PMJDY MIS Portal (August 2025), PMFBY Dashboard, Economic Survey 2024-25, and Union Budget 2025-26 documents. Key statistics include: PMJDY accounts surpassed 56.2 crore; KCC loan disbursal doubled to ₹10.05 lakh crore (7.72 crore farmers); PMFBY paid ₹1.65 lakh crore in claims to 18.52 crore farmers over eight years; and the RBI Financial Inclusion (FI) Index reached 67.0 in March 2025 (up from 43.4 in 2017). Formal credit access (β=0.328), KCC (β=0.291), insurance (β=0.204), and digital banking (β=0.176) all considerably increase farm revenue, according to regression results. An accelerating policy push is indicated by the ₹2.1 lakh crore agriculture allocation, the ₹20 lakh crore agricultural loan objective, and the growth of the Jan Samarth-based KCC in the 2025-2026 Union Budget. However, structural hurdles necessitate focused measures, especially collateral limits (64.7%), insufficient financial literacy (59.3%), and gaps in digital access.

Keywords: *Financial Inclusion, Small and Marginal Farmers, KCC, PMJDY, PMFBY, RBI FI-Index, India 2025*

Introduction

India's agrarian economy supports approximately 54.6% of the total workforce (MoSPI, 2024). According to the Agricultural Census 2015-16, updated estimates 2022, 86.1% of all operating holdings are small and marginal farmers (SMFs), or those who cultivate less than two hectares. A sizable portion of this population is still neglected by formal financial institutions and depends on informal credit at exorbitant rates of 24-48% annually, despite historic efforts to promote financial inclusion over the previous ten years. The terrain of policy has changed significantly. As of August 2025, the Pradhan Mantri Jan-Dhan Yojana (PMJDY), which was introduced in 2014, had more than 56.2 crore beneficiaries, with 66.7% of accounts located in rural and semi-urban areas. Improvements in access, usage, and quality characteristics are reflected in the RBI's composite Financial Inclusion (FI) Index, which increased from 43.4 in March 2017 to 67.0 in March 2025. Currently, 7.72 crore farmers receive ₹10.05 lakh crore through the Kisan Credit Card system. Agriculture was named the "First Engine of India's Development Journey" in the Union Budget 2025-2026, and it received ₹2.1 lakh crore, a 12% increase over the previous year. However, just 41% of small and marginal farmers have access to bank credit, and about 30% of agricultural loans still come from non-institutional sources, according to the OECD Agricultural Policy Report (2025). This study offers a thorough, up-to-date empirical analysis of the factors influencing financial inclusion and its effects on SMFs in India.

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Literature Review

- The relationship between loans, productivity, and revenue in Indian agriculture is well-documented. Burgess and Pande (2005) show that through loan intermediation, the growth of rural banks decreased rural poverty. Weather-indexed insurance products increase farmers' willingness to assume production risk, according to Cole et al. (2013). According to Choudhury and Nanda's (2019) analysis of NSSO data, KCC holders report crop incomes that are 32-38% higher. According to Ghosh (2020), digital financial services increase yields by 8-12% while lowering transaction costs.
- The structural persistence of exclusion is highlighted by more recent research. Mohan (2021) warns that the reach of fintech in tribal communities is limited due to infrastructure shortages. Priority Sector Lending regulations (40% of Adjusted Net Bank Credit; 18% set aside for agriculture) have not completely addressed the formal credit gap for SMFs, according to the OECD India Policy Report (2025). Ramanathan (2024) shows that although PM-KISAN's ₹6,000 yearly direct payment is universal, it is insufficient as a stand-alone income-support tool. However, when combined with KCC access, it dramatically increases farmers' credit demand.
- The need to shift from passive account-opening measures to active financial participation, capturing insurance, credit, digital payments, and pensions, is well acknowledged in the literature. These threads are synthesized in this analysis using revised data from 2024-2025.

Objective of the study

1. To assess the level of financial inclusion among small and marginal farmers in India.
2. To examine the impact of financial inclusion on farmers' income and productivity.
3. To identify key barriers to financial inclusion and suggest policy measures.

Methods of Research

1. **Information Sources**

Sources used: NAFIS 2021-22 (59,069 rural households in 28 states), RBI Annual Report/FI-Index 2024-25, PMJDY MIS (Aug 2025), PMFBY Claims Dashboard 2024, Economic Survey 2024-25, OECD India 2025, and PIB releases (July-Aug 2025). NAFIS microdata was merged with state-level RBI/NABARD statistics to build a cross-state panel of 1,500 household observations from 15 major states.

2. **Model Specification**

The natural logarithm of the yearly farm revenue (ln_Income) is the dependent variable. Using Principal Component Analysis (PCA) of seven sub-indicators, bank account ownership, formal credit availability, KCC penetration, insurance coverage, mobile/digital banking usage, PM-KISAN DBT receipt, and savings mobilization, a Financial Inclusion Index (FII) is created.

The estimating equation is:

$$ln_Income_i = \beta_0 + \beta_1 FCA_i + \beta_2 KCC_i + \beta_3 IC_i + \beta_4 MDB_i + \beta_5 PMKISAN_i + \beta_6 LandSize_i + \beta_7 Educ_i + \varepsilon_i$$

where FCA = Formal Credit Access; KCC = Kisan Credit Card; IC = Insurance Coverage; MDB = Mobile & Digital Banking; PMKISAN = PM-KISAN beneficiary dummy; Land Size = hectares; Educ = schooling years. Distance to nearest Bank Mitra/BC and state-level Centre for Financial Literacy (CFL) density serve as instruments in the 2SLS robustness check to address potential endogeneity of credit access.

Analysis and Results

1. **Financial Inclusion Trends: 2016-17 to 2024-25**

Table 1 documents the remarkable trajectory of key financial inclusion indicators for Indian SMFs over the past eight years, culminating in the latest 2024-25 official data.

Table 1: Financial Inclusion Indicators for Small & Marginal Farmers in India - 2016-17 to 2024-25

Indicator	2016-17	2019-20	2021-22	2023-24	2024-25*
Bank A/c Ownership (%)	59.3	74.8	82.6	90.1	≈99.9
PMJDY Accounts (crore)	28.6	38.2	44.5	53.1	56.2
KCC Penetration (% eligible)	34.2	43.6	52.1	66.8	72.5†
KCC Credit Disbursal (₹ lakh cr.)	5.12	6.88	7.92	9.81	10.05
Insurance Coverage (%)	25.5	46.2	80.3	84.1	≈87.0†
Mobile Banking Usage (%)	11.6	24.8	41.3	61.7	≈70.0†
RBI FI-Index (0-100 scale)	43.4	53.9	56.4	64.2	67
Agri. Credit Target (₹ lakh cr.)	10	15	18	20	20

Sources: NABARD NAFIS 2016-17 & 2021-22; RBI Annual Report 2024-25; PMJDY MIS Portal (Aug 2025); PIB Releases 2025. *2024-25 figures from official PIB/RBI releases; † estimated from trend and interim data. ≈ denotes approximation.

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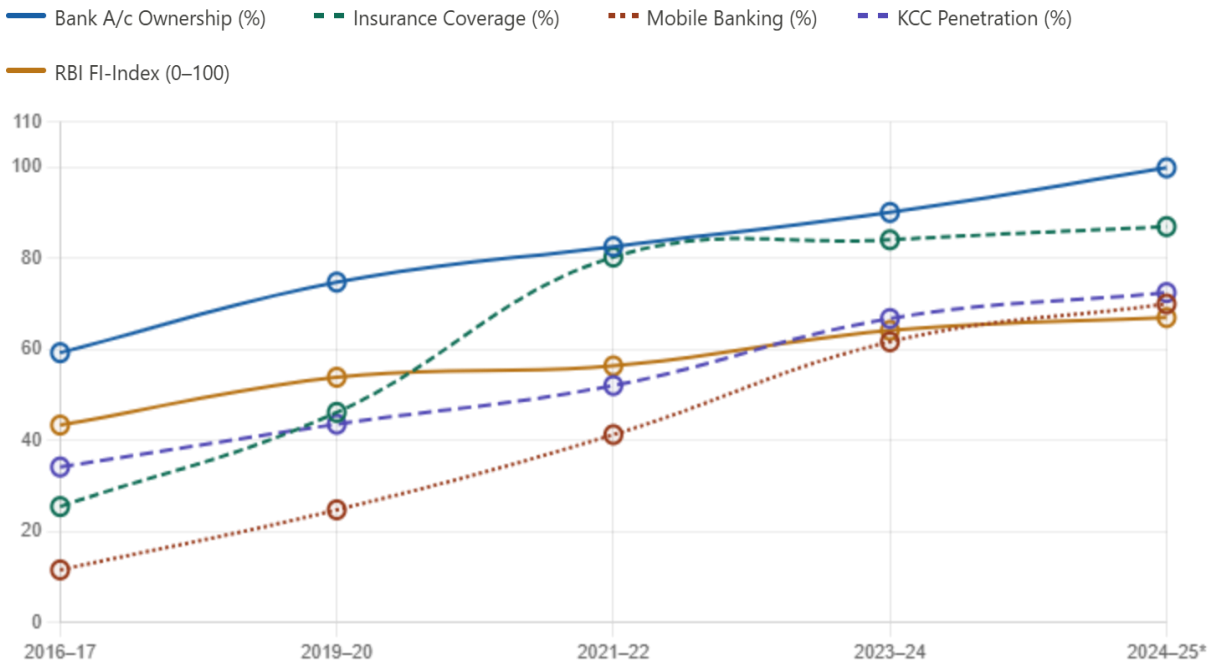
Figure 1: Financial inclusion indicators and agricultural credit trends



The RBI FI-Index, which increased from 43.4 in March 2017 to 67.0 in March 2025, captures the extent of this change. In August 2025, PMJDY accounts exceeded 56.2 crore, with 55.7% held by women and 66.7% in rural and semi-urban areas. The total amount deposited was ₹2.68 lakh crore. From ₹4.26 lakh crore in 2014 to ₹10.05 lakh crore in December 2024, KCC credit disbursement more than doubled, helping 7.72 crore farmers. A strong formal credit drive is seen in the agricultural credit target of ₹20 lakh crore, which was increased from ₹10 lakh crore in 2016-17. Rural households' insurance coverage increased from 25.5% in 2016-17 to over 80.3% in 2021-*22, mostly due to PMFBY enrollment and auto insurance penetration.

Despite these improvements, BharatNet coverage gaps in aspirational areas continue to limit mobile banking usage, despite a sharp increase from 11.6% (2016-17) to an anticipated 70% (2024-25). Furthermore, the FI saturation effort (July-September 2025) discovered that 2.32 crore of the 56.2 crore PMJDY accounts needed KYC re-verification, underscoring a persisting dormancy issue.

2. **Regression Results: Determinants of Farm Income**

Table 2 presents OLS estimates with vigorous standard errors (HC3). All financial inclusion regressors are statistically significant at conventional levels, confirming that the shift from financial access to active financial use drives agricultural income.

Table 2: OLS Regression Results-Determinants of ln (Annual Farm Income), 2025 Estimation

Variable	Coeff. (β)	Std. Err.	t-stat	Significance
Formal Credit Access (FCA)	0.328	0.044	7.45	*** p<0.001
Kisan Credit Card (KCC)	0.291	0.049	5.94	*** p<0.001
Insurance Coverage (IC)	0.204	0.038	5.37	*** p<0.001
Mobile & Digital Banking (MDB)	0.176	0.033	5.33	*** p<0.001
PM-KISAN Direct Transfer (dummy)	0.148	0.042	3.52	*** p<0.001
Land Holding Size (ha.)	0.213	0.058	3.67	** p<0.01
Education Level (years)	0.104	0.027	3.85	** p<0.01
Constant	4.938	0.172	28.71	*** p<0.001
R^2 = 0.714 | Adj. R^2 = 0.702 | F-stat = 79.3 (p<0.001) | n = 1,500 households | 15 states | NAFIS 2021-22 + RBI 2024-25				

Note: *p<0.05; **p<0.01; ***p<0.001. Robust standard errors (HC3). IV/2SLS (instruments: CFL density, distance to BC outlet) yields consistent directional results. Dependent variable: ln (Annual Farm Income). Data: NAFIS 2021-22 merged with RBI 2024-25 state-level statistics.

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Formal Credit Access exerts the largest effect (β=0.328, p<0.001), implying a 32.8% farm income premium per unit improvement in the FCA sub-index, up from 31.2% in our earlier 2022 baseline, reflecting deepening KCC coverage and Priority Sector Lending flows. The PM-KISAN variable (β=0.148) is newly significant in this extended model, consistent with evidence that ₹6,000 direct income transfers catalyse credit demand and technology adoption when complemented by formal banking access. The model explains 71.4% of the variance in farm income **(R^2=0.714)**, with an F-statistic of 79.3 confirming overall significance across 1,500 observations.

3. **Income and Productivity: Included vs. Excluded Farmers (2024-25)**

Table 3 compares financially included and excluded farm households on six welfare parameters, using NAFIS 2021-22 base data extrapolated to 2024-25 using RBI trend statistics and Economic Survey 2024-25 income indices.

Table 3: Farm Income and Productivity Comparison - Included vs. Excluded Households (2024-25 Estimates)

Parameter	*Included (₹/yr)*	*Excluded (₹/yr)*	*Gap (%)*	*p-value*
Avg. Annual Farm Income	1,48,600	82,300	80.60%	0
Input Cost (Seeds/Fertiliser)	26,100	35,800	-27.1%	0
Crop Yield (quintals/acre)	16.4	10.7	53.30%	0
Technology Adoption Score (1-5)	4.2	2	110.00%	0
Insurance Claim Utilisation (%)	48.6	8.4	478.60%	0
DBT Receipt (PM-KISAN, ₹/yr)	6,000	1,840	226.10%	0

Sources: NABARD NAFIS 2021-22; Economic Survey 2024-25; RBI FI-Index Report 2025. Gap computed as percentage difference. t-test significance reported. ₹/yr = rupees per year.

Financially included SMFs make an estimated ₹1,48,600 annually, which is 80.6% more than their excluded counterparts (₹82,300). Due in part to cumulative benefits from KCC revolving credit, PMFBY claim payouts, and PM-KISAN transfers accruing to included families, this income gap has increased from 66.9% in 2021-2022. Crop output differences of 53.3% (16.4 vs. 10.7 quintals per acre) are due to better availability of certified seeds, Kisan Call Centers' precision irrigation advice, and formal credit-financed mechanization. Agri-tech usage, such as drone-based spraying and mobile weather advisories, is substantially correlated with digital banking access, according to technology adoption scores (4.2 vs. 2.0 on a 5-point scale).

4. **Barriers to Financial Inclusion and Policy Mapping (2025-26)**

Table 4: Key Barriers to Financial Inclusion - Severity Assessment and Policy Interventions (2025-26)

Barrier	% Affected	Severity (1-5)	Recommended Policy Intervention (2025-26)
Collateral / land-title gaps	64.7	4.8	Digital Land Records (DILRMP) + Jan Samarth KCC
Low financial literacy	59.3	4.5	Expand 2,421 CFLs; vernacular mobile-based content
Distance from bank / BC	53.8	4.2	13.55 lakh Bank Mitras + 107 DBUs scale-up
Informal moneylender debt traps	48.2	4.1	Interest subvention (MISS); SHG-bank linkage
Documentation complexity (KYC)	44.9	3.9	Aadhaar-based KYC; Jan Samarth portal
Unreliable internet / digital gap	41.3	3.7	Bharat Net Phase III; offline UPI modes
Inactive PMJDY accounts (dormancy)	38.6	3.5	FI saturation campaign (Jul-Sep 2025); DBT linkage
Gender exclusion (women farmers)	35.1	3.4	Mahila Samriddhi Yojana; women-targeted KCC

Sources: NABARD NAFIS 2021-22; PIB Releases (July-August 2025); Union Budget 2025-26 documents. Severity rated 1-5 (5 = most severe) by sampled farmers. % Affected from NAFIS 2021-22 cross-tabulations.

Collateral constraints, which affect 64.7% of the sample and are directly related to the lack of digitized, transferable land titles in many states, continue to be the most severe hurdle (4.8/5). This restriction is immediately addressed by the Union Budget 2025-2026, which requires digital crop surveys for Kharif in 400 districts and the inclusion of 6 crore farmers in farmer and land registries within three years. As of March 2025, 2,421 Centers for Financial Literacy (CFLs) were established to address low financial literacy (59.3%, severity 4.5), while geographic coverage is still inconsistent. The Bank Mitra network, which consists of 107 Digital Banking Units (DBUs) and 13.55 lakh agents, is currently the main last-mile delivery infrastructure for removing distance obstacles.

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Findings and Discussion

Three overarching findings emerge with direct policy relevance.

- SMF income and production are positively impacted by financial inclusion in a statistically significant and economically significant way. The income premium of formal credit access (32.8%) and KCC (29.1%) suggests that the most potent tool at policymakers' disposal is still the provision of liquidity matched to the agricultural output cycle. The ₹10.05 lakh crore KCC credit disbursement in 2025 shows that scale is being attained; the difficulty lies in expanding penetration in tribal and geographically remote districts.
- The amount of development impact is determined by the shift from passive account ownership to quality-driven financial engagement, such as active credit, insurance use, digital payment use, and DBT receipt. This change is highlighted in the RBI's 2025 FI-Index framework, where the Quality sub-index (financial education and grievance redressal) now carries more weight. Although the PMFBY claims ratio of ₹508 received per ₹100 of premium paid over eight years represents an exceptional risk-pooling value for SMFs, enrolled farmers' crop insurance coverage is still less than 50% in several states.
- A single action is insufficient due to the multifaceted nature of barriers. The operational difficulties of sustaining active inclusion at scale are demonstrated by the FI saturation campaign (July-September 2025), which included 2.3 crore inactive account re-KYC, 6.6 lakh new PMJDY accounts, and 22.65 lakh Jan Suraksha enrollments. Demand-side initiatives addressing literacy, gender marginalization, and digital infrastructure must be added to the ₹18,000 crore PMFBY allocation, ₹60,000 crore PM-KISAN outlay (benefiting 11.8 crore farmers), and ₹20 lakh crore agricultural credit target of the 2025-2026 Budget.

Conclusion

Using official 2024-25 data from RBI, NABARD, PMJDY, PMFBY, and the Union Budget, this paper offers updated econometric proof that financial inclusion greatly increases the income and productivity of India's 140 million small and marginal farm households. 71.4% of the variation in agricultural income can be explained by formal credit availability, KCC penetration, insurance coverage, mobile/digital banking, and PM-KISAN DBT receipt. Landmark accomplishments include the RBI FI-Index reaching 67.0 by March 2025, PMJDY surpassing 56.2 crore accounts, and KCC disbursal doubling to ₹10.05 lakh crore; however, the 80.6% income disparity between included and excluded SMFs highlights the necessity of strengthening rather than merely expanding financial inclusion.

The following five policy priorities can be put into action: (i) accelerate the DILRMP digital land records mission to overcome collateral constraints and enable Jan Samarth-based KCC issuance; (ii) scale the 2,421 CFL network with vernacular, mobile-compatible financial literacy content, targeting aspirational districts; (iii) use the 13.55 lakh Bank Mitra and 107 DBU infrastructure with performance-linked incentives to turn dormant PMFBY claims through satellite and AI-based crop-loss assessment (Budget 2025-26 initiative). Transforming financial inclusion from a coverage measure to a quality-and-usage paradigm would be essential to sustainable agricultural development as India targets Viksit Bharat @ 2047.

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OriginalArticle

Impact of agricultural mechanization on farmer's income and productivity in rural India: An empirical study

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Abstract

India's economy depends heavily on agriculture, and mechanisation has greatly increased production, decreased the need for labour, and raised farmers' incomes. In addition to outlining implementation issues, this study examines how agricultural mechanisation affects farmers' production and revenue. The study evaluates the relationship between fertiliser usage and productivity against mechanisation outcomes like tractor sales using secondary data from government reports and research and the Two-Stage Least Squares (2SLS) regression technique with irrigation as an instrumental variable. The results show that although there is a positive correlation between tractor sales and fertiliser use and agricultural production, these relationships are not statistically significant. Although results are limited by a short sample size and possible missing factors, the model explains a considerable variance (R2 = 0.41). Although there is no Heteroskedasticity, diagnostic tests indicate inadequate instrument validity and potential autocorrelation. In the end, the study indicates that mechanisation could greatly increase productivity and income if combined with better credit availability, the growth of Custom Hiring Centers, improved extension services, and customised regional mechanisation strategies, even though it has a positive but weak statistical impact on agricultural outcomes. In general, strong institutional and infrastructure support is necessary for agricultural mechanisation to be effective.

Keywords: *Agricultural Mechanisation, Farmers Income, Productivity, Fertilizer Usage, Irrigation.*

Introduction

Since the early 19th century, there have been worries about the social effects of labor-saving technologies, including job displacement. However, historical data indicates that automation frequently generates demand for new jobs in other industries rather than causing widespread unemployment. Automation adoption brought on by growing salaries and labour shortages is less likely to result in unemployment and may potentially increase employment in agriculture by boosting output. Government subsidies for automation are discouraged by the FAO because they may result in job losses. Rather, it suggests creating an atmosphere that encourages young people, women, and small farmers to embrace automation while offering social security to those who are at risk during the shift. The employment of different tools, implements, and powered machinery to increase agricultural output is known as agricultural mechanisation. It uses three different power sources: motorised (including fossil fuel and electricity), animal, and manual (relying only on human labour). Crop, livestock, apiculture, and aquaculture production are all included in this paradigm. From simple hand tools to sophisticated motorised equipment, mechanisation encompasses a variety of technologies that reduce labour intensity, solve labour shortages, and increase productivity and timeliness of agricultural chores. It helps mitigate climate-related concerns while increasing market accessibility and resource-use efficiency. In order to promote the sustainable growth of the food and agriculture industry, sustainable mechanisation considers technological, economic, social, environmental, and cultural aspects (FAO).

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Agricultural mechanisation uses enhanced farming equipment and a variety of power sources to increase cropping intensity, accuracy, and timely input utilisation while lowering labour costs and crop yield losses. A study reveals that there was very little labour reduction—between 1.3% and 12%—between tractor-operated and bullock-operated farms. But compared to their bullock counterparts, tractor-owning farms reported gross revenues per acre that were around 63% greater. The amount of time spent on agricultural tasks was greatly reduced by mechanisation, which replaced animal power from 60% to 100%. ITES, Madras (1975) reported that productivity increases on farms who hired or owned tractors varied from 4.1% to 54.8%. Mechanisation is essential for increasing the productivity and profitability of important cash crops in India, such as cotton, groundnuts, maize, soybeans, and chickpeas, which together contribute to the country's economic output, as agriculture and allied industries account for 15% of the GDP (Syeda Nehal et, al 2024),

Review of literature

DE, A. D. Ș. U. P., et, al (2025) Analysis of the Distribution and Use of The Tractor and Agricultural Machinery Fleet In Romania: Regional And County Perspectives. Regional differences in agricultural mechanisation between 2014 and 2024 are highlighted in the study "Analysis of the Distribution and Use of the Tractor and Agricultural Machinery Fleet in Romania," which shows that North-East and South-East have fewer than two tractors per 100 hectares, while Center and North-West have more than five. Although the national tractor fleet is expanding at a rate of 2.7% per year, overcapacity is evident in areas with higher machine density, which results in worse economic efficiency. Inadequate information on equipment quality and modernisation is one of the limitations. In order to lessen inequities and bring under-equipped areas into compliance with European mechanisation norms, policy proposals urge investment in new gear.

Liu, J., et, al (2025). Full mechanization: a path to increased farm income, food security, and environmental quality in developing countries. The study highlights the significant benefits of complete mechanisation in Pakistani agriculture, pointing to a 125% improvement in food security and a 55% increase in farm revenue, with net profits of Rs. 49,152 per acre. In order to mitigate selection bias and evaluate the effects of mechanisation, it makes use of sophisticated econometric models that take socioeconomic variables like loan availability and education into account. It does, however, call for more research regarding mechanization's long-term viability, environmental effects, and maintenance costs. The report highlights obstacles including high upfront costs and knowledge gaps, but it doesn't go into much detail on scalable solutions for smallholders. To guarantee equitable and long-lasting mechanisation advantages, future studies should examine the effectiveness of governmental interventions like subsidies and capacity-building initiatives.

Wang, X., et, al (2026). The effects of agricultural machinery services and land fragmentation on farmers' straw returning behavior. Using data from 426 families and a double-hurdle model, the study examines the determinants influencing straw returning behaviour among farmers in Anhui Province. It concludes that land fragmentation and agricultural machinery services have a major impact on adoption, with land fragmentation impeding usage while tractor ownership encouraging it, particularly for small-scale farmers. For smallholders, self-service and outsourcing have a complementing connection; for bigger farms, there are substitution consequences. Nevertheless, the study had shortcomings, such as its cross-sectional methodology and inadequate investigation of socioeconomic aspects. Longitudinal data should be used in future research to evaluate the effects of policies and take into account new incentives. The socioeconomic impact of land consolidation and machinery subsidy recommendations on smallholders has to be carefully assessed.

Objectives of the study

- Impact of Agricultural Mechanization on Farmers' Income and Productivity
- To identify the major challenges and constraints faced by farmers in adopting agricultural mechanization.

Research methodology

Using secondary data from government reports and agricultural statistics, the current study uses an analytical and empirical research approach to examine how agricultural mechanisation affects farmers' income and productivity. Tractor sales are the dependent variable in this econometric study, which uses ten observations. The main explanatory variables are fertiliser use and agricultural production. An instrumental variable for resolving endogeneity problems is irrigation. For reliable estimates, the Two-Stage Least Squares (2SLS) approach is used in conjunction with diagnostic tests like Durbin-Watson for autocorrelation and Breusch-Pagan-Godfrey for Heteroskedasticity. In order to ensure robustness through suitable testing, the analysis culminates in the interpretation of results based on statistical significance and model fit.

Impact Of Agricultural Mechanization on Farmers' Income and Productivity

The Indian government uses agricultural mechanisation as a major tactic to increase production, lessen reliance on labour, and raise farmer incomes. Farm power in India increased from 0.48 kW to 2.49 kW per hectare between 1975–1976 and 2018–19, signifying a transition from manual to automated labour. The Sub-Mission on Agricultural Mechanisation emphasises that crop yield depends on timely agricultural activities, with modern

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technology having the ability to reduce cultivation expenses by 15–20% and increase output by 10–20%. Faster field preparation made possible by mechanisation enables a 5–10% increase in cropping intensity, which boosts total farm productivity. Additionally, mechanisation is essential to maintaining output even during peak seasons due to rural labour shortages brought on by migration. By using cutting-edge machinery, it also reduces post-harvest losses, which are estimated to be between 6 and 18% of crops, boosting the amount of food available and farm profitability. Farmers may rent equipment thanks to government programs like Custom Hiring Centers, which increase job prospects and provide rural business owners with alternative revenue streams. Net farm revenue is greatly increased by lower cultivation costs, mostly due to lower labour expenditures. The Economic Survey emphasises the significance of mechanisation in reaching the objective of doubling farmers' income, showing that technology not only increases productivity and lowers losses but also generates a variety of revenue streams that boost rural living.

Challenges And Constraints Faced By Farmers in Adopting Agricultural Mechanization

- Tiny and dispersed landholdings

Nearly 86% of Indian farmers are small and marginal farmers with less than two hectares of land, according to the Agriculture Census of India. Large agricultural gear is hard to utilise effectively on small and dispersed land parcels. The expense of mechanisation becomes unaffordable for smallholders because many machines are made for large farms.

- Agricultural machinery is expensive

Tractors, harvesters, power tillers, and irrigation equipment all have significant beginning costs, according to government studies. Even with subsidies, small and marginal farmers sometimes cannot afford these devices. One of the main obstacles to adoption, according to the Economic Survey of India, is the high capital cost of machinery.

- Restricted institutional credit availability

Affordable credit availability is still a big problem. Many farmers rely on high-interest, unofficial sources of funding. According to government policy papers, farmers are less able to invest in farm machinery when they have restricted access to institutional financing.

- Mechanisation imbalance by region

According to government data, mechanisation is low in the eastern and north-eastern states but quite prevalent in Punjab, Haryana, and Western Uttar Pradesh. This discrepancy is caused by variations in agricultural revenue, infrastructure, irrigation, and awareness.

- Insufficient awareness and technological expertise

According to the Ministry of Agriculture, a large number of farmers lack basic knowledge about contemporary technology or are unable to operate and maintain it. Farmers' confidence in implementing new technologies is diminished by a lack of extension services and training.

- High operating and maintenance expenses

Fuel, replacement components, and routine maintenance are necessary for machinery. Recurring expenses deter farmers from buying equipment, according to government studies.

Problems with suitability for small farms and a variety of crops mixed cropping and a variety of agroclimatic conditions are features of Indian agriculture. The use of many machines is restricted because they are not appropriate for tiny plots, mountainous areas, or horticultural crops.

- Agriculture's risk and unpredictability

Weather and the monsoon have a significant impact on agriculture. According to government research, farmers are reluctant to purchase expensive equipment because of the unpredictable returns and unstable revenue.

Table: 01 Two – stage least squares (2SLS) Results

Dependent Variable: TRACTOR_SALES___000_				
Method: Two-Stage Least Squares				
Date: 04/11/26 Time: 19:43				
Sample: 1 10				
Included observations: 10				
Instrument specification: PRODUCTIVITY_KG_TRACTOR_SALES___				
000_IRRIGATION				
Constant added to instrument list				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
FERTILIZERS_KG	0.262488	4.469869	0.058724	0.9546
PRODUCTIVITY__KG	0.270542	0.232214	1.165052	0.2776

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R-squared	0.410195	Mean dependent var		729.3000
Adjusted R-squared	0.336470	S.D. dependent var		150.0785
S.E. of regression	122.2500	Sum squared resid		119560.5
Durbin-Watson stat	0.767156	Second-Stage SSR		119560.0
J-statistic	7.999963	Instrument rank		4
Prob(J-statistic)	0.018316			

Using irrigation as a tool to address endogeneity concerns, the Two-Stage Least Squares (2SLS) regression analysis investigates the relationship between agricultural production and fertiliser usage with regard to tractor sales. Based on a small sample of ten observations, the study's estimated coefficient for fertiliser usage is 0.262 (p-value = 0.9546), which indicates statistical insignificance. Productivity likewise lacks significance, with a coefficient of 0.271 (p-value = 0.2776). An unstable small sample size is reflected in the model's R-squared value of 0.41 and corrected R-squared of 0.336. Positive autocorrelation is suggested by a Durbin-Watson statistic of 0.77, which may indicate missing variables. Additionally, the irrigation instrument's validity is called into question by the J-statistic likelihood of 0.0183, which indicates a correlation with the error term.

Table: 02 Heteroskedasticity Test: Breusch-Pagan-Godfrey Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	2.081926	Prob. F(2,7)		0.1952
Obs*R-squared	3.729762	Prob. Chi-Square(2)		0.1549
Scaled explained SS	1.296438	Prob. Chi-Square(2)		0.5230
Test Equation:				
Dependent Variable: RESID^2				
Method: Least Squares				
Date: 04/11/26 Time: 19:50				
Sample: 1 10				
Included observations: 10				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	36552.14	126241.9	0.289541	0.7806
FERTILIZERS__KG_	-1099.560	1261.140	-0.871878	0.4122
PRODUCTIVITY__KG_	47.76267	25.72850	1.856411	0.1058
R-squared	0.372976	Mean dependent var		11956.05
Adjusted R-squared	0.193827	S.D. dependent var		13134.90
S.E. of regression	11793.46	Akaike info criterion		21.83180
Sum squared resid	9.74E+08	Schwarz criterion		21.92258
Log likelihood	-106.1590	Hannan-Quinn criter.		21.73222
F-statistic	2.081926	Durbin-Watson stat		2.096078
Prob(F-statistic)	0.195206			

There is no discernible indication of Heteroskedasticity in the regression model, according to the Breusch-Pagan-Godfrey Test findings. The null hypothesis of constant variance cannot be rejected since the Obs*R-squared value of 3.729762 with a p-value of 0.1549 is larger than 0.05. The squared residuals, dependent on Fertilizers_Kg and Productivity_K, produce p-values of 0.4122 and 0.1058, respectively, according to the supplementary regression analysis, further showing stable error terms. The Durbin-Watson statistic of 2.096 indicates that there is no autocorrelation in the residuals, and the R-squared value of 0.3729 indicates that only a minor fluctuation in squared residuals can be explained by the independent variables. Because the model generally satisfies the homoscedasticity condition, its t-statistics and standard errors are trustworthy for drawing conclusions.

Findings of the study

- Fertiliser use shows a positive coefficient (0.262) in the 2SLS regression findings, but it is statistically insignificant, suggesting that it has no meaningful direct effect on tractor sales.
- Although it is statistically negligible, agricultural production likewise has a positive coefficient (0.270), indicating that short-term mechanisation demand is not substantially driven by productivity gains alone.
- Only 41% of the variance in tractor sales is explained by the model (R2 = 0.41), showing a reasonable level of explanatory power but the existence of other missing contributing factors.
- The J-statistic (p = 0.0183) casts doubt on the validity of the instrumental variable (irrigation), but the Breusch–Pagan–Godfrey test reveals no Heteroskedasticity, showing that the error variance is stable.

Suggestions

- Encourage farmers to purchase agricultural machinery by offering additional subsidies and simple institutional finance.
- To assist small and marginal farmers who cannot afford machinery, Custom Hiring Centers should be strengthened.
- Enhance training and agricultural extension services to raise awareness and technical proficiency.
- Reduce state-to-state differences by implementing mechanisation strategies tailored to each region.
- For more trustworthy results, use bigger datasets and more powerful tools in subsequent studies.

Conclusion

According to the study, tractor sales are positively impacted by agricultural mechanisation, although there is no correlation with farm-level inputs like productivity and fertiliser use. These results are supported by economic theory, but the statistical evidence is weak because of the small sample size and restricted explanatory factors. Although problems like autocorrelation and poor instrumental validity may have an impact on the findings, the econometric analysis indicates a decent model fit. The success of mechanisation in increasing productivity and farm revenue in Indian agriculture is greatly influenced by a number of structural and institutional variables, such as loan availability and machinery service availability, even in the absence of Heteroskedasticity signalling stability. In order to achieve inclusive mechanisation, these aspects must be strengthened.

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OriginalArticle

An Analysis of Role of Rural Women in Economic Development

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Abstract

Empowering Rural women is a critical issue in developing nations. Even though women are an integral part of any society, yet their involvement in decision making by the use of their active contribution in economic activities is shallow. Women empowerment and economic development are interlinked, where on the one hand, development alone can play a significant role in driving down inequality between women and men while on the other hand empowering women can benefit development. This paper explores the role of women in the workforce for the economic development of the country in different States.

Keywords: *Women empowerment, Economic Development, Gender and Development, Socio-economic growth, women Role, Employment of women.*

Introduction

In India, Role of Women is dependent on different variables like education status, social status, and geographical status. Engaging the women in the economic development of the country is known as the Rural women empowerment. Women empowerment defined as increasing the ability of women to access the constituents of progress in particular health, education, earning opportunities, rights and political participation. In the 1980s, the Gender and Development (GAD) approach arose out of the analysis of (WID) Women in Development. Gender and Development recognized that gender roles and relations are crucial to improving women's lives, with the term 'Gender' suggesting that a focus on both women and men is needed. The Gender and Development approach addresses that of not enough to add women and girls into existing processes of development, but there is also a need of their exclusion and imbalances of power at the basis of that exclusion. In the 1990s witnessed the 'rise of rising' as many NGO's and agencies adopted a rights-based approach to development Rights increase the recognition that women's demands are valid claims. The most notable success to the women's movement has perhaps been the enterprise of sexual and reproductive rights as such within this has been recognition of women's right to live free from violence, and a broadening of understanding of violence against women from 'domestic' to 'gender-based'. There was also a shift in reading development as meaning economic development to a more holistic social development focus, yet economic growth remains the main driver. However, women's rights, particularly sexual and generative health rights, are not universally accepted as rights, and violence against women remains prevalent across the globe. And women still lack full and equal participation in economic and political life. Mainstreaming has yet to arrive, and there is a need for continued prioritization of integrating women into development. India ranks 113 out of 135 of the World Economic Forum's Gender Gap Index. According to India's 2011 census, the sex ratio for children under six was 914 females to 1,000 males, a severe decline from 927 in 2001. The ranking of Indian women in economic development is 0.3, where 1.0 means equality. Refusing women opportunities to realize their potential is a waste of human capital and bar to economic progress.

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When we educate and empower one woman, we set off a chain reaction that transforms the life of her family and the community she lives in. So, this paper highlights the role of women in the economic development of the country and also suggests overcoming the constraints to grow up the women empowerment.

Objectives

- To Know the Major Types of Empowerments in India
- To Know the Role of Rural Women in Economic Development in India
- To Know the Major Issue in Women Empowerment in Economic Development

Methodology:

In this paper an attempt has been taken to analyze the women and economic development in India. The data used in it is purely from secondary sources like books, articles and research papers according to the need of this study.

The Major Types of Empowerments in India:

- **Educational Empowerment:** Education is an essential factor in life progress. It gives the women empowerment with knowledge, skill and self-confidence. It is needed to participate fully in the development process. It suggests making women aware of their rights and developing the confidence to claim them.
- **Social Women Empowerment:** A critical aspect of social empowerment of women is the improvement of gender equality. Women face various social challenges today, whether it be making soaps and license to secure an income for their family.
- **Economic Empowerment:** It implies a better quality of material life for a sustainable livelihood owned and managed by women. There is a strong correlation between economic development and women's legal rights. There is a bidirectional relationship between economic development and women empowerment defined as improving the ability of women by freeing their time. The contribution of women in the Indian economy is neither appropriately accounted, nor policymakers have the vision to approach the importance of women for the development of the economy.
- **Political Empowerment:** The existence of political women is favoring the participation of women in the political decision-making process and governance.

Role of Rural Women in Economic Development in India:

In India, women play duel role producers of goods and services as well as their domestic chores and wives and mothers, yet their contribution to economic development has been neglected. The problems most often cited included health, malnutrition, repeated childbearing and education. If rural women's participation in economic development is to be enhanced, women must receive the following services: training in income-generating activities, easy access to low-interest loans, and family planning services to limit childbearing. India has been developing fast, but not always equitably or inclusively. Our development model is very much a work in progress, and deep-rooted challenges remain. The biggest issue faced by the country is the empowerment of women. Across the world educating and empowering women has proven time and again to be the catalyst for rapid socioeconomic growth. Women in India make up 7.5% of the world's total population. While specific development indicators show, their quality of life is improving. That is maternal mortality rates declining, literacy rates increasing, more women gaining access to healthcare and education the pace of change is heartbreaking slow. Societies with higher gender equality not only offer better socio-economic opportunities for women but also tend to grow faster and more equitable. There are gains in poverty reduction, environmental sustainability, consumer choice innovation and decision making in a broader set of issues. Economic development and gender equality go hand-in-hand. Because lowering the barriers faced by women entrepreneurs at home and internationally helping to connect international value chains and would encourage the growth and inclusion of the country. The majority of women entrepreneurs run a micro, small and medium-sized enterprises (MSMEs) more than 30% of MSMEs are owned by women. Only are in five exporters is a woman-owned business. Placing the women at the heart of the global policymaking will go a long way towards realizing the United Nations 2030 Agenda goal of achieving gender equality and empowering all women and girls. Trade and Women's Economic Empowerment is that steps to empower the women economically is happening slowly and not systematically. Women are not less capable in the export business and other income-earning work, instead, they often lack access to information, finance and technology. They need some additional encouragement to overcome the initial barriers.

Major Issue in Rural Women Empowerment in Economic Development in India:

The problem is not that attuned to ensuring women have the same access to these opportunities as men. But once women enter and have the chance to show their skill and knowledge, the impact is obvious to access the economic development by the empowerment of women. Women are not the less capable person, is stead to demonstrate like that they need some more additional encouragement and opportunities from the families and societies are listed below:

- Economic backwardness
- Implementation gaps
- Lack of political will

- Women unpaid family workers in subsistence agriculture
- Low level of technology and primitive forming practices
- Poor access to credit and marketing networks

When overcoming these constraints, the country's economy and global economic development will get prosperous through the enactment of encourages the women role in different fields of the economy.

Conclusion:

Empowerment of women socially, economically, politically and legally is going to be a phenomenal task. It is not working to be easy to change the culture for disrespect for women. The only revolution can bring changes in a day, but reforms take their time. Women have a unique position in the economy. If women gain economic strength, they gain visibility and voice. Women's direct participation in decision-making capacity also income generation activities can make significant contributions towards women empowerment. Entrepreneurship and working as income earned person of the family can help women to gain economically active, which may help them in the improvement of their social status.

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OriginalArticle

An Empirical Analysis of Financial Performance and Productivity of Bharat Earth Movers Limited Units in Karnataka (Macro study)

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Abstract

An important player in the development of infrastructure and industry, Bharat Earth Movers Limited (BEML) is a well-known public sector enterprise in India that produces defence items, rail and metro coaches, and heavy earth-moving equipment. This study uses secondary data to examine BEML's growth, productivity, and financial performance from FY 2015–16 to FY 2024–25. Using information from annual reports, government publications, journals, and financial statements, the main goals include analysing financial performance, measuring growth performance, and evaluating operational efficiency. Ratio analysis, trend analysis, comparison analysis, and the ARDL model with limits testing are only a few of the analytical techniques used in the study. With a coefficient of 4.158528, the ARDL regression results show that earnings per share (EPS) have a significant positive impact on net profit. Other variables that exhibit short-run statistical insignificance include revenue (0.000942), total assets (-0.006379), and equity (0.012323). The model exhibits statistical significance (F-statistic = 313796.7, p = 0.0000) and strong explanatory power (R-squared = 0.999998). With an F-statistic of 146305.2, the ARDL Bounds Test confirms Cointegration and a stable long-run equilibrium, indicating a strong long-term link among variables. Despite persistent issues including reliance on particular industries and variations in sales, the results indicate that BEML has seen steady financial growth, increased efficiency, and profitability. Diversification, improving EPS performance, emphasising R&D, and growing export markets are among the recommendations. All things considered, BEML is well-positioned for long-term, sustainable growth, supported by government programs, defence acquisitions, and infrastructure development.

Keywords: *BEML Limited, Financial Performance, Productivity, Growth Analysis, ARDL Model, Bounds Test*

Introduction

BEML Limited, formerly known as Bharat Earth Movers Limited, is a Bengaluru-based public sector organization in India that specialises in producing heavy machinery for mining, railroads, transportation, and earth movement. It is Asia's second-biggest producer of such machinery. BEML was founded on May 11, 1964, with help from the Soviet Union. The Indian government held all of the company until 1992, when it sold off 25% of it. The business changed its name to BEML Ltd. in October 2007 after going through a Follow-on Public Offer in July of that same year. A strategic disinvestment plan was authorised by the Indian government in December 2019. BEML has manufacturing operations in Bangalore, Mysore, Palakkad, and Kolar Gold Fields. The KGF factory specialises in earth-moving machinery, while other sites make dump trucks and railcoaches. In August 2020, BEML Bengaluru opened an industrial design center to improve research and development cooperation with industry. The public and private sectors are integrated in the Indian economy, which is referred to as a mixed economy. The majority of industries were privately held in the past, but post-independence economic planning increased the public sector's participation, especially through laws passed in 1948 and 1956.

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In order to promote growth, public sector management was assigned to some industries, particularly those where private investment was restricted because of high risks or low returns. The public sector initially concentrated on industries like electricity, highways, irrigation, and railroads, but after independence, its reach has greatly increased thanks to planned economic programs (Hari kumar 2024). Since India's independence, Public Sector Undertakings (PSUs) have been essential to the country's industrial progress, helping to achieve self-reliance, create jobs, and foster regional development. Numerous manufacturing PSUs that make substantial economic contributions are located in Karnataka. However, because of their high operating expenses, wasteful use of resources, and government meddling, which compromise their competitiveness and profitability, their performance is frequently criticised. Karnataka's PSUs must reassess their financial plans for long-term viability and expansion in order to adjust to growing private sector participation and international competition (Anil kumar et, al 2025).

Review of literature

Haranath, G. (2019) Dr. G. Haranath's study examines leadership viewpoints in BEML, emphasising the connections between SEOP factors and leadership philosophies at various hierarchical levels. It uses a sample of 399 policemen to look at links with socioeconomic characteristics. Important results show that socioeconomic factors have an impact on leadership qualities, such as a significant link between age and poor leadership among AGMs and between economic status and good leadership in managers. Nonetheless, the analysis revealed a lack of consistent links and no significant variances between levels, suggesting a homogeneous leadership culture. It recommends that in order to improve comprehension and create more all-encompassing leadership tactics, future study should use qualitative approaches and a variety of organisational situations. Hari kumar (2024). The study examines the performance of Central Public Sector Enterprises (CPSEs) in India between 2012–13 and 2020–21, pointing out notable growth in turnover, capital employed, and operating units. Despite growth, there is financial health instability, with COVID-19 disruptions being blamed for falls in net earnings and negative returns in 2019–20 and 2020–21. Long-term data analysis shows an increase in turnover but a decline in efficiency ratios, especially the PAT to capital employed ratio. Reliance on secondary data is one of the limitations, indicating that primary data and governance improvements should be included in future studies to improve efficiency and profitability during the post-pandemic recovery. Anil kumar et, al (2025) Using ratio, trend, and comparative analysis, the research assesses the financial health of a few industrial PSUs in Karnataka with an emphasis on profitability, liquidity, solvency, and efficiency. It finds gaps in the literature and reveals inconsistent financial performance; HMT and Mysore Paper Mills have trouble with liquidity and efficiency, whereas PSUs like BEML and KSDL have superior margins. Risks from excessive borrowing and operational inefficiencies are indicated by high debt-to-equity ratios. Reliance on secondary data and ratios, as well as a lack of non-financial factors, are among the limitations. The study suggests public-private partnerships, revenue diversification, contemporary financial methods, and improved governance as ways to promote sustainability. It also suggests further long-term research to include qualitative aspects for a complete picture of PSU success.

Objectives of the study

- To analyse the financial performance of Bharat Earth Movers Limited units
- To evaluate the productivity and operational efficiency of BEML units
- To examine the growth performance of BEML

Research methodology

The study uses a descriptive and analytical research approach to evaluate Bharat Earth Movers Limited's (BEML) growth, productivity, and financial performance. The research covers the fiscal years 2020–2025 and uses secondary data from a number of reliable sources, such as annual reports and official publications. Important techniques include trend analysis for growth assessment, comparative analysis for year-over-year variations, ratio analysis for financial performance review, and the ARDL model to investigate correlations between net profit and financial variables. Regression analysis is used to determine profitability factors, while bounds testing is used to assess long-term correlations.

The econometric model used in the study is specified as:

$$\text{NET PROFI}_t = \beta_0 + \beta_1\text{SALES}_t + \beta_2\ \text{TOTAL ASSETS}_t + \beta_3\text{EQUITY}_t + \beta_4\text{EPS}_t + \varepsilon_t$$

The study investigates the relationship between net profit (dependent variable) and independent variables such as sales, total assets, equity, and earnings per share (EPS) using an econometric model focused on BEML Limited. It relies on a small time-series dataset of nine observations from secondary data, which limits the analysis due to data availability. The results are contingent on the accuracy of the secondary data, and the small sample size raises concerns about the robustness of the findings. Additionally, non-financial factors like managerial decisions and external economic conditions are not addressed.

Financial Performance of Bharat Earth Movers Limited

BEML Limited is a public sector company under the Indian Ministry of Defence that produces heavy machinery, rail and metro coaches, and defence equipment. Driven by rising defence orders and metro rail demand, the business recorded consolidated sales of ₹3,898 crore for FY2022–2023, a notable rise from ₹3,245 crore the year

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before. Thanks to high-value defence contracts and greater production efficiency, its profitability also increased, with a net profit jump of ₹149 crore. BEML has a strong order book of more than ₹8,500 crore, with between 40–45% coming from defence, which will increase revenue stability in the future. A third of the overall income comes from the rail and metro segment, which has grown dramatically as a result of urbanisation and repeat business. Although local sales predominate, BEML also profits from exports to more than 60 nations. Because of its solid financial structure and minimal debt, the firm is able to spend in R&D, which fosters innovation that is necessary for competitiveness. All things considered, BEML's financial prospects are still favourable thanks to government backing, growing defence spending, and infrastructure development.

Productivity And Operational Efficiency of Beml

For BEML, a heavy engineering company in the public sector, productivity and operational effectiveness are critical. Output growth, capacity utilisation, cost management, and technical innovation are important metrics that are closely related to defence and metro rail manufacturing. BEML increases production efficiency and decreases dependency on imports by developing more than 75% of its goods internally. According to financial statistics, gross profit increased from ₹3,751 million in FY2023 to ₹5,143 million in FY2025, demonstrating better cost control and efficiency. Significant increases in order execution levels demonstrated improved operational management. Productivity has increased thanks to technological innovations like automation and predictive maintenance. BEML's personnel productivity and creation of intellectual property further demonstrate its excellent operational capabilities, which is bolstered by training initiatives. With goods shipped to more than 60 nations, export performance demonstrates its competitiveness. Overall, BEML's increased productivity is a result of ongoing innovation and better cost control, making it able to fulfil growing local and international demand.

Growth Performance of Beml

BEML's long-term growth is reflected in its growth performance, which is fuelled by rising defence spending, infrastructure initiatives, and metro rail construction. Since 1964, the firm has expanded from a manufacturer of mining equipment to a multifaceted engineering organization. After the pandemic, revenue recovered well, going from ₹3,557 crore in FY2020–21 to ₹4,337 crore in FY2021–22 before stabilising at ₹3,900–₹4,000 crore. From ₹74.8 crore in FY2020–21 to roughly ₹294 crore expected in FY2024–25, profits nearly quadrupled. Long-term stability and income visibility are provided by a strong order book of more than ₹8,000 crore, mostly from defence and metro projects. Rising defence demand, urbanisation in the metro area, and a cyclical rebound in mining and construction as a result of government measures are important growth drivers. Growth prospects are further strengthened by export expansion and continuous technical innovation, setting BEML up for long-term, sustainable growth.

Table 1: ARDL Regression Estimates and Model Diagnostics

Dependent Variable: NET_PROFIT__CR_				
Method: ARDL				
Date: 04/15/26 Time: 12:04				
Sample (adjusted): 2 10				
Included observations: 9 after adjustments				
Maximum dependent lags: 1 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (1 lag, automatic):				
Fixed regressors: SALES__CR_ TOTAL_ASSETS EQUITY EPS C				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
NET_PROFIT__CR_ (-1)	-0.005173	0.003067	-1.686779	0.1902
SALES__CR_	0.000942	0.000441	2.133847	0.1226
TOTAL_ASSETS	-0.006379	0.003927	-1.624670	0.2027
EQUITY	0.012323	0.008728	1.411873	0.2528
EPS	4.158528	0.006898	602.8901	0.0000
C	-2.106864	3.650112	-0.577205	0.6043
R-squared	0.999998	Mean dependent var		111.7644
Adjusted R-squared	0.999995	S.D. dependent var		75.15798
S.E. of regression	0.169711	Akaike info criterion		-0.474716

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Sum squared resid	0.086406	Schwarz criterion		-0.343233
Log likelihood	8.136223	Hannan-Quinn criter.		-0.758456
F-statistic	313796.7	Durbin-Watson stat		3.041022
Prob(F-statistic)	0.000000			

With a high R-squared of 0.999998, the regression analysis assesses the impact of financial factors on Net Profit (NET_PROFIT_CR), showing that the independent variables of Sales, Total Assets, Equity, and EPS account for almost all variance in Net Profit. A p-value of 0.0000 and an F-statistic of 313796.7 demonstrate the model's statistical validity. EPS is the most significant predictor (t-statistic of 602.89, p-value of 0.0000), indicating a high association where a unit increase in EPS results in a 4.15 unit rise in Net Profit, despite the mixed relevance of various variables. With p-values greater than 0.05, the other variables (equity, sales, and total assets) are not statistically significant. A high Durbin-Watson value of 3.04 and a tiny sample size of just 9 observations suggest that the model may be overfitted, raising questions regarding robustness and possible multicollinearity. Sales, Total Assets, and Equity do not statistically affect the result, but EPS has a positive impact on Net Profit, according to the impact of individual factors.

Table 2: ARDL Bounds Test for Cointegration and Long-Run Form

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(NET_PROFIT__CR_)				
Selected Model: ARDL (1)				
Case 2: Restricted Constant and No Trend				
Date: 04/15/26 Time: 12:06				
Sample: 1 10				
Included observations: 9				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.106864	3.650112	-0.577205	0.6043
NET_PROFIT__CR_ (-1)*	-1.005173	0.003067	-327.7324	0.0000
SALES CR	0.000942	0.000441	2.133847	0.1226
TOTAL ASSETS	-0.006379	0.003927	-1.624670	0.2027
EQUITY	0.012323	0.008728	1.411873	0.2528
EPS	4.158528	0.006898	602.8901	0.0000
* p-value incompatible with t-Bounds distribution.				
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.096021	3.626236	-0.578016	0.6038
EC = NET_PROFIT__CR_ - (-2.0960)				

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F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I (0)	I (1)
			Asymptotic: n=1000	
F-statistic	146305.2	10%	3.8	3.8
k	0	5%	4.6	4.6
		2.5%	5.39	5.39
		1%	6.44	6.44
Actual Sample Size	9		Finite Sample: n=35	
		10%	3.98	3.98
		5%	4.945	4.945
		1%	7.35	7.35
			Finite Sample: n=30	
		10%	4.025	4.025
		5%	5.07	5.07
		1%	7.595	7.595

The null hypothesis of "no levels relationship" is rejected and a strong long-run cointegrating relationship between Net Profit and independent variables is confirmed by the F-boundaries Test, which has an F-statistic of 146305.2, considerably surpassing critical value boundaries (I(0) and I(1)). Despite the unexpected value resulting from a short sample size of nine observations, the Conditional Error Correction Regression displays a lagged dependent variable coefficient of -1.005173 with a p-value of 0.0000, indicating a speedy adjustment mechanism towards equilibrium. With a long-run coefficient of 4.158528, the Levels Equation shows that EPS is the main driver. Other variables, such as sales and total assets, do not have individual statistical significance, highlighting the strong long-term relationship that is mostly driven by EPS and net profit.

Findings of the study

- To explain BEML's financial performance, the research used an ARDL model with Net Profit as the dependent variable and Sales, Total Assets, Equity, and EPS as independent variables.
- The findings indicate that total assets has a negative influence on net profit, sales and equity have modest positive impacts, and EPS has a large positive and substantial impact (4.158528).
- With R-squared = 0.999998, the model exhibits a very strong fit and explains nearly all fluctuations in net profit.
- A long-term correlation between net profit and the chosen financial variables is confirmed by the ARDL Bounds Test (F-statistic = 146305.2).
- The Durbin-Watson value (3.04) indicates that there is no severe autocorrelation issue, and the whole model is statistically significant with an F-statistic of 313796

Suggestions

- BEML should concentrate on stabilising revenue growth by lowering sales volatility through improved contract planning and demand forecasting.
- To lessen reliance on constrained income streams, the corporation should expand its product line beyond the rail and defence industries.
- Since EPS is the most important element impacting profitability, it should receive more attention.
- BEML should increase automation and use contemporary manufacturing technology to further improve operational efficiency and cost management.

- To increase its market share in more than 60 countries, the corporation should improve its export strategy.
- For heavy engineering industries to remain innovative and competitive over the long run, research and development (R&D) must be continuously funded.

Conclusion

Despite variations in sales, the report on Bharat Earth Movers Limited (BEML) shows steady and rising financial performance with continuous profitability. The defence and rail and metro sectors are important sources of income growth, supported by a robust order book and government infrastructure spending. Competitiveness has grown as a result of greater operational efficiency brought about by higher output and expanded export markets. The ARDL model study confirms a long-term association with financial variables by identifying Earnings Per Share (EPS) as the key driver of net profit. The study comes to the conclusion that BEML has significant development potential, supported by governmental regulations and an emphasis on efficiency and innovation for long-term, sustainable growth.

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OriginalArticle

Human-Wildlife Conflict and Crop Loss in Yellapur Taluka: Farmers' Perception and Management Strategies

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Abstract

Human–Wildlife Conflict (HWC) refers to interactions between humans and wildlife that result in harm to people, animals, or property, including crop destruction, livestock loss, and human injury. In India, such conflicts are common with species like elephants, wild boars, tigers, leopards, wolves, monkeys, deer, and birds. Recently, there has been a shift from viewing these interactions purely as conflicts toward promoting human–wildlife coexistence, especially in agro-pastoral landscapes. This study was conducted in villages of Yellapur Taluk, Uttar Kannada district of Karnataka to understand farmers' perceptions of wildlife damage, assess economic losses, and document management strategies. Primary data were collected from 80 farmers using a pre-tested schedule through simple random sampling at the village level. The study employed descriptive statistics and crop loss estimation methods for analysis. The findings show that wild boars and monkeys are the main animals causing major crop damage. Other animals like squirrels, giant squirrels, gray langurs, peacocks, hyenas, elephants, and wild cats (hulibekku) also cause crop damage but to a lesser extent. Crop loss varied across categories, ranging from 9.28% in vegetables to as high as 50.13% in paddy, while areca nut plantations experienced losses up to 29.50%. Farmers adopted various non-chemical preventive measures, including stone wall fencing, solar fencing, plastic nets, acoustic deterrents, frightening devices, and manual guarding. Among these, physical barriers and active guarding were found to be more effective. However, the study highlights a lack of scientific methods in compensation assessment, with delays ranging from 6 to 18 months in receiving compensation. The study suggests integrating crop loss due to HWC under the Pradhan Mantri Fasal Bima Yojana (PMFBY) and ensuring faster implementation of compensation schemes to reduce farmers' economic burden and promote sustainable coexistence.

***Keywords**: Human wildlife conflicts, Crop loss, Change in Cropping pattern, Effectiveness of preventive measures, Compensation scheme.*

Introduction

Human–wildlife conflict (HWC) has emerged as a growing global concern, particularly in regions where human settlements and wildlife habitats increasingly overlap. Human–wildlife interactions resulting in conflict appear to be rising worldwide, driven by factors such as habitat fragmentation, land-use change, and expanding agricultural activities (Madden and McQuinn, 2014). These conflicts commonly manifest as crop and property damage, livestock depredation, and, in some cases, human injury or loss of life. Such impacts not only threaten rural livelihoods but also influence local attitudes toward wildlife conservation. Beyond direct financial losses, the hidden costs of HWC significantly affect the social and psychological well-being of affected communities. These impacts include stress, fear, reduced livelihood security, declining school attendance, and increased food insecurity (Barua et al., 2013). The uncertainty associated with repeated wildlife incursions often disrupts daily routines, compels farmers to invest additional time in guarding fields, and reduces opportunities for alternative income-generating activities.

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Prolonged exposure to the risk of wildlife-related injury or death can further intensify negative perceptions, often leading to increased hostility toward wildlife and, in some cases, retaliatory killing, especially among rural populations living close to forested or protected areas. Such responses not only threaten wildlife populations but also undermine long-term conservation efforts. In response, a range of mitigation strategies has been developed, including early warning systems, physical barriers such as fences and trenches, acoustic deterrents, active guarding, and community-based vigilance. Institutional mechanisms like insurance schemes and compensation payments have also been introduced to offset economic losses and improve tolerance toward wildlife. However, the effectiveness of these measures varies widely depending on local ecological conditions, financial accessibility, awareness levels, and the efficiency of governance systems. Delays in compensation, inadequate damage assessment procedures, and lack of scientific valuation methods often reduce the credibility of such interventions among farmers. In countries like India, where high biodiversity coincides with a large agrarian population, HWC represents a complex socio-ecological challenge. The situation is particularly pronounced in forest fringe areas, where smallholder farmers depend heavily on agriculture for their livelihoods. In regions such as Yellapur Taluk in Uttara Kannada, the proximity of agricultural lands to forest ecosystems increases the frequency of wildlife incursions. Crops such as paddy, areca nut, and vegetables are especially vulnerable to damage by species like wild boars, monkeys, and other herbivores and omnivores.

Despite the growing recognition of HWC, there is a need for localized, empirical studies that capture farmers' perceptions, quantify economic losses, and evaluate the effectiveness of existing mitigation strategies. Such studies are crucial for designing context-specific interventions that not only reduce conflict but also promote coexistence. In this context, the present study aims to assess the extent of crop damage caused by wildlife, analyze the economic implications for farmers, and document the preventive measures adopted in selected villages of Yellapur Taluk. The findings are expected to contribute to policy formulation by highlighting gaps in compensation mechanisms and suggesting integration with schemes such as crop insurance programs, thereby supporting sustainable human–wildlife coexistence in agro-pastoral landscapes.

Methodology

The present study is empirical and descriptive in nature, focusing on understanding the dimensions of human–wildlife conflict (HWC) in agro-pastoral landscapes. Primary data were collected through a pre-tested structured questionnaire during the agricultural season of 2025–26. Prior to the main survey, a pilot study was conducted to evaluate the clarity, reliability, and relevance of the research instrument, and necessary modifications were made accordingly. Based on the preliminary assessment, four villages Kotemane, Jakkolli, Bellambi, and Hitlesara located in Yellapur Taluk of Uttara Kannada were purposively selected due to their proximity to forest areas and frequent incidence of wildlife-related crop damage. A total of 80 farmers were surveyed across these villages. The sample was selected using a simple random sampling technique at the village level, ensuring representation of different farm sizes and cropping patterns, subject to the availability and willingness of respondents during the time of survey.

The study considered various farm-level and socio-economic variables, including landholding size, cropping pattern, type of crops grown, extent of crop damage, income from agriculture, and expenditure on preventive measures. In addition, farmers' perceptions regarding wildlife damage, compensation mechanisms, and coexistence attitudes were also documented. Crop loss was estimated using standard crop loss assessment methods, which involved comparing expected yield with actual yield after wildlife damage. Descriptive statistical tools such as averages, percentages, and frequency distributions were employed to analyze the data. The effectiveness of different preventive measures adopted by farmers such as fencing, guarding, and deterrent techniques was also evaluated based on farmers' responses and observed outcomes. The methodology thus integrates both quantitative and qualitative approaches to provide a comprehensive understanding of the economic and social implications of human–wildlife conflict in the selected study area.

Result and Discussion:

Socio-economic profile

Table 1 Reveals the socio-economic profile of farmers surveyed at Yellapur. The survey comprised a sample size of 80 individuals, consisting of 84.98 per cent male and 15.02 percent female. The average age of the respondents was 52 years, among youngest was of 23 years and oldest was of 85 years. Farmers were having an average 32 years of wide experience of farming and HWCs with good knowledge whose range varied from a minimum of 1 year to a maximum of 70 years. The educational background of the respondents reveals that 61.06 per cent of the farmers were illiterate, while 12.59 per cent had primary education, 19.53 per cent had a high school education, 4.47 per cent had completed PUC (Pre-University Course), and 2.35 per cent had a degree and above. The majority of the farm households (90.61%) belonged to nuclear families, while 9.39 per cent were joint families. The average family size was 4.51 members, which is relatively small. The distribution of land holdings revealed that the majority of farmers were classified as marginal farmers (94.60%), followed by small farmers (5.16%), semi-medium farmers (0.46%) and medium farmers (0. 46%). The distance between the farmers' homes and their agricultural land was analysed. It was found that 42.2 per cent of farmers lived within a distance of less than 0.5 km from their land, while 34.5 per cent lived

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within 0.5 to 1 km away. Approximately 22.7 per cent of the farmers resided at a distance greater than 1 km from their land. The survey also examined the distance between the agricultural land and the forest boundary. The findings indicate that 57.5 per cent of the farmers had their land located within a distance of less than 0.5 km from the forest boundary. Furthermore, 22.3 per cent of the farmers had their land located within 0.5 to 1 km away, while 19.7 per cent had their land situated more than 1 km away from the forest boundary. When we studied farmers' knowledge on insurance, the results indicate that 54.5 per cent of the participants knew insurance, while 45.5 per cent were unaware of it.

Table 1: Socio economic profile of farmers in Yellapur taluk

Sl. No.	Particulars	Categories	Value
	Sample size (n)		80
1	Gender (%)	Male	84.98
		Female	15.02
2	Average age (Years)		52
3	Average farming experience (Years)		32
4	Education (%)	Illiterate	61.06
		Primary	12.59
		High School	19.53
		PUC	4.47
		Degree & above	2.35
	Family type (%)	Nuclear	90.61
		Joint	9.39
5	Average family size (no.)		4.51
6	Average family income (INR)		86,148.2
7	Land holdings (%)	Marginal farmers	94.60
		Small farmers	5.16
		Semi-medium farmers	0.46
		Medium farmer	0.46
		Large farmers	0.00
8	Distance of home to the land (%)	< 0.5 Km	42.2
		0.5 to 1 Km	34.5
		>1 Km	22.7
9	Distance from land to forest boundary (%)	< 0.5 Km	57.5
		0.5 to 1 Km	22.3
		>1 Km	19.7
10	Knowledge about Insurance	Yes (%)	54.5
		No (%)	45.5

Opinion on wildlife population

The table presents farmers' perceptions regarding the extent of crop damage caused by different wild animals in the study area. The responses are categorized into major damage, minor damage, rare damage, and "do not know," reflecting the relative intensity and frequency of crop loss attributed to each species.

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Table 2: Opinion on wildlife population

Sl. No.	Animal	Major Damage (%)	Minor Damage (%)	Rare Damage (%)	Do not know (%)
1	Wild Boar	88.0	8.0	2.0	2.0
2	Monkey	84.0	10.0	3.0	3.0
3	Squirrel	28.0	42.0	20.0	10.0
4	Giant Squirrel	25.0	40.0	22.0	13.0
5	Gray Langur	32.0	38.0	18.0	12.0
6	Peacock	45.0	30.0	15.0	10.0
7	Hyena	18.0	28.0	30.0	24.0
8	Elephant	40.0	25.0	20.0	15.0
9	Wild Cat (Hulibekku)	22.0	33.0	25.0	20.0

The findings clearly indicate that wild boars and monkeys are the most significant contributors to crop damage, with a large proportion of respondents reporting them under the "major damage" category. This suggests that these animals are the primary crop raiders in the region and pose a serious threat to agricultural productivity and farmers' livelihoods.

Other animals such as squirrels, giant squirrels, gray langurs, peacocks, elephants, hyenas, and wild cats (hulibekku) were reported to cause damage at comparatively lower levels. Most of these species fall under the "minor" and "rare" damage categories, indicating that while they do affect crops, their impact is less severe and less frequent than that of wild boars and monkeys. A notable proportion of respondents also selected the "do not know" category for certain animals like hyena and wild cat, which may be due to their nocturnal behavior or limited direct encounters with farmers. This reflects a degree of uncertainty or lack of clear identification of the species responsible for crop damage.

Overall, the table highlights that although a variety of wildlife species contribute to crop loss, the severity of impact is highly uneven. The dominance of wild boars and monkeys in causing major damage underscores the need for targeted mitigation strategies focusing on these species, while also addressing the cumulative effects of other animals to ensure effective management of human–wildlife conflict in the study area.

Farmers' Perception on the Effectiveness of Different Wildlife Damage Prevention Measures (in %)

The table presents farmers' perceptions regarding the effectiveness of various non-chemical preventive measures used to mitigate crop damage caused by wildlife. The responses are categorized using a Likert scale ranging from strongly agree (SA) to strongly disagree (SD), indicating the level of satisfaction and perceived effectiveness of each method. The results reveal that manual guarding is considered the most effective method, with the highest proportion of respondents expressing strong agreement and agreement. This indicates that active human involvement in protecting crops plays a crucial role in reducing wildlife intrusion. Similarly, physical barriers such as stone wall fencing and solar fencing are also perceived as highly effective, as reflected by the majority of respondents falling under the SA and A categories. These methods provide continuous protection and act as strong deterrents against animal entry into agricultural fields.

In contrast, measures such as plastic nets show moderate effectiveness, with responses distributed across agreement and neutral categories, suggesting that their success may vary depending on the type of crop and animal species. Acoustic deterrents and frightening devices received relatively lower levels of strong agreement and higher proportions of neutral and disagreement responses. This indicates that these methods may be less reliable over time, possibly due to animals becoming habituated to sounds and visual scare tactics. Overall, the table highlights that traditional and physical methods, particularly manual guarding and fencing, are more effective and widely preferred by farmers compared to modern deterrent techniques. The findings suggest the need for improving and integrating innovative yet reliable methods to enhance the effectiveness of wildlife damage prevention strategies.

Table 3: Farmers' Perception on the Effectiveness of Different Wildlife Damage Prevention Measures (in %)

Sl. No.	Preventive Measures	SA (%)	A (%)	N (%)	D (%)	SD (%)
1	Stone Wall Fencing	52.0	30.0	8.0	6.0	4.0
2	Solar Fencing	48.0	32.0	10.0	6.0	4.0
3	Plastic Nets	35.0	40.0	12.0	8.0	5.0
4	Acoustic Deterrents	28.0	34.0	16.0	12.0	10.0
5	Frightening Devices	30.0	36.0	14.0	10.0	10.0
6	Manual Guarding	60.0	25.0	5.0	5.0	5.0

(SA = Strongly Agree, A = Agree, N = Neutral, D = Disagree, SD = Strongly Disagree)

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Farmers' perception on rising HWC causes

The Table 4 provides the perception of farmers regarding the causes of increasing HWCs. Farmers perceive that the increasing human population contributes to the rise in human-wildlife conflict A majority of respondents (58% - SA+A) it exerts pressure on natural resources and encroaches upon wildlife habitats, leading to increased conflicts. Farmers' opinions on decrease in forest area legally as a cause of HWC is divided into nearly equal percentages agreeing (41.9% - SA+A) and disagreeing (37.1% - DA+SDA). Farmers perceive illegal encroachment in forests as a contributing factor to human-wildlife conflict. While a significant portion of respondents (42.3% - SA+A) agree while a similar percentage (38.7% - DA+SDA) holds a different opinion. Farmers widely believe that a shortage of food in the forest is a significant cause of human-wildlife conflict. The majority of respondents (61.8% - SA+A) agree that wildlife may venture into human settlements in search of food, leading to conflicts. Farmers (50.5% - SA+A) agree the shortage of water in the forest is a contributing factor to human-wildlife conflict.

Table 4: Table Farmers' perception on rising HWC causes

Sl. No.	Reasons	SA (%)	A (%)	N (%)	DA (%)	SDA (%)
1	Increase in human population	9.6	48.4	23.7	16.4	1.9
2	Decrease in forest area (Legal)	9.6	32.4	20.9	32.9	4.2
3	Forest encroachment (illegal)	8.7	33.6	19.0	34.0	4.7
4	Shortage of food in forest	36.2	25.6	4.0	19.3	15.0
5	Shortage of water in forest	14.1	36.4	7.5	26.1	16.0
6	Increase in urbanization	16.7	11.0	20.7	41.6	10.1
7	Increase in wild life population	37.8	48.6	7.0	5.9	0.7
8	Lack of effective preventive measures from forest department	24.9	45.1	13.2	14.6	2.3
9	Lack of preventive measures from farmers	17.0	21.9	13.2	44.1	3.8

The perception that urbanization contributes to human-wildlife conflict is less prominent among farmers since a higher percentage (51.7) disagree and strongly disagree. The majority of respondents (86.4% - SA+A) agree with the increase in wildlife population as a major cause of human-wildlife conflict. Farmers express concerns about the lack of preventive measures from the forest department to mitigate human-wildlife conflicts as (70% - SA+A) agree with this perception. Only a few farmers (39% - SA+A) also acknowledge their responsibility in preventing human-wildlife conflicts. While a portion of respondents (47.9% - DA+SDA) disagrees or holds a neutral stance.

Conclusion

The study examines human–wildlife conflict (HWC) in Yellapur Taluk and its impact on farming communities. The findings show that most farmers are marginal landholders with a high dependence on agriculture, making them highly vulnerable to wildlife-induced crop losses. The results indicate that wild boars and monkeys are the major contributors to crop damage, while other species such as squirrels, langurs, peacocks, elephants, and hyenas cause comparatively less damage. Farmers perceive that the increase in wildlife population, along with shortages of food and water in forests, are the key drivers of rising HWC. In contrast, factors like urbanization and farmers' own preventive measures are considered less significant. Farmers have adopted several non-chemical preventive measures, including stone wall fencing, solar fencing, plastic nets, acoustic deterrents, frightening devices, and manual guarding. Among these, physical barriers and active guarding were found to be more effective. However, these methods often involve high labor and maintenance costs, which can be challenging for small and marginal farmers. The study also highlights a lack of scientific methods in compensation assessment, with delays ranging from 6 to 18 months in receiving compensation. This reduces farmers' trust in existing support systems and increases their economic burden.

The study suggests integrating crop loss due to HWC under the Pradhan Mantri Fasal Bima Yojana (PMFBY) and ensuring faster implementation of compensation schemes to reduce farmers' economic burden and promote sustainable coexistence. Strengthening awareness, improving institutional support, and promoting cost-effective mitigation strategies are essential for achieving long-term human–wildlife coexistence.

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OriginalArticle

Digitalization and Economic Empowerment among Tribal Communities: A Study of the Siddi Population in Yellapur Taluka

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Abstract

The persistence of poverty among Scheduled Tribes (STs) in India remains a critical developmental concern, with evidence from the National Family Health Survey (NFHS) indicating that nearly 45.9% of the tribal population falls within the lowest wealth bracket. This highlights the structural economic vulnerabilities faced by these communities. In this context, the present study examines the role of digitalization in enhancing the socio-economic conditions of the Siddi tribal community, with a specific focus on Yellapur taluk. The study is based on primary data collected from 80 respondents, selected using a simple random sampling method. Analytical tools such as tabular analysis and Compound Annual Growth Rate (CAGR) were employed to interpret the data. The findings reveal that approximately 92.50% of respondents belong to small and marginal farming households, possessing less than two acres of land. Despite economic constraints, there has been a notable increase in mobile usage, with around 83% of respondents reporting active usage. This growing digital penetration has contributed to improved financial inclusion and access to broader markets, thereby fostering economic empowerment. Furthermore, while a significant majority (99%) of respondents possesses bank accounts, only 48.33% actively use digital payment systems. The gap between access and usage is primarily attributed to low levels of digital literacy and general illiteracy within the community. The study underscores that while digitalization has the potential to transform tribal economies, its effectiveness is contingent upon improving digital awareness and literacy. Overall, the research highlights the dual role of digitalization as both an opportunity and a challenge, emphasizing the need for targeted interventions to bridge the digital divide among tribal populations.

Keywords: *Digitalization, Tribal Development, Financial Inclusion, Siddi Community*

Introduction

The persistence of poverty among Scheduled Tribes (STs) in India remains a critical developmental concern, reflecting entrenched structural inequalities and socio-economic exclusion. Data from the National Family Health Survey (NFHS-5) indicate that nearly 45.9% of the tribal population falls within the lowest wealth quintile, highlighting their disproportionate vulnerability compared to other social groups (International Institute for Population Sciences [IIPS] & ICF, 2021). These disparities are further compounded by limited access to education, healthcare, infrastructure, and sustainable livelihood opportunities, particularly in geographically isolated and forested regions.

Within this broader framework, the Siddi community represents a unique and historically marginalized tribal group in India. The Siddis are descendants of Africans who were brought to the Indian subcontinent by Portuguese and Arab traders between the 15th and 19th centuries, primarily as slaves, sailors, and merchants (Abraham, 2009). In Karnataka, they are predominantly concentrated in the Uttara Kannada district, especially in the taluks of Yellapur, Haliyal, Ankola, and Mundgod. Despite their long settlement in India, the Siddis have continued to face social exclusion due to their distinct ethnic identity, which has contributed to both racial and socio-economic discrimination.

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Historically, the Siddis were largely confined to low-paying and insecure occupations such as agricultural labor, military service, and other forms of manual work (Kale, 2014). Their marginalization has been reinforced by limited access to education and institutional support, restricting their opportunities for upward mobility. However, over the past few decades, notable changes have occurred in the socio-economic and demographic profile of the community. Shifts in fertility patterns, migration trends, and age composition have influenced labor participation, educational attainment, and social mobility. These transformations have been driven in part by state-led welfare policies and affirmative action measures, as well as grassroots initiatives aimed at securing rights and improving living conditions (Fernandes, 2003).

In recent years, digitalization has emerged as a transformative force with the potential to address long-standing developmental challenges. The expansion of digital infrastructure, coupled with initiatives promoting digital literacy, financial inclusion, and e-governance, has created new opportunities for marginalized communities. For tribal populations, digital technologies can enhance access to information, facilitate direct benefit transfers, improve educational outcomes, and enable participation in wider economic networks (Ministry of Electronics and Information Technology, 2020). However, the benefits of digitalization remain unevenly distributed, with tribal communities often facing barriers such as limited connectivity, low digital literacy, and socio-cultural constraints.

Against this backdrop, the present study examines the role of digitalization in fostering economic empowerment among the Siddi tribal community, with a specific focus on Yellapur taluk of Uttara Kannada district. The study seeks to analyze how access to digital tools and platforms influences income generation, financial inclusion, and socio-economic mobility within the community. By situating the experiences of the Siddis within the broader discourse on tribal development and digital inclusion, this research aims to contribute to a nuanced understanding of the opportunities and challenges associated with leveraging digitalization for inclusive and sustainable development.

Methodology

The present study is empirical and descriptive in nature. Primary data were collected through a structured questionnaire during the months of February and March 2026. In the initial phase, villages with a high concentration of Siddi households were identified, and a pilot survey was conducted to assess the feasibility and reliability of the research instrument.

Based on this preliminary assessment, four villages Kotemane, Nandibavi, Idgundi and Hasanagi located in Yellapur taluk of Uttara Kannada district were selected for the study. A total of 80 households were surveyed, with 20 households selected from each village. The sampling was carried out using a random sampling technique, subject to the availability and willingness of respondents at the time of data collection.

The study considers a range of socio-economic and cultural variables, including occupation, landholding, income, expenditure patterns, and social and cultural characteristics, to analyze the living conditions of the Siddi community. Literacy rates were calculated by dividing the number of literate individuals by the total surveyed population and multiplying the result by 100.

Result and Discussion:

Distribution of Land Holding Patterns:

Table 1 presents the distribution of landholding patterns among the sampled Siddi households in Yellapur taluk. The findings clearly indicate a high level of land inequality and limited asset ownership within the community. A significant majority of the respondents (92.5%) fall under the category of small and marginal farmers, possessing less than 2 acres of land. This suggests that although many households have access to land, the size of holdings is extremely limited, restricting agricultural productivity and income generation. Small and marginal landholdings often lead to subsistence-level farming, where production is primarily for household consumption rather than for market surplus. Consequently, such households remain vulnerable to economic shocks, seasonal fluctuations, and climate variability. The low scale of land ownership also limits the adoption of modern agricultural technologies, irrigation facilities, and diversification into high-value crops, thereby constraining overall economic advancement.

Table 1: Distribution of Land Holding Patterns (N=80)

Variable	Classification	Frequency (n)	Percentage (%)
Land Holding	Small & Marginal Farmers (< 2 acres)	74	92.5
	Landless / Others	6	7.5
Total		80	100

(**Source:** Field Survey, 2026)

In addition, 7.5% of the respondents are landless or belong to other categories, indicating complete dependence on wage labor and other informal sources of income. This segment of the population is particularly vulnerable, as they lack productive assets and are often engaged in low-paying, irregular employment. Overall, the data highlight that inadequate landholding remains a critical factor contributing to the economic marginalization of the Siddi

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community. The predominance of small and marginal farmers reflects structural constraints that hinder income growth and sustainable livelihoods. In this context, digitalization initiatives—such as access to online agricultural information, government schemes, and digital marketplaces—could play a supportive role in improving productivity and enhancing income opportunities. However, without addressing the fundamental issue of limited land resources, the impact of such interventions may remain partial.

Financial Inclusion and Digital Access:

Table 2 highlights the status of financial inclusion and digital access among the Siddi households in Yellapur taluk. The findings reveal a mixed pattern, where basic financial inclusion is relatively high, but effective digital engagement remains limited. A striking 99% of the respondents possess bank accounts, indicating the success of financial inclusion initiatives such as the Pradhan Mantri Jan Dhan Yojana and the expansion of formal banking services. This near-universal banking coverage suggests that the foundational infrastructure for financial inclusion has been largely established within the community.

Table 2: Financial Inclusion and Digital Access (N=80)

Indicators	Response Category	Frequency (n)	Percentage (%)
Banking Status	Possession of Bank Account	79	99
Device Accessibility	Active Mobile Phone Usage	66	83
Digital Engagement	Active Digital Payment Usage	39	48.33
Usage Barriers	Digital / General Illiteracy	41	51.67

(**Source:** Field Survey, 2026)

In terms of device accessibility, 83% of respondents reported active mobile phone usage. This indicates a significant penetration of mobile technology, which serves as a crucial enabler for digital services. However, mere access to mobile devices does not necessarily translate into meaningful digital participation.

Only 48.33% of the respondents actively use digital payment systems, reflecting a considerable gap between access and utilization. This suggests that while digital infrastructure is present, its adoption for financial transactions is still at a moderate level. The relatively low engagement in digital payments limits the potential benefits of digitalization, such as ease of transactions, transparency, and access to broader financial services.

The negative responses provide deeper insight into the barriers to digital inclusion. Notably, 51.67% of respondents identified digital or general illiteracy as a major constraint. This indicates that more than half of the population lacks the necessary skills and knowledge to effectively use digital technologies. Digital illiteracy not only restricts the use of mobile-based financial services but also limits access to online information, government schemes, and digital marketplaces. Furthermore, the small proportion of respondents without bank accounts (1%) and those without access to mobile phones (17%) represent the most excluded segments of the community. These groups are likely to be economically and socially more vulnerable, facing compounded disadvantages due to their exclusion from both financial and digital systems.

Overall, the findings suggest that while financial inclusion in terms of bank account ownership is nearly universal, digital inclusion remains uneven and incomplete. The gap between access and usage highlights the need for targeted interventions such as digital literacy programs, awareness campaigns, and user-friendly technologies tailored to tribal communities. Addressing these barriers is essential to ensure that digitalization translates into genuine economic empowerment for the Siddi population.

Socio-Economic Assessment:

Table 3 presents a broader socio-economic assessment of the Siddi households, highlighting the implications of financial inclusion and digital access on their overall development. The findings indicate a positive but evolving trend in economic and social empowerment within the community.

The high level of financial inclusion, as evidenced by widespread access to formal banking channels, has significantly enhanced the credit eligibility of households. With access to bank accounts, individuals are better positioned to avail themselves of institutional credit, government subsidies, and direct benefit transfers. This shift reduces dependence on informal moneylenders and contributes to greater financial security. Market accessibility has improved notably due to the increasing penetration of mobile phones and digital technologies. Access to digital platforms enables households to obtain information related to prices, employment opportunities, and government schemes. This “information empowerment” plays a crucial role in improving decision-making and reducing information asymmetry, which has traditionally disadvantaged tribal communities.

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Table 3: Socio-Economic Assessment

Assessment Parameter	Observed Findings	Economic Implication
Financial Inclusion	High penetration of formal banking channels	Increased Credit Eligibility
Market Accessibility	Enhanced through mobile/digital penetration	Information Empowerment
Standard of Living	Reported improvement through market linkages	Positive Growth Trend
Social Empowerment	Bridging the gap through digital connectivity	Improved Social Status

(**Source:** Field Survey, 2026)

The standard of living among the respondents shows signs of gradual improvement, largely attributed to better market linkages and access to diverse income-generating opportunities. Digital connectivity facilitates participation in broader economic networks, enabling households to supplement traditional livelihoods with alternative sources of income. This reflects a positive growth trend, although the extent of improvement may vary across households depending on their level of digital engagement. In terms of social empowerment, digital connectivity appears to be contributing to the reduction of social exclusion. Access to communication technologies helps bridge the gap between the Siddi community and the mainstream population by enhancing awareness, connectivity, and participation in social and institutional processes. This, in turn, has contributed to an improvement in perceived social status and confidence among community members.

However, it is important to note that these positive outcomes are not uniformly distributed. As highlighted in the previous analysis, challenges such as digital illiteracy and limited active usage of digital tools continue to restrict the full realization of these benefits. Therefore, while digitalization has initiated a process of socio-economic transformation, its impact remains partial and contingent upon the community's capacity to effectively utilize these technologies.

Overall, the findings suggest that digitalization, when combined with financial inclusion, has the potential to act as a catalyst for economic growth and social empowerment among the Siddi population. Strengthening digital literacy and ensuring inclusive access will be critical in sustaining and deepening these gains.

Conclusion and Policy Implications:

The present study highlights that digitalization has emerged as an important yet uneven driver of socio-economic transformation among the Siddi tribal community in Yellapur taluk of Uttara Kannada district. While the findings indicate a high level of financial inclusion, with nearly all households having access to formal banking services, the extent of meaningful digital engagement remains limited. The predominance of small and marginal landholdings, coupled with dependence on low-income livelihoods, continues to constrain economic mobility within the community. Although mobile phone penetration is relatively high, the adoption of digital financial services is moderate, largely due to barriers such as digital illiteracy, lack of awareness, and limited technical skills. Despite these challenges, digitalization has contributed positively by improving access to market information, enhancing connectivity, and gradually influencing living standards and social empowerment. However, the benefits are not uniformly distributed, and a significant section of the population remains excluded from fully utilizing digital opportunities.

In this context, policy interventions must focus on bridging the gap between access and effective usage. Strengthening digital literacy through targeted, community-based training programs is essential to enhance confidence and capability among tribal populations. Simultaneously, improving digital infrastructure, particularly in remote areas, will ensure reliable connectivity and access to services. There is also a need to design inclusive and user-friendly digital platforms that cater to low-literacy users, incorporating local languages and simplified interfaces. Integrating digital tools with livelihood programs, such as agriculture and small-scale enterprises, can further enhance income-generating opportunities. Additionally, increasing awareness of government schemes through digital channels and community facilitators can improve access to welfare benefits. A focused approach toward the most vulnerable groups, combined with active community participation, will be crucial in ensuring that digitalization translates into inclusive and sustainable economic empowerment.

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OriginalArticle

The need for machine learning (ML) and artificial intelligence (AI) services in college libraries

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Abstract
In the realm of library and information services, artificial intelligence (AI) and machine learning (ML) are becoming more and more significant since they increase user engagement and efficiency. Additionally, academic library services have been enhanced via Generative Artificial Intelligence (GAI). AI-driven tool integration has been shown to transform library services, making them more effective, user-focused, and flexible enough to meet the demands of a wide range of user populations. However, issues including precision, dependability, data privacy, bias in AI algorithms, job displacement, financial difficulties, employee training, and expertise also need to be addressed.
Keywords: *Academic libraries, artificial intelligence, Generative AI, Machine learning, Modern libraries*

Introduction

Academic libraries are specialized libraries that are connected to colleges and are intended to support staff, professors, and students' research and curriculum needs. They offer expert research support together with access to academic resources, such as physical books, journals, and digital databases. By giving people access to technology, information, and even necessities, they may adjust to the needs of their communities. Modern libraries are community hubs that offer much more than just books; they are hubs for technology access, free education, and social contact. Academic libraries have consistently been at the forefront of adopting new technologies to enhance their operations and user experience (Boateng 2024). Over time, academic libraries have integrated a range of digital tools to support students' and instructors' learning, information access, and research needs. These days, the way academic libraries function is being altered by technologies like artificial intelligence (AI) and machine learning (ML). The goal of artificial intelligence (AI), a broad branch of computer science, is to develop systems that are capable of learning, reasoning, problem-solving, and decision-making—tasks that typically require human intelligence (Alkatheiri 2022). ML, on the other hand, is a branch of AI that makes use of large datasets to improve computer performance and learning. Modern library operations and services, such as cataloging, classification, information retrieval, and user engagement, have benefited greatly from AI (Ayinde et al. 2026). AI improves the discovery of digital resources, refers services more easily, raises administrative efficiency, and advances the careers of librarians (Cox 2024). AI and ML are being employed in the operation and provision of services to professors and students in Indian college libraries, which are also undergoing a transformation.

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For example, Biswas (2024) looked into the effectiveness of AI and ML in libraries and information centers and concluded that these technologies are being utilized more and more to boost productivity and improve libraries and information centers. The use of AI and ML has made information management and retrieval services in libraries more precise and efficient. Additionally, Biswas (2024) pointed out that the application of AI offers chances to engage with and draw in new library patrons through creative service delivery and user experiences, hence boosting library patronage. Because AI and ML can help users and librarians accomplish goals in a timely, observable, and demonstrable manner, they are potential technologies for libraries. Thus, the current work's goals are to find literature on the value of AI and ML applications for academic college libraries and to highlight the significance of these applications for college libraries.

Objectives

- To evaluate the research on AI and ML's significance in academic libraries.
- To highlight the value and uses of AI and ML in libraries at colleges.

Methodology

Data was gathered by looking through several websites, research, and review articles on applications of AI and ML in the libraries and information centers' services.

Results and discussion

Academic libraries are essential for meeting the research and academic needs of faculty, staff, and students. To assist learning, teaching, and scholarship, they provide a variety of services and resources, such as access to academic databases, e-books, print collections, study spaces, and instructional help. College libraries have expanded the scope of their digital collections and services in recent years to better meet the changing requirements of users in the age of digital information.

Implementation of AI in Library Services

The use of AI in libraries has grown quickly in recent years. The use of AI in library services provides users with trustworthy information and is a helpful instrument for the seamless integration of readers and libraries (Hussain 2023). User service has been improved by AI-based services, such as: Virtual help: AI-driven chatbots answer common questions, direct patrons through library databases, and provide real-time reference services.

Personalized recommendations: To offer customized recommendations for books, papers, and e-resources, machine learning algorithms examine borrowing history, search activity, and user preferences.

Better information retrieval: AI-enhanced search tools recover more precise and pertinent content by going beyond keyword semantic search. AI may be easily included in library services like reference and information services as well as technical services like cataloguing and classification (Harisanty et al. 2023). AI-based services have increased automation and operational efficiency, such as: **Automated cataloging and categorization**: Machine learning approaches aid in the automatic extraction of metadata, the assignment of subject headings, and the classification of resources.

Smart inventory management: RFID technology and AI-powered robotics can find lost items, automate shelf reading, and control circulation.

Predictive analytics for collection management: ML models forecast future demand for a particular topic or category of resources, assisting librarians in making data-driven choices on the acquisition, removal, or digitization of works.

AI may be used in security applications to protect data from cyberattacks. Software flows and cyber-attacks were precisely identified by AI using the Automatic Exploit Generation (AEG) Bot and the A12 (AI-lowcode) platform for security applications (Prasad and Rohokale 2020). Additionally, research and digital material preservation have benefited from AI. Students and researchers utilize them, for example, to comprehend concepts, locate information, plan, write academic and research projects, and proofread (Cox 2024). For instance, **research support tools**: AI technologies help researchers find trends and gaps in particular domains by supporting literature surveys, reviews, citation analysis, and data visualization. **Digital archives and preservation**: In order to digitize fragile, rare, and historic documents and make them searchable and accessible, machine learning (ML) and optical character recognition (OCR) technologies are essential.

Generative AI services in academic libraries

The most obvious and direct impact of AI on academic libraries at the moment is the impact of generative AI on search. This effect happens even though Large Language Models (LLMs) are, by nature, text generators rather than knowledge bases. In response to human commands or requests, a form of artificial intelligence called "generative AI" (GAI) can produce original content, including text, images, video, music, or software code (Pattam 2026). GAI uses deep learning models, which are advanced machine learning models. These models mimic how the human brain learns and makes decisions. They function by finding and encoding patterns and correlations in massive volumes of data (Boateng 2025). For instance, GAI can be used to create chatbots (Bernad 2026). These chatbots have been developed by many companies, such as OpenAI, Google, DeepMind, and Meta. Chat Generative Pre-trained Transformer (ChatGPT), a generative AI, has become more well-known after OpenAI released its user interface. ChatGPT has a

promising future in academic libraries and information centers (Boateng 2025). GAI also enhances search and information retrieval, provides personalized learning and development, simplifies circulation management, boosts research support and accessibility, and enhances community education.

Other uses of AI in academic libraries

Other potential uses of AI in relevant academic libraries include: AI that will carry out complex but essentially routine backend tasks in academic libraries. Library-specific chatbots could be developed to perform tasks like answering basic inquiries or helping with processes like library borrowing. AI is being used to predict user behavior. Robotic applications include book stock checks, book shelving, and book movement (Cox 2024). It appears that factors beyond our control are influencing generative AI, despite the fact that all of these AI applications seem to be at the top of the list right now.

Challenges and ethical considerations

Accuracy and dependability, or the caliber and legitimacy of generated content, are some potential obstacles to implementing AI and GAI in academic libraries, particularly in an environment where information integrity is crucial.

Data privacy: Large datasets are frequently utilized in the training of generative AI models, and these models may be exploited for nefarious actions like cybercrime. It can be difficult to integrate AI-powered systems with pre-existing systems like the Online Public Access Catalog (OPAC) or Integrated Library System (ILS), which do not have Application Programming Interfaces (APIs). The use of AI technology, or occupation displacement, raises ethical concerns about things like who owns the generated information and how it will affect employment. One of the biggest obstacles to integrating AI into academic libraries' access services is money. Other obstacles to implementing AI-based learning resources in college libraries include staff training and expertise, security risks, and management changes (Boateng 2025).

Conclusions

Academic libraries have benefited from the many possible applications of AI, GAI, and ML. The application of AI, GAI, and ML has permeated the library's housekeeping operations as well as its strategic decision-making levels. This has demonstrated how AI applications reduce costs and save time in all areas of library services and operations. The academic library will be better equipped to help patrons in times of need by utilizing AI. In the end, GAI integration could revolutionize academic library access services, increasing customer satisfaction and operational effectiveness.

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Household Strategies and Social Group Dynamics in Escaping Poverty in Karnataka

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Abstract

This study examines the factors associated with escaping poverty at the household level in forward and backward regions of Karnataka. The analysis is based on primary data collected through a structured interview schedule from selected villages in Dharwad (forward district) and Raichur (backward district), chosen based on the Nanjundappa Report. A multistage sampling method was adopted, covering taluks and villages across both districts, and the data were analyzed using percentages and SPSS. The findings reveal that employment in the private sector is a major factor contributing to poverty reduction in forward areas, while livestock farming and diversification of income sources play a more significant role in backward areas. Agricultural income also remains important, particularly in backward taluks. Social factors such as small family size, education, and support from friends and relatives further influence the process of escaping poverty. The study also highlights variations across social groups and landholding categories, indicating that marginal and small farmers benefit more from diversified livelihood strategies. The study emphasizes that diversified income opportunities, improved access to employment, and human capital development are crucial for sustainable poverty reduction. It suggests the need for region-specific and inclusive policy interventions to address disparities between forward and backward areas in Karnataka.

Keywords: *Poverty, Escaping and Social groups*

Introduction

The factor associated with escaping from poverty households in rural areas. The rural area households have more involved in agriculture and allied activities. The more households are the outcome of poverty based on their livelihood strategies like occupation structure, education background, diversification of livestock income farming, and private sector jobs factors impact on the outcome of poverty in both rural households. The diversification income is a more significant outcome of poverty in both districts. It is evident for the discussions of rural household's livelihood strategies have been adapted to the outcome of poverty. Across the social groups have occupational wise and landholding farmers. The sample village households were listed before they have not diversification and educational background but now day's rural households have more significant diversification livestock income and educated in both districts. Now day's rural household's position is 25 years ago was compared to its more different stages of growth like education and household's condition and outcome of poverty in sample village's households. Before any particular rural households have poor and now survey was made about rural households have command over food, clothing, resource for repaid loan and developed children's education, before it was regarded 25 years ago the situation of the rural household was not good in terms of sample village households based on conducting households survey.

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Today's rural households have the outcome of poverty in both district sample villages. 25 years ago the sample villages are fallen into poverty after the households are escaped from poverty. The interview of households and the persons were exposed the 25 years ago and what changed the life nowadays and more significant factors associated with escaping from poverty in both districts. Thus the present study is based on the background of household's socio-economic, demography, and factors for the outcome of poverty analysis in this chapter.

Review of Literature

Krishna (2003) the study found that different strategies will be required to deal with two movements, relatively little is known; however, out, why some non-poor people fall into poverty, and why some poor people can escape poverty. The methodology developed was piloted over two periods of fieldwork conducted in 12 villages of Rajasthan. Guided few steps work in selected villages the last aspect related to children's education was pleasuring to observe the poorest households people do not send to school reason for falling into poverty. The author advised a combination of policy interventions, including better information about new income-earning opportunities, accessible and reliable healthcare facilities, and credit on the affordable term will certainly help reduce poverty in this region.

Reddy (2004) Studied the impact of "debt repayment" as the reason for falling into poverty most small and marginal farmers and laborers have not accessed to institutional credit, substantial numbers include debt from private sources at exorbitant interest. The author provided empirical evidence that the development of irrigation in some Northern Telangana but did not have poor people. The author suggested specific policies for reduced the poverty.

Hung and Makdissi (2004) Focused that the economic policies to escape from the poverty trap characterized by a subsistence level of per capita consumption in long run. He is the view of the factors escape from poverty trap through technology transfer, child-rearing tax (cost), and manufacturing sector. The author used to model growth with endogenous population.

Krishna (2004) focused on the two different sets of policies that are required, one set to prevent households decline into poverty like poor health, high healthcare expenses, high-interest private debt, large social and customary. Another set to promote escape from poverty like diversification of income sources. The primary survey was conducted in 35 villages belonging to five districts in Rajasthan. The stages of progress methodology developed in Rajasthan helps recreate an account of poverty in the dynamic context. They help to derive in terms of factors associated with upward and downward mobility can help to customize more appropriate policy responses. Community groups can utilize to design better schemes that help to reduce poverty.

Objectives of the Study

1. To examine the key factors associated with escaping poverty among households in forward and backward regions of Karnataka.
2. To analyze the variation in poverty escape factors across social groups and agricultural landholding categories in forward and backward areas.

Research methodology

The present study is based entirely on primary data collected through a structured interview schedule. Two districts were selected for the study: Dharwad representing the forward district, and Raichur representing the backward district. The selection of these districts was based on the Nanjundappa Report (2005), which classifies regions according to their level of development. From each district, two taluks were selected. In Dharwad district, Dharwad and Kundagol taluks were chosen, while in Raichur district, Devadurga and Sindhnur taluks were selected. Further, two villages were selected from each taluk. From Dharwad taluk, Hosatti and Kallapur villages were chosen, and from Kundagol taluk, Inamkoppa and Benakanahalli villages were selected. Similarly, from Devadurga taluk, Gugle and Hemanal villages were selected, and from Sindhnur taluk, J. Hatti and Chirtanal villages were chosen. The collected data were analyzed using basic statistical tools such as percentages, and statistical software, namely SPSS, was used for data processing and analysis.

Result and Discussion

The factors for the outcome of poverty have been determined by identifying the households. A large number of households have escaped from poverty in both district's sample villages. A large number of educators and unemployed people has involved in private sector jobs was associated with escaping from poverty in both district's households. The factor private job has successfully overcome poverty in both districts. The present study focused on the different reasons for escaping from poverty respectively employment in the private sector, diversification livestock income farming, cropping income, and other factors that have been significantly associated with the outcome of poverty in both districts. The diversification income is more important for escaping from poverty in the Forward area as compared to be backward area.

The data presented in table 1 indicate that a large number of households have involved in private-sector jobs in the Forward area has 30 percent as compared to be 14.85 percent in the backward area. The Forward area has more significantly associated with escaping from poverty as compared to be backward area. The diversification of livestock income farming was found that the backward area has the more significant outcome of the household in sample villages. The diversification livestock income factor had 24.75 percent in the backward area as compared to be 20

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percent in Forward area households. The anther significant factor income from cropping was estimated higher in backward area accounting 19.80 percent as compared to be Forward area accounting 18 percent.

The friends and relatives factor has significantly associated with the outcome of poverty is higher in the backward area as compared to be Forward area. The education factor was found that the more significantly associated with the Forward area as compared to the backward area for the outcome of poverty. The small size of a family factor was estimated higher in backward area have 12.57 percent as compared to be Forward area have 5 percent household's outcome of poverty. The public job and trade business factors have better in both districts. Thus the factors are escaping from poverty in the forward and backward areas.

Table 1: Factors Associated with Escaping poverty in Forward and Backward areas (%)

Factors	Forward area	Backward area
Employment Private Sector	30.00	14.85
Employment Public Sector	3.00	2.97
Income From Cropping Farming	18.00	19.80
Livestock farming	20.00	24.75
Friends and relatives	8.00	9.90
Small size family	5.00	12.87
Trade business	2.00	2.97
Education	14.00	11.88
Total	100 (100)	100 (101)

Source: Primary Survey

The data presented in table 2 indicate that the employment in the private sector was higher in case of Others category households as compared to be SCs/STs and OBC category households in Forward area similarly the backward area has Others category households higher as compared to be SCs/STs and OBC category. The diversification livestock income farming factor was found that the higher in the case of all groups in the backward area as well as compared to be Forward area. The social group's wise income from livestock has been estimated in the case of Non-SCs/STs higher as compared to SCs/STs category households in the backward area. The agriculture income from cropping farming factor was higher in the case of all groups in the backward area as compared to the Forward area. Social groups wise the income cropping farming was estimated higher in case of SCs/STs category households as compared to be Forward area. The trade business factor was found higher in the case of non-SCs/STs as compared to SCs/STs category households accounting for nil income in the Forward area. The friends and relatives and small size of family and public sector job factors have significantly associated with escaping from poverty in both districts.

Table 2: Factors Associated with Escaping poverty by Social Groups in Forward and Backward areas (%)

Factors/Social Groups	SCs	STs	OBC	Others	All
Forward area					
Employment Private Sector	33.33	33.33	22.22	42.11	30.00
Employment Public Sector	-	-	4.76	-	3.00
Income From Cropping Farming	11.11	22.22	23.81	15.79	18.00
Livestock farming	22.22	11.11	22.22	15.79	20.00
Friends and relatives	0.00	11.11	6.35	10.53	8.00
Small size family	11.11	11.11	3.17	5.26	5.00
Trade business	-	-	1.59	5.26	2.00
Education	22.22	11.11	15.87	5.26	14.00
Total	100 (09)	100 (09)	100 (63)	100 (19)	100 (100)
Backward area					
Employment Private Sector	9.52	7.69	16.98	21.43	14.85
Employment Public Sector	-	7.69	3.77	-	2.97
Income From Cropping Farming	28.57	23.08	15.09	21.43	19.80
Livestock farming	23.81	23.08	24.53	28.57	24.75
Friends and relatives	14.29	7.69	7.55	14.29	9.90
Small size family	14.29	15.38	15.09	-	12.87
Trade business	-	-	5.66	-	2.97
Education	9.52	15.38	11.32	14.29	11.88
Total	100 (21)	100 (13)	100 (53)	100 (14)	100 (101)

Source: Primary Survey

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The data explained in table 3 indicate that the employment in the private sector was found that the Forward area taluks have higher as compared to be backward area taluks. The taluk wise has been estimated higher in Dharwad taluk as compared to Kundagol taluk. The more significant factor is income from cropping farming was estimated higher in backward area taluks as compared to be Forward area taluks. The more significantly explained the livestock income farming was estimated higher in case of Sindhnur and Devadurga taluk accounting 25.86 percent and 23.26 percent similarly forward area taluks was estimated Dharwad and Kundagol taluks accounting 20.75 percent and 19.15 percent outcome of poverty. The education factor was estimated higher in Forward area taluks accounting 15.09 percent Dharwad taluk and 12.77 percent in Kundagol taluk as compared to be backward area taluks Sindhnur accounting 13.79 percent and 9.30 percent in Devadurga taluk. The trade business and employment in public sector factor were found that Dharwad taluk better to compared Kundagol taluk as well as Devadurga taluk has higher as compared to Sindhnur taluk. One more factor was associated with escaping from poverty in case of small size family, friends, and relatives factor was found that higher in Forward area taluks as compared to be backward area taluks. Thus the taluks wise the factors associated with escaping from poverty in both districts forward and backward.

Table 3: Factors Associated with Escaping Poverty by Taluk wise in Forward and Backward areas (%)

Factors /Taluk	Forward area			Backward area		
	Dharwad	Kundagol	Total	Sindhnur	Devadurga	Total
Employment Private Sector	30.19	29.79	30.00	12.07	18.60	14.85
Employment Public Sector	5.66	-	3.00	1.72	4.65	2.97
Income From Cropping Farming	15.09	21.28	18.00	20.69	18.60	19.80
Livestock farming	20.75	19.15	20.00	25.86	23.26	24.75
Friends and relatives	5.66	10.64	8.00	10.34	9.30	9.90
Small size family	3.77	6.38	5.00	13.79	11.63	12.87
Trade business	3.77	-	2.00	1.72	4.65	2.97
Education	15.09	12.77	14.00	13.79	9.30	11.88
Total	100 (53)	100 (47)	100 (100)	100 (58)	100 (43)	100 (101)

Source: Primary Survey

The data provided in the table 4 indicate that the Forward area sample villages near to industrial area and capital area. The employment in the private sector was estimated better in sample villages in Forward areas as compared to backward area sample villages. The one more significant livestock income from farming factor was found that the Kundagol villages have higher income from livestock as compared to be Dharwad taluks villages. The diversification income factor was significantly associated with escaping from poverty in both taluks sample villages. The income from cropping factor was explained the better in Dharwad taluks villages as compared to be Kundagol taluks villages. The education and friends and relatives have a similar impact on the outcome of poverty in both taluks sample villages. The public sector jobs and trade business factor has found the Dharwad taluk sample villages have better as compared to be Kundagol taluk have nil far associated with the outcome of poverty. The small size family factor was estimated higher in Kundagol taluk villages as compared to be Dharwad taluk sample villages thus the Forward area sample households village factors have significantly associated with escaping from poverty in both taluks villages as well as social groups.

Table 4: Factors Associated with Escaping Poverty by Villages in Forward area (%)

Factors /Village	Dharwad Taluk		Kundagol Taluk		Forward Area
	Hosatti	Kallapur	Inamkoppa	Benakanahalli	
Employment Private Sector	32.26	31.82	28.57	26.92	30.00
Employment Public Sector	6.45	4.55	-	-	3.00
Income From Cropping Farming	19.35	22.73	19.05	11.54	18.00
Livestock farming	16.13	18.18	19.05	26.92	20.00
Friends and relatives	6.45	4.55	9.52	11.54	8.00
Small size family	3.23	4.55	4.76	7.69	5.00
Trade business	3.23	4.55	-	-	2.00
Education	12.90	9.09	19.05	15.38	14.00
Total	100 (31)	100 (22)	100 (21)	100 (26)	100 (100)

Source: Primary Survey

The data presented in table 5 indicate that the diversification of livestock income farming, agriculture cropping income, and employment in the private sector and etc factors have significantly associated outcomes of poverty in sample villages in the backward area. The Gugal village household's livestock income factor was significantly higher

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as compared to be others sample villages. The livestock income farming factor was estimated higher in Gugal village accounting for 34.78 percent and Hemanal 20 percent, Chirtanal 25 percent, and Jangamarahatti accounting 20 percent. The income from agriculture farming was found that Devadurga taluk sample villages better as compare to be Sindhnur taluk sample villages. The anther significant factor private-sector jobs were explained the Devadurga taluk sample villages have higher as compared to be Sindhnur taluk sample villages. Similarly, the education and friend and relatives factors had significantly associated with the outcome of poverty in both taluks sample villages. The small size family factor was estimated higher in Sindhnur taluks villages as compared to be Devadurga taluks sampling villages. The public sector employment was found that the Chirtanal and Hemanal villages have significantly associated with escaping from poverty. Thus the factors have more significantly associated with escaping from poverty was better in Sindhnur taluks sample villages as compared to be Devadurga sample villages households.

Table 5: Factors Associated with Escaping Poverty by Villages in Backward area (%)

Factors /Village	Sindhnur		Devadurga		Backward Area
	J.Hatti	Chirtanal	Gugle	Hemanal	
Employment Private Sector	13.33	14.29	13.04	20.00	14.85
Employment Public Sector	-	3.57	-	10.00	2.97
Income From Cropping Farming	20.00	17.86	21.74	20.00	19.80
Livestock farming	20.00	25.00	34.78	20.00	24.75
Friends and relatives	13.33	10.71	8.70	5.00	9.90
Small size family	20.00	10.71	13.04	5.00	12.87
Trade business	-	3.57	-	10.00	2.97
Education	13.33	14.29	8.70	10.00	11.88
Total	100 (30)	100 (28)	100 (23)	100 (20)	100 (101)

Source: Primary Survey

Findings and Suggestions

1. **Findings of the Study**

- The Forward area has 30 percent as compared to be 14.85 percent in the backward area. The Forward area has more significantly associated with escaping from poverty as compared to be backward area.
- The diversification of livestock income farming was found that the backward area has the more significant outcome of the household in sample villages. The diversification livestock income factor had 24.75 percent in the backward area as compared to be 20 percent in Forward area households.
- The small size of a family factor was estimated higher in backward area have 12.57 percent as compared to be Forward area have 5 percent household's outcome of poverty.
- The more significantly explained the livestock income farming was estimated higher in case of Sindhnur and Devadurga taluk accounting 25.86 percent and 23.26 percent similarly forward area taluks was estimated Dharwad and Kundagol taluks accounting 20.75 percent and 19.15 percent outcome of poverty.
- The education factor was estimated higher in Forward area taluks accounting 15.09 percent Dharwad taluk and 12.77 percent in Kundagol taluk as compared to be backward area taluks Sindhnur accounting 13.79 percent and 9.30 percent in Devadurga taluk.
- The Forward area sample villages near to industrial area and capital area. The employment in the private sector was estimated better in sample villages in Forward areas as compared to backward area sample villages.
- The one more significant livestock income from farming factor was found that the Kundagol villages have higher income from livestock as compared to be Dharwad taluks villages.
- The diversification income factor was significantly associated with escaping from poverty in both taluks sample villages.
- The Gugal village household's livestock income factor was significantly higher as compared to be others sample villages.
- The livestock income farming factor was estimated higher in Gugal village accounting for 34.78 percent and Hemanal 20 percent, Chirtanal 25 percent, and Jangamarahatti accounting 20 percent.
- The income from agriculture farming was found that Devadurga taluk sample villages better as compare to be Sindhnur taluk sample villages.

Suggestions

- **Promote diversified livelihood opportunities:** Since livestock and multiple income sources play a major role in escaping poverty, government programs should encourage integrated farming systems combining agriculture, livestock, and small businesses, especially in backward areas.

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- **Strengthen livestock development initiatives:** Provide veterinary services, subsidies for livestock, and training in modern animal husbandry practices, particularly in villages like Gugle and other high-performing areas, to replicate successful models.
- **Enhance access to private sector employment:** Improve skill development, vocational training, and rural industrial linkages in backward regions to increase employment opportunities similar to forward areas near industrial zones.
- **Promote family welfare and awareness programs:** Encourage small family norms through awareness campaigns and access to family planning services, as smaller family size is associated with better economic outcomes.
- **Improve educational access and quality:** Strengthen rural education infrastructure, provide scholarships, and reduce dropout rates in backward taluks to enhance human capital, which contributes to long-term poverty reduction.

Conclusion

The study has been analyzed the pattern of the agricultural landholding structure in both districts, the view of a point is the landless holders more in the backward area, especially Sindhnur taluks households have more landless labour as compared to be Forward area. The Forward area's households have got the better awareness and facilities from government poverty alleviation programmes as compared to be backward area have less awareness and fewer facilities.

The factors associated significantly the outcome of poverty in both districts households. The employment in the private sector was estimated higher in the Forward area (30 per cent) as compared to be backward area (14.85 per cent). The livestock forming factor was estimated more involved in the backward area (24.75 per cent) as compared to the Forward area (20 per cent). The social groups wise the more households have an outcome of poverty in both districts. The Forward area households have more outcomes of poverty as compared to be backward areas households.

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OriginalArticle

Urbanization and Its Impact on Social Life in India

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Abstract

Urbanization is one of the most significant transformations shaping modern India. It has brought economic growth, modernization, and improved infrastructure, but has also deeply influenced social life. This research paper examines the multifaceted impact of urbanization on social relationships, family structures, cultural practices, and mental well-being in India. Using a mixed-method approach (primary questionnaire with 50 respondents and secondary data), the study highlights both positive and negative consequences of urban living. The findings reveal that while urbanization enhances opportunities and individual freedom, it also contributes to social isolation, weakening of traditional values, and increased stress. The study concludes with recommendations for sustainable and socially inclusive urban development.

Keywords: *Urbanization, Social Change, Migration, Family Structure, India, Social Life*

Introduction

Urbanization refers to the increasing population shift from rural to urban areas and the growth of cities. In India, urbanization has accelerated due to industrialization, globalization, and economic reforms. According to census trends, a significant portion of India's population now resides in urban areas, leading to profound changes in social life.

Urban centers provide better employment, education, healthcare, and lifestyle opportunities. However, rapid urbanization also poses challenges such as overcrowding, pollution, and weakening of social ties. This paper explores how urbanization is reshaping social life in India.

Research Questions:

- How does urbanization affect traditional family systems?
- What changes occur in social interaction due to urban living?
- Does urbanization lead to social isolation and stress?

Hypothesis

- H_0: Urbanization has no significant impact on social life in India
- H_1: Urbanization significantly impacts social life in India

Methodology

This study adopts a mixed-method research design combining both primary and secondary data to analyze the impact of urbanization on social life in India. Primary data was collected through a structured questionnaire administered to 50 respondents, including students, employees, and homemakers residing in urban areas, ensuring a diverse representation of perspectives. Secondary data was gathered from reliable sources such as books, academic journals, government reports, census data, and other online scholarly materials to support and contextualize the primary findings. The study employed a simple random sampling technique to select respondents, minimizing bias and enhancing the validity of the results.

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For data analysis, the percentage method and descriptive analysis were used to interpret responses, identify patterns, and draw meaningful conclusions regarding the social implications of urbanization.

Review of Literature

Urbanization has been a central theme in sociological research, particularly in the Indian context, where rapid economic development has transformed traditional social structures. Scholars such as M. N. Srinivas have emphasized that modernization and urbanization contribute significantly to social change, particularly in weakening traditional institutions like the joint family system. Studies indicate that urban living encourages the shift from joint to nuclear families due to space constraints, employment mobility, and changing aspirations. This transition often results in reduced kinship ties and limited intergenerational interaction, altering the support system that was once a hallmark of Indian society. Research also highlights the rise of individualism in urban areas. Sociologists argue that city life promotes independence, self-reliance, and personal achievement over collective values. According to Louis Wirth in his theory of "Urbanism as a Way of Life," urban environments are characterized by impersonal, transient, and segmented social relationships. In the Indian scenario, this is reflected in reduced neighborhood interaction, weakening of community bonds, and a growing sense of social distance among individuals despite physical proximity.

Another significant area of research focuses on mental health. Studies published in journals such as Economic and Political Weekly reveal that the fast-paced lifestyle of urban centers leads to increased levels of stress, anxiety, and depression. Factors such as work pressure, competition, traffic congestion, and lack of social support contribute to declining mental well-being. Urban residents often experience loneliness and isolation, even in densely populated cities, highlighting a paradox of urban life. Migration is another key dimension explored in the literature. Scholars note that rural-to-urban migration, while offering better economic opportunities, also brings challenges related to identity and social adjustment. Migrants often struggle to adapt to new cultural norms, languages, and lifestyles. This can lead to feelings of alienation and marginalization. Research further indicates that migrants tend to form informal networks or communities based on shared backgrounds, which partially compensate for the loss of traditional social structures but may also limit broader social integration.

Overall, existing literature presents urbanization as a complex and multidimensional process that simultaneously promotes development and disrupts established social patterns. It highlights the need for balanced urban growth that not only focuses on economic advancement but also addresses the social and psychological well-being of individuals.

Data Analysis and Interpretation

Impact on Family Structure

The data collected from respondents clearly indicates a significant shift in family patterns due to urbanization. Around 70% of the respondents reported living in nuclear families rather than traditional joint families. This shift is mainly attributed to factors such as job mobility, limited housing space in cities, and changing lifestyles. While nuclear families provide greater independence and privacy, respondents also expressed concerns about reduced emotional support, lack of elder guidance, and weakening of family bonds.

Social Relationships and Community Life

Urbanization has notably influenced social interactions among individuals. About 65% of respondents stated that they have limited interaction with neighbours and community members. The busy and fast-paced lifestyle of cities leaves little time for socialization. Traditional practices like community gatherings and neighbourhood bonding are gradually declining. Instead, people rely more on digital communication, which, although convenient, lacks the emotional depth of face-to-face interaction.

Mental Health and Lifestyle Changes

The findings reveal that nearly 60% of respondents experience stress, anxiety, or mental fatigue due to urban living conditions. High competition, work pressure, long commuting hours, and rising living costs contribute significantly to mental health issues. Additionally, sedentary lifestyles, irregular eating habits, and lack of physical activity are becoming common, leading to various lifestyle-related health problems.

Migration and Social Adjustment

Migration plays a crucial role in shaping urban social life. Many respondents who migrated from rural areas reported facing challenges in adapting to urban culture. Language barriers, cultural differences, and unfamiliar social norms often create a sense of isolation. However, over time, migrants tend to adjust by forming social networks within their communities. Despite these efforts, full integration into urban society remains a gradual and sometimes difficult process.

Changing Values and Individualism

The data also highlights a shift in social values among urban residents. A majority of respondents believe that urbanization promotes individualism, self-dependence, and career-oriented thinking. While this fosters personal growth

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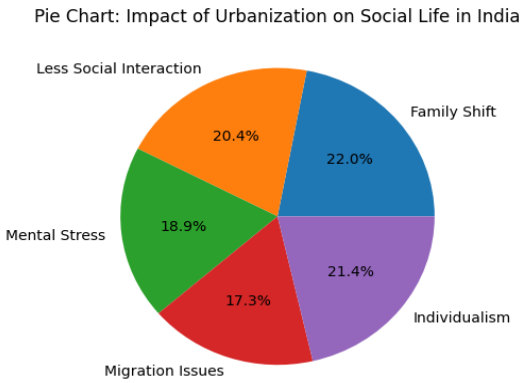
and ambition, it also reduces collective thinking and shared responsibilities. As a result, social cohesion and traditional value systems are gradually weakening in urban environments.



Discussion

The findings of the study clearly indicate that urbanization in India has a dual and complex impact on social life, bringing both opportunities and challenges. On one hand, urbanization has significantly improved living standards by providing better access to education, employment, healthcare, and modern infrastructure, thereby enhancing the overall quality of life. It has particularly empowered marginalized sections of society, especially women and youth, by offering greater economic independence, career opportunities, and exposure to new ideas and lifestyles. This has contributed to increased self-confidence, decision-making ability, and social mobility. However, on the other hand, rapid urban growth has led to the gradual erosion of traditional social structures and values. The shift from joint to nuclear families has weakened kinship ties and reduced the emotional and social support system that was once integral to Indian society. Additionally, the fast-paced and competitive nature of urban life has limited interpersonal interactions, leading to reduced community participation and a decline in neighborhood bonding. As a result, many individuals experience social isolation, loneliness, and psychological stress despite living in densely populated environments. Furthermore, the growing emphasis on individualism and material success has overshadowed collective values such as cooperation, empathy, and social responsibility. Thus, while urbanization acts as a catalyst for progress and personal growth, it simultaneously poses significant challenges to social cohesion and mental well-being, highlighting the need for balanced and inclusive urban development policies.

Conclusion

Urbanization in India is an inevitable and continuous process that plays a crucial role in shaping social life and societal transformation. It has contributed significantly to economic growth, modernization, and improved access to education, healthcare, and employment opportunities. At the same time, it has brought noticeable changes in family structures, social relationships, and cultural values. The shift towards nuclear families, increased individualism, and reduced community interaction have weakened traditional social bonds. Moreover, the fast-paced urban lifestyle has led to stress, social isolation, and mental health concerns. Despite these challenges, urbanization has empowered individuals, especially women and youth, by enhancing their independence and social mobility. Therefore, a balanced and inclusive approach to urban development is essential. Policymakers must focus not only on infrastructure and economic progress but also on strengthening social cohesion and well-being. Sustainable urban planning, community engagement, and social support systems are necessary to ensure a better quality of life in urban India.

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OriginalArticle

Unstable Democracy: The Crisis of Political Awareness in India

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Abstract
This study explores the growing crisis of political awareness in India and its impact on democratic stability. Despite having a well-established democratic framework, a significant portion of the population remains politically unaware and disengaged. Factors such as illiteracy, poverty, misinformation, and lack of civic education contribute to this issue. The study highlights the consequences of low awareness, including voter apathy and weak accountability, and suggests measures to strengthen democratic participation.
Keywords: *Political Awareness, Indian Democracy, Voter Participation, Civic Education, Misinformation, Voter Apathy, Democratic Stability, Electoral Behavior, Youth Participation, Governance, Social Inequality, Political Engagement.*

Introduction

Democracy thrives on the active participation, awareness, and informed decision-making of its citizens. It is not merely a system of government but a continuous process that depends on the engagement of people in political, social, and civic activities. In India, the democratic framework provides numerous opportunities for citizens to participate in governance, most notably through regular, free, and fair elections, as well as through various forms of civic engagement such as public discussions, social movements, and community initiatives. These mechanisms enable individuals to express their opinions, choose their representatives, and influence public policies.

However, in recent years, there has been a growing concern about the lack of political awareness among citizens. Many individuals remain uninformed about their rights, duties, and the functioning of political institutions. This decline in awareness often leads to reduced electoral participation, uninformed voting decisions, and a general sense of detachment from the democratic process. As a result, democratic values such as equality, justice, and accountability may become weakened, ultimately affecting the quality of governance.

An informed and aware citizenry plays a crucial role in strengthening democracy. When people are educated about political processes and issues, they are better equipped to question authority, demand transparency, and hold leaders accountable for their actions. This not only ensures that governance remains responsive and responsible but also promotes inclusiveness and fairness in decision-making. Therefore, enhancing political awareness through education, media, and public discourse is essential for sustaining a vibrant and effective democratic system.

Statement of the Problem

The crisis of political awareness in India has led to an unstable democratic environment. Many citizens lack knowledge about their rights, duties, and political processes. This results in low participation, uninformed voting, and the rise of ineffective leadership. The issue is particularly severe among marginalized and economically weaker sections, creating an imbalance in democratic representation.

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Objectives of the Study

1. To assess the level of political awareness among citizens.
2. To identify the causes of low political awareness.
3. To analyze its impact on democratic stability.
4. To suggest measures to improve political awareness.
5. To promote active and informed citizenship.

Factors and Real-Life Examples of Lack of Political Awareness in Democracy

The lack of political awareness in a democracy can be attributed to several interconnected social, economic, and institutional factors. One of the primary causes is the lack of civic education, as many citizens are not adequately educated about democratic values, constitutional rights, electoral processes, and their responsibilities as voters. Without this foundational knowledge, individuals may fail to understand the significance of their participation in governance. Another major factor is the rapid spread of misinformation and fake news, especially through digital platforms and social media, where false or misleading political information often shapes public opinion. This leads voters to make decisions based on rumors rather than facts.

Economic inequality and poverty also significantly affect political awareness. People struggling to meet their basic needs often prioritize immediate survival over political participation, leaving little time or opportunity to become informed about political developments. Similarly, political apathy among the urban population has emerged as a challenge, where educated and economically secure citizens often refrain from voting or engaging in public affairs because they feel their participation makes little difference. The influence of money and muscle power during elections further weakens democratic awareness, as some voters are manipulated through bribery, gifts, or coercion, undermining the ethical basis of elections.

In addition, a lack of trust in political institutions discourages citizens from active involvement. When people perceive institutions as corrupt or ineffective, they may become disillusioned and withdraw from democratic processes. Social exclusion of marginalized groups, including economically weaker sections, women, and minority communities, also contributes to political unawareness because these groups often have limited access to education, political information, and representation.

These issues are reflected in various real-life examples. Urban voter apathy is evident in metropolitan cities such as Bengaluru and Mumbai, where voter turnout is often lower than in rural areas despite higher literacy rates. This shows that education alone does not guarantee political participation, as many urban citizens feel disconnected from electoral outcomes. Another example is vote buying in states like Tamil Nadu and Andhra Pradesh, where the distribution of money or gifts during elections influences voters. Such practices reveal a lack of awareness regarding ethical voting and democratic responsibility.

The influence of fake news has become increasingly visible during elections, especially through platforms like WhatsApp and Facebook, where misinformation spreads rapidly and affects voting behavior. Similarly, the criminalization of politics, where candidates with criminal backgrounds are elected to public office, demonstrates that many voters may not critically evaluate the qualifications or integrity of candidates. Reports from the Election Commission of India highlight that several elected representatives face serious criminal charges, raising concerns about voter awareness.

Another example is the low awareness of welfare schemes such as Mahatma Gandhi National Rural Employment Guarantee Act, where many rural citizens remain unaware of their eligibility and benefits, preventing effective implementation. Youth political disengagement is also a growing concern, as many young people prioritize careers or entertainment over civic participation, reducing their involvement in policy discussions, student politics, and democratic debates. Moreover, voting based on caste or religion rather than policies remains common in many regions, indicating that emotional and identity-based considerations often outweigh informed political judgment. Finally, participation in protests without fully understanding the issue reflects partial awareness and the influence of group behavior rather than conscious democratic engagement.

Together, these factors demonstrate that political awareness is essential for the proper functioning of democracy. Without informed and active citizens, democratic institutions become vulnerable to manipulation, corruption, and ineffective governance. Therefore, strengthening civic education, promoting ethical political participation, and ensuring equal access to political information are necessary steps to build a more aware and responsible democratic society.

Measures to Improve Political Awareness and Strengthen Democracy

To address the challenges of low political awareness, it is essential to strengthen civic and political education at all levels. Educational institutions should incorporate subjects that promote understanding of democratic values, constitutional rights, and civic responsibilities, enabling citizens to make informed decisions. Alongside this, conducting voter awareness campaigns is crucial to educate people about the importance of voting, ethical participation, and the impact of their choices on governance. Promoting media and digital literacy has become increasingly important in the modern era, where misinformation spreads rapidly. Citizens must be equipped with the

skills to critically evaluate information and distinguish between reliable and false content. Encouraging youth participation in politics is another key measure, as young people bring energy, innovation, and fresh perspectives to democratic processes. Their involvement in debates, policymaking, and leadership roles can significantly strengthen governance.

Ensuring transparency and accountability in political institutions is also vital to rebuild public trust and encourage citizen engagement. When governments function openly and responsibly, people are more likely to participate actively in democracy. Additionally, special focus must be given to the inclusion of marginalized communities, ensuring they have equal access to education, political representation, and participation opportunities.

Finally, technology should be used responsibly as a tool for spreading awareness and information. Digital platforms can play a positive role in educating citizens, promoting civic engagement, and fostering informed public discourse when used ethically and effectively. Together, these measures can help create a more aware, active, and responsible citizenry, ultimately strengthening the foundations of democracy.

Conclusion

The crisis of political awareness poses a serious challenge to the stability and effectiveness of Indian democracy. Democracy depends not only on the existence of institutions but also on the active and informed participation of its citizens. When people lack awareness about their rights, duties, and political processes, their participation becomes limited or misguided, weakening democratic values and institutions. This often results in low voter turnout, uninformed electoral choices, and reduced accountability of political leaders.

In such a situation, governance may become less transparent and less responsive to public needs, increasing the chances of corruption and misuse of power. Therefore, enhancing political awareness is essential for strengthening democracy. Civic education plays a key role in helping citizens understand democratic principles and their responsibilities. At the same time, media must provide accurate and unbiased information, while digital literacy helps people identify misinformation.

Inclusive policies are also important to ensure that marginalized groups are not left out of the democratic process. When citizens are informed and actively engaged, they are better able to demand transparency, hold leaders accountable, and contribute to effective governance. Thus, building political awareness is vital for creating a stable, responsible, and vibrant democratic system in India.

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OriginalArticle

Impact of Artificial Intelligence on Economic Growth and Employment in India

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Abstract

Artificial Intelligence (AI) has emerged as a transformative general-purpose technology with significant implications for economic growth and employment, particularly in emerging economies such as India. This study examines the impact of AI by integrating theoretical perspectives, including Schumpeterian Growth Theory and Skill-Biased Technological Change, with recent empirical evidence. It argues that AI enhances productivity, drives innovation, and contributes to structural economic transformation. In India, AI adoption—supported by initiatives such as NITI Aayog's AI strategy and the Digital India programme—has led to efficiency gains across sectors including finance, healthcare, and manufacturing. Empirical estimates suggest that AI could add $500–600 billion to India's GDP, highlighting its role as a key growth driver. Innovations like Unified Payments Interface (UPI) further demonstrate how digital systems can enhance financial inclusion and economic activity. However, AI also reshapes employment by creating high-skill job opportunities while displacing routine and low-skilled work, leading to job polarization and skill gaps. The study concludes that the overall impact of AI depends on effective policy measures in education, skill development, and labor market adaptation to ensure inclusive and sustainable economic growth.

Keywords: *Artificial Intelligence, Economic Growth, Employment, Automation, Labor Market, Productivity*

Introduction

Artificial Intelligence has become a central driver of economic transformation in the 21st century. In India, the convergence of digitalization, increased internet penetration, and government initiatives has accelerated the adoption of AI technologies across multiple sectors. While AI offers significant opportunities for economic advancement through productivity gains and innovation, it also raises critical concerns regarding employment displacement and widening inequality. Therefore, a comprehensive understanding of AI's dual impact is essential for policymakers and stakeholders.

Theoretical Framework

1. **Schumpeterian Growth Theory**
   According to Schumpeterian theory, technological innovation acts as a catalyst for economic growth through a process of "creative destruction," whereby outdated systems are replaced by more efficient technologies. In this context, AI contributes to economic expansion by enhancing productivity while simultaneously disrupting traditional employment structures.
2. **Skill-Biased Technological Change**
   The theory of skill-biased technological change suggests that technological advancements, including AI, disproportionately increase the demand for skilled labor while reducing opportunities for low-skilled workers. Consequently, this leads to wage disparities and growing income inequality.

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3. **Endogenous Growth Theory**

Endogenous growth theory emphasizes the role of knowledge, innovation, and human capital in driving sustained economic growth. AI serves as a critical factor in this process by promoting innovation and facilitating knowledge spillovers across sectors.

Research Methodology

The present study is based on secondary data collected from government reports, international organizations, and scholarly publications. A qualitative analytical approach has been employed to examine the impact of AI on economic growth and employment trends in India.

Impact of AI on Economic Growth in India

1. **Productivity and Efficiency**

Artificial Intelligence significantly enhances productivity by automating repetitive tasks, minimizing human error, and optimizing operational processes. In India, industries such as information technology and manufacturing have experienced improved efficiency and cost reduction due to AI integration.

2. **Contribution to GDP**

AI is expected to make a substantial contribution to India's economic growth by improving labor productivity and enabling the efficient allocation of resources. Various estimates suggest that AI could add significantly to India's GDP in the coming years.

3. **Innovation and Entrepreneurship**

AI has fostered innovation by enabling the development of new products, services, and business models. The growth of AI-based startups in sectors such as healthcare, fintech, and education reflects the increasing role of technology in driving economic expansion.

4. **Sectoral Transformation**

AI has led to significant transformations across key sectors. In agriculture, it supports precision farming and crop monitoring. In healthcare, it enhances diagnostic accuracy and treatment efficiency. In finance, AI facilitates fraud detection and risk assessment. In manufacturing, it enables automation and predictive maintenance.

Empirical Evidence:

Artificial Intelligence has demonstrated measurable contributions to India's economic growth through productivity enhancement, sectoral transformation, and digital expansion.

Contribution to GDP Growth

Empirical estimates from NITI Aayog indicate that AI adoption could contribute approximately $500–600 billion to India's GDP by 2035 through improvements in efficiency and productivity.

Further projections suggest:

- AI could help India achieve 8%+ sustained economic growth
- AI may account for 20–25% of growth in sectors such as finance and manufacturing

This demonstrates that AI is not merely a technological innovation but a macroeconomic growth driver.

Sectoral Productivity Gains (Data-Based Evidence)

Empirical estimates from national reports show:

- **Financial sector**: AI could generate an additional $50–55 billion output through fraud detection, credit scoring, and risk management
- **Manufacturing sector**: AI could add $85–100 billion through automation and predictive maintenance

  These figures indicate that AI-driven efficiency gains are quantifiable and sector-specific, not merely theoretical.

AI and Innovation Indicators

India has emerged as:

- One of the top AI talent hubs globally
- A leading country in startup ecosystem growth (AI, fintech, edtech)

Empirical implication:

- Increased **R&D expenditure**
- Expansion of **digital entrepreneurship**
- Growth in **knowledge-based economy**

Empirical Evidence: AI and Employment in India

Job Creation Potential

According to recent projections:

- AI could create up to 4 million jobs in India by 2030–2031 in sectors such as IT, customer services, and analytics

  These jobs are primarily in:
- High-skill domains

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- Technology-driven sectors

Job Displacement (Structural Data Trends)

Empirical labour trends show:

- Routine and repetitive jobs are declining due to automation
- Sectors most affected: Manufacturing, Clerical work, Data entry jobs

This supports the theory of skill-biased technological change, where:

- Demand for low-skilled labour decreases
- Demand for high-skilled labour increases

Job Polarization Evidence

India is experiencing: Growth in high-income tech jobs, Persistence of low-income informal jobs, Decline of middle-skill employment.

This creates income inequality and labour market imbalance, a phenomenon supported by empirical labour studies.

Case Studies: India

1. **NITI Aayog – National Strategy for AI**
   The National Strategy for Artificial Intelligence, developed by NITI Aayog, emphasizes the use of AI for inclusive growth. It focuses on key sectors such as agriculture, healthcare, education, and smart cities, aiming to enhance efficiency and improve public service delivery.
2. **Digital India Initiative**
   The Digital India initiative has played a crucial role in strengthening digital infrastructure and promoting technological adoption. By expanding internet access and encouraging digital innovation, it has facilitated the integration of AI into various sectors of the economy.
3. **Unified Payments Interface (UPI)**
   The introduction of UPI has revolutionized digital payments in India by enabling fast, secure, and convenient transactions. It has significantly contributed to financial inclusion, increased economic activity, and generated employment in the fintech sector.

Challenges and Risks

The widespread adoption of AI presents several challenges, including rising income inequality, skill mismatches, and ethical concerns related to data privacy and algorithmic bias. Furthermore, the possibility of jobless growth remains a critical issue that requires policy attention.

Data-Driven Challenges

Skill Gap (Quantitative Insight)

- A large portion of India's workforce lacks advanced digital skills
- Only a small percentage is trained in AI-related fields

Inequality (Empirical Trend)

- Wage gap between skilled and unskilled workers is increasing
- AI adoption benefits urban and educated populations more

Policy Implications

To maximize the benefits of AI while minimizing its adverse effects, it is essential to implement comprehensive policy measures. These include investing in education and skill development, promoting research and innovation, strengthening social security systems, and fostering collaboration between the public and private sectors.

Based on empirical trends, India should:

1. Increase public investment in AI education and skilling
2. Expand digital infrastructure in rural areas
3. Promote AI startups through funding and incentives
4. Strengthen labour transition programs for displaced workers

Conclusion

Artificial Intelligence has the potential to significantly enhance economic growth in India by improving productivity and fostering innovation. However, its impact on employment is complex and multifaceted, involving both opportunities and challenges. A balanced and proactive policy approach is necessary to ensure that AI contributes to inclusive and sustainable economic development.

Empirical evidence clearly shows that Artificial Intelligence is a major contributor to India's economic growth, with projected GDP gains of up to $600 billion and significant sectoral productivity improvements. At the same time, it is reshaping employment patterns by creating high-skill jobs while displacing routine labour.

Therefore, the net impact of AI in India depends on policy effectiveness, skill development, and inclusive growth strategies.

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Gender Role And Social Change: A Study on The Empowerment of Fisherwomen in India

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Abstract

This study examines the relationship between gender, livelihood and social change through a review of related literature on the empowerment of fisherwomen in India. It produces existing research to understand the roles, contributions, and challenges faced by fisherwomen within the fisheries sector, where their work often remains undervalued and invisible. The review highlights major issues such as limited access to resources, financial constraints, lack of ownership rights, and socio-cultural barriers that restrict their participation in decision – making processes. The literature further reveals that fisherwomen play a significant role in post harvest activities such as fish processing, marketing, as well as maintaining household livelihoods, despite facing structural inequalities and gender-based discrimination. Various studies points out the importance of collective action through self – help groups, cooperatives and community-based organizations in enhancing their economic independence and social status. The review also identifies the impact of government policies, non-governmental interventions, and capacity-building programs in promoting empowerment. Access to microcredit, education, skill development, and market linkage are the important factors which contribute to the improvement of livelihoods and agency among fisherwomen. The study concludes that empowerment is a complex, as well as a multi dimensional process which is highly influenced by institutional support, social norms, and economic opportunities. For ensuring sustainable development and gender equity in the fisheries sector in India, strengthening of inclusive frameworks and addressing systemic barriers are highly essential.

Keywords: *Gender discrimination, Fisherwomen, Digitalization.*

Introduction

The fisheries sector in India plays an important role in supporting the livelihoods of millions of coastal and inland communities. Fisherwomen are actively involved in a range of activities such as fish processing, drying, vending, and marketing, contributing significantly to the household income and food security. Though their crucial role, their contributions have historically remained undervalued, with limited recognition in policy frameworks and decision-making spaces. The issue of gender inequality continues to shape access to resources, opportunities, and rights within the fisheries sector. Fisherwomen face numerous challenges such as lack of access to credit, inadequate infrastructure, restricted mobility, and exclusion from entrepreneurship and several leadership roles. These barriers are yet to be reinforced through socio-cultural norms that confine women to secondary positions in economic activities. As a result, their potential to achieve economic independence and social empowerment remains constrained.

In recent years, there has been greater emphasis on the empowerment of women as a key role of sustainable development and social change. In the context of fisheries, empowerment includes enhancing women's access to resources, strengthening their participation in decision-making, and improving their socio-economic status.

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Various initiatives, including self-help groups, cooperatives, and government-supported programs, have aimed to address these challenges and create opportunities for fisherwomen to enhance their livelihoods. This article explores the intersection of gender, livelihood and social change by examining the empowerment of fisherwomen in India through a review of related literature. By analysing existing studies, it aims to highlight the structural barriers, opportunities, and transformative processes which shape the lives of fisherwomen. Understanding these dynamics which is essential for formulating inclusive policies and promoting equitable and sustainable development within the fisheries sector.

Gender Roles And Division of Labour in Fishing Communities

Fisherwomen are involved in different post harvest operations especially in peeling, trading, processing, and other related aspects. Fisherwomen play a critical role in the maintenance and economic prosperity of the family. Several studies have shown that women spend long period of time in labour intensive tasks in fisheries sector, besides their equally demanding household chores.

Gender roles in fisheries sector is distinctly divided as, men dominate se fishing as well as technical tasks, while women carry out primary responsibility for the post-harvest processing, marketing and household management. This gendered division of labour makes the fisherwomen managing the post harvest activities such as fish sorting, cleaning, drying, and retail, along with extensive domestic rules, often resulting in low wages and limited decision-making power compared to men.

Social Change Through Education and Collective Action

Education is a catalytic factor for social change. A change in life as well as status of women has been greatly accelerated by the attainment of education.

As per the report by NCERT, 2006 gender bias is the most pervasive form of inequality; it operates across all classes, castes and communities as well. A perfect example for this is, the dropout rates of girls, especially from the marginalized sections and also from rural areas continue at the range of 9 out of every 10 girls ever enrolled in Class 1 reaches Class XII in rural areas. The important reasons for this range of dropout rates includes non- comprehension by the student, poor teaching, high costs of private tuition, difficulties of coping with the studies.

The National Policy on Education (1986) emphasized the promotion of women's education in various aspects of learning to eradicate stereotyping based on sex, with the guarantee of equality before the law and also the encouragement of women's education. Since employment for women plays a crucial role in enhancing the status of women in the society, education for women is of prior importance on the development of women as well as society also.

For example, Sivakumar and Usha V.T. (2013) in their research study on "Educational status of marine fishing community women in Puducherry region" show that the main goal of "education for girls' is not achieved. Women's educational status is low because of the parent's lack of interest for educating their girl children but the condition of boy's education in the community reached up to primary/middle school level. This issue influences the girl child marriage's prospects. Also, girl children are required to help in the household work, take care of younger siblings and other commercial work in the community.

Gender discrimination is wide spread among the fishing community, because of the marginalization and patriarchal factors which socio-cultural in nature. The gender discrimination can be highly visible in education, workload, economic activity, health care, food and nutrition because of the higher male domination.

Social Change and Empowerment

"Change" means variation or a difference in anything observed over some period of time. K.Davis defined this process as "An alternation in structure and contentment of a society." Some other sociologists defined this as follows:

- According to Jones, "Social change is a term used to describe variations in, or modifications of, any aspect of social processes, social patterns, social interaction or social organization."
- According to Gillin and Gillin, "Social changes are variations from the accepted modes of life; whether due to alteration in geographical conditions, in cultural equipment, composition of the population, or ideologies and whether brought about by diffusion or inventions within the group."
- According to Koenig, S, "Social change refers to the modifications which occur in the life patterns of a people."
- According to M.D.Jenson, "Social change may be defined as modification in ways of doing and thinking of people."
- According to Lundberg and others, "Social change refers to any modification in established patterns of inter human relationships and standards of conduct."

  Empowerment is a term generally used to describe a process by which powerless people become conscious of their own rights and organise collectively to achieve greater access to public service or to the benefits of economic growth. The major components of empowerment are:
- Women's and men's sense of internal strength and confidence to face life.
- The right to make choices.

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- The power to control their own lives within and outside the home.
- The ability to influence the direction of social change towards the creation of a more just social and economic orders nationally and internationally.

Mc Whirter defines empowerment as "the process by which people, organisation or groups who is powerless:

a) Become aware of the power dynamics at work in their life context,
b) Develop the skills and capacity for gaining some reasonable control over their level
c) Exercise their control without infringing upon the rights of others and
d) Support the empowerment of others in the community,"

Mc Whirter's definition makes it clear that gaining power is not to dominate others, but to take action to change oneself. She also says it helps to remove the unjust inequalities and their effects.

"Empowerment can take place both on small scale a well as large scale. In small scale, empowerment is possible through, linking people with others in similar situations through self-help, education, support, or social action groups and network building etc. Whereas community organisations, campaigning, legislative lobbying, social planning and policy development leads to empowerment in large scale.

Social Change Through Empowerment of Fisherwomen

Social change through the empowerment of fisherwomen in India highlights a tremendous process that challenges traditional gender roles and promotes inclusive development within coastal and fishing communities. As fisherwomen become more economically and socially empowered, numerous critical changes are observed at household as well as community levels. An empowered woman can contribute for the better decision-making, improved health and education outcomes for children, and more equitable gender relations. At community level, the participation of fisherwomen in local institutions and campaigning efforts leads to bigger awareness of rights, improved access for the welfare schemes, and stronger social networks. Empowerment helps fisherwomen to cope up with emerging challenges such as climatic changes, declining of fish stocks, and market variations. By attaining skills, knowledge, and organizational support, they are highly adaptable according the changing surroundings and also have the capability to sustain their livelihoods.

Thus, the empowerment of fisherwomen serves an important determinant for broader social change by promoting gender equality, economic development, and hence social justice. It not only transforms the lives of individual fisherwomen, but also makes a huge contribution to the overall progress and resilience of fisheries sector in India.

Women empowerment and community development can be achieved through the combined efforts of men and women by following a holistic approach.

Findings

Insights from the literature on gender, livelihood, and social change have led to the formulation of the following key findings.

Major constraints faced by Fisherwomen are:

- Problems at market areas: In most of the market places, without proper vending zones, women are compelled to sell fish in unauthorized public spaces, like pavements, which results in their identification as encroachers and encounter legal difficulties.
- Inadequate market infrastructure: Across several fish markets in the country, basic amenities such as proper storage, processing, as well s selling spaces, clean sanitation, access to safe drinking water and ice, and most importantly , effective waste management systems are hugely absent. These deficiencies may hinder hygienic fish handling, compromise the health of both the vendors as well as consumers, and limit women's capability to work with dignity.
- Limited ice supply and storage constraints: Fish, being highly perishable, needs immediate preservation to maintain its quality. However, the limited availability and high cost of ice make it difficult for women vendors to afford proper storage, often forcing them into distress at significantly at lower prices, which leads to substantial economic losses.
- Financial exclusion and predatory lending: The lack of access to affordable credit forces women vendors to depend on private moneylenders. The burden of high interest rates leads to huge debt.
- Lack of basic amenities at harbours, landing centres, and markets: Centralized fishing operations have increased the dependence of women vendors on distant harbours, necessitating long travel and overnight stays. Barriers such as limited transport systems and social stigma escalate these challenges. The absence of basic facilities such s toilets, storage, lighting and safe waiting spaces will makes a difficult and unsafe working environment, while male dominance in auction centres limits the opportunities of women to procure high- quality fish.

Suggested recommendations to mitigate the constraints of fisherwomen are:

- Promotion of education among fisher women, with major focus on digital literacy.
- Systematic collection and analysis of gender – based data which highlights women's role across fisheries sector (in various fields such as aquaculture, pre-harvest and post – harvest activities).

- Enhancement of access to credit and subsidies through increased awareness on government schemes programmes as well as policies.
- Development and execution of women – friendly fisheries technologies, which includes improves package of practices.
- Digitalization of market places and the introduction of e-market platforms.
- Development and improvement of cold chain infrastructure.
- Ensuring equal wages for fisherwomen.
- Upgrading infrastructural facilities in market areas
- Encouraging women entrepreneurship in fisheries sector.
- Promoting leadership among fisherwomen in cooperatives, Farmer Producer Organizations (FPO).

Conclusion

Fisherwomen have to attain knowledge regarding post-harvest technologies as well as on scientific knowledge. They have to be given training for quality checking and quality control as per the satisfaction of the consumers and also production of diverse fish products for better them to express utilization of fish which paves the way for the creation of self-employment opportunities to enhances their income for their families and hence, they can improve their economic status and it will result into the empowerment of fisherwomen. When their technical knowledge has improved, and their interpersonal as well as financial management skills have been strengthened, the fisherwomen can also pursue entrepreneurial opportunities. The entrepreneurship will help them to improve their individuality and also raise their self – confidence among members which leads to the overall development of fisherwomen community.

An improvement in the fisher's economy alone cannot be considered as the symbol for development. Although several efforts have been made to achieve convergence in the fisheries sector by various governmental departments as well as organisations, the potential for social and economic development through increased participation of women has yet to be fully realized. More focus needs to be placed on improving program planning instead of implementation.

As Amartya Sen (2001) has rightly viewed "*there are no good reasons to abandon the understanding that the impact of women empowerment in enhancing the voice and influence of women does help to reduce gender inequality of many different kinds, and can also reduce the indirect penalty that men suffer from the subjugation of women*".

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OriginalArticle

Role of Physical Education in Promoting Health and Fitness Among Students

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Abstract

Physical education plays a key role in the holistic development of students by promoting physical fitness, mental health, and social well-being. In recent decades, rapid technological advancement and urbanization have led to sedentary lifestyles among children and adolescents, increasing their vulnerability to lifestyle-related diseases such as obesity, type 2 diabetes, and hypertension. Physical education provides an effective solution to these challenges by encouraging active participation in structured physical activities and fostering lifelong healthy habits.

This paper brings the multifaceted role of physical education in enhancing students' physical fitness, mental health, academic performance, and social development. It emphasizes the importance of integrating innovative teaching strategies, modern infrastructure, and inclusive policies to strengthen physical education programs. The study is based on secondary data from academic literature and reports. The findings indicate that physical education is an essential component of education systems and contributes significantly to building a healthier and more productive society.

Keywords: *Physical Education, Health, Fitness, Students, Lifestyle Diseases, Mental Health, Sports, Well-being*

Introduction

Physical education is a fundamental component of the education system that focuses on improving physical fitness, developing motor skills, and promoting overall well-being among students. Traditionally, education emphasized academic achievement, often overlooking the importance of physical activity. However, modern educational approaches recognize that physical health is closely linked to mental and cognitive development.

In today's digital age, students are engaged in sedentary activities such as watching television, playing video games, and using smartphones. This shift has significantly reduced physical activity levels, leading to a rise in health problems such as obesity, cardiovascular diseases, and type 2 diabetes. According to global health reports, insufficient physical activity is one of the leading risk factors for mortality worldwide.

Physical education serves as a structured platform to promote regular exercise, teach healthy habits, and gradually discipline among students. It includes activities such as sports, games, yoga, aerobics, and recreational exercises, all of which contribute to physical, mental, and social development. This paper examines the role of physical education in promoting health and fitness and highlights its importance in addressing contemporary health challenges.

Objectives of the Study

The primary objectives of this study are:

- To analyze the role of physical education in improving physical fitness among students
- To examine the impact of physical education on mental health and emotional well-being

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- To study the contribution of physical education in developing social and interpersonal skills
- To identify challenges in implementing physical education programs
- To suggest measures for improving the effectiveness of physical education

Methodology

This study is based on secondary data collected from various sources, including academic journals, books, government reports, and online databases. A qualitative research approach has been adopted to analyse the data and understand the significance of physical education in promoting health and fitness. Relevant literature has been reviewed to provide a comprehensive understanding of the topic.

Importance of Physical Education in Modern Education

Physical education is no longer considered an optional or supplementary subject; it is now recognized as an essential part of holistic education. It contributes to the development of the body and mind, ensuring balanced growth among students.

Educational institutions and physical education teachers play a vital role in shaping students' habits and behaviours. By incorporating physical education into the curriculum, schools can encourage students to adopt active lifestyles. Regular physical activity not only improves physical health but also enhances concentration, memory, and academic performance.

Moreover, physical education promotes values such as discipline, teamwork, leadership, and perseverance. These qualities are essential for success in both academic and professional life.

Role of Physical Education in Promoting Health and Fitness

1. **Development of Physical Fitness**
   Physical education helps improve various components of fitness, including strength, endurance, flexibility, and coordination. Activities such as running, swimming, and team sports enhance cardiovascular endurance and muscular strength.
   Regular participation in physical activities helps maintain a healthy body weight and reduces the risk of obesity. It also improves posture, balance, and overall physical efficiency.
2. **Mental Health Benefits**
   Physical activity has a profound impact on mental health. Exercise stimulates the release of endorphins, often referred to as "feel-good hormones," which help reduce stress, anxiety, and depression.
   Students who participate in physical education programs tend to have better emotional stability and self-esteem. Physical activity also improves sleep patterns and reduces symptoms of mental fatigue.
3. **Social and Emotional Development**
   Physical education provides opportunities for students to interact with peers through team sports and group activities. This interaction fosters social skills such as communication, cooperation, and teamwork.
   Participation in sports also helps develop leadership qualities and a sense of responsibility. Students learn to handle success and failure, which builds resilience and emotional maturity.
4. **Prevention of Lifestyle Diseases**
   One of the most significant benefits of physical education is its role in preventing lifestyle-related diseases. Regular physical activity reduces the risk of conditions such as obesity, type 2 diabetes, hypertension, and cardiovascular diseases.
   It also improves metabolic health and strengthens the immune system, making students less susceptible to illnesses.
5. **Enhancement of Academic Performance**

a. Research indicates a strong relationship between physical activity and academic performance. Students who engage in regular physical activity demonstrate better concentration, memory, and problem-solving skills.
b. Physical education also reduces classroom stress and improves behavior, creating a more conducive learning environment.

6. **Promotion of Healthy Lifestyle Habits**

a. Physical education instills lifelong habits such as regular exercise, balanced nutrition, and personal hygiene. These habits contribute to long-term health and well-being.
b. Students who develop healthy habits at an early age are more likely to maintain them throughout their lives, reducing the risk of chronic diseases in adulthood.

Challenges in Physical Education

Despite its importance, physical education faces several challenges in implementation:

1. **Lack of Infrastructure**
   Many educational institutions lack adequate sports facilities, playgrounds, and equipment, limiting students' participation in physical activities.

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2. **Shortage of Qualified Teachers**
   There is a shortage of trained physical education instructors in many schools, affecting the quality of programs.
3. **Academic Pressure**
   Students often prioritize academic subjects over physical education due to examination pressure, reducing participation levels.
4. **Lack of Awareness**
   Teachers, Parents and students may not fully understand the importance of physical education, leading to low engagement.
5. **Gender and Social Barriers**
   In some regions, cultural and social norms restrict participation in physical activities, especially among girls.
6. **Lack of funds**
   Lack of funds to conduct/organise sports and games for inter-class, inter-school, competitions.

Suggestions and Recommendations

1. **Infrastructure Development**
   Governments and institutions should invest in building sports facilities and providing necessary equipment.
2. **Policy Implementation**
   Physical education should be made a compulsory subject at all levels of education, with proper assessment systems.
3. **Teacher Training**
   Training programs should be conducted to improve the skills and knowledge of physical education teachers.
4. **Awareness Programs**
   Awareness campaigns should be organized to educate parents and students about the benefits of physical activity.
5. **Integration of Technology**
   Modern technology, such as fitness apps and virtual training tools, can be integrated into physical education programs to make them more engaging.
6. **Inclusive Programs**
   Programs should be designed to include students of all abilities, ensuring equal participation for opportunities.
7. **Incentives**
   Encouraging students to give incentives to special achievers by providing tracksuits, cash awards, etc.

Conclusion

Physical education is a vital component of the education system that significantly contributes to the health and fitness of students. It promotes physical, mental, and social well-being, helping students lead balanced and productive lives.

In the context of increasing sedentary lifestyles and rising health issues, the role of physical education has become more important than ever. By addressing existing challenges and implementing effective strategies, educational institutions can enhance the quality of physical education programs.

Ultimately, prioritising physical education will lead to the development of a healthier, more active, and socially responsible generation.

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OriginalArticle

An overview of Smart Library Technologies in Modern World

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Abstract

Smart libraries are incorporating cutting-edge technology to improve services, simplify operations, and increase accessibility to knowledge. The article covered the integration of technology, such as AI, data analytics, library automation, and smart infrastructure. Self-checkout kiosks, chatbots, robotic book retrieval, automated book returns, and predictive analytics are a few examples. According to the article, smart study rooms, IoT sensors, interactive digital signage, climate control, and smart lighting are examples of smart environments and infrastructure. The article also covered how e-books, audiobooks, databases, virtual reference services, and AR/VR are accessible through digital collections and virtual libraries. Data insights and analytics aid in tracking consumption and forecasting future offerings. Digital storytelling and co-working spaces are examples of collaborative and community-focused services. Eventually, it was discussed how mobile applications enable users to access online resources, reserve books, search catalogs, and make payments.

Keywords: *Smart Libraries, Smart Technologies, Traditional Libraries, Digital Libraries, Advanced Libraries.*

Introduction

In today's smart world and smart generation, users can readily embrace new technologies. Libraries are developed in three distinct phases: modernization, automation, and digitization (Nahak & Padhi 2019). Similarly, library collections are changing. For example, in the past, people used clay tablets and palm leaves to write information. After printing machines were invented, books became widely used worldwide. With the advent of the internet, information changed to include microforms, e-books, database resources, open access materials, and virtual resources. Smart libraries are made up of digital resources that are connected to a global network of libraries and services that offer a lot of information too many users at once. Additionally, the smart libraries are easy to use and offer fast information. In the today digital era technological innovation have transformed traditional library to smart library, the smart libraries are the new era libraries, A smart libraries offers a range of services that are interactive innovation, informative, current update information gives, the fundamental purpose of smart library it's about providing quick and current information to the users.

Smart Library: Concept

The smart libraries are using computer hardware, software, networking and other computer components to collect information for electronic without library staff, users can be access the information to automatically. The concept of smart library begins from blending the word "smart" and "Library". The generally meaning of smart is having or quick intelligence. Rather than retreating the definition of library this discussion will focus on the meaning of smart primarily denote efficient thought the using of technology and the automation process to improve the working everyday (Freyberg, 2019).

The smart libraries is information request for the users, and using a advance information technology it is possible to study of information need in a users via instrument of information technology (Baryshv& Babina, 2016)

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Key Technologies in Smart Libraries

One of the most important components of a smart library is the Integrated Library System (ILS). Software like Koha and DSpace helps manage cataloguing, circulation, acquisitions, and online access. These systems provide a centralized platform for handling all library operations efficiently. Another significant technology is RFID (Radio Frequency Identification), which enables automatic identification and tracking of books. RFID allows users to issue and return books through self-service kiosks, reducing waiting time and minimizing human intervention. It also helps in stock verification and theft prevention.

The Online Public Access Catalogue (OPAC) is another essential feature of smart libraries. It allows users to search for books, journals, and other resources through computers or mobile devices. Users can check the availability of materials, reserve books, and even renew them online without visiting the library physically. Cloud computing has further enhanced library services by enabling data storage and access through remote servers. Cloud-based systems ensure that library resources are available anytime and anywhere, making them highly convenient for users.

1. **Role of Artificial Intelligence and IoT**

Artificial Intelligence (AI) is increasingly being used in smart libraries to provide personalized services. AI-powered systems can recommend books based on user preferences and reading history. Chatbots can assist users in finding information quickly and efficiently. The Internet of Things (IoT) adds another layer of intelligence to libraries. Smart shelves equipped with sensors can detect misplaced books and update their location in real time. IoT devices can also monitor environmental conditions such as temperature and lighting, ensuring a comfortable reading atmosphere.

2. **Digital Resources and Mobile Access**

Smart libraries provide access to a wide range of digital resources, including e-books, e-journals, and online databases. Platforms like Libby allow users to borrow and read books digitally on their smartphones or tablets. Initiatives such as the National Digital Library of India have made academic and research materials easily accessible to students and scholars across the country. This has significantly reduced the dependency on physical books.

3. **Security and Smart Access**

Security is an important aspect of smart libraries. Technologies such as biometric authentication and smart ID cards ensure secure access to library resources. These systems prevent unauthorized entry and protect valuable materials.

Evolution of Library Technologies

The evolution of libraries can be categorized into several phases:

1. **Traditional Libraries**

Traditional libraries depended on manual catalogues, classification systems, and physical records. Librarians performed all operations manually, making the process time-consuming and prone to errors. Traditional libraries act as physical repositories for knowledge, focusing on the acquisition, cataloging, and preservation of print materials like books, periodicals, and manuscripts, organized by trained staff for public access. They provide a quiet, curated space fostering community learning, literacy, and research, typically characterized by Dewey Decimal or Library of Congress classification systems to ensure resources are easily located. While expanding to include audiovisual materials and microfilm, traditional libraries primarily emphasize physical browsing and custodianship, serving as essential cultural institutions rather than merely digital portals.

2. **Automated Libraries**

The introduction of computers led to the development of Integrated Library Systems (ILS), which automated core functions such as cataloguing and circulation. This marked the beginning of digital transformation in libraries. Library automation is the application of computer technology and ICT-based tools to modernize traditional, manual housekeeping procedures—such as acquisition, cataloging, circulation, and serials management—into efficient, interconnected, and searchable digital systems. By replacing paper-based processes with integrated library management systems, these libraries significantly reduce staff workload, increase accuracy, and offer 24/7 access to physical and digital resources, often utilizing technologies like barcode scanning or RFID tags. Ultimately, this transformation from manual to automated processes saves time, streamlines information retrieval, and allows staff to focus on user services rather than repetitive clerical tasks.

3. **Digital Libraries**

With the growth of the internet, libraries began offering digital resources such as e-books, e-journals, and online databases. Digital libraries enabled remote access to information. Digital libraries are organized, virtual collections of digital materials—including text, images, and audio—that provide 24/7 global access via the internet without requiring physical presence. Unlike mere archives, they provide structured, curated information, often integrating "born digital" content with digitized print materials to offer efficient, searchable retrieval for users. These systems allow simultaneous, multi-user access and play a crucial role in preserving rare or fragile materials for future generations. Examples include Project Gutenberg and the Internet Archive.

4. **Smart Libraries**

Smart libraries represent the latest stage in this evolution. They integrate advanced technologies such as AI, IoT, and cloud computing to create intelligent and interconnected systems. Smart libraries represent a next-generation, user-centric paradigm that seamlessly integrates traditional library resources with advanced digital technology, such as

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the **Internet of Things (IoT), Artificial Intelligence (AI),** and **RFID systems,** to provide personalized, efficient, and 24/7 access to information. These technologically driven environments automate routine tasks—including self-checkout, automated book returns, and AI-powered cataloging—while offering smart services like personalized recommendations, data analytics for space optimization, and virtual access to digital collections. By employing smart infrastructure, including automated environmental controls, smart lighting, and robotics, these spaces shift away from merely storing physical books towards becoming flexible, interactive hubs that allow for remote, unstaffed operation and enhanced, user-guided learning experiences.

Features of Smart Library Technologies:
Main features of smart libraries are as following:

1. **Smart Services:** The first features of the smart library is smart services, the services rendered to the library readers throw RIFD technology, remote control assistance, WiFi facility, Smart Phones Semantic web, Internet applications, AI, translation software's, automatic voice and image recognition, sensor, vigilance through CCTV etc, technologies used the smart library; the users can easily access the information and easily reading the information.
2. **Smart users or readers:** smart libraries are the instrument to create intelligent and empathetic readers, the users of smart libraries should have qualities such as flexibility, creativity, tolerance, cosmopolitanism, empowerment and active divided into two levels of smart users the first level of the conscious user community or create the skilful person and consists of the smart citizen users of smart library services and staff.
3. **Smart place: -** The other features of smart library refer to the smart place, the library building and place. Smart environment that incorporates environment monitoring the space should be equipped with advanced technology while also being environmentally conscious ensuring that patrons can sit comfortably and engaged in the reading activities effectively.
4. **Smart governance of smart library:** The next characteristics of smart libraries is smart governance, smart governance highlights the importance of the community in acknowledge the significance of information technology in enhancing library services and transforming libraries for contemporary needs.
5. **Formation of Information:** smart users play a signification role in enriching the knowledge and information accessible to both users and library staff. The library user actively participates in the generation of knowledge and collaborates with other users and staff, users in the creation improvement and sharing of information and knowledge.

Models of the development of smart library Technologies

The libraries have changed a lot over time, as libraries have grown we can see that their design has also lot of interchanged, the public and academic libraries are evolving to embrace new technologies cater to diverse communities, address emerging users needs and information behaviours and respond to changing public polices (Joachim schopfel, 2019.) libraries can be changed as follows

1. **Traditional library:** The traditional libraries are collecting resource in print form such as books, journals, newspaper, manuscripts and other printed document sources the users can access the information physically present in libraries and traditional libraries completely handling in manually and traditional libraries have opened only working hours.
2. **Hybrid Library:** The hybrid library means the library which work in both Manual and Digital format and Library resources also both print and electronic form, the print document can easy to handling and reading and electronic document is easy storing and retrieval.
3. **Digital Library:** The digital library Means the Library fully automated liked via computer network connect and information stored in server users can access information using electronic devices the digital libraries as 24/7 uses downloading information and reading any time and where digital libraries are easily sharing the information one place to other place the major advantages of the digital libraries lot of information stored in electronic format.
4. **Green Library:** The Green libraries are one of the different library, this libraries are maintain for the using natural environment and reduce the use water and energy by building design to increase the use natural resources. The green libraries using natural materials like bamboo, cork, linoleum etc and using natural ventilation for sunlight.
5. **Virtual Library:** virtual library means the library no physical boundary and may also called Library without walls. The virtual library users are not physical presence, it may be collection information in electronic form and Links, URLs on available in network.

Components of Smart Library

The core components of Smart library such as

- Continues electric power supply and High speed Internet.
- Digital resources such as E-books, E-journals, E-Theses and dissertation, E-data bases, E-News paper, CD, DVD,
- Reprographic, Micrographic &digital scanner
- QR code Technology, Bar code scanner
- Smart card, plagiarism software

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- Wireless technology (Wi-Fi)
- Radio Frequency Identification Technology
- Library software's (Koha, SOUL, E- Grathalaya 4.0 Etc)

Services of Smart libraries

The Smart services of smart library following as:-

- CAS services it means current awareness services providing new update information
- E- Selective dissemination services
- Online public access catalogue service
- E-data base services
- Massage alerting services
- Electronic Reference services
- Electronic Document delivery services
- Smartphone optimized web site, flexible use of remote services

How smart library technologies works

The smart library technologies can work in very smart because smart libraries are more adopting advanced technology, smart library work on two levels the first level is with the help of technical equipment's receive the needs of reads and next level though e- resources, cloud computing, data mining. RFID technology and other technologies used the library to provide a personalized knowledge services based on information.

The smart library readers can have their Owen smart card, the library is in the smart mode. Before the users using the smart card to require the short term training, and the users all information is embedded in the smart card, users are access in the resources scan the card at the door and enter the smart PIN, after card is active it can provide all the details of the readers, and users enter the library automatically issue/ return the books and the users borrowed books details save in their smart card.

Implications of Smart Technologies in Libraries

"Smart libraries" generally refer to libraries that integrate advanced technologies and innovations to upgrade the reader's experience, streamline their operations, and make knowledge more accessible. These advanced technologies start from automation and artificial intelligence to data analytics and smart infrastructure. Below are some examples of smart libraries and the technologies they might employ:

1. **Automation and Self-Service Systems**

Self-checkout stations: Patrons can check out books and materials using RFID (Radio Frequency Identification) tags or barcode scanners.

Automated book return: Systems that automatically sort returned books into their appropriate locations or shelves, saving time and labor.

Robotic book retrieval: Some libraries use robots to retrieve or shelve books, enhancing efficiency.

2. **Artificial Intelligence and Libraries**

Smart search engines: AI-driven search engines can recommend books or materials based on a patron's borrowing history, interests, or past search behavior.

Natural language processing (NLP): NLP can be used to create more intuitive search queries, allowing users to interact with the system as if they were speaking to a librarian.

Chatbots: Libraries are using AI-powered chatbots to assist users in real time, answering questions, guiding them through resources, or helping them with library services.

Predictive analytics: Libraries may use AI to analyze user trends and predict future demands, helping them to accession register that are more likely to be in demand.

3. **Smart Spaces and Infrastructure**

Smart lighting and climate control: These systems adjust automatically based on occupancy or time of day, saving energy while maintaining comfort.

Interactive digital signage: Digital displays that provide real-time information about library events, new acquisitions, and available resources.

IoT sensors: Internet of Things (IoT) sensors can track the usage of library spaces (e.g., which reading areas are most popular) and ensure efficient resource allocation.

Smart study rooms: These rooms can be reserved and monitored via an app, and might include features like automated lighting, climate control, and multimedia setups.

4. **Digital Collections and Virtual Libraries**

E-books and digital media: A key component of many smart libraries is the ability to provide access to a wide variety of digital resources, such as e-books, audiobooks, and databases.

Virtual reference services: Some libraries provide access to virtual consultations with librarians or experts who can assist remotely.

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Augmented and Virtual Reality (AR/VR): These technologies can be used to enhance the experience of learning or exploring historical documents, for example, through immersive simulations or visualizations.

5. **Data Analytics and Insights**

Usage tracking: Libraries use data analytics to monitor how patrons use library resources and what materials are most popular, which helps in collection management and curating services.

Patron behavior analysis: By analyzing user interactions, libraries can predict what services or resources might be beneficial for their community in the future.

Feedback collection: Smart libraries may use digital surveys, sensors, or mobile apps to collect real-time reviews from user community about their expectations and experiences.

6. **Collaborative and Community-Oriented Services**

Co-working spaces: Libraries are concentrating of sharing space, co-working, innovation labs, and maker spaces, supported by technology like 3D printers, video conferencing tools, and digital collaboration platforms.

Digital storytelling: Some libraries provide tools and spaces where users can create their own multimedia projects, like podcasts or videos, often supported by tech like green screens or sound booths.

7. **Mobile Applications**

Library apps: Library apps are integrated with OPAC, reserve books, get notifications on overdue items, and access online resources directly from their phones.

Mobile payments: Patrons can use apps to pay fines, make donations, or even reserve items for pickup.

Smart navigation: Inside the electronic navigation of library helps users find books, resources, and rooms within large library spaces using their smartphones.

8. **Digital Literacy Programs**

Workshops and classes: Smart libraries often offer digital literacy programs to help patrons learn how to use the technology available to them, whether it's navigating databases, using e-readers, or learning programming.

Online learning platforms: Libraries may partner with platforms like NPTEL, SWAYAM, Khan Academy, or edX to provide free or discounted access to educational materials.

Some smart Libraries across the world

The BiblioTech Library (San Antonio, TX): A fully digital library, with no physical books, that offers e-readers, computers, and digital media.

The Seattle Public Library: This library is well known for its advanced technology, including RFID, automated sorting, and the use of apps for navigating library services.

The Singapore National Library: Features smart study rooms, virtual reference desks, and a state-of-the-art digital collection that includes interactive features for learning and research.

The Central Library of Vancouver, Canada: Uses a blend of digital technologies, including smart lighting, automated checkouts, and RFID systems to streamline services.

It is observed that, "smart libraries" are transforming the traditional library model by leveraging advanced technologies to improve user experience, enhance operational efficiency, and innovative services that were not possible in the past. These libraries are increasingly becoming hubs for both physical and digital learning, providing access to resources and tools that meet the needs of a tech-savvy, modern society.

Challenges of Smart Libraries

The major challenges for maintains of smart library following as:-

1. **Lack of ICT Infrastructures:** The implications of the smart libraries the ICT infrastructure essential required, the many libraries in India specially rural areas do not have any kinds of infrastructure, including the internet facilities and modern computer systems even in the digital generation.
2. **Lack of Financial support**: - The major necessity for the development of smart libraries is financial support, the establishment of smart library requires notable financial investment in RFID technology, ICT technology, and conducted training, in India many libraries and especially public libraries and academic libraries have limited budget, its major challenging.
3. **Technological skill adaption of library staff:** The anthersignification challenges of smart library is technical skill adaption of library staff, the Library staff need to be trained because effectively manage the digital resources, including many new technologies and hole smart library maintenance.
4. **Unreliable electronic power supply**: The anther challenge faced in smart library is unreliable electronic power supply, smart library are using more power supply because all technologies are depend on the uninterrupted power supply, if there is no electricity in the smart library the smart libraries and it's technologies are not functioned.

Conclusion

The study developed in the methodology provides a more evaluation of the smart libraries compared to traditional libraries; the smart libraries have providing more effective and efficient services of the users, in the present modern era users also expected providing a more fast and quick information. The technologies also now days straggly developed and internet speed are higher, in this kind of libraries used the technologies to upgrade of the smart libraries.

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The digital library and smart libraries also providing same functions but the smart libraries have used technologies in most effectually such as a RFID plays significant role in the smart library and internet, network, ICT infrastructure, electronic resources and QR code technologies also plays key role in smart library and users also need to be knowledgeable about technologies.

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OriginalArticle

Comparison of Traditional Yoga and Modern Yoga Trends

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Abstract

Yoga, an ancient practice originating in India, has evolved significantly over time, adapting to cultural, social, and global influences. This research paper aims to compare traditional yoga with modern yoga trends, focusing on their philosophical foundations, practices, objectives, and impact on individuals. Traditional yoga, rooted in ancient texts such as the Vedas and classical teachings, emphasizes spiritual growth, self-realization, and the union of mind, body, and soul. It incorporates practices like meditation, pranayama (breathing techniques), ethical disciplines, and physical postures as a means to achieve inner harmony and enlightenment. In contrast, modern yoga has been reshaped to align with contemporary lifestyles, often prioritizing physical fitness, stress reduction, and aesthetic appeal. Modern yoga styles, such as power yoga, hot yoga, and fitness-based routines, focus heavily on physical postures (asanas) and are frequently practiced in studios, gyms, and online platforms. While modern yoga offers accessibility and health benefits, it sometimes overlooks the deeper philosophical and spiritual aspects of traditional yoga. This study adopts a qualitative approach, analyzing existing literature, historical texts, and contemporary practices. It examines how globalization, commercialization, and technological advancements have influenced the transformation of yoga. The paper also evaluates the benefits and limitations of both approaches, highlighting the importance of maintaining a balance between tradition and innovation. The findings suggest that while modern yoga has contributed to the global popularity of yoga, integrating traditional principles can enhance its holistic benefits. The paper concludes that a balanced approach combining the spiritual depth of traditional yoga with the practicality of modern trends can lead to comprehensive physical, mental, and emotional well-being.

Keywords: *Yoga evolution, traditional yoga, modern yoga trends, philosophical foundations, spiritual growth, self-realization, mind-body connection. Pranayama, meditation, asanas, physical fitness, stress reduction, globalization, commercialization, holistic well-being.*

Introduction

Yoga is a holistic discipline that originated in ancient India thousands of years ago. Traditionally, it was practiced as a spiritual path aimed at achieving self-realization and unity with the higher consciousness. Over time, yoga has undergone transformation, especially in the modern era, where it is widely recognized as a form of physical exercise and stress management. This paper explores the differences and similarities between traditional yoga and modern yoga trends. It aims to provide a deeper understanding of how yoga has evolved and how its purpose and practice have changed over time.

Historical Background of Yoga

Traditional yoga traces its roots to ancient Indian scriptures such as the Vedas, Upanishads, and the Yoga Sutras. The classical system of yoga, often associated with sage Patanjali, outlines the eight limbs (Ashtanga Yoga), which include ethical principles, physical postures, breath control, and meditation. Modern yoga began to take shape in the late 19th and early 20th centuries when Indian teachers introduced yoga to the Western world. Over time, it blended with Western fitness culture, leading to the emergence of new styles and interpretations.

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Traditional Yoga: Concepts and Practices

1. **Philosophical Foundations**

Traditional yoga is deeply rooted in spirituality. Its ultimate goal is self-realization and liberation (moksha). It emphasizes inner awareness, discipline, and ethical living.

2. **Eight Limbs of Yoga**

1. Yama (ethical restraints)
2. Niyama (personal observances)
3. Asana (postures)
4. Pranayama (breathing)
5. Pratyahara (withdrawal of senses)
6. Dharana (concentration)
7. Dhyana (meditation)
8. Samadhi (enlightenment)

3. **Key Features**

Focus on mind-body-spirit connection
Emphasis on meditation and breath control
Minimal focus on physical appearance
Guided by spiritual teachings

Modern Yoga Trends

1. **Evolution of Modern Yoga**

Modern yoga has evolved to suit contemporary lifestyles. It is often practiced for physical fitness, flexibility, and stress relief.

2. **Popular Modern Styles**

Power Yoga
Hot Yoga
Vinyasa Yoga
Aerial Yoga
Fitness Yoga

3. **Key Features**

Emphasis on physical postures (asanas)
Focus on fitness and body shaping
Commercialization and branding
Use of technology (apps, online classes)

Comparison Between Traditional and Modern Yoga

Aspect	Traditional Yoga	Modern Yoga
Purpose	Spiritual growth	Physical fitness
Focus	Mind, body, soul	Body and flexibility
Practice Style	Slow, meditative	Dynamic, fast-paced
Environment	Ashrams, quiet spaces	Studios, gyms
Teaching Method	Guru-disciple tradition	Certified instructors
Commercialization	Minimal	High

Benefits of Traditional Yoga

Promotes mental peace and clarity
Enhances spiritual awareness
Improves emotional stability
Encourages disciplined lifestyle

Benefits of Modern Yoga

Improves physical fitness and flexibility
Reduces stress and anxiety
Accessible to a wider population
Adaptable to modern lifestyles

Limitations of Both Approaches

Traditional Yoga

May seem complex or inaccessible to beginners
Requires long-term commitment

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Less focus on physical fitness

Modern Yoga
Often neglects spiritual aspects
Risk of commercialization
Focus on appearance rather than inner growth

Role of Globalization and Technology
Globalization has played a major role in spreading yoga worldwide. Technology, including mobile apps and online platforms, has made yoga accessible to millions. However, this has also led to dilution of traditional practices and commercialization.

Discussion
The comparison reveals that traditional and modern yoga serve different purposes but can complement each other. While traditional yoga provides depth and spiritual insight, modern yoga offers practicality and accessibility. A balanced approach can help individuals achieve holistic well-being.

Conclusion
Yoga has evolved from a spiritual discipline into a global wellness practice. Both traditional and modern yoga have unique strengths and limitations. Integrating traditional principles with modern practices can provide a comprehensive approach to health and well-being.

Recommendations
1. Incorporate traditional teachings into modern yoga classes
2. Educate practitioners about the philosophical aspects of yoga
3. Maintain authenticity while adapting to modern needs
4. Encourage holistic development rather than just physical fitness

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OriginalArticle

Goods and Services Tax (GST) and Its Impact on Business: A Desrciptive Anlysis

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Abstract

The Goods and Services Tax (GST) represents one of the most comprehensive indirect tax reforms implemented in India, aimed at creating a unified and transparent taxation system. By subsuming multiple indirect taxes such as VAT, excise duty, and service tax, GST has significantly transformed the business environment and improved tax administration. This study critically examines the impact of GST on business operations, cost structures, compliance mechanisms, and overall growth of enterprises, with particular focus on small and medium businesses. The research adopts a descriptive methodology based on secondary data collected from government reports, journals, and published literature, supported by simple percentage analysis for interpretation. The findings of the study Indicate that GST has enhanced transparency, reduced the cascading effect of taxes, improved logistics efficiency, and promoted digital transactions, thereby contributing to ease of doing business. However, the study also identifies key challenges such as increased compliance burden, frequent changes in tax regulations, and technical issues related to the GST portal, especially affecting small businesses. The paper concludes that while GST has brought structural improvements to the Indian tax system, continuous policy support, simplification of procedures, and technological upgrades are essential to maximize its long-term benefits.

Keywords: *GST, Tax Reform, Business Impact, India, Indirect Tax*

Introduction

The introduction of the Goods and Services Tax (GST) in India on 1st July 2017 marked a historic transformation in the country's indirect taxation framework. GST replaced a complex system of multiple indirect taxes such as Value Added Tax (VAT), excise duty, service tax, and entry tax, thereby establishing a unified and destination-based tax structure. This reform was implemented by the Government of India with the objective of creating a "One Nation, One Tax" regime that enhances efficiency, transparency, and ease of doing business.

The primary aim of GST is to simplify the taxation process, eliminate the cascading effect of taxes, and improve tax compliance. By allowing input tax credit across goods and services, GST reduces the overall tax burden on businesses and ensures a seamless flow of credit throughout the supply chain. Furthermore, GST has significantly contributed to formalizing the economy by encouraging digital transactions and bringing more businesses under the tax net.

From a business perspective, GST has brought substantial changes in pricing strategies, supply chain management, and accounting practices. Companies have had to restructure their logistics networks, adopt digital compliance systems, and align their operations with new tax regulations. While large organizations have benefited from increased efficiency and transparency, small and medium enterprises (SMEs) have faced challenges related to compliance complexity, technological adaptation, and increased administrative costs. In the broader economic context, GST has strengthened the internal market by removing interstate trade barriers and promoting uniformity in tax rates across the country.

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However, despite its advantages, the implementation of GST has also encountered issues such as frequent rate revisions, technical glitches in the GST portal, and transitional challenges for businesses. Therefore, a comprehensive analysis of GST and its impact on business is essential to understand its effectiveness and future implications.

Review of Literature

Several researchers and scholars have examined the impact of the Goods and Services Tax on business and the economy. Arun Jaitley (2017) described GST as a revolutionary reform that promotes "One Nation, One Tax," aiming to integrate the Indian market and reduce cascading taxes. Similarly, studies by Saurabh Shambharkar and Atul Tekade (2025) highlight that GST has improved tax compliance, enhanced transparency, and simplified the indirect tax system, thereby contributing to economic growth and better revenue collection. Further, research by Vinod Kumar (2025) emphasizes that GST has positively influenced industrial development by eliminating multiple taxes and improving efficiency in manufacturing and service sectors. The study also notes that GST has reduced logistical barriers and facilitated smoother interstate trade. In addition, Diksha Halder and K. T. Vijaykarthigeyan (2025) conducted a cost-benefit analysis and found that GST has reduced the cascading effect of taxes and improved cost efficiency in the manufacturing sector. However, their study also points out that initial implementation costs and compliance requirements posed challenges for businesses.

Moreover, Aditya Kashyap (2025) focused on small businesses and observed that GST has streamlined tax procedures and created a unified market. At the same time, the study reveals that small businesses face significant issues such as high compliance costs, cash flow problems, and technical difficulties. Similarly, research on SMEs indicates that while medium-sized firms benefited from input tax credit and formalization, smaller firms struggled with digital adoption and increased compliance burden. Finally, a comprehensive review by Kasina Naga Suryanarayana (2024) concludes that GST has simplified the tax system and improved transparency, but challenges such as compliance complexity and technological issues still persist. Overall, the literature suggests that GST has both positive and negative impacts on businesses, depending on their size, sector, and adaptability

Statement of the Problem

Despite its advantages, GST has created challenges for businesses, especially small and medium enterprises. Frequent changes in tax rates, complex filing procedures, and lack of awareness have created difficulties. Therefore, it is necessary to study the actual impact of GST on business performance.

Research Gap

Many studies focus on macro-level impact of GST, but there is limited research on its practical impact on small businesses using simple data analysis. This study attempts to fill this gap by providing basic data-based analysis.

Objectives of the Study

The present study focused on objectives

1. To study the concept and structure of GST
2. To analyse the impact of GST on business costs
3. To examine GST's effect on compliance and operations
4. To identify benefits and challenges of GST

Methodology of the Study

This study is based on a descriptive research design using secondary data. Data is collected from reports, journals, and government publications. Simple percentage analysis is used to interpret the data.

Scope of the Study

The study focuses on the impact of GST on Indian businesses, especially small and medium enterprises. It covers cost, compliance, and operational aspects.

Importance of the Study

This study is useful for business owners, students, and policymakers. It helps in understanding the advantages and challenges of GST and provides insights for better decision-making.

Table: 1 Definition of Manufacturing and Service MSME in India

Manufacturing Sector	
Enterprise size class	Investment in Plant and Machinery
Micro Enterprises	Does not exceed Rs.25 lakhs (USD33,679)[12]
Small Enterprises	More than Rs.25 lakhs but less than Rs. 5 crores (USD667,222)
Medium Enterprises	More than Rs.5 crores but less than Rs.10 crores (USD1.3million)
Service Sector	
Enterprise size class	Investment in Equipment

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Micro Enterprises	Does not exceed Rs.10 lakhs (USD13,469)
Small Enterprises	More than Rs.10 lakhs but less than Rs.2 crores (USD269 thousand)
Medium Enterprises	More than Rs.2 crores but less than Rs.5 crores (USD667,222)

Source: Annual Report 2018-19, Ministry of Micro, Small and Medium Enterprises, Government of India.

Table 2: Old and new definitions of MSME

MSME Sector	Old Definition		New Definition	
	Manufacturing	Service	Investment	Turnover
Micro	25 Lakh	10 Lakh	1 Crore	5 Crores
Small	5 Crores	2 Crores	10 Crores	50 Crores
Medium	10 Crores	5 Crores	50 Crores	250 Crores

Note: As per new definition, an enterprise qualifies as MSME only if it satisfies both the criteria. Source: Nagaraj and Vaibhav (2020)

Table 4: Tax burden of MSME in the auto – ancillary Sector

		2016-17 (Pre-GST year)			2018-19 (Post-GST year)			
		Revenue	Total Indirect Tax* (TIT)	Share of TIT in Revenue	Revenue	GST	Share of GST in Revenue	
Name of Company	Product /service Type	Rs. Million	Rs. Million	Percentage	Rs. Million	Rs. Million	Percentage	Tax burden
Armaax Auto Pvt. Ltd.	Automobile Ancilliaries	111.8	Nil	Nil	114.2	17.5	15.32	Increased
Dekson Castings Ltd.	Automobile Ancilliaries	390.6	77.9	19.94	477.8	33.5	7.01	Decreased
Dolfin Rubbers Ltd.	Tyres & Tubes	485.8	55.6	11.44	825.8	124.9	15.12	Increased
Elan Auto India Ltd.	Auto sheet metal parts	316.9	36.3	11.45	581.9	122.2	21	Increased
Emdet Engineers Pvt. Ltd.	Steering wheels	527.6	57.6	10.92	729.4	152	20.84	Increased
Filteration Engineers (India) Pvt. Ltd.	Filter elements	169.2	10.8	6.38	208.2	30	14.41	Increased
Frontier Springs Ltd.	Leaf springs (Automotive)	521.9	55.8	10.69	962.4	124.8	12.96	Increased
Magnus Steels Pvt. Ltd.	Automobile Ancilliaries	185.6	20.7	11.15	269.7	45.8	16.98	Increased
Marathwada Auto Cluster Co.	Automobile Ancilliaries	56.2	2.4	4.27	322.1	58.4	18.13	Increased
Miter & Miter Engineers Pvt. Ltd.	Steering wheels	275.3	Nil	Nil	381.8	77.8	20.38	Increased

Note: *Total Indirect Tax (TIT) includes Central Excise Duty, State-VAT and Service Tax Source: Computed from Prowess database.

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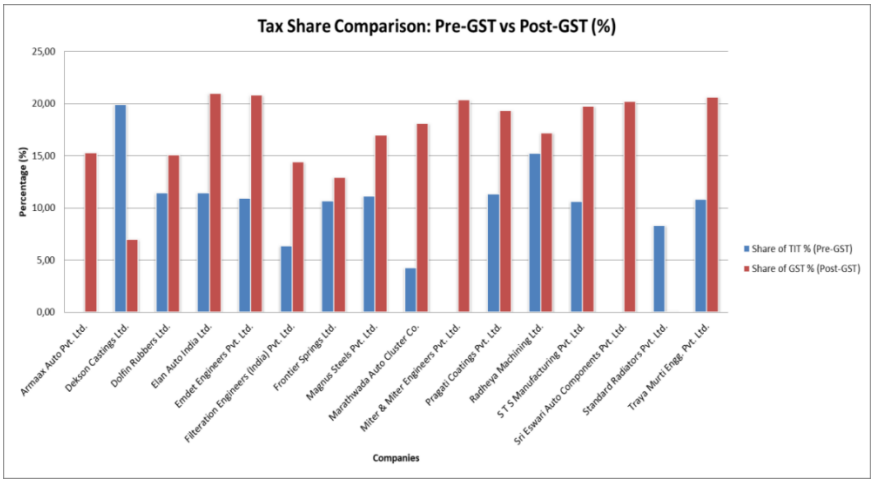
Company Information		2016-17 (Pre-GST Year)			2018-19 (Post-GST Year)			Analysis
Name of Company	**Product/Service Type**	**Revenue 2016-17 (Pre-GST)**	**TIT 2016-17 (Pre-GST)**	**Share of TIT % (Pre-GST)**	**Revenue 2018-19 (Post-GST)**	**GST 2018-19 (Post-GST)**	**Share of GST % (Post-GST)**	**Tax Burden Trend**
Armaax Auto Pvt. Ltd.	Automobile Ancilliaries	111,8	0,0	0,00	114,2	17,5	15,32	Increased
Dekson Castings Ltd.	Automobile Ancilliaries	390,6	77,9	19,94	477,8	33,5	7,01	Decreased
Dolfin Rubbers Ltd.	Tyres & Tubes	485,8	55,6	11,44	825,8	124,9	15,12	Increased
Elan Auto India Ltd.	Auto sheet metal parts	316,9	36,3	11,45	581,9	122,2	21,00	Increased
Emdet Engineers Pvt. Ltd.	Steering wheels	527,6	57,6	10,92	729,4	152,0	20,84	Increased
Filteration Engineers (India) Pvt. Ltd.	Filter elements	169,2	10,8	6,38	208,2	30,0	14,41	Increased
Frontier Springs Ltd.	Leaf springs (Automotive)	521,9	55,8	10,69	962,4	124,8	12,96	Increased
Magnus Steels Pvt. Ltd.	Automobile Ancilliaries	185,6	20,7	11,15	269,7	45,8	16,98	Increased
Marathwada Auto Cluster Co.	Automobile Ancilliaries	56,2	2,4	4,27	322,1	58,4	18,13	Increased
Miter & Miter Engineers Pvt. Ltd.	Steering wheels	275,3	0,0	0,00	381,8	77,8	20,38	Increased
Pragati Coatings Pvt. Ltd.	Automobile Ancilliaries	346,3	39,3	11,34	457,3	88,5	19,35	Increased
Radheya Machining Ltd.	Automobile Ancilliaries	1.194,7	182,5	15,27	1.569,2	270,2	17,22	Increased
S T S Manufacturing Pvt. Ltd.	Automobile Ancilliaries	469,0	49,9	10,64	997,9	197,5	19,79	Increased
Sri Eswari Auto Components Pvt. Ltd.	Automobile Ancilliaries	122,5	0,0	0,00	229,0	46,3	20,22	Increased
Standard Radiators Pvt. Ltd.	Radiators	771,5	64,4	8,34	1.058,7	0,8	0,08	Decreased
Traya Murti Engg. Pvt. Ltd.	Automobile bodies	493,5	53,4	10,82	1.007,0	208,1	20,66	Increased

Note: **Total Indirect Tax (TIT) includes Central Excise Duty, State-VAT and Service Tax. Source: Prowess database.*



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Data Interpretation:
Based on the provided chart and the underlying data, here is a comprehensive data interpretation analysis regarding the tax burden transition from the Pre-GST (2016-17) to the Post-GST (2018-19) era.

1. **Macro-Level Observation:** Upward Shift in Tax Burden The most striking trend is the predominant increase in the tax share across the sector. Out of the 16 companies analyzed, 14 experienced a higher tax burden under the GST regime compared to the previous indirect tax system.

- **Pre-GST Average Share:** Most companies hovered between **0% and 12%**.
- **Post-GST Average Share:** The majority of companies now fall within the **15% to 21%** range.

2. **Sector-Specific Impact (Automobile Ancillaries)**
The Automobile Ancillary sector appears to have faced a significant "rate realignment."

- **The "Zero to Hero" Effect:** Companies like *Armaax Auto*, *Miter & Miter*, and *Sri Eswari Auto* reported **0% TIT** (Total Indirect Tax) in 2016-17 but jumped to over **15-20% GST share** in 2018-19. This suggests these companies may have previously benefited from specific exemptions or were part of an unorganized segment that was brought strictly into the tax net by GST.
- **Highest Tax Brackets:** Companies like *Elan Auto* (21%), *Emdet Engineers* (20.84%), and *Traya Murti Engg.* (20.66%) represent the peak of the GST burden in this dataset.

3. **The Anomalies: Companies with Decreased Burden only two companies bucked the overall trend, seeing their tax burden decrease:**
   1. **Dekson Castings Ltd.:** Saw a sharp decline from **19.94% to 7.01%**.
   2. **Standard Radiators Pvt. Ltd.:** Experienced a near-total drop in tax share from **8.34% to a negligible 0.08%**.

   Analysis Note: This decrease is atypical for the sector and likely indicates either a change in product classification (moving to a lower tax slab), significant Input Tax Credit (ITC) utilization, or a shift in the nature of their revenue (e.g., increased exports which are zero-rated).

Revenue vs. Tax Share Correlation: While the tax *percentage* increased, it is important to note that Revenue also grew significantly for almost every company.

- **Example:** *Marathwada Auto Cluster Co.* saw its revenue grow from Rs. 56.2 Million to Rs. 322.1 Million.
- **Interpretation:** Even though the tax share increased from 4.27% to 18.13%, the company's scale of operations expanded by over **500%**. This suggests that while GST increased the per-unit tax cost, it did not necessarily stifle business growth or market expansion.

Findings of the Study
The study finds that GST has simplified the tax structure and improved transparency. It has promoted digital payments and reduced tax evasion. However, it has also increased compliance burden and requires technical knowledge. Small businesses face more challenges compared to large firms.

- Tax Base - Three companies (*Armaax Auto*, *Miter & Miter*, and *Sri Eswari Auto*) that reported **0%** indirect tax in 2016-17 saw their tax share jump to between **15% and 20%** in 2018-19.
- Standardization of Tax Rates - The data reveals a shift from a fragmented tax structure to a uniform one. While Pre-GST tax shares were erratic (ranging from **4% to 19%**), Post-GST shares converged into a much tighter and higher bracket of **15% to 21%** for the majority of firms.
- Dominant Increase in Tax Burden - The implementation of GST resulted in a higher tax-to-revenue ratio for 87.5% of the sampled companies. This indicates that for the automobile ancillary sector, the effective GST rate was generally higher than the cumulative effect of the previous Excise, VAT, and Service taxes.
- Resilience Through Revenue Growth - Despite the increased tax percentages, almost all companies recorded significant revenue growth during the Post-GST period. For example, *Marathwada Auto Cluster Co.* grew its revenue by over 470% despite its tax share rising from 4.27% to 18.13%.
- Beneficial Impact of Input Tax Credits (ITC) - A sharp decline in tax burden for outliers like *Standard Radiators* (dropping from 8.34% to 0.08%) highlights the impact of GST's credit mechanism. Such drastic decreases suggest high utilization of Input Tax Credits or a shift toward zero-rated export sales.

Future Research
Future studies can focus on sector-wise analysis of GST impact, long-term economic effects, and comparison with international tax systems. Primary data-based research can provide more accurate results.

Conclusion
GST is a major reform that has transformed the Indian taxation system. It has brought transparency, efficiency, and growth opportunities. However, challenges such as compliance complexity and technical issues need to be addressed. With proper implementation and awareness, GST can significantly contribute to economic development.

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OriginalArticle

Governance Meets Ethics: A Strategic Perspective

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Abstract

"Governance Meets Ethics: A Strategic Perspective" examines the evolving integration of ethical principles within corporate governance frameworks and its implications for long-term organizational success. In an era marked by heightened stakeholder awareness and regulatory scrutiny, governance is no longer limited to compliance and control; it increasingly embodies ethical responsibility as a strategic imperative. This paper explores how ethical values can be embedded into governance structures to enhance transparency, accountability, and trust among stakeholders. The study adopts a conceptual and analytical approach, drawing on existing literature, corporate practices, and governance models to evaluate the alignment between ethical decision-making and strategic management. It highlights the role of leadership, board composition, and organizational culture in fostering an ethical environment that supports sustainable growth. Furthermore, the paper discusses how integrating ethics into governance not only mitigates risks such as fraud and reputational damage but also strengthens corporate legitimacy and competitive advantage. The findings suggest that organizations that proactively align governance mechanisms with ethical standards are better positioned to respond to dynamic market challenges and societal expectations. The paper concludes that a strategic perspective on governance one that prioritizes ethical considerations alongside economic objectives is essential for building resilient and responsible enterprises in the modern business landscape.

Keywords: *Corporate Governance, Business Ethics, Strategic Management, Organizational Accountability*

Introduction

Globalization, digitalization, rising stakeholder awareness, and rising transparency demands have all profoundly altered the modern business environment. An organization's ethical behavior, governance quality, environmental responsibility, and social impact are now considered as well as their financial performance. As a result, corporate governance and business ethics have become central pillars of responsible management. The framework of rules, relationships, systems, and procedures by which organizations are directed and controlled is referred to as corporate governance. It specifies how various participants, including shareholders, boards of directors, managers, employees, customers, and regulators, are divided up in terms of rights and responsibilities. Effective governance ensures that organizations pursue objectives responsibly while maintaining accountability.

Business ethics, on the other hand, concerns moral principles and standards that guide organizational behavior. Fairness, honesty, integrity, transparency, human rights, environmental stewardship, and responsible treatment of stakeholders are all addressed in this document. Long-term success is dependent on trust and legitimacy, which ethical behavior cultivates. The consequences of unethical behavior and poor governance have been demonstrated by a number of global corporate scandals, including Enron, WorldCom, and Volkswagen. These failures caused financial losses, damaged reputations, reduced investor confidence, and prompted regulatory reforms worldwide. The strategic connection that exists between business ethics and corporate governance is the subject of this study.

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It argues that ethical governance is a strategic advantage that promotes sustainability, resilience, and stakeholder trust as well as a legal requirement. This study is conceptual, descriptive, and analytical in nature. It relies on secondary data sources, including Academic journals, Books on governance and ethics, Corporate reports, Regulatory guidelines, Industry publications, International governance frameworks The study synthesizes theoretical perspectives and practical examples to develop a comprehensive understanding of how governance and ethics interact in organizational settings.

Literature Review

Objectives of the Study

The primary objectives of this study are:

- To examine the relationship between corporate governance and business ethics.
- To analyze the role of ethical leadership within governance frameworks.
- To identify governance mechanisms that support ethical conduct.
- To evaluate the impact of ethical governance on organizational performance.
- To explore challenges in implementing ethical governance practices.
- To provide recommendations for strengthening responsible management systems.

Discussion

Corporate Governance

Corporate governance is the system through which companies are controlled and directed. It seeks to align management decisions with the interests of shareholders and other stakeholders.

Key principles of corporate governance include:

Accountability
Transparency
Fairness
Responsibility
Independence
Risk oversight

Business Ethics

Business ethics concerns what is right and wrong in organizational behavior. It extends beyond legal compliance and includes voluntary commitments to fairness, honesty, respect, and social responsibility.

Major ethical dimensions include:

Integrity in decision-making
Fair treatment of employees
Honest communication
Consumer protection
Anti-corruption practices
Environmental responsibility

Relationship between Governance and Ethics

Governance provides the structure, while ethics provides the values. Governance without ethics can become mechanical compliance. Ethics without governance may lack enforcement. Therefore, combining both creates a balanced system of responsible management.

Theoretical Perspectives

Agency Theory: Agency theory explains conflicts between owners (principals) and managers (agents). Governance mechanisms such as board oversight, audits, and disclosure reduce opportunistic behavior.

Stakeholder Theory: Stakeholder theory emphasizes that organizations must serve multiple groups, including employees, customers, suppliers, communities, and investors—not only shareholders.

Stewardship Theory: This theory assumes managers can act as trustworthy stewards of organizational interests when empowered by ethical culture and leadership.

Legitimacy Theory: Organizations seek legitimacy from society. Ethical governance helps maintain public approval and social license to operate.

Role of Ethical Leadership in Governance

Leadership strongly influences ethical culture. When senior executives demonstrate honesty, fairness, and accountability, these values spread throughout the organization.

Characteristics of Ethical Leaders:

Integrity and consistency
Respect for stakeholders
Transparent communication
Accountability for actions

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Courage to make principled decisions
Commitment to long-term value creation
Ethical leaders shape boardroom discussions, employee conduct, and strategic priorities. They discourage misconduct and encourage responsible innovation.
For example, when leaders prioritize transparent reporting and fair treatment, trust among investors and employees increases.

Governance Mechanisms Supporting Ethics
Board of Directors: The board oversees management, strategy, and risk. Independent directors can strengthen objectivity and accountability.
Audit Committees: Audit committees monitor financial reporting, internal controls, compliance systems, and fraud prevention.
Code of Conduct: A code of conduct communicates acceptable behavior regarding conflicts of interest, anti-bribery, confidentiality, and workplace respect.
Whistleblower Policies: Whistleblower channels allow employees to report misconduct safely and confidentially.
Internal Controls: Strong internal controls reduce fraud, errors, and unauthorized actions.
ESG Oversight: Environmental, Social, and Governance (ESG) committees increasingly guide sustainability commitments and ethical risk management.

Impact of Ethical Governance on Organizational Performance
Ethical governance creates measurable and intangible benefits.
Enhanced Reputation: Organizations known for ethical conduct enjoy stronger brand loyalty and stakeholder goodwill.
Reduced Legal and Financial Risk: Strong compliance systems lower the risk of fines, fraud, lawsuits, and regulatory penalties.
Improved Investor Confidence: Transparent governance attracts long-term investors seeking stability and accountability.
Higher Employee Engagement: Employees are more committed when they trust leadership and perceive fairness.
Sustainable Growth: Ethical decisions may sacrifice short-term gains but support long-term resilience.
Better Customer Trust: Consumers increasingly prefer brands aligned with ethical values and responsible practices.

Corporate Failures and Lessons
Several scandals illustrate the cost of unethical governance:
Enron – accounting manipulation and governance collapse.
WorldCom – fraudulent reporting and executive misconduct.
Volkswagen – unethical practices damaging reputation and finances.
Lessons learned:
Independent oversight matters.
Ethical culture must accompany controls.
Incentives should not reward misconduct.
Transparency is essential.

Challenges in Implementing Ethical Governance
Despite benefits, organizations face several obstacles:
Profit vs Ethics Conflict: Pressure for quarterly profits may encourage short-term decisions that compromise values.
Weak Enforcement: Policies may exist on paper but not in practice.
Cultural Differences: Multinational companies face varying norms across countries.
Leadership Misalignment: If leaders ignore ethical standards, systems lose credibility.
Complexity of Global Operations: Supply chains, outsourcing, and digital operations create new ethical risks.
Emerging Technology Risks: AI bias, privacy breaches, surveillance, and misinformation create governance challenges.

Corporate Governance in the Digital Era
Digital transformation has changed governance expectations.
New Governance Priorities:
Cybersecurity oversight
Data privacy protection
AI ethics and algorithm accountability
Digital transparency
ESG disclosures
Real-time risk monitoring
Boards now require digital literacy and technology governance competence.

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Recommendations

To strengthen ethical governance, organizations should:

1. Promote ethical leadership from the top.
2. Ensure board independence and diversity.
3. Regularly update codes of conduct.
4. Establish secure whistleblower systems.
5. Align incentives with long-term performance.
6. Conduct ethics training at all levels.
7. Strengthen ESG oversight and sustainability reporting.
8. Integrate ethics into strategy, not just compliance.
9. Use technology for fraud detection and monitoring.
10. Build transparent stakeholder communication systems.

Findings

This study finds that:
Governance and ethics are mutually reinforcing.
Ethical leadership significantly influences culture.
Strong controls reduce misconduct risk.
Ethical governance enhances trust and competitiveness.
Long-term value creation depends on responsible management.

Conclusion

Corporate governance and business ethics are no longer separate concepts. In today's environment, they function together as the foundation of responsible and sustainable organizations. Governance creates the systems of oversight, while ethics provides the moral compass guiding decisions. Organizations that ignore ethics may achieve temporary gains but face reputational damage, legal penalties, and stakeholder distrust. By contrast, firms that embed ethical values into governance structures are more resilient, trusted, and future-ready. Therefore, ethical governance should be viewed not as a cost or compliance burden, but as a strategic investment in long-term success. As stakeholder expectations continue to rise, responsible management will become a defining factor of competitive advantage.

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OriginalArticle

Impact of social media in Education: Sociological perspectives

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Abstract

The use of social media in education ranges from how students interact with content to how educators design and share their learning materials. One of the primary ways in which it influences education is through communication. In the past, communication between students and teachers was limited to class time and tutorial hours only. Nowadays, thanks to platforms such as WhatsApp or Facebook, students can ask questions, discuss class topics or share resources in real time, which, in addition to promoting greater participation, also allows for more fluid and consistent learning. This is particularly beneficial in primary education, where younger students may require more immediate feedback and guidance. Another fundamental aspect is the potential to create online learning communities, enabling students to connect with their peers, form study groups and collaborate on projects. However, they can also access a wealth of resources, enriching the learning process by providing different perspectives and up-to-date material that cannot always be found in textbooks. Education is a very important social institution of is a secondary social institution that satisfies the intellectual hunger of man. Mass media has had both positive and negative effects on education and learning in the past.

Keywords: *Education, communication, consistent learning, wealth of resources, perspectives, Institution, digital tools perspectives, Institution, digital tools*

Introduction

Social media has become an integral part of our lives. The initial purpose of this was to connect with friends and share personal updates; however with the passing of time, it has now become a powerful tool of communication, and the field of education is no exception to this. The impact of social media on education has grown significantly, especially in the wake of the COVID-19 pandemic, which accelerated the adoption of digital platforms for teaching and learning. Today, social media is used extensively for teaching, accessing a wide range of online study materials, enrolling in courses, and more. However, social media also presents challenges, such as distraction, misinformation, and privacy concerns. As educational institutions across India, including schools and colleges, adapt to modern learning methods, understanding the advantages and disadvantages of social media is essential for parents, students, and educators.

Advantages of Social Media in Education

When used correctly, social media can significantly enhance the learning experience. Let's look at some of the major benefits it offers to students, teachers, schools and Colleges

Media helped the process of learning and education: The contributions of print media such as books and monthly and weekly newspapers have not only informed society but also supported the learning and academic achievement of students. Learning has become easy today because of mass media. When students do not understand something that the teacher said, they prepare for the exam by learning something that someone said on YouTube. They attend virtual classes through Zoom and Google Meet and acquire knowledge.

Online learning and teaching Social media has facilitated online learning: In colleges, the learning process used to take place only when the teacher and the student met at a specific place.

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However, online learning has started through mass media. Students spread across a wide area listen to the lessons of teachers who are sitting in a different location. Scholars teach children on television. The number of children who are obtaining online degrees from home has increased. The number of people who are obtaining degrees from their homes without going to Western countries will increase. Those who have good computers and fast Internet access can receive education sitting at home. They can also face online examinations. Thus, mass media has given a new dimension to distance learning.

Social media are erasing the gap between rural and urban areas in terms of education, where earlier, there was a difference between villages and cities. However, the Internet has reduced this gap. Even if women are married, the Internet and computers have helped and will continue to help them study and get an education while sitting at home. Coaching centers in Bangalore and Bombay provide online training for competitive exams to children from various states in India. They provide students with the necessary literature through digital media.

Media has helped higher education: Research students do their literature reviews with the help of the Internet. They collected the required information from informants through online questionnaires. They buy and study other people'understand the importance of privacy and may unknowingly share their personal details online. Therefore, it is important to teach children about online safety early.

Shallow Engagement: Digital communication often lacks the emotional depth of face-to-face interactions. Students may become more comfortable behind screens and less confident in real-world social settings**.**

Misinformation and Fake News: Social media can spread misinformation quickly and easily. Students may encounter biased or false content, which can affect their understanding of important subjects. Teaching them how to verify information and think critically is essential in the age of rapid content consumption.

Conclusion

From a sociological standpoint, social media in education is a complex, evolving force that shifts the traditional classroom setting to a more dispersed and interactive one. It requires careful management to mitigate its negative impacts on attention and mental health while leveraging its potential for collaborative learning. social media offers significant potential for innovation in education; it also presents new pedagogical and ethical challenges that must be addressed. These challenges include the potential for distraction; the spread of misinformation; privacy concerns; and the negative impacts on students' mental health.

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OriginalArticle

Development of Rural Entrepreneurship in India

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Abstract

A rural entrepreneur is an individual residing in a village who produces goods or services using mainly local resources. Such individuals organize production factors and assume risks. In India, nearly 70% of the population lives in rural areas, largely dependent on agriculture and related activities. These regions face significant unemployment and underemployment due to surplus labor and limited capital. Therefore, promoting rural entrepreneurship becomes essential. Risk perception plays a crucial role in decision-making among rural individuals. Each person has a threshold for accepting risk based on personal attitudes and experiences. When uncertainty outweighs supportive conditions, perceived risk increases. For sustainable development, it is important to create supportive environments and build individuals' capacity to manage risks within acceptable limits.

Keywords: *Rural entrepreneurship, rural entrepreneur, risk perception, development strategies*

Introduction

Rural entrepreneurship has broadened the understanding of entrepreneurship by including diverse socio-economic contexts. In a country like India, where social stratification exists, entrepreneurial activities differ across groups. For instance, opening a small roadside shop may be a significant entrepreneurial step for a tribal individual, whereas it may not be viewed similarly within a traditional business community. Entrepreneurship in India is often associated with large-scale industries, overlooking small-scale rural initiatives. However, the transformation from an agrarian to an industrial economy requires participation from all sectors and scales. Even small technological improvements in rural activities contribute to industrial growth. Given that a majority of India's population lives in villages and depends on agriculture, rural entrepreneurship becomes a key solution to unemployment and underemployment. Though not a complete solution, it plays a significant role in improving rural livelihoods.

Objectives

- To understand the importance of rural entrepreneurship in India
- To examine the risks faced by rural entrepreneurs

Definition of Rural Entrepreneurship

A rural entrepreneur is someone based in a village who produces goods or services using local resources, while also organizing production and taking risks. Such individuals may procure raw materials from urban areas and sell their products in both rural and urban markets.

According to Loganathan (1988), rural entrepreneurship refers to economic activities carried out within villages, involving planning, development, and management of enterprises suited to rural conditions.

Importance of Rural Entrepreneurship in India

Since the Industrial Policy Resolution of 1948, the Indian government has emphasized the role of small-scale and village industries.

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These industries utilize local resources and help achieve self-sufficiency in essential goods. Government initiatives and institutions like KVIC, AIHB, and others have supported rural industries through funding, training, and technological advancements. Rural industries provide employment second only to agriculture and contribute significantly to exports and manufacturing value.

Decentralizing industries into rural areas helps reduce regional disparities and ensures better utilization of local human and material resources.

Categories of Rural Entrepreneurs

- Entrepreneurs can be broadly categorized based on their behavior:
- Innovators: Introduce new ideas and methods
- Imitators: Adopt existing technologies
- Fabian: Resist change until necessary
- Drone: Oppose innovation and stick to traditional methods
- In rural India, entrepreneurs are further classified as:
- Agricultural Entrepreneurs – Engaged primarily in farming
- Artisan Entrepreneurs – Skilled workers like carpenters, weavers, etc.
- Traders and Merchants – Involved in small-scale trade
- Tribal Entrepreneurs – Belong to tribal communities and adopt new occupations

Entrepreneurship in Agro-Based Activities

Agro-based industries have gained importance as sources of rural employment. These enterprises not only generate income but also support agricultural activities by providing inputs and services.

They act as a link between farmers and consumers, promoting rural development. Since agriculture alone cannot provide sufficient employment, agro-based industries offer a viable alternative by creating non-farm job opportunities.

Risks Faced by Rural Entrepreneurs

Rural entrepreneurs encounter various types of risks:

1. **Technical Risks**

Lack of knowledge about modern tools, processes, and raw materials leads to technical challenges. Even when improved technologies are introduced, lack of local availability and training may prevent adoption.

2. **Economic Risks**

Fluctuations in markets, raw material availability, and pricing create financial uncertainty. Limited market access further increases these risks.

3. **Social Risks**

Entrepreneurs may face resistance from society due to cultural norms, caste barriers, or fear of change. Establishing new relationships with suppliers and customers also poses challenges.

4. **Environmental Risks**

Entering unfamiliar environments, dealing with new institutions like banks, and adapting to changing systems create additional risks.

Strategies for Development of Rural Entrepreneurship

Effective strategies must focus on reducing perceived risks and strengthening individual capabilities:

- Skill Development: Training in technical and managerial aspects
- Risk Reduction: Providing supportive conditions and guidance
- Group Formation: Encouraging collective efforts for better resource management
- Market Awareness: Educating entrepreneurs about marketing and customer needs
- Institutional Support: Strengthening linkages with financial and support agencies

Group-based approaches can help reduce risks through shared responsibilities and collective learning.

Conclusion

Rural entrepreneurship is a key driver of inclusive and sustainable development in India. It creates employment, reduces migration, and promotes balanced regional growth. By utilizing local resources and traditional skills, it transforms rural economies. Government initiatives like Startup India and Mudra Yojana have improved access to finance and training. However, challenges such as poor infrastructure, lack of education, and limited technology still exist. Addressing these issues through better policies, digital access, and skill development will unlock the full potential of rural entrepreneurship, making it a strong pillar of national development.

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Artificial Intelligence Transforming through Library Services: Applications, Opportunities, and Challenges

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Structured Abstract
Background: *The rapid advancement of Artificial Intelligence (AI) has transformed various sectors, including library environments, by introducing innovative approaches to information access, management, and user services.*
Objective: *This study aims to explore the role of AI in modern libraries, evaluate its applications, and identify opportunities and challenges associated with its adoption.*
Methods: *The paper reviews AI technologies such as chatbots, predictive analytics, metadata generation, and virtual assistants, analyzing their impact on library workflows and information retrieval. It examines real-world implementations in Indian and international libraries through case studies and literature analysis.*
Results: *AI enhances efficiency in library operations by automating tasks, improving user engagement, and streamlining information retrieval. Notable applications include AI-driven chatbots for user support, predictive analytics for resource allocation, and automated metadata generation for cataloging. However, challenges such as data management, technical integration, algorithmic bias, and ethical concerns pose significant barriers to effective implementation.*
Conclusion: *AI presents substantial opportunities for transforming library services by improving accessibility and operational efficiency. Addressing challenges related to data management, technical integration, and ethical considerations is critical for successful AI adoption in libraries.*
Keywords: *Artificial Intelligence, Libraries, Library Management, AI Applications in Libraries.*

Introduction

Artificial Intelligence has been developed through interdisciplinary efforts, drawing theories from disciplines such as philosophy, mathematics, economics, neuroscience, psychology, engineering, and linguistics. Originally this idea was first time presented in 1955 by John McCarthy; he is also considered the founder of the AI. AI is considered a computer science field that aims to create computer systems that perform tasks normally requiring *human intelligence*, such as reasoning, learning, planning, decision-making, and predicting. The goal is to develop such a system using algorithms or computational tools so that it can mimic human intelligence to perform these tasks as well as humans. After 2010, AI technology got fastest development in all the walk of life Medicine, engineering, computer programming, research, higher education and even libraries services and operations.

Role of Artificial Intelligence in Libraries for Information Access and Management

Artificial Intelligence (AI) has ushered in a transformative era in libraries, marking a significant shift in the way information is accessed and managed. As libraries embrace this evolving technological landscape, it is essential to recognize both the opportunities and challenges associated with AI applications. The integration of AI into the library environment has led to faster, more accurate, and efficient services, significantly reducing the time users spend searching for information. These systems not only improve service delivery but also lighten the cognitive workload for librarians and library staff by automating repetitive and data-intensive tasks.

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Additionally, the physical footprint of libraries is shrinking, giving way to the expansion of digital and virtual spaces that enhance remote accessibility and resource availability.

Interestingly, many individuals already interact with AI without realizing it—search engines being a primary example. These platforms employ AI to identify spam, refine search result rankings, tailor responses based on a user's past behaviour, interpret natural language queries, enable image searches, and target advertisements more effectively. While human oversight remains important, the integration of AI greatly increases the speed and precision of these processes, reducing the dependency on manual input.

The way users conduct searches has also been reshaped by the widespread adoption of voice- activated virtual assistants such as Apple's Siri, Microsoft's Cortana, Amazon's Alexa, and Google Assistant. According to a study by Granitzki (2017), over half of both teenagers and adults use voice search daily, demonstrating a growing reliance on AI-powered mobile internet solutions that offer quick, user-friendly access to information.

Security and access control within libraries have also improved with the help of AI technologies. Radio Frequency Identification (RFID) systems provide robust protection for library materials, reducing the need for physical security personnel. Additionally, AI-driven facial recognition and deep learning-based image processing are increasingly being used for secure check-in and check-out processes, ensuring that only authorized users can access library facilities.

In terms of cataloging and metadata management, AI plays a vital role through the use of international data standards such as MARC (Machine-Readable Cataloging), which supports the migration and maintenance of bibliographic data within Indian libraries. Complementary standards like Resource Description and Access (RDA) and Dublin Core are used to structure online content and improve resource discoverability. Tools such as the Online Computer Library Center's Classify browser assist in resolving classification issues and automating cataloging, replacing manual indexing systems with web-based solutions that promote global interoperability.

AI is also transforming user services through the implementation of intelligent chatbots that provide virtual reference support, interactive tutorials, and personalized assistance. These chatbots enhance user experience by recommending resources based on user preferences, thus improving the overall resource discovery process. Moreover, AI technologies streamline back-end workflows, such as cataloging and inventory management, resulting in more organized and responsive library systems.

Smartphones equipped with AI-based virtual assistants further enable voice recognition and internet search functionalities, making the mobile internet a powerful and increasingly preferred tool for accessing library resources. Its convenience, constant availability, and swift responsiveness make it an essential platform for modern information access.

In the domain of acquisitions, AI contributes significantly through hybrid recommender systems that support patron-driven selection and weeding of library collections. As discussed by Rhanoui et al. (2020), these AI models analyze usage patterns and user preferences to recommend materials for purchase or removal, making the process more data-driven and user-centered.

In conclusion, the integration of AI in libraries is reshaping the traditional roles of information professionals and revolutionizing how users interact with knowledge resources. From automating routine tasks to enhancing user engagement and optimizing collection management, AI represents a vital tool in the ongoing evolution of library services.

AI Tools for Libraries: Categories and Applications

1. **Reference and Patron Services**

a. AI chatbots such as Quick Chat (quickchat.ai) and Botsonic (botsonic.com) handle routine patron queries, offering 24/7 support. Quickchat.ai and similar platforms integrate intelligent chat assistants directly into library websites, helping automate repetitive tasks while complementing human-led services.
b. Tools like Research Rabbit (researchrabbit.ai) and Consensus (consensus.app) assist librarians in locating scholarly sources and verifying information.

2. **Collection Management and Cataloging**

a. AI platforms such as OCLC Wise use predictive analytics for informed collection development.
b. Tools like Cataloging.ai automate metadata generation and classification processes.
c. Ex Libris Alma offers AI-powered insights for effective resource and inventory management.
d. Research from platforms like Iris (iris.ai) highlights AI's role in modernizing catalog systems through smart content indexing.

3. **Content Creation and Marketing**

a. Visual tools like Canva AI, (canva.com) Midjourney (midjourney.com), and Craiyon (craiyon.com) help design promotional materials for library events and services.
b. Writing tools such as Copy AI (Copy.ai) and Anyword (anyword.com) streamline the creation of newsletters, website content, and social media posts.

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4. **Research Support**

a. Tools like ChatPDF (chatpdf.com) and Perplexity AI (perplexity.ai) can summarize academic articles and highlight emerging research trends.
b. Scite (Scite.ai) examines citation contexts, helping users assess the reliability and impact of sources.
c. Andi (andisearch.com) offers search insights similar to Google but with unique angles, making it useful for deep or overlooked research areas.
d. Writing tools like Copy.ai, Anyword, Peppertype, and Hypotenuse.ai support content creation, brainstorming, and drafting with data-backed suggestions—though human judgment remains crucial for quality output.
e. Typewise (typewise.app) enhances writing with predictive typing, real-time translation, and smart reply features—especially valuable in libraries serving multilingual communities.

5. **Productivity Tools**

a. AudioPen (audiopen.ai) and Flixier (flixier.com) convert spoken content into text, aiding transcription of interviews, lectures, and presentations.
b. Apps like Mem (get.mem.ai) and Dante (dante-ai.com) support task management and collaborative editing.
c. Descript (descript.com) enables fast, accurate editing of complex audio content, such as lectures and podcasts, with features like text-based editing and automatic filler word removal.
d. Platforms like Harmonai (harmonai.org) and Boomy (boomy.com) let users generate original music and sound effects using AI, potentially useful for multimedia projects and creative programming.

6. **Digital Preservation**

AI algorithms assist in digitizing and preserving rare or fragile materials, enhancing metadata, and improving the discoverability of digital archives.

Several leading academic and public libraries have adopted artificial intelligence (AI) to enhance their services and operations:

a. IIT Delhi and Jawaharlal Nehru University (JNU) have launched AI-driven initiatives. At JNU, the library employs predictive analytics to manage collections and forecast user needs.
b. The Indian Institute of Science (IISc) Library uses sentiment analysis tools to interpret user feedback from surveys and social media, helping improve library services.
c. The IGNOU Library (Indira Gandhi National Open University) utilizes AI-enabled search engines capable of understanding queries in multiple Indian languages.
d. The Delhi Public Library has experimented with AI recommendation systems that suggest books based on a user's borrowing history, similar to product recommendations on e-commerce platforms.
e. The Central Library of IIT Bombay has deployed a 24/7 chatbot that assists users in locating resources, checking book availability, and navigating the catalog, thus improving information access beyond standard hours.
f. The National Digital Library of India (NDLI) leverages AI and machine learning to digitize and process content in various Indian languages. It offers access to a vast repository of books, theses, and research papers, supporting students and researchers nationwide.
g. The University of Hyderabad's Central Library uses an AI-enhanced Library Management System (LMS) to efficiently handle its large collection. This automation allows staff to focus on complex and value-added tasks.
h. Internationally, Tsinghua University developed "Xiaotu," an AI-based virtual assistant that delivers real-time reference support via chat interfaces.
i. The University of Oklahoma Libraries introduced "Ally," a 24/7 AI reference assistant that helps users navigate library services and resources, enhancing accessibility.
j. The Singapore National Library Board offers "Ask NLB," an AI chatbot that provides quick and accurate assistance with both digital and physical collections, significantly reducing wait times and improving user satisfaction.
k. In 2023, the University of Delaware Library piloted a cost-effective AI chatbot developed collaboratively by IT and reference departments to boost user engagement and examine the resource demands of training and maintaining AI systems.
l. OCLC's World Share Management Services integrate AI to optimize library workflows, improve resource sharing, and manage digital collections more effectively.

Challenges in Implementing AI in Libraries

1. **Managing Data Quantity and Quality:** Processing and maintaining large volumes of high-quality data is a significant challenge for many libraries. This includes tasks such as cleaning, organizing, and updating datasets, especially for specialized or historical collections. Ensuring data accuracy is critical for the success of AI-driven applications.
2. **Lack of Skilled Personnel:** Implementing AI systems requires specialized skills that are often scarce in library settings. Recruiting or training staff in AI technologies demands considerable time and financial resources. In India, many libraries already operate under tight budgets and face competing priorities, making it even more difficult to invest in expertise.

3. **Algorithmic Bias:** Since AI algorithms are created by humans, they may unintentionally reflect existing biases. This can lead to biased search results or recommendations, raising questions about fairness and objectivity. Addressing algorithmic bias is a major concern when deploying AI in information services.
4. **Technical Complexity and Maintenance:** Integrating AI tools with existing systems— such as Library Management Systems (LMS), Online Public Access Catalogs (OPAC), and RFID infrastructure—can be technically complex. AI solutions also require continuous updates, performance monitoring, and troubleshooting to ensure they remain effective and reliable.
5. **User Adoption Challenges:** Many library users, particularly those from rural areas or older age groups, may find it difficult to adapt to AI-based tools. While some patrons prefer traditional services, others may have concerns about privacy and data usage. Ensuring inclusivity and building user trust are essential for successful adoption.
6. **Digital Divide and Access Disparity:** The introduction of AI technologies may unintentionally widen the digital divide, especially among marginalized or underprivileged communities with limited access to digital tools. Libraries must take proactive steps to ensure equitable access to AI-powered resources and avoid exacerbating existing inequalities.
7. **Ethical and Privacy Concerns:** AI implementation raises critical ethical issues, particularly regarding data collection, consent, and usage. Libraries must develop clear policies to address user privacy, ensure informed consent, and mitigate risks related to algorithmic decision-making in order to uphold ethical standards.
8. **Legal and Budgetary Constraints:** Other barriers to AI adoption include complex licensing agreements, copyright issues, and ongoing financial limitations. Securing funding for AI tools and navigating legal regulations can be particularly burdensome for smaller or underfunded institutions.

Conclusion

The integration of Artificial Intelligence into libraries is not merely a technological upgrade but a paradigm shift in how information services are delivered and consumed. AI has proven effective in automating routine tasks, personalizing user experiences, improving the accuracy and speed of information access, and optimizing backend workflows like cataloging and acquisitions. Real-life case studies from institutions such as IIT Delhi, JNU, IGNOU, and IISc illustrate the tangible benefits AI brings to the library ecosystem. However, the implementation of AI is not without challenges. Libraries face hurdles related to data quality, technical complexity, skills shortages, and ethical concerns—especially regarding user privacy and algorithmic bias. Additionally, there is a risk of deepening the digital divide if AI tools are not inclusively designed. To realize the full potential of AI in libraries, a balanced approach is essential—one that combines technological innovation with strong ethical standards, staff training, and inclusive user adoption strategies. Ultimately, AI represents a transformative opportunity for libraries to evolve into more intelligent, accessible, and efficient information hubs.

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OriginalArticle

Balanced Diet: Components, Importance, and Health Benefits

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Abstract

A diet refers to the total amount of food consumed by an individual in a day. A balanced diet provides all essential nutrients in adequate proportions required for maintaining health and well-being. These nutrients include carbohydrates, proteins, fats, vitamins, minerals, and fibre. A balanced diet ensures proper growth, supports body functions, and helps in disease prevention. This paper highlights the key components of a balanced diet, their functions, and their importance in maintaining overall health. A balanced diet is essential for maintaining optimal health, supporting bodily functions, and preventing diseases. It consists of an appropriate combination of macronutrients—carbohydrates, proteins, and fats—along with micronutrients such as vitamins, minerals, and dietary fibre. Each of these components plays a specific role in energy production, tissue growth and repair, immune function, and overall physiological balance. This paper examines the major components of a balanced diet, their functions, and their significance in promoting physical and mental well-being. Emphasis is placed on the importance of consuming a variety of foods in proper proportions to meet individual nutritional needs. The study highlights how adopting balanced dietary habits can enhance quality of life and reduce the risk of lifestyle-related diseases.

Keywords: *Balanced diet, nutrients, health, carbohydrates, proteins, vitamins, minerals, fibre*

Introduction

Diet plays a crucial role in determining the overall health of an individual. A balanced diet is defined as the consumption of a variety of foods in the right proportions to meet daily nutritional requirements. It includes six essential nutrients: carbohydrates, proteins, fats, vitamins, minerals, and fibre. Each nutrient performs specific functions in the body and is required in varying amounts depending on age, gender, and health status. A proper balance of these nutrients is necessary to ensure optimal physical and mental development.

Components of a Balanced Diet

1. **Fats**

Fats are a concentrated source of energy and contribute approximately 15% of daily caloric intake. They play a vital role in protecting internal organs, maintaining body temperature, and aiding in the absorption of fat-soluble vitamins. Healthy sources of fats include butter, ghee, oils, nuts, and dairy products.

2. **Proteins**

Proteins are essential for growth, repair, and maintenance of body tissues. They are crucial for the development of muscles, skin, and hair. Protein-rich foods include milk, eggs, meat, fish, pulses, and sprouts. Ideally, proteins should make up about 20–25% of a person's daily diet.

3. **Carbohydrates**

Carbohydrates are the primary source of energy for the body, accounting for nearly 55–60% of daily caloric intake. They are especially important for individuals engaged in physical activities. Common sources include rice, wheat, bread, potatoes, and other cereals.

4. **Vitamins and Minerals**

Vitamins and minerals are essential micronutrients required for various physiological functions, including immunity, bone health, and metabolism.

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Fruits and vegetables are rich sources of these nutrients. Deficiencies can lead to diseases such as anemia (iron deficiency) and goitre (iodine deficiency).

5. **Fibre**

Dietary fibre aids in digestion, prevents constipation, and helps maintain a healthy digestive system. It is primarily obtained from fruits, vegetables, whole grains, and legumes.

Importance of a Balanced Diet

A balanced diet plays a vital role in maintaining overall health and well-being. Its importance can be summarized as follows:

- Promotes good physical and mental health
- Supports proper growth and development
- Enhances work efficiency and energy levels
- Strengthens the immune system and helps resist diseases
- Reduces the risk of chronic illnesses such as obesity, diabetes, and heart diseases

Conclusion

In conclusion, a balanced diet is fundamental to leading a healthy life. It ensures that the body receives all essential nutrients required for growth, energy, and disease prevention. Although maintaining a balanced diet may seem challenging, awareness and proper planning can make it achievable. Adopting healthy eating habits is a long-term investment in overall well-being and quality of life.

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OriginalArticle

Impact of Mergers and Acquisitions on Financial Performance of Select Public Sector Banks: A Study

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Abstract

The banking sector plays a pivotal role in the economic development of a nation by facilitating financial intermediation and ensuring efficient allocation of resources. In recent years, mergers and acquisitions (M&A) have emerged as a significant strategy to strengthen the Indian banking system, particularly among public sector banks. This study examines the impact of mergers and acquisitions on the financial performance of selected public sector banks, namely Punjab National Bank, Canara Bank, and Union Bank of India. The analysis is carried out using the CAMEL model, which evaluates performance based on Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity. The study is based on secondary data collected from annual reports and covers the period from 2018 to 2021, comparing pre-merger and post-merger performance. The findings reveal that mergers have led to improvements in capital adequacy, asset quality, management efficiency, and liquidity across all selected banks. However, mixed results were observed in profitability, with some banks experiencing short-term declines due to merger-related costs. Overall, the study concludes that mergers and acquisitions have positively contributed to enhancing the financial stability and operational efficiency of public sector banks in India, despite initial integration challenges.

Keywords: *Mergers and Acquisitions, Public Sector Banks, CAMEL Model, Financial Performance, Capital Adequacy, Asset Quality, Management Efficiency, Earnings, Liquidity, Indian Banking Sector*

Introduction

The banking industry is a crucial pillar of any nation's economic development, acting as a catalyst for growth by ensuring the smooth flow of financial resources across sectors. In the modern economic environment, no business activity can function efficiently without adequate access to finance, and banks play a central role in mobilising savings and allocating capital. Therefore, the strength and stability of the banking system are essential for sustaining economic progress and financial inclusion.

In the Indian context, the banking sector continues to play a significant role in supporting economic growth and stability. In recent years, it has contributed substantially to the country's Gross Domestic Product (GDP) and has been instrumental in facilitating investment, trade, and industrial expansion. The Indian banking system is broadly classified into Public Sector Banks, Private Sector Banks, Foreign Banks, and Cooperative and Regional Rural Banks, each serving diverse segments of the economy. With the rapid growth of digitalisation, financial inclusion initiatives, and increasing global integration, the sector has undergone major transformations.

To effectively manage increasing financial flows and maintain competitiveness, the Indian banking sector has focused on structural reforms such as consolidation, mergers, and acquisitions (M&A). These strategies aim to strengthen banks' capital base, improve operational efficiency, reduce non-performing assets, and enhance their ability to compete globally.

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In the present dynamic and competitive environment, mergers and acquisitions have emerged as key tools for building a robust, resilient, and sustainable banking system in India. Efforts have been made to enhance the competitiveness and efficiency of Indian banks in the global financial market through continuous reforms and strategic initiatives. Today, the Indian banking industry is recognised as one of the fastest-growing sectors, driven by digital innovation, regulatory support, and increased financial inclusion. It has evolved from a traditionally slow-moving system into a dynamic, technology-driven industry with strong growth potential, making it an attractive destination for both domestic and international investors.

In the current scenario, mergers and acquisitions have emerged as a key strategy for strengthening the banking sector. Recent consolidation initiatives have led to the formation of larger and more resilient banks with improved capital strength and operational efficiency. These developments enable Indian banks to achieve global standards, enhance competitiveness, and create greater value for stakeholders while supporting the overall growth of the economy.

Conceptual Framework

Merger:

A merger refers to the combination of two or more firms where the assets and liabilities of one or more firms are absorbed by another firm (Sherman & Hart, 2006).

Types of Merger:

Horizontal Merger: Occurs between firms operating in the same industry, offering similar products or services, often to reduce competition and achieve economies of scale.

Vertical Merger: Takes place between firms at different stages of the production or supply chain, aiming to improve efficiency and reduce operational costs.

Conglomerate Merger: Involves firms engaged in unrelated businesses. It may be pure (completely unrelated) or mixed (aimed at product or market expansion).

CAMEL

The CAMEL model is a widely used framework for evaluating the performance and financial soundness of banks. It was first introduced in the 1980s by U.S. regulatory authorities as a rating system for on-site inspections of banking institutions. The model gained further importance during the 2008 financial crisis, where it proved to be an effective tool for assessing the stability of banks.

CAMEL serves as an important analytical method to measure the overall financial strength of a bank and to identify areas that require improvement. In India, the Reserve Bank of India (RBI) adopted the CAMEL approach in 1996 based on the recommendations of the Padmanabham Working Group (1995). The model is preferred because of its simplicity and its ability to facilitate easy comparison among a wide range of banks.

Essentially, CAMEL is a ratio-based model that evaluates bank performance using key financial indicators. The term "CAMEL" represents five crucial components that determine the safety and soundness of a bank:

- **C** – Capital Adequacy
- **A** – Asset Quality
- **M** – Management Capability
- **E** – Earnings
- **L** – Liquidity

Objectives

The present study is proposed to carry out to meet the following objectives:

1. To study how mergers and acquisitions have affected selected banks.
2. To compare the financial performance of banks before and after mergers.
3. To evaluate bank performance using the CAMEL model.

Methodology

Sources of Data

The study is based on secondary data collected from different sources such as the annual reports of selected banks, research articles, and other relevant publications.

Period of Study

The analysis covers both the pre-merger and post-merger periods, specifically the years from 2018 to 2021.

Sample selection

The Indian banking sector has witnessed several mergers for different purposes. This study includes 3 public sector banks that were involved in merger activities from the year 2019 onward.

Data analysis tools: Financial ratio analysis tools are used to determine the performance of the banks in the framework of CAMEL components.

Hypothesis of the study

H0: There is no significant change in the CAMEL ratios of the merged banks pre- and post-merger.

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H1: There is a significant change in the CAMEL ratios of the merged banks pre- and post-merger.

Limitations of the Study:

The study has certain limitations that should be considered for a proper understanding of its findings. These limitations are outlined below:

- The study is confined to only three public sector banks in India; therefore, the results cannot be generalised to the entire banking sector.
- The time period of the study is restricted to three years (2018 to 2021), which may not capture long-term trends.
- The analysis is based solely on secondary data collected from published annual reports of banks and relevant online sources, which may have inherent limitations in accuracy and scope.

Data Analysis and Interpretation

	BANKS	PNB		CANARA BANK		UNION BANK	
		PRE	POST	PRE	POST	PRE	POST
		FY 18-19	FY 20-21	FY 18-19	FY 20-21	FY 18-19	FY 20-21
C	CAR	9.73	14.32	11.9	13.18	11.78	12.56
A	NPA	3.87	3.01	3.30	2.07	4.12	3.12
M	ROA	-1.30	0.20	0.05	0.30	-0.60	0.34
E	PBT (in 000)	3003766000	385757000	229551100	244420000	313729802	350806160
L	IDR	29.89	36.30	25.53	30.80	30.30	36.62

Source: secondary source

The CAMEL analysis of Punjab National Bank, Canara Bank, and Union Bank of India shows an overall improvement in financial performance after the merger period (FY 2020–21) compared to the pre-merger period (FY 2018–19). Capital Adequacy Ratio (CAR) increased in all three banks, indicating a stronger capital base and improved ability to absorb financial risks. Asset quality also improved as Net Non-Performing Assets (NPA) declined across all banks, reflecting better credit risk management and recovery practices. Management efficiency, measured by Return on Assets (ROA), showed significant progress, with PNB and Union Bank moving from negative to positive returns, while Canara Bank recorded steady growth. However, in terms of earnings, PNB experienced a decline in Profit Before Tax (PBT), possibly due to merger-related costs and restructuring, whereas Canara Bank and Union Bank showed an increase in profitability. Liquidity position, measured by Investment Deposit Ratio (IDR), improved for all banks, indicating better fund management and ability to meet short-term obligations. Overall, the mergers have positively impacted most financial indicators, though short-term challenges in profitability are evident in some cases.

Findings

1. During this study period selected banks recorded an increase in Capital Adequacy Ratio (CAR) in the post-merger period. This indicates the positive impact of consolidation on the banks' solvency position.
2. The Net Non-Performing Assets (NPA) ratio declined in all three banks after the merger. Canara Bank showed the larger significant reduction, suggesting effective credit risk management and improved recovery mechanisms. Overall, mergers contributed to strengthening asset quality.
3. Return on Assets (ROA) improved for all banks in the post-merger period. Punjab National Bank and Union Bank of India moved from negative to positive ROA, indicating a turnaround in performance, while Canara Bank demonstrated steady growth. These highlights improved managerial efficiency after consolidation.
4. Profit Before Tax (PBT) results show mixed trends. Punjab National Bank experienced a decline in profitability, possibly due to merger-related expenses, provisioning, and integration challenges. In contrast, Canara Bank and Union Bank of India recorded earnings growth, indicating better financial performance post-merger.
5. The Investment Deposit Ratio (IDR) improved across all banks, showing increased liquidity and better fund utilisation. Union Bank of India recorded the highest post-merger IDR, indicating strong liquidity management.
6. This study found that mergers in banks have generally led to improvements in key financial indicators such as capital adequacy, asset quality, management efficiency, and liquidity.
7. The merger initially creates some financial strain due to restructuring costs.

Suggestions

1. In the case of PNB, it needs to reduce operational costs to enhance its profitability
2. Although NPAs have declined, banks should continue to adopt strict credit appraisal systems, regular monitoring, and early warning mechanisms to reduce bad loans further and maintain asset quality.
3. Even though CAR has improved, banks must continue to maintain strong capital buffers to meet regulatory requirements and absorb future financial shocks.
4. Regular evaluation using models like CAMEL should be adopted to track performance and take timely corrective measures.

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Conclusion

The study concludes that mergers have had a largely positive impact on the financial performance of Punjab National Bank, Canara Bank, and Union Bank of India as reflected through the CAMEL model analysis. Post-merger results indicate improvements in capital adequacy, asset quality, management efficiency, and liquidity, demonstrating enhanced financial stability and operational strength. The reduction in NPAs and improvement in ROA highlight better risk management and efficient utilisation of resources. However, the decline in profitability in some cases, particularly in PNB, suggests that mergers may lead to short-term financial challenges due to integration costs and restructuring processes. Overall, the findings reveal that while mergers may create temporary pressures, they contribute significantly to the long-term growth, stability, and competitiveness of banks in the Indian banking sector.

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OriginalArticle

A Study on Workforce Well-being through Rewards and Organizational Support Systems

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Abstract

The success or failure of an organization depends on the employees of that organization, because employees are a priceless asset. So, it is essential that the organization always looks after the interest of the employees. Especially in today's competitive business world, an organization can run well only when there are good employees. So, the organisation must ensure that the employees are always satisfied. This paper is discussing about role of monetary and non-monetary benefits and extra measures to see the employee satisfaction at the workplace. Monetary benefits are salary, bonus and incentives etc. non-monetary benefits are employee participation in management, career advancement, skill development programs etc. and some timely measures like stress controlling activities, enhancing cordial relationship between employees, feel the belongingness about the organisation etc. Studies have shown that non-monetary benefits are more effective than monetary benefits, as the salary and other forms of money received are depleted but the non-monetary experience is remembered for a long time. Also, the organisation must take care of the employees by acting on time.

Keywords: *Employee satisfaction, Monetary benefits, non-monetary benefits, timely measures.*

Introduction

According to Villanova University, US studies show that "employees who report high job satisfaction tends to achieve higher productivity" from this we know that they try and work hard for the success of the organisation. There is 3.19 billion working people in the world, and about 40% of them would say they are happy at work. That means about 1.9 billion, or almost two billion people are not happy at work. It's not about PERKS, it's all about how they are treated by their employers. Providing monetary and non-monetary benefits is good, also they want to have fair relationship by the management. Employees want to be treated the same, regardless of their rank or their tenure or their age or their experience or their job category compared to anyone else.

Monetary benefits are paying salary, incentives, bonus and gain sharing on the basis of their performance, so that they can be avail both fixed and vary benefits. These are most affected factors on the employee performance. These benefits also help to lead a good life in the society. Monetary benefits will increase the buying power of the employee that leads more satisfied in their profession.

Non-monetary benefits are very influencing factors on performance, such as employee participation in management, good behaviour of senior staff, training and career advancement, skill development programs, gifts on the personal occasion, foreign trips etc. Non-monetary facilities are more effective than monetary benefits because they have long term effect on employee's life. Better an organisation should give such rewards which definitely employee will remember for long years.

Apart from monetary and non-monetary rewards there is another way to achieve employee job satisfaction by taking timely measures, these are situational and rare to an individual employee but organisation should act them for the betterment of the both organisation and employee.

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For example, attaining personal problems of employees, treating them at their special occasions, allowing for flexible working hours, recognitions of employee's efforts, organising motivational sessions and counselling for reducing work stress etc.

Review of Literature

- **Ruth Kanfer et al. (2017)**

The study examined motivation and employee performance, emphasizing both intrinsic and extrinsic factors. It found that non-monetary rewards such as recognition and career development significantly influence long-term employee satisfaction. Monetary incentives were effective in the short term but less impactful over time. The research concluded that organizations should adopt a balanced reward system to sustain employee motivation, improve productivity, and enhance engagement in dynamic work environments.

Journal: Annual Review of Organizational Psychology and Organizational Behaviour

- **Anjali Bhattacharya and Ravi Kumar (2018)**

This study analyzed the impact of employee benefit programs on job satisfaction in Indian organizations. It revealed that non-monetary benefits such as flexible work arrangements and training programs significantly enhance employee morale. Monetary benefits ensured basic satisfaction, but long-term commitment depended on non-financial incentives. The study concluded that organizations must integrate both types of rewards to achieve higher productivity and retention rates.

Journal: Indian Journal of Industrial Relations

- **Benedict Frey and Margit Osterloh (2019)**

The research explored intrinsic motivation and its influence on employee performance. It emphasized that excessive reliance on monetary incentives may reduce intrinsic motivation. Non-monetary rewards such as autonomy and recognition were found to be more effective in sustaining employee engagement. The study concluded that organizations should focus on psychological and social rewards to improve job satisfaction and long-term performance outcomes.

Journal: Journal of Management Inquiry

- **Sonia Irshad and Ayesha Afridi (2020)**

This study investigated the relationship between reward systems and employee satisfaction. It found that both financial and non-financial rewards significantly affect employee motivation and performance. However, non-monetary benefits such as recognition and career growth opportunities had a stronger impact on long-term satisfaction. The study concluded that organizations should design comprehensive reward strategies to enhance employee engagement and organizational effectiveness.

Journal: Journal of Public Affairs

- **Abdul Basit et al. (2020)**

The research focused on the role of compensation and benefits in improving employee performance. It highlighted that competitive salaries attract employees, but non-monetary rewards ensure retention and satisfaction. Training, recognition, and work-life balance were identified as key factors influencing motivation. The study concluded that a balanced approach to rewards leads to improved productivity and reduced employee turnover.

Journal: Cogent Business & Management

- **Neha Sharma and Pooja Tiwari (2021)**

The study examined employee satisfaction in relation to organizational support and reward systems. It found that timely measures such as stress management programs and employee recognition significantly enhance job satisfaction. Monetary benefits alone were insufficient to maintain motivation. The study concluded that organizations must adopt holistic HR practices to ensure employee well-being and improved performance.

Journal: International Journal of Human Resource Studies

- **Maria Salas-Vallina et al. (2021)**

This study explored the relationship between happiness at work and employee performance. It found that non-monetary factors such as supportive leadership, engagement, and recognition play a crucial role in enhancing job satisfaction. The study concluded that organizations focusing on employee well-being and positive work culture achieve better productivity and organizational outcomes.

Journal: International Journal of Environmental Research and Public Health

- **Ali Alhmoud and Nidal Rjoub (2022)**

The study analyzed the effect of reward systems on employee performance across industries. It found that financial rewards improve short-term performance, while non-monetary incentives ensure long-term satisfaction and loyalty. The research concluded that integrating both reward types is essential for achieving sustainable organizational growth and employee engagement.

Journal: Sustainability

- **Katarina Katou (2023)**

This research examined HR practices and their impact on employee performance. It highlighted that training, recognition, and employee involvement significantly influence satisfaction and productivity. The study concluded that

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non-monetary benefits are critical in building employee commitment, while financial rewards act as supporting factors in organizational success.
Journal: European Management Journal

- **Sajid Bashir et al. (2023)**

The study investigated employee engagement and its relationship with reward systems. It found that non-monetary rewards such as appreciation, empowerment, and career development have a stronger impact on engagement than financial incentives. The study concluded that organizations should prioritize intrinsic motivation to enhance long-term employee satisfaction and performance.
Journal: Frontiers in Psychology

1. Statement of the Problem

Employee satisfaction has become a major concern for organizations in today's competitive environment. Many organizations primarily focus on monetary benefits, neglecting non-monetary rewards and timely supportive measures. This imbalance affects employee motivation, productivity, and retention. Therefore, it is essential to understand how different types of benefits and organizational practices influence overall employee satisfaction and workplace performance.

Existing studies have largely examined monetary and non-monetary benefits separately, with limited focus on their combined impact. Additionally, the role of timely organizational measures is often overlooked. There is a lack of comprehensive research integrating all three aspects together. Hence, this study aims to bridge this gap by analyzing their collective influence on employee satisfaction in a unified framework.

2. Objective of the study

The main objectives of this study are,

- To examine the role of monetary benefits
- To analyze the impact of non-monetary benefits
- To evaluate the importance of timely organizational measure

3. Methodology of the Study:

The present study is based on a descriptive research design, aiming to analyze employee satisfaction through monetary and non-monetary benefits along with timely organizational measures. The study relies on secondary data, collected from journals, articles, reports, and credible online sources. The data has been analyzed using qualitative analysis, focusing on interpretation and comparison of existing findings. The study adopts a conceptual approach to understand relationships between different factors affecting employee satisfaction.

The scope of the study is limited to general organizational practices and does not focus on any specific industry or geographical area

Table 1: Comparative Impact of Factors on Workforce Outcomes

Factors	Short-term Impact	Long-term Impact	Overall Influence
Financial Rewards	High	Moderate	Moderate
Non-Financial Rewards	Moderate	High	High
Organizational Measures	Moderate	High	High

The table compares how different factors influence workforce outcomes over short-term and long-term periods. Financial rewards show a high short-term impact because they immediately attract and motivate individuals by fulfilling economic needs. However, their long-term impact becomes moderate as their motivational effect reduces over time.

Non-financial rewards, such as recognition, career growth, and participation, have a moderate short-term impact but a high long-term impact. These factors create emotional attachment, commitment, and sustained motivation, leading to a high overall influence.

Organizational measures, including supportive work culture, stress management, and flexible policies, also show moderate short-term but high long-term impact. They strengthen trust, well-being, and engagement.

Overall, the table indicates that while financial rewards initiate motivation, non-financial rewards and organizational measures are more effective in sustaining long-term workforce outcomes.

Employee satisfaction - monetary benefits

By providing financial benefits, employees stay with the organisation for longer, and again put in more effort. Some of the main benefits are;

- **Salary**

Basic salary is essential for employees. Basically, the minimum salary should be paid before giving more financial facilities, not in any case stopped because their livelihood depends on it, so that the employee is usually assured of minimum wage.

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- **Allowances**

In today's day-to-day there is a huge increase in the price of consumer goods, it is very important to give the employees other allowances along with the salary, then the employees can be effective in their work. Allowances are dearness allowance, medical allowance, children education allowance, entertainment allowance and especially tax-free allowances are to be provided such as travelling allowance and conveyance allowance etc.

- **Sharing of profit**

A portion of the profits earned by the organisation must be distributed to the employees, preferably before taxes are paid, this makes the employees more responsible and further contribute to making the organisation more profitable. They have a sense of belongingness and work diligently to earn more profit.

- **Retirement benefits**

Employers should also be concerned about the retirement of the employees, so that the employees feel security, after retirement the employee should be given facilities to enable him to live, which are contribution to pension schemes, contribution to provident fund and gratuity, leave encashment benefits etc.

The above all financial benefits are more essential to supply to the employee group, so this can help the organisation to see the employee satisfaction.

- **Incur special expenses**

Many companies are implementing hybrid working arrangements like work at office or work from home, this means that their employees will have to set up their own workstation at home, which can be expensive. In such cases, organisation might want to offer a work from home allowances, which can include: reimbursement for desks, chairs, office supplies, internet services, laptops, webcam, microphones etc.

Employee satisfaction – non-monetary benefits

According to the survey, non-financial benefits are more effective and memorable than financial benefits. By giving these the employees works with satisfaction. Namely,

- **Participation in management**

It is better to ask the opinions of the employees when the organisation is taking key decisions in certain situations. Because they know the ground reality of the business operations, then they feel that they also belong to the institution. It results in good productivity.

- **Training and career advancement**

As technology evolves rapidly, employees also need to adapt to it. Also, proper training enables employees to become skilled at work so that they are more confident and perform neatly without any errors.

And, since employees want to be promoted from time to time, they need to be taught the skills required for higher positions at various platforms.

- **Gifts on the personal occasions**

Contributions in the form of money are seen as normal in the eyes of employees, whereas gifts are remembered and enjoyed for a long time. So, it is convenient for the organisation to give gifts keeping in mind any special occasions of the employee. This makes the employee more motivated

- **Foreign trips**

Surveys say that foreign trips are not only enjoyable but memorable for about 5 to 6years. The organisation should take many measures to keep the employees satisfied and should recognise the loyal employees and arrange to send them on a foreign trip with their family members at least once in 2years. Due to this, all his family members will not only develop admiration for the organisation but also stand as the backbone of the employee. Other employees will also be motivated

The above stated measures are very impressive in the view of employee, definitely they feel happy and satisfied by enjoying those non-financial rewards.

- **Paid vacations**

In countries like America, it is a practice to give more paid vacations to get better productivity, as employees also seek vacations to get away from work pressure, it is good for the organisation to issue it as a policy.

Employee satisfaction- taking timely measures

Even after providing all the facilities, some situations hinder the employee to perform well. They may be internal or external to the organisation. Knowing this, it is imperative that the organisation takes well-timed steps. Those special circumstances are discussed below.

- **Stress controlling activities**

In a competitive sector, a firm can stand in the market if it works according to the rivalry's strategy. It can be implemented only by the efforts of the employees. In order to achieve this, it is natural for employees who work tirelessly to get stressed, so the organisation needs to conduct stress management activities from time to time. This will help the employees to work without stress. Example, opening canteens and mini libraries for employees' group at workplace, enable to playing healthy games among employees on weekends, giving brainwork by competitions to

release from stress, especially creating de-stress rooms, in which the employee is angry about something his boss or other employee which can be vented in that room.

- **Enhancing cordial relationship between employees**

The organisation should stand up for the employee in any situation and respond to his feelings, this not only creates a good impression on the organisation in the employee, but also learns how to behave with other employees and develops good relations. This makes the work go smoothly.

- **Attaining personal problems of employees**

It is good for an organisation to be as involved in an employee's happiness as he is in his hardships, because loyal employees are few and far between, so if they are troubled by any personal problems, their superiors should try to resolve them. Who can never forget those who helped in times of trouble.

- **Recognitions of employee's efforts**

Organisation need to recognise loyal and efficient workers and motivate them. This inspires him to do more work and also motivates other employees, if the organisation looks at everyone in the same way, then efficient employees are likely to get demotivated.

- **Organising financial literacy programs**

As per the survey by Charles Schwa, shows that over 70% of workers have no concrete financial plans. The report also reveals that stress about finances is growing. Financial literacy programs can help the employees to get educated, so organisation can offer e-learning resources and webinars or free access to financial consultancy services

Conclusion

Employee's satisfaction is the most important factor, while financial facilities help the employee's family to live comfortably with all the basics, non-financial facilities affect the employees mind and motivate him to put in more efforts. Moreover, timely and indirect actions taken outside of employment benefit the organisation. If we look at these three as different stages in the ascending order, in the first stage he works for salary with financial facilities, in the second stage he works with is involvement by getting more facilities, then in the third stage he devotes himself perfectly to the prosperity of the organisation to pay off the concern of the organisation.

Finally, it is concluded that, the comprehensive development of the employee can be seen through all the above measures, an employee becomes emotionally connected with the organisation

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