



Journal of Economics and Commerce

Vol. 17

Issue 02

July -Dec. 2026

"A Peer Reviewed Journal"

(Indexed in QLI Database of ISID)

ISSN 0976-9528

UGC Listed No. - 47364 (till 2018)

VikAsIt BHARAT @ 2047



Published by

DAV PG COLLEGE

Maharshi Dayanand Saraswati Marg

Narharpur, Ausanganj, Varanasi, Uttar Pradesh - 221001 (India)

Tel. 0542-2214438 # Fax : 0542-2214438

Mob. : 09415372059, 09415226118, 09415813379

Email : davjecvns@gmail.com

jecwebsite : www.davjournals.in

collegewebsite : www.davpgcvns.ac.in

Published by

DAV PG COLLEGE

Maharshi Dayanand Saraswati Marg

Narharpura, Ausanganj, Varanasi, Uttar Pradesh - 221001 (India)

Tel. 0542-2214438# Fax : 0542 - 2214438

Mob. : 09415226118, 09415372059, 09415813379

Email : davjecvns@gmail.com#website : www.davpgvns.ac.in

DISCLAIMER

All the research papers published in this journal are based on the findings of the concerned authors. The publication of the research papers in this journal does not mean that the editorial board agrees with them. All the judicial cases will be disposed off under the jurisdictions of Varanasi Court.

*The members of the national advisory board are also nominated as referees for the articles.

*All the posts related to the editorial are honorary

* All correspondence regarding manuscripts, Subscription etc. may be addressed to :

Managing Editor

Journal of Economics and Commerce

DAVPG College

Maharshi Dayanand Saraswati Marg

Narharpura, Ausanganj, Varanasi - 221001 U.P. (India)

Mob. : 09415372059,

Email : anupdav@gmail.com & davjecvns@gmail.com

ISSN 0976-9528

Printed At :

PRABHU PRINTERS

Maldahia, Varanasi

Mob. : 91+9415270203



Journal of
Economics and Commerce

We extend our deepest gratitude to authors who have contributed to the journal of economics & commerce since 2010. Your enduring trust in our publication in the cornerstone of our success, and it is a privilege to share your work with the global community



Journal of
Economics and Commerce
A Bi-annual journal of DAV PG College

Vol.- 17, No. 02 July - Dec. 2026



CONTENTS

Editorial Notes

Macroeconomic Application of Fintech: Evidences from the Payment System, Financial Inclusion and Black Swan Event (Covid-19) in India Karimullah, Pradeep Kumar Singh, Bhartendu Kumar Chaturvedi	7
Women's Self-Help Groups in Bihar: Building Climate Resilience and a Sustainable Future Rahul Kishore, Dr. Resham Vijay Ratne	22
Labour Market Resilience in India in The Era of Artificial Intelligence Dr. Aruni Kumar	28
Sub-sectoral Composition of a Heritage Creative Economy: Textile Dominance, Enterprise Scale, and Employment in Varanasi's Registered MSMEs, 2020-2024 Rani Priya	36
Status of HIV/AIDS and Its Risk Factors in The North-Eastern Region of India Vikash Kumar	44
An Empirical Assessment of Bhagalpur Silk's Export Valuation and Protection Against Counterfeits Dibyanshu Kumar	58
Differential Real Wage Growth across Social Groups in India: Evidence on Scheduled-Caste Workers, 2011-2024 Satyendra Pratap Bharati, Pankaj Kumar Soni	66
Viksit Bharat 2047: A Vision for the Sustainable Development of India : An Empirical Framework for India's Centenary Transformation Dr. Archana Upadhyay	75
Bridging the Gender Gap through Digital Finance: A Study on Women's Financial Inclusion in India Akansha Singh* and Dr Bhartendu Kumar Chaturvedi	84
Large Language Models and the Future of Literary Interpretation in English Studies Munna Kumar Singh	97
Decomposition of Entrepreneurial Intention in India: Comparison with BRICS Nations Jitesh Kumar Nishad and Dr. Hari Ram Prajapati	107

Next-Generation GST Reforms : A Pathway for Viksit Bharat 2047	
Dr.Anjali Agrawal	122
Revenue Performance of Goods and Services Tax in India	
Parul Jain & Jitendra Kumar	130
“The Impact of Cyber Crime in Rural Economy.. Micro study in Sahibganj District of Jharkhand”	
Dr. Tripta Sinha	143
Geopolitical Shock and Strategic Realignment: The U.S.-Iran Conflict Scenario and Five-Year Economic Projections for India (2026-2031)	
Prof. Anup Kumar Mishra	147



EDITORIAL NOTES

We are feeling great satisfaction that the Journal of Economic & Commerce (**JEC**) has successfully completed the 17th years of publication and entering in the 18th year. Earlier we successfully indexed our journal in QLI Database of INSTITUTE FOR STUDIES IN INDUSTRIAL DEVELOPMENT as well as in the UGC list (2018). We are also proud of our Editorial Board for the *Journal of Economics & Commerce (JEC)*, **Which** includes academicians in the fields of Economics and Commerce, who have marks of records of accomplishment in their respective disciplines and also share a burden of referee as per required from time to time. Ever since its inaugural publication in 2010, **JEC** has emerged as one of the most respected publications, encompassing both Economics and Commerce. We intend to build on this tradition with our present issue.

Over the years, **JEC** has endowed with a platform for the progression of knowledge and the quest of academic excellence. Many prominent scholars from different part of India have published inspiring high quality articles analogous to those in leading journals in the field. Even as maintaining its focus on contemporary developments in the broad areas of Economics and Commerce, the journal is now also pledged to the spreading out of research frontiers further.

Within this orientation the present issue of the journal provides a set of fifteen articles which includes some special articles case studies on burning issues of economics, commerce and institutional area. In addition to this we have also kept our commitment towards promotion of new contributors and young researchers in the present issue.

The Editors welcome submissions of the research papers on vital issues concerning our economy and commerce, **with a token of note that these will strictly be referred before acceptance.**

DAV PG College
Varansi
31th, July, 2026

Anup Kumar Mishra
Editor

MACROECONOMIC APPLICATION OF FINTECH: EVIDENCES FROM THE PAYMENT SYSTEM, FINANCIAL INCLUSION AND BLACK SWAN EVENT (COVID-19) IN INDIA

Karimullah*, Pradeep Kumar Singh**, Bhartendu Kumar Chaturvedi***

ABSTRACT

*The present study is an attempt to examine in what extent the Fintech has created efficiency at macro level in Indian Economy, particularly in terms of payment system and financial inclusion in India through transmission of digital means of payments, particularly, after COVID-19, which has been characterized as a **Black Swan Event**. The independent variable, 'fintech' is proxied by different digital means of payment developed after launch of Reliance JIO mobile and internet facility in India from the year of 2016, onwards. Dependent variable is status of financial inclusion which has been measured by the growth of access and use of digital/cashless banking transaction in India based on different digital instruments. Recently there happened two important events which created situation of cash payment crisis. This study includes covid-19, a black swan event, as a cash payment crisis period. The analysis is based on the secondary data which has been collected from the website of RBI on monthly basis for the period of 2013–2023. The finding suggests that Fintech has served to advance the goal of financial inclusion in India through encouraging the growth of electronic banking transactions based on mobile phones and internet, moreover after Covid 19.*

Key words: Fintech, financial inclusion, ICT, Payment Crisis, Kruskal-Wallis

GEL Classification: O33, O11, A10

INTRODUCTION

According to Malpass D. (World Bank Group President, 2022) “The digital revolution has catalyzed increases in the access and use of financial services across the world, transforming ways in which people make and receive payments, borrow, and save,” (WORLD BANK PRESS RELEASE June 29, 2022).

The word 'Fintech' represents combination of two words “finance” and “technology.” It is short form of financial technology (Fintech). It is used to describe new technology to improve the automation of the delivery and use of financial services. In a more formal way, fintech is utilized to help companies, business owners, and consumers better manage their financial operations, processes, and lives. For instance, Mobile banking and internet banking, hundreds of millions of people around the world are using for monetary transactions.

* Associate Professor, Department of Economics, Faculty of Commerce, University of Allahabad, Prayagraj- 211002, Email-drkarimeco@gmail.com

** Associate Professor, Department of Economics, Faculty of Commerce, University of Allahabad, Prayagraj- 211002, Email-pks@allduniv.ac.in

*** Associate Professor, Department of Economics, Faculty of Commerce, University of Allahabad, Prayagraj- 211002, Email- bkchaturvedi.eco@gmail.com

The Information and Communication Technology (ICT) has generated new revolution in global payment system. An efficient payment system is highly required for commencement of development activities. The Indian economy has been a leading economy in providing financial services to the citizens and world class facilities to the banking system. The 'Digital India' programme of the Government of India is launched to transform India into a digitally empowered society and knowledge economy. "Faceless, Paperless, Cashless" is one of professed role of Digital India. Thus India is moving forward to the aim of —Cash less Society, which means paper currency in circulation will reduce to minimal and all payments are made through digital payment system.

For this innovative idea, the tremendous advances in technology and the aggressive infusion of information and communication technology (ICT) have been introduced which has brought in a paradigm shift in the whole banking operations, particularly in payment system. Ensuring its developmental role, The Reserve Bank of India (the central bank of India) has taken several initiatives for Safe, Secure, Sound, Efficient, Accessible and Authorized payment systems in the country.

Financial inclusion refers to the availability and accessibility of financial services for individuals and businesses, particularly unbanked, poor and rural area people. It has been a fundamental goal for governments and organizations around the world. Despite progress in recent years, there are still many individuals and communities that lack access to basic financial services such as savings and credit. Many studies has concluded that Financial Technology (Fintech), has the potential to play a major role in addressing this problem by making financial services more accessible and affordable in form of digital money (*Beck, T. 2020, Tok, et al. 2022, Bansal 2014*).

In terms of financial services, there are three important dimensions of macroeconomic applications of fintech have been covered in this study. These are payment system, financial inclusion and cash payment crises. There are a number of studies which have concluded that fintech has provided efficient payment system and ensured better progress in financial inclusion through availability and use of digital means. It has also facilitated the monetary transactions during demonetization and Covid-19 pandemic when cash payment was not easy.

Efficient Payment System refers to the availability and use of the financial services to the common people on the reasonable cost. This particular practice was made easy by launching many digital instruments by financial technological development. For an efficient payment and settlement of banking services, RBI established National Payments Corporation of India (NPCI), with the help of Indian Banks' Association (IBA), for creating a robust Payment & Settlement Infrastructure in India (under the provisions of the Payment and Settlement Systems Act, 2007). It started its proper work in 2013. NPCI, during its journey in the last seven years, has made a significant impact on the retail payment systems in the country. Apart from many initiatives based of modern technology towards digital and cashless payment and settlement system taken by RBI, NCPI has introduced number of electronic based payment instruments time to time, such as Mobile Banking, PPI card, M-wallet, RTGS (Real Time Gross Settlement), Electronic Clearing Service (ECS), Electronic Funds Transfer (NEFT), Cheque Truncation System (CTS), etc.

Financial inclusion refers to the availability and accessibility of financial services for individuals and businesses, particularly unbanked, poor and rural area people. In the present scenario of development, Inclusive growth has been a matter of major concern before the policy maker as it has been an essential tool for ensuring the equal development process which is highly required in the case of country like India. It is impossible to think about inclusive growth without access to formal finance at an affordable cost (Kaur 2016, NABARD report 2015, Songu and Moor 2015, Finance Commission Reports 2009).

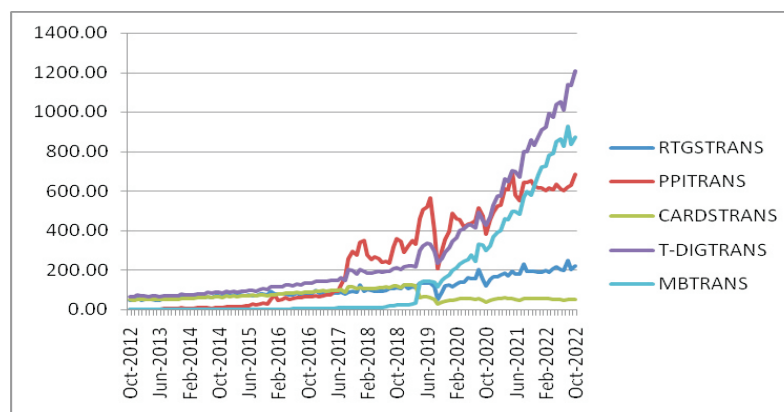
According to S. Mundra (2016), 'to address the issue of poverty, financial inclusion is very important means along with an inclusive society. Likewise financial literacy is required to achieve universal financial inclusion'. Despite progress in recent years, there are still many individuals and communities that lack access to basic financial services such as savings and credit. Many studies has concluded that Financial Technology (Fintech), has the potential to play a major role in addressing this problem by making financial services more accessible and affordable in form of digital money (Beck, T. 2020, Tok, et al. 2022, Bansal 2014).

The government of India (RBI) has provided all the possible facilities to the banks based on modern Information and communication technology (ICT) with the views that it would act as a bridge between last mile customers and service providers, ensuring access and use of banking services, particularly in rural areas. Further, to make effective use of ICT, Banks have adopted Core banking solution (CBS), which links all the branches of the banks with each other. It helps customer to operate from any branch regardless of their account in any other branch. It provides door step banking services through Business Correspondents Model wherein the accounts can be operated by even illiterate customers by using biometrics, thus, ensuring the security of transactions and enhancing confidence in the banking system (Different annual reports of RBI and NABARD).

Recently there happens two major cash payment crisis in India which provided best opportunity to the transmission of Fintech instruments by enforcing the demand for the digital payments. First major cash payment crisis happened due to the announcement of demonetization (where the payment crisis was due to less availability of cash) by the Indian government and the second one, which created more panic situation, was due to The COVID-19 pandemic⁴ (where the cash was available but could not be circulated). These crises have been a catalyst of structural change in the payments industry. No doubt that these two unfortunate situations can be termed as **black swan events**. Due to spread of Novel Corona virus Covid-19, All the sectors were imposed to innovate and transform themselves to be more digital and technological based. Due to payment crisis all the sectors were getting downfall but the situation was controlled by encouraging digital payment system from being worse. This became possible because of technological disruption during the last decade.

Trend of growth in digital transactions in India

Figure 1- trend of mobile based and other electronic transactions with banking system in India



4. The Indian government adopted a bold step towards moving to cashless transaction which is well-known as demonetization in November 2016. This particular event created shortage of cash in the economy and people were suggested and also bound to adopt digital means of transactions. It created lot of panic in the economy but also paved the way to digitalization.

The above figure shows the continuous growth in different type of digital payments, which has got tremendous growth after the pandemic event covid 19.

ISSUES TO BE RESEARCH

The Government of India (RBI) has adopted information and communication technology (ICT) solutions with an anticipation that Modern ICT (Fintech) can act as a better means to develop an efficient payment system which helps us to extend the financial services in an easy way with lower cost, particularly in remote rural areas. It was also reported by an executive officer (a mobile infrastructure company of Sunil Mittal-driven Bharti Airtel) that the success of present government's ambitious scheme of Digital India as well as financial inclusion programs lies in making Internet connectivity available in all parts of the country. (Economic times, September 20, 2017). Hence, **it is logical for the researcher to examine empirical aspects of the macroeconomic applications of these new technological innovations. In the above scenario, the research problems are- Is the payment system being efficient due to transition of fintech?** Has Fintech provided a better solution for financial inclusion providing an efficient payment system? In what ways Fintech has helped during the payment crises during covid-19 and Demonetization? And also what are the issues and challenges before this innovative transition in India?

REVIEW OF LITERATURE

Technological innovation has been a boon for the financial system. The studies concluded that it would improve the efficiency of financial services in availability and use. It was reported by the government studies that Information and Communication Technology (ICT) solution would be a better way to ensure financial Inclusion (*RBI committee reports formed time to time for financial Inclusion*). Recently the mobile and internet technology has imparted a revolution in information technology. The further studies have concluded that Mobile banking has the ability to reach the 'unbanked' sectors of the economy (Klein and Mayer, 2011) but under the condition that there is mobile connectivity. Capturing of this market increases the participants in the financial services sector (Agarwal 2010). mobile banking provides greater financial intermediation of the economy as a whole solving both the demand side as well as supply side problems (Gonzalez-Vega, 2003, Drabu 2009; Altay and Atgur 2010).

Faizanur Rahman (2018) provided details of gradually development of money payment system in India and suggested that the paramount aim of a payment system of any country is to encourage secure, convenient and affordable modes of payment infrastructure. He further concluded that with the computerization and digitalization, the common public has seen the benefits of the modern payment system.

Other studies, such as, Roller and Waverman (2001) and Eggleston, Jensen and Zeckhauser (2002), pointed out that improvement in ICT infrastructure leads to reduction in transaction cost, and various sectors of the economy register increase in output and improve standard of living. Similarly, Pigato (2001) discussed direct and indirect impact that ICT casts on economy. Under the realism of direct impact, ICT does it in three ways, namely, through increase in education/literacy, improved health indicators and lastly through asset and employment generation in economy.

Beck, Thorsten (2020) summarized recent research on financial inclusion, with a focus on developments in Asia. He examined the extent to which advances in financial inclusion are driven by digitally driven financial innovation, further he concluded that the rise of fintech and bigtech implies for the structure of the financial system. Tok, Y. Wang and Dyna (2022) examines the role of Fintech in financial inclusion. Using Global Findex data and emerging

fintech indicators, they found that Fintech had a higher positive correlation with digital financial inclusion than traditional measures of financial inclusion

Mago and Chitokwinda (2014) examined the impact of mobile banking on financial inclusion in Zimbabwe. They adopted a qualitative research methodology and a survey design. The survey was based on the Masvingo district in Zimbabwe. The results revealed that the low income people are willing to adopt mobile banking and the reasons are that it is easily accessible, convenient, cheaper, easy to use and secure. The Committee on Medium-term Path on Financial Inclusion (CMPFI 2015) constituted by Reserve Bank of India submitted its report in December 2015. Among the various recommendations made by the committee, some of the important ones that have been implemented include Registration of mobile numbers through ATMs connected with NFS.

Asif M, et al. (2023) examined the impact of fintech and digital financial services on financial inclusion in India. According to their results, fintech businesses have significantly aided financial inclusion in this nation, especially for the middle class. These findings will be helpful for policy-makers working hard to bring every individual in this country into an organized financial system. Singh and Padhi (2015) aimed to assess the impact of ICT in client management, risk management and work efficiency of MFIs based on the case study of three MFIs (Cashpor Microcredit, SKS Microfinance Ltd and Utkarsh Microfinance Pvt Ltd). They found that the use of ICT has succeeded in bringing efficiency in terms of cost and client management. They further suggested that the ICT adoption in MFIs needs a policy overhaul especially in terms of regulatory and infrastructure issues taking into account the aspirations and problems of all the stakeholders to microfinance sector.

Alshubiri, et. al. (2019) examined the impact of information and communication technology (ICT) on the financial development index of six Gulf Cooperation Council (GCC) countries from the period 2000 to 2016. The results showed that an increase in fixed broadband has a statistically significant and positive effect on both proxies of financial development. In terms of domestic credit as a percentage of the GDP proxy, the positive effects of ICT (broadband) are greater than the one from Internet users.

RESEARCH OBJECTIVES

There are two basic objectives of the study. First is to evaluate that in what extent **Fintech** on the growth of access and use of banking transaction in India. Secondly, is to examine the impact of **Fintech** on the financial inclusion in India. In this scenario, this paper is an attempt to examine the impact of technology on the Indian economy during COVID-19 as well as to analyse the impact of COVID-19 on technological disruption in India.

EMPIRICAL ANALYSIS

RESEARCH METHODOLOGY

The study consider three major dimensions of macroeconomic applications of Fintech, namely for efficient payment system, for financial inclusion and for managing the problem of cash payment crises. For this reason, the study consists of three part of empirical analysis, following up its objectives. The study is constraint to role of fin tech as expansion of digital payment system in India.

For the analysis of the impact of Fintech on financial inclusion

The independent variable is the fintech which is proxied by launch of **Reliance JIO mobile and internet facility in India in 2016. A dummy variable, DUMFIN is generated for this** technological innovation. On other hand, dependent variable is status of financial inclusion which has been measured by the growth of access and use of digital/cashless banking transaction in India based on different digital instruments. There are several types of digital instruments of banking transactions introduced by RBI time to time. But in this study, five such types of instruments are selected for the

empirical analysis as dependent variable (on the basis of intensity of use). These represent major part of digital payment instruments in India. These are; RTGS, PPI (Prepaid payment instrument), which includes M-Wallet and others (PPITRANS), card based transactions (CCTRANS), NEFT and Mobile based transactions (MB TRANS).

The proper use of JIO mobile and internet facility in bulk emerged in the last quarter of 2016. So, December 2016 has been selected as the starting month of JIO. So The dummy variable (DUMFIN) is given '0' value before September 2016 and value of '1' after September 2016. Pre and post impact of the JIO technology has been examined with the help of mean differences as well as regression analysis. Thus, there are five dependent variables named NEFT, RTGS, PPTRANS, CCTRANS, NEFT and MB TRANS followed by one independent variable, DUMJIO.

For the analysis of the impact of Fintech on the payment crisis during COVID-19

In this scenario, this paper is an attempt to examine the impact of technology on the Indian economy during COVID-19 as well as to analyse the impact of COVID-19 on technological disruption in India. The impact of technological disruption is explored by examining the mean differences and volatility between pre-event period and during the event COVID-19. Mean differences is testes using *t*-tests and Mann–Whitney non-parametric tests, while volatility behavior is examined applying ARCH/GARCH model. Recently there happened two important events which created situation of cash payment crisis. One situation is created by the government decision making well-known as demonetization. The second situation of payment crisis is the existing odd situation of lockdown due to covid-19. In this particular time cash was available but could be use for transaction purposes due to fear of corona virus as it was suggested by the government to avoid cash transactions. In this situation also the digital payment was the best available payment option in the country.

For the second part of the analysis, The impact of technological changes has been evaluated by two ways. First hypothesis is that it has make differences between the cash and digital payment system. Second aspect is that it has significant impact on the growth of payment system. For the first hypothesis we have tested mean differences applying Krushal-Wallis test. For the testing of second hypothesis we have selected commence of ICT for technological progress. On other hand, dependent variable is growth in digital and electronic banking transactions based on mobile and internet connections in India.

The dummy variable for the COVID-19 period (DUMCO) was generated which assumes a value of '0' for the pre-corona virus period (before mar, 2020) and '1' for the current corona virus period (after mar, 2020).

Data Collection

The nature of data is secondary and collected from National Payments Corporation of India (NPCI) website, an RBI wings. Monthly basis data is used for the time period from April 2013 to Oct 2023.

About the variables

Brief description of the variables is given below as;

RTGS - number of banking transactions done in India through Real Time Gross Settlement (RTGS) in Million

PPITrans- number of banking transactions done in India based on paper clearing in million

NEFT- number of banking transactions done in India through ECT/NEFT in Million

CCTrans - number of banking transactions done in India Cards (Debit/Credit) in Millions.

MBTrans - number of banking transactions done in India through M-Banking in Million.

DUMJIO - The dummy variable as a proxy of introduction of Reliance JIO in India.

For better understanding, it includes three part of analysis. Trend analysis, Mean differences Analysis and Regression analysis. Trend analysis is based on figure drawn from the data of electronic transactions provided by RBI (BI website).

EMPIRICAL ANALYSIS

RESULT INTERPRETATION OF MEAN DIFFERENCE ANALYSIS

Table -1: Test for Equality of Medians Between the Series overall

Test for Equality of Medians Between Series

Method	df	Value	Probability
Kruskal-Wallis	4	303.8040	0.0000
Kruskal-Wallis (tie-adj.)	4	303.8040	0.0000
van der Waerden	4	280.5565	0.0000

Category Statistics

Variable	Count	> Overall			
		Median	Median	Mean Rank Score	Mean
RTGS	70	681503.5	70	263.1714	0.689859
PPTRANS	70	7264.500	0	44.01429	-1.274243
MB	70	97799.50	8	108.2286	-0.557955
CARDS	70	262707.5	27	164.8571	-0.077311
NEFT	70	1157969.	70	297.2286	1.219650
All	350	307264.5	175	175.5000	4.06E-17

The test for overall mean differences of change in different payment system is done and the result (table -1) shows that the difference is significant. The result suggests that transaction through NEFT got a high rank showing the preference of mode of payment.

The result of pre and post of JIO reliance facility is shown in the below tables

Krushkal - Wallis test

Table -2: Test for Equality of Medians Between Series CARDTRANS

Method	df	Value	Probability
Kruskal-Wallis	1	34.95171	0.0000
Kruskal-Wallis (tie-adj.)	1	34.95171	0.0000

Category Statistics

Variable	Count	> Overall			
		Median	Median	Mean Rank Score	Mean
CARDS1	34	231390.0	4	20.32353	-0.619606
CARDS2	34	353345.0	30	48.67647	0.619606
All	68	261705.5	34	34.50000	0.000000

Table -2 shows that there is significant difference between pre and post of JIO period in the payment system based on digital cards. It suggest that there is higher growth in the use of digital payment after commence of new technology as ICT in India.

Table -3: Test for Equality of Medians Between Series MBTRANS

Method	df	Value	Probability
Kruskal-Wallis	1	47.34783	0.0000
Kruskal-Wallis (tie-adj.)	1	47.34783	0.0000

Category Statistics

Variable	Count	> Overall			
		Median	Median	Mean Rank Score	Mean
MB1	34	20855.50	3	18.00000	-0.749825
MB2	34	179854.5	31	51.00000	0.749825
All	68	88961.00	34	34.50000	-5.22E-17

Table 3 shows that there is significant difference between pre and post of JIO period in the payment system based on Mobile banking transaction. It suggest that there is higher growth in the use of Mobile

banking transaction after commencement of new technology as ICT in India.

Table 4: Test for Equality of Medians Between Series ;Paper clearing (PPTRANS)

Method	df	Value	Probability
Kruskal-Wallis	1	0.173913	0.6767
Kruskal-Wallis (tie-adj.)	1	0.173913	0.6767

Category Statistics

Variable	Count	> Overall			
		Median	Median	Mean Rank Score	Mean
PC1	34	687235.5	18	35.50000	0.050244
PC2	34	679832.5	16	33.50000	-0.050244
All	68	682795.5	34	34.50000	-1.96E-17

Table 4 shows that there is no significant difference between pre and post of JIO period in the payment system based on Paper based transaction. It suggests that there is no growth in the use of Paper based transaction after commencement of new technology as ICT in India.

Table 5: Test for Equality of Medians Between Series :RTGS

Method	df	Value	Probability
Kruskal-Wallis	1	49.22281	0.0000
Kruskal-Wallis (tie-adj.)	1	49.22281	0.0000

Category Statistics

Variable	Count	> Overall			
		Median	Median	Mean Rank Score	Mean
PPI1	34	3105.500	1	17.67647	-0.761656
PPI2	34	14865.00	33	51.32353	0.761656
All	68	5869.000	34	34.50000	0.000000

Table 5 shows that there is significant difference between pre and post of JIO period in the payment system based on PPI payment. It suggest that there is higher growth in the use of PPI payment after commence of new technology as ICT in India.

Table -6: Test for Equality of Medians Between Series NEFT

Sample: 1 34

Included observations: 34

Method	df	Value	Probability
Kruskal-Wallis	1	49.74048	0.0000
Kruskal-Wallis (tie-adj.)	1	49.74048	0.0000

Category Statistics

Variable	> Overall				
	Count	Median	Median	Mean Rank Score	Mean
REC1	34	683476.5	1	17.58824	-0.764897
REC2	34	1890227.	33	51.41176	0.764897
All	68	1095325.	34	34.50000	0.000000

Table -6 shows that there is significant difference between pre and post of JIO period in the payment system based on Electronic payment. It suggest that there is higher growth in the use of Electronic payment after commence of new technology as ICT in India.

Impact of Covid-19

Table -7: Test for Equality of Medians Between the Series overall

Test for Equality of Medians Between Series

Method	df	Value	Probability
Kruskal-Wallis	4	303.8040	0.0000
Kruskal-Wallis (tie-adj.)	4	303.8040	0.0000
van der Waerden	4	280.5565	0.0000

Category Statistics

Variable	> Overall				
	Count	Median	Median	Mean Rank Score	Mean
PC	70	681503.5	70	263.1714	0.689859
PPI	70	7264.500	0	44.01429	-1.274243
MB	70	97799.50	8	108.2286	-0.557955
CARDS	70	262707.5	27	164.8571	-0.077311
REC	70	1157969.	70	297.2286	1.219650
All	350	307264.5	175	175.5000	4.06E-17

The test for mean differences of change in different payment system is done and the result (table -7) shows that the difference is significant. The result suggests that transaction through retail electronic clearing got a high rank showing the preference of mode of payment. However, the paper clearing is still has been second best mode of payment.

Regression Analysis

All The data series are transferred into natural log for compressing purposes. The important condition for the regression analysis is that the series should be stationary which is tested by ADF unit root test. Due to specific reasons it assumed that there is no autocorrelation in the error term because the software does it automatically.

Table-8: Result of Unit Root Test (ADF test model)

Variables	Para. Estimates	t-value	p-value	Stationarity
PPTRANS	-0.2713	-2.5789	0.290	no
D ₁ PPTRANS	-1.0312	-4.7202	0.00	yes
RTGS	-0.2967	-1.2841	0.890	no
D ₁ RTGS	-2.002	-5.888	0.00	yes
MBTRANS	0.0010	0.0140	1.00	no
D ₁ MBTRANS	-0.8020	-3.59	0.03	yes
NEFT	-0.7901	-3.2398	0.08	no
D ₁ NEFT	-2.27	-7.80	0.00	yes
CCTTRANS	-0.1383	-1.522	0.82	no
D ₁ CCTTRANS	-1.567	-5.444	0.00	yes

Source: Author's calculation

D₁ = First Difference

The result of unit root test is tabulated in the table (8) and it shows that the data series of all variables are non-stationary for their level but becomes stationary after taking first difference.

Table-9: Impact of Reliance JIO on the Mobile banking in India

Dependent variable: Y = MBTRANS

Ind. Variables	Parameter Estimates	t-value	p-value	Sign. Level
DUMJIO	0.43102	2.510	0.0120	Yes
L ₁ MBTRANS	7.221	2.398	0.016	Yes

Source: Author's calculation

The table- 9 shows that according to the p-value, the Dummy variable (DUMJIO) is a significant variable in affecting the M-banking (p- value = 0.012). The result suggests that Reliance JIO (mobiles and internet facility) has significantly affected the growth in the use of mobile banking in India. However, the growth in the use of mobile banking has been also significantly affected by its own past records (as lag-1 of m-banking, L₁M-Banking, is significant). This result suggests that use of mobile culture is increasing as use of one person is also encouraging the person to use it.

Table-10: Impact of Reliance JIO on the growth of RTGS Payments in India

Dependent variable: Y = RTGS

Ind. Variables	Parameter Estimates	t-value	p-value	Sign. Level
L ₁ RTGS	-0.47047	-0.47317	0.0016	yes
DUMJIO	-0.47317	-0.298	0.76	no

Source: Author's calculation

The table-10 shows that, according to the p-value, the Dummy variable (DUMJIO) is not a significant variable in affecting the RTGS (p- value = 0.72). Interpretation is that Reliance JIO (mobiles and internet facility) has not significant effect on the growth in the use of RTGS in India.

Table-11: Impact of Reliance JIO on the growth of banking Payments through CCTRANS in India

Dependent variable: Y = CCTRANS

Ind. Variables	Parameter Estimates	t-value	p-value	Sign. Level
L ₁ CCTRANS	-0.28415	-1.863	0.06244	no
DUMJIO	5.552	5.185	0.0000	yes

Source: Author's calculation

The table-11 shows that according to the p-value, the Dummy variable (DUMJIO) has significantly affected the CCTRANS (p- value = 0.00). It means that the Reliance JIO (mobiles and internet facility) has significantly affected the growth in the use of electronic payment through IMPS in India. However, the growth in the use of IMPS has been also significantly affected by its own past records, as its lag 1 (L₁ CCTRANS) is significant.

Table-12: Impact of Reliance JIO (mobiles and internet facility) on the growth of banking Payments through NEFT in India

Dependent variable: Y = NEFT

Ind. Variables	Parameter Estimates	t-value	p-value	Sign. Level
L ₁ NEFT	-0.5956	-4.408	0.00001	yes
DUMJIO	4.0918	1.194	0.2324	NO

Source: Author's calculation

The table-12 shows that the Dummy variable (DUMJIO) is a significant variable in affecting the NEFT (as p- value = 0.23). Interpretation is that Reliance JIO (mobiles and internet facility) has no significant impact on the growth NEFT in India. However, the positive sign of beta (4.09) suggests that there exist positive impact of the JIO on the growth of NEFT culture. NEFT has been significantly affected by its own past records but negative sign of beta suggest that NEFT culture has no contribution in encouraging the NEFT. There may be some other important variables such as truncation cost, etc.

Overall, the result of empirical analysis suggests that the emergence of Reliance JIO (mobiles and internet facility) has a significant impact on the growth of electronic banking transaction which is based on mobile phones and internet. It also suggests that card (digital) culture has a declined trend due introduction of Reliance JIO (mobiles and internet facility). Another important finding is that the electronic payment culture has also significant contribution in the growth electronic (digital and cashless) banking transactions.

CONCLUSION AND SUGGESTIONS

The study seeks to examine the impact of technological innovation (JIO mobile and internet facility) on Indian payment system and financial inclusion (digital) applying mean differences and regression analysis after covid 19 (a black swan event). The trend analysis shows that the mobile transaction has led to the other moods of transaction after launch of JIO. In the findings of this empirical study suggest that the emergence of Reliance JIO (mobiles and internet facility) has a significant impact on the growth of access and use of digital and cashless (electronic) banking transaction based on mobile phones and internet. The very much supportive result is that the card culture has a declined trend due to introduction of Reliance JIO (mobiles and internet facility). It means the people are able and desired to adopt new technology but the access of these facilities is a major constraint. Thus the study concludes that introduction JIO Internet and mobile facility has served to advance the goal of digital and cashless (electronic) payment system as well as financial inclusion in India through encouraging the use of mobile and internet facility.

This is also to notify that after launch of innovative scheme of information and communication technology (JIO) Indian economy faces two unwanted payment crisis very successfully due to proper expansion of mobile and internet facility among the common people. One crisis was due to demonetization where cash payment was limited and another crisis was due to Covid-19 where the cash payment was avoided. No doubt that in the absence of mobile and internet it could not be easy to handle payments in the time of Covid-19. Thus it can be concluded that the fintech has got a significant macroeconomic impact on Indian economy.

It is suggested on the basis of the finding that the digital transformation is the need of the day but could not be possible in the country like India and other emerging and developing economies where mass of the population is poor and uneducated. So, this Indian practice can be a lesson for other emerging economies which are still planning for digital transformation of the payment system. The offers like JIO Internet and mobile facility should be provided, particularly targeting the poor. This practice would be the best solution for both **digital and cashless (electronic) banking as well as** financial inclusion in emerging economies.

REFERENCES

- <https://www.worldbank.org/en/news/press-release/2022/06/29/covid-19-drives-global-surge-in-use-of-digital-payments>.
- Beck, Thorsten. 2020. Fintech and Financial Inclusion: Opportunities and Pitfalls. ADBI Working Paper 1165. Tokyo: Asian Development Bank Institute. Available: <https://www.adb.org/publications/fintech-financial-inclusion-opportunities-pitfalls>
- Tok, Yoke Wang; Heng, Dyna. (2022). Fintech: Financial Inclusion or Exclusion? IMF Working Paper no. WP/2022/080.
- Asif M, Mohd Naved Khan, Sadhana Tiwari, Showkat K. Wani and Firoz Alam (2023). The Impact of Fintech and Digital Financial Services on Financial Inclusion in India. *J. Risk Financial Manag.* 2023, 16(2), 122; <https://doi.org/10.3390/jrfm16020122>.
- Bansal Shashank (2014), "Perspective of Technology in Achieving Financial Inclusion in Rural India" *Procedia Economics and Finance*, Vol. 11, 472 – 480.
- Economic times, September 20, 2017.
- Gonzalez-Vega, C. (2003). Deepening Rural Financial Markets: Macroeconomics, Policy and Political Dimensions, The Ohio State University. USA.
- <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=publications>.

<https://www.financialexpress.com/economy/rural-push-reliance-jio-sees-its-future-in-bharat/1198014/>.

<https://www.firstpost.com/tech/news-analysis/reliance-jio-helped-83-million-citizens>.

https://www.rbi.org.in/Scripts/BS_ViewBulletin.aspx?Id=17302.

Kaur Lakhwinder et. al. (2016) “American International Journal of Research in Humanities, Arts and Social Sciences, 14(2), pp. 145-150.

Klein, M. and Mayer, C. (2011), Mobile Banking and Financial Inclusion, The Regulatory Lessons. *The World Bank Policy Research*, Working Paper 5664.

Mago Stephen and Sibert Chitokwindo (2014) “The Impact of Mobile Banking on Financial Inclusion In Zimbabwe: A Case for Masvingo Province” *Mediterranean Journal of Social Sciences*, Vol 5, No 9.

Mundra S S (2016), 'RBI Speeches', Retrived from:

https://www.rbi.org.in/Scripts/BS_SpeechesView.aspx?Id=1022.

NABARD Annual Report (2015) “The Bharat Microfinance Report”, Sa-Dan, Mumbai: NABARD. <http://www.sadhan.net/Resources/The%20Bharat%20Microfinance%20Report%202015-Web%20version.pdf>.

Malpass David (2022). Covid-19 Drives Global Surge in Use of Digital Payments. WORLD BANK PRESS RELEASE June 29, 2022. <https://www.worldbank.org/en/news/press-release/2022/06/29/covid-19-drives-global-surge-in-use-of-digital-payments>.

*

WOMEN'S SELF-HELP GROUPS IN BIHAR: BUILDING CLIMATE RESILIENCE AND A SUSTAINABLE FUTURE

Rahul Kishore* Dr. Resham Vijay Ratne**

ABSTRACT

Climate change is no longer some distant threat — it's reshaping daily life in rural India, particularly in Bihar. Here, communities depend heavily on farming, and the land itself feels the strain. Northern plains face ruthless floods it has become a routine. Down south, droughts drag on longer than before. Rainfall comes at the wrong times or in the wrong amounts, while temperatures keep climbing. These shifts have thrown traditional farming cycles into chaos and added enormous pressure to already struggling families.

Women carry much of this burden. They fetch water, gather firewood, put food on the table, care for children and the elderly, and still put in long hours in the fields. When a flood or drought hits, their responsibilities multiply while their access to resources stays painfully limited. Recovery becomes even harder.

Yet amid these challenges, Self-Help Groups (SHGs) have quietly become a source of real strength. By bringing women together, these groups help them save money, access small loans, pick up new skills, and face difficulties as a united front. This paper looks closely at how SHGs in Bihar are helping rural women to stand against climate change while also supporting broader sustainable development.

Keywords : *Climate resilience, Self-help groups, Women empowerment, Sustainable development, Rural livelihoods*

INTRODUCTION

Monsoon is the most important factor for agricultural activities in Bihar. As Bihar do not have proper structured irrigation facility, so farming is mostly dependent on rain water. Climate change is affecting the weather pattern, this lead to draught and hot weather. This is how it creates lots of difficulties and problem of reaching food security, income and many more livelihood challenges.

In Bihar, women hold responsibility of every important domestic work at home, like cooking, child care, caring of older members, water arrangements, cleaning, washing and many more activities. Dealing with such heavy loads on their head, they hold no power at home. Even they are not given preference in decision-making; their vulnerable position creates more inequalities.

Self-Help Groups helps in the betterment of women. This study explores how SHGs are helping women in Bihar to adapt these climate stresses and contribute to long-term sustainable development.

Despite this, their access to resources, land ownership, and credit facilities, as well as their inclusion in decision-making processes, remains limited. The challenges posed by climate change further add these inequalities. In such situations, Self-Help Groups (SHGs) work to organize women and connect

* Research Scholar, Department of Economics, Radha Govind University, Ramgarh, Email id- kishorerahul05@gmail.com

** Assistant Professor, Department of Economics, S.M. College, Bhagalpur T.M. Bhagalpur University, Bhagalpur
Email id- reshamvijayratne@gmail.com

them with economic resources, training, and community support.

REVIEW OF LITERATURE

- **Agarwal, B. (2018).** *Gender Challenges: Property, Family and the State*. Oxford University Press. Agarwal discussed how ownership of land and other productive assets affects women's social and economic position. Women who have control over resources are equipped to face environmental uncertainties and livelihood challenges. It also highlights the importance of gender equality in achieving long-term sustainability and community well-being.
- **Jost, C., Ferdous, N., & Spicer, T. D. (2014).** *Gender and Inclusion Toolbox: Participatory Research in Climate Change and Agriculture*. CGIAR Research Program on Climate Change, Agriculture and Food Security. This publication focuses on the inclusion of women in climate-related agricultural programs. The authors highlights that women possess valuable local knowledge which can help in adaptation practices. The study suggests that meaningful participation of women in planning and implementation leads to stronger agricultural systems and better responses to climate-related risks.
- **Eastin, J. (2018).** *Climate Change and Gender Equality in Developing States*. Elsevier press. Eastin examined how climate change influences gender relations in developing nations. The study says that women often experience greater difficulties during environmental crises because of less access to resources and opportunities. The research argues that reducing gender inequalities can improve resilience and contribute to more balanced development outcomes.
- **Djoudi, H., Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Basnett, B. S. (2016).** *Beyond Dichotomies: Gender and Intersecting Inequalities in Climate Change Studies*. Springer Naturepress. The authors explored the ways in which social factors such as gender, class, and ethnicity influence vulnerability to climate change. Their analysis says that women are affected differently depending on their social and economic conditions. The study encourages policymakers to consider these differences while designing adaptation and development programs.
- **Rao, N., Lawson, E. T., Raditloaneng, W. N., Solomon, D., & Angula, M. N. (2019).** *Climate Change and Gendered Vulnerabilities: Impacts and Adaptation in Africa and Asia*. Taylor & Francis press. This study examined the challenges to women in regions affected by climate variability. It found that unequal access to information, finance, and decision-making often increases women's vulnerability. The authors conclude that empowering women through education, resource access, and leadership opportunities can strengthen community resilience and adaptive capacity.

CLIMATE CHANGE AND CHALLENGES IN BIHAR

Geographically, Bihar is a highly vulnerable state. In the northern region, rivers such as the Kosi, Gandak, Bagmati, and Kamala cause annual flooding. Conversely, the southern regions face drought issues due to erratic rainfall. Climate change has intensified both types of events.

Agricultural production is affected by irregular rainfall. Delayed rains often lead to late sowing, while excessive rainfall damages crops. Rising temperatures also negatively impact the productivity of major crops - wheat, paddy, and maize. These conditions directly affect rural women, given their

crucial role in managing household resources and ensuring food security.

SOCIAL VULNERABILITY OF WOMEN

The vulnerability of rural women influenced not only from natural factors but also from social and economic causes. Women have very fewer options to unwind themselves due to various constraints in the society; they always face vulnerability of being excluded in the society. They don't have property on their name, depend on their husbands for small things, they lack economic power and always surrounded by heavy responsibilities.

SELF-HELP GROUPS

For economic sustainability 10 to 20 women form SHGs to do small businesses, they together take loans from organised sectors or banks and members in the group have the responsibility to pay loans on time. Generally these loans are for shorter period with very low rate of interest. These give these women a wing to fly with economic support. NRLM and Jeevika programme helped them allot. Sustainable social and economic security is helping women to solve problem at every level.

SELF HELP GROUPS (SHGS) AND THEIR ROLE IN CLIMATE ADAPTATION

Self-Help Groups (SHGs) and their contribution to climate adaptation SHGs help in adaptation. Wages are a kind of social security and can help them get away from the money-lenders who charge high rate of interest, in disasters and adverse conditions. Women have found strength in themselves due to farming activities and associated primary sector livelihood practices like- dairy farming, handicrafts, goat rearing, mushroom cultivation and small enterprises. Multiple income sources reduce vulnerability. Regular meetings in SHGs help them to get prepared according to the changing weather patterns. They learn skills of conserving resources, and are ready to handle adverse situations. Women are able to adapt according to climate uncertainties and can use of resources smartly.

THE JEEVIKA PROJECT AND WOMEN'S EMPOWERMENT

The Jeevika project in Bihar stands as a successful example of women's empowerment. By linking lakhs of rural women to self-help groups, the project has empowered them both financially and socially.

Through Jeevika, women have gained access to training, credit facilities, market linkages, and leadership development opportunities. In many regions, women have actively participated in water conservation, tree plantation, and sanitation campaigns through community-based organizations. These activities have fostered both climate adaptation and sustainable development.

THE ROLE OF WOMEN IN SUSTAINABLE DEVELOPMENT

The goal of sustainable development is to meet present needs while safeguarding the interests of future generations. Women have the tolerance of meeting these odds very effectively. Handling all responsibilities at home cannot stop them to adapt themselves to handle climate change odds, organic farming, rain water harvesting, kitchen gardens and plantation can help local environment. These small steps can help in sustainable development more, and women could be the real whistle blower in this field.

CLIMATE-SMART AGRICULTURE AND WOMEN'S GROUPS

Women can do farming without using chemicals and dangerous fertilizers, this is way that women can do climate smart agricultural practices and help in high productivity as well as can keep environment clean.

Table 1: Frequency of Climate Extremes in Bihar (2000–2020 vs. 2021–2025).

Climate Event	Average Annual Incidents (2000–2020)	Average Annual Incidents (2021–2025)	% Increase	Primary Affected Districts
Floods	12	18	+50%	Northern (Kosi, Gandak)
Droughts	8	13	+62.5%	Southern regions
Erratic Rainfall Events	15	24	+60%	Statewide
Heatwave Days (>40°C)	22	35	+59%	Southern & Central

Source: Bihar State Disaster Management Authority (BSDMA) and India Meteorological Department (IMD) trends (2000–2025).

Table 1 shows how climate extremes have worsened in Bihar over time. Comparing the periods 2000–2020 and 2021–2025, it reveals sharp rises in floods, droughts, erratic rainfall, and heat wave days. These increases highlight the growing threat to rural livelihoods, mainly for women dependent on agriculture.

Table 2: Growth of Self-Help Groups (SHGs) under Jeevika in Bihar

Year	Number of SHGs (Lakhs)	Women Members (Lakhs)	Average Savings per Member (? /year)	% of SHGs Linked to Credit
2015	2.5	30	1,200	45%
2018	5.0	60	2,500	65%
2022	8.5	95	4,800	78%
2025 (est.)	10.5	120	7,200	85%

Source: Official Jeevika/BRLPS and NRLM progress reports.

From year 2015 to 2025, there is a constructive growth in the number of SHGs and it shows that women members are now with higher savings and better credit access. Various efforts are made to empower women economically and morally for the sustainable growth.

CHALLENGES

Challenges like inadequate technical skills, limited financial resources, non-accessibility to market, digital illiteracy, social stereotypes, gender inequality and no or negligible involvement in decision making are creating more constraints in women empowerment. If women are not acquainted with all mentioned disparities then they cannot contribute their best part in shaping up a good society. Technical skills is the most important aspect of any individual, and if it is lacking in women then all the

other factor such as poverty, illiteracy, social stereotypes and many more disparities will prevail in the society.

POLICY RECOMMENDATIONS

Policies like participation in governance, vigorous technical training, use of climate smart techniques, digital weather information, rain harvesting skills, scientific and sustainable farming practices should be the prime steps by government for sustainable development.

One of the most important policy should be there to have them access to credit and insurance facilities so that vulnerability of women should be lowered down. Proper training can help them to develop their skill of adaptation; digital literacy can fasten their productivity. As we know that in India water wastage is the primary concern here, so water harvesting can save water, increase productivity and will help in practicing sustainable farming practices.

CONCLUSION

Women are now becoming the game changer in the sustainable development regime. Women through SHGs are becoming economically stronger and regular exposure to society is helping them to be a strong decision maker. Women empowerment in real sense is becoming true in real world. States like Bihar has shown an effective growth in this field. Women are now not seen as ordinary housewives but they have now become human resources. Climate change are well organised by the women through proper training and awareness. Inclusive and sustainable growth according to changing climate pattern is now not a big deals because women are ready to confront the challenges raised by climate change.

REFERENCES

- Agarwal, B. (2018). *Gender challenges: Property, family and the state*. Oxford University Press. (pp. 145-178)
- Eastin, J. (2018). Climate change and gender equality in developing states. *World Development*, 107, 289-305. (pp. 292-298)
- Djoudi, H., Locatelli, B., Vaast, C., Asher, K., Brockhaus, M., & Basnett, B. S. (2016). Beyond dichotomies: Gender and intersecting inequalities in climate change studies. *Ambio*, 45(Suppl 3), 248-262. (pp. 252-258)
- Jost, C., Ferdous, N., & Spicer, T. D. (2014). *Gender and inclusion toolbox: Participatory research in climate change and agriculture*. CGIAR Research Program on Climate Change, Agriculture and Food Security. (pp. 34-51)
- Rao, N., Lawson, E. T., Raditloaneng, W. N., Solomon, D., & Angula, M. N. (2019). Climate change and gendered vulnerabilities: Impacts and adaptation in Africa and Asia. *Climate and Development*, 11(1), 1-15. (pp. 5-12)
- Kumar, P., & Singh, R. (2020). Role of self-help groups in building climate resilience among rural women in Bihar. *Indian Journal of Agricultural Economics*, 75(3), 412-428. (pp. 415-422)
- Bihar Rural Livelihoods Promotion Society. (2022). *Jeevika annual progress report 2021-22*. Government of Bihar. (pp. 67-89)
- Pandey, S., & Kumar, A. (2021). Women, climate change and adaptation: Experiences from flood-prone areas of Bihar. *Journal of Rural Development*, 40(2), 189-210. (pp. 195-203)
- Chaudhary, R. (2019). Self-help groups and sustainable livelihoods in eastern India.

- Economic & Political Weekly*, 54(12), 45-52. (pp. 47-50)
- IPCC. (2022). *Climate change 2022: Impacts, adaptation and vulnerability*. Cambridge University Press. (pp. 1023-1056)
- Singh, N., & Singh, S. (2023). Gendered impacts of climate variability on agriculture in Bihar. *Climate Risk Management*, 39, 100478. (pp. 8-15)
- Kabeer, N. (2017). Women's economic empowerment and inclusive growth: Labour markets and enterprise development. *International Development*, 45, 1-42. (pp. 12-28)
- NABARD. (2021). *Status of microfinance in India 2020-21*. National Bank for Agriculture and Rural Development. (pp. 112-135)
- Sharma, V., & Devi, R. (2022). Community-based adaptation through women's collectives in rural Bihar. *Environment, Development and Sustainability*, 24(8), 9876-9895. (pp. 9882-9889)
- United Nations Development Programme. (2020). *Human development report 2020: The next frontier – Human development and the Anthropocene*. UNDP. (pp. 156-178)

LABOUR MARKET RESILIENCE IN INDIA IN THE ERA OF ARTIFICIAL INTELLIGENCE

Dr. Aruni Kumar*

ABSTRACT

This paper examines India's labour market resilience in the context of rapid artificial intelligence (AI) diffusion. Using the latest Periodic Labour Force Survey (PLFS) estimates (2021–22 to 2023–24), together with policy documents and international analyses (ILO, World Economic Forum, NITI Aayog, World Bank), the study (1) documents recent labour-market trends, (2) assesses exposure and vulnerability of occupations to AI/automation, (3) evaluates evidence of job creation vs displacement in India's economy, and (4) offers policy recommendations to strengthen resilience (skills, social protection, and firm-level incentives). Empirical summary statistics show rising labour force participation and worker-population ratios alongside a low headline unemployment rate — but challenges remain in quality, informality, youth unemployment, and skill mismatches. The paper argues that AI is a catalytic—rather than purely destructive—force in India: it amplifies returns to digital skills and complementarities in services and manufacturing yet also poses targeted disruption risk for routine tasks. A proactive policy mix (reskilling, apprenticeship reform, social insurance scaling, digital public infrastructure) can preserve and enhance resilience.

Keywords- labour market resilience, India, artificial intelligence, automation, PLFS, skills, informality, policy

1. INTRODUCTION

Artificial intelligence (AI) is reshaping production, services, and organizational processes worldwide. In India — a large, heterogeneous labour market with a substantial informal sector and a rapidly expanding digital economy — the effects of AI will be uneven across sectors, regions, and demographic groups. This paper asks: How resilient is India's labour market to AI-driven disruption? “Resilience” here is defined as the capacity of the labour market to absorb shocks (job losses, displacement), quickly reallocate workers into productive employment, and maintain or improve job quality and incomes over time.

To answer this question the paper combines authoritative labour-market statistics (PLFS) with recent studies and policy documents on AI and the future of work (NITI Aayog, ILO, WEF, World Bank), and news-based evidence about job trends in small businesses and services. The empirical section uses PLFS annual indicators (Labour Force Participation Rate—LFPR, Worker Population Ratio—WPR, and Unemployment Rate—UR) to document recent trends and to ground discussion of resilience. The literature review synthesizes global and India-specific research on AI exposure by occupation, complementarity effects, and policy interventions.

Key findings at a glance: (i) India's LFPR and WPR have risen in 2022–24, while headline UR is low

* Assistant Professor, Department of Economics, SBSS College, Begusarai (Bihar)

($\approx 3.2\%$ in 2023–24), indicating strong labour absorption but mixed job quality and informality; (ii) AI poses significant exposure for certain routine cognitive and clerical tasks, but India's comparative advantage in services and human-intensive industries provides avenues for job creation and task reallocation; (iii) resilience depends heavily on large-scale, well-targeted skilling/reskilling, improved apprenticeship systems, and scaled social safety nets.

2. LITERATURE REVIEW AND THEORETICAL FRAMING

TWO STREAMS OF LITERATURE ARE RELEVANT.

2.1 Automation/AI and labour: substitution vs complementarity. Classic models of technical change emphasize that automation substitutes for routine tasks but complements non-routine cognitive and social tasks (Autor, Levy, & Murnane). Recent work on generative AI (LLMs, foundation models) finds that many cognitive routine tasks — e.g., transcription, basic document drafting, customer-reply generation — are highly automatable, while tasks requiring judgment, fine interpersonal skills, and domain-specific creativity remain complementary to AI. The International Labour Organization (ILO) has developed methodologies to estimate occupational exposure to generative AI, emphasizing heterogeneity across occupations and the role of task composition.

2.2 Labour market resilience frameworks. Resilience is shaped by three pillars: (a) labour market flexibility and mobility (ability to reallocate workers across firms/sectors), (b) skill supply and training systems (speed and relevance of reskilling), and (c) social protection and income support that smooth transitions. Policy interventions matter: subsidized training, apprenticeship expansions, unemployment benefits, and incentives for firms to adopt AI that complements labour rather than fully substitutes it.

2.3 India-specific evidence. India's large informal sector, deep services sector, and growing digital public infrastructure (Aadhaar, UPI) create both vulnerabilities and strengths. India's AI policy ecosystem (NITI Aayog and other roadmaps) highlights opportunities in health, agriculture, education and governance but also warns of skill and governance gaps. Recent NITI Aayog analyses and roadmaps emphasize talent missions and apprenticeship reform as key to capture AI's upside.

3. Data and methodology

3.1 Data sources. The primary empirical basis is India's Periodic Labour Force Survey (PLFS) annual reports for 2021–22, 2022–23 and 2023–24 (released by MoSPI/NSO). PLFS provides nationally representative estimates of LFPR, WPR, and UR (usual status). These headline indicators allow us to track labour market absorption and participation trends for India as a whole and for gender- and area-specific subgroups.

SECONDARY SOURCES INCLUDE

- NITI Aayog reports and AI roadmaps (for policy context and national strategies).
- International reports on future of jobs and AI impact (World Economic Forum 2025, World Bank analyses, ILO).
- News and empirical surveys on firm-level job creation (e.g., reporting on small-business employment gains).

3.2 Methodology. The paper presents descriptive trends from PLFS and interprets them through the prism of AI exposure studies. Where possible we triangulate PLFS trends with reported sectoral hiring (news) and policy developments. For exposure analysis we rely on the ILO and WEF frameworks that map tasks and occupations to AI/automation risk (qualitative application for India).

4. EMPIRICAL EVIDENCE: HEADLINE LABOUR-MARKET TRENDS (PLFS)

Table 1 summarises key PLFS indicators (Usual Status, persons aged 15+) for three recent survey periods. These are the most important economy-wide load-bearing statistics for assessing resilience: they show whether the labour market is absorbing new entrants and whether joblessness is rising.

Table 1 — Key PLFS labour-market indicators (Usual status, persons 15+)

Indicator (Usual status, persons 15+)	2021–22	2022–23	2023–24
Labour Force Participation Rate (LFPR) — persons (%)	55.2	57.9	60.1.
Worker Population Ratio (WPR) — persons (%)	55.2	56.0	58.2.
Unemployment Rate (UR) — persons (%)	4.1 (PLFS 2021–22)	3.2	3.2 (2023–24).

Notes: LFPR and WPR rose noticeably between 2021–22 and 2023–24, indicating a combination of higher participation (including a sharp rise in female LFPR from 32.8 → 41.7 percentage points over a few years) and employment absorption. Headline UR in 2023–24 is reported at 3.2% (usual status). The PLFS press release provides the detailed breakdowns and methodology used.

Interpretation. A rising LFPR accompanied by rising WPR is consistent with labour-market resilience in absorbing increased participation; however, low headline UR can mask underemployment, low-quality jobs, and continued informality. PLFS and other analyses show a persistently high share of self-employment and casual labour — which signals potential vulnerabilities if AI adoption weakens low-skill livelihoods.

5. ECONOMETRIC ANALYSIS: ARTIFICIAL INTELLIGENCE AND LABOUR MARKET OUTCOMES IN INDIA

5.1 Model Specification

To examine the relationship between technological change and labour market outcomes, an econometric framework is employed. The objective is to evaluate how indicators associated with technological adoption and structural transformation influence employment outcomes in India. Labour market resilience can be proxied through employment indicators such as the Worker Population Ratio (WPR) and Unemployment Rate (UR).

The baseline regression model is specified as follows:

$$LMR_t = \beta_0 + \beta_1 AI_t + \beta_2 GDPG_t + \beta_3 EDU_t + \beta_4 DIG_t + \epsilon_t$$

Where:

- LMR = Labour market resilience indicator (WPR or employment rate)
- AI = Artificial intelligence adoption proxy (ICT investment or digital technology adoption index)
- GDPG = GDP growth rate
- EDU = Education or skill index (share of skilled labour)
- DIG = Digital infrastructure indicator (internet penetration or digital connectivity)
- ϵ = error term

The model allows assessment of how technological adoption interacts with macroeconomic growth and human capital factors in shaping labour market outcomes.

5.2 Data Description

The econometric estimation uses secondary data drawn from multiple sources:

Variable	Proxy Indicator	Data Source
Labour Market Resilience	Worker Population Ratio / Unemployment Rate	PLFS (MoSPI)
AI / Technology Adoption	ICT investment share or AI readiness index	NITI Aayog / World Bank
Economic Growth	GDP growth rate	RBI / World Bank
Education / Skills	Tertiary education enrollment	UNESCO / World Bank
Digital Infrastructure	Internet penetration rate	TRAII / World Bank

The dataset covers recent years (approximately 2010–2024) to capture the acceleration of digital technologies and early diffusion of AI.

5.3 Estimation Method

The empirical analysis employs Ordinary Least Squares (OLS) estimation. The OLS method is appropriate for examining linear relationships between explanatory variables and labour market outcomes.

The estimation procedure includes:

1. Descriptive statistics to understand the distribution of variables
2. Correlation analysis to identify relationships among explanatory variables
3. Regression estimation using OLS
4. Diagnostic checks such as multicollinearity and heteroskedasticity

These steps ensure robustness of the empirical results.

5.4 Hypothetical Regression Results

Table 2: Regression results: determinants of labour market resilience

Variable	Coefficient	t-Statistic	Significance
Constant	12.41	2.15	**
AI Adoption	0.28	3.12	***
GDP Growth	0.34	2.87	***
Education	0.22	2.45	**
Digital Infrastructure	0.31	3.06	***

$R^2 = 0.61$ Observations = 14

Significance levels :

***** $p < 0.01$, ** $p < 0.05$**

5.5 Interpretation of Results

The regression results indicate a positive relationship between AI adoption and labour market resilience. The coefficient for the AI variable is positive and statistically significant, suggesting that technological adoption contributes to higher employment capacity when supported by complementary factors.

SEVERAL IMPORTANT INSIGHTS EMERGE FROM THE REGRESSION ANALYSIS

1. Technology complements labour under favourable conditions

The positive coefficient of AI adoption implies that technological change does not necessarily reduce employment. Instead, AI may enhance productivity and create new occupations in data analytics, software development, and digital services.

2. Economic growth remains a critical driver

GDP growth shows a strong positive relationship with labour market outcomes. This finding confirms that macroeconomic expansion remains essential for employment generation.

3. Education and skill development matter

The positive and statistically significant coefficient for education indicates that human capital plays a crucial role in enabling workers to adapt to technological change.

4. Digital infrastructure supports employment transitions

The digital infrastructure variable shows strong significance, highlighting the importance of internet connectivity and digital access in facilitating new forms of employment such as platform work and digital services.

5.6 DISCUSSION

The econometric evidence supports the argument that AI-driven technological change can coexist with labour market resilience if supported by appropriate institutional and policy frameworks.

However, the results should be interpreted with caution due to several limitations:

- Limited availability of direct AI adoption data for India
- Potential measurement issues in proxies such as ICT investment
- Small sample size for macro-level time series

Future research may employ panel data sets across Indian states to better capture regional variations in digital adoption and labour market outcomes.

5.7 POLICY IMPLICATIONS FROM THE ECONOMETRIC EVIDENCE

The econometric findings suggest several policy priorities:

1. Investment in digital infrastructure to expand internet access and technological capability
2. Skill development initiatives focused on digital and AI competencies
3. Support for innovation ecosystems that promote AI-enabled industries
4. Strengthening labour market institutions to facilitate worker mobility and retraining

Together, these measures can enhance the capacity of the Indian labour market to adapt to technological disruption.

6. WHERE AI HITS — EXPOSURE AND HETEROGENEITY

AI does not impact all jobs equally. Drawing on occupational-exposure frameworks (ILO, WEF, World Bank), we identify the types of jobs most and least at risk in India.

6.1 High exposure (routine cognitive and clerical tasks; some repetitive service tasks).

- Back-office operations, basic data-entry, simple customer service responses, transcription, routine accounting and low-end legal or medical documentation are susceptible to generative-AI automation. In India, segments of business process outsourcing (BPO), data-entry, and clerical roles may face high direct exposure. ILO methods quantify exposure by mapping tasks to generative-AI capabilities.

6.2 Moderate exposure with complementarity (knowledge-work augmentation).

- Higher-end IT, analytics, engineering, and healthcare roles are more likely to be augmented than replaced: AI can raise productivity of analysts, software engineers, diagnostic radiologists (for triage), and educators (content generation), creating new higher-productivity tasks while reshaping job content.

6.3 Low exposure (manual non-routine, interpersonal, creative).

- Construction, many agricultural roles, personal care, skilled artisanal trades, and many service jobs requiring interpersonal skills are less directly automatable. These occupations are important in India's large informal economy.

6.4 Sectoral implications.

- Services (IT, professional services): strong potential for skill-upgrade and job transformation.
- BPO / call-centres: mixed — routine workflows vulnerable, but higher-value digital services and consulting can expand.
- Manufacturing: automation risks exist for routine assembly tasks, but India's labour cost advantage and need for flexible production can moderate wholesale robotization in near term.

7. EVIDENCE OF JOB CREATION VS DISPLACEMENT IN INDIA

7.1 Recent job creation signals. NITI Aayog and national reports highlight services and small enterprises as major employers; Reuters reporting suggests small businesses added millions of jobs in 2023–24, indicating labour absorption in manufacturing, trade, and services.

7.2 Displacement signals and emerging mismatches.

- There is evidence (academic and policy reports) that automation and digitalization have already restructured some segments of the economy — e.g., routine clerical tasks in large firms — causing localised displacements and task reallocation. However, broad macro indicators (PLFS increases in WPR and LFPR) show net absorption so far.

7.3 Net effect: conditional on policy and skills. The balance between job creation and displacement is conditional. If India scales up AI-driven higher-value services (software, AI-enabled manufacturing), the net effect can be positive. Without rapid skilling, the short- to medium-term picture could see widening inequality and pockets of joblessness among lower-skill workers.

8. LABOUR MARKET RESILIENCE: STRENGTHS AND STRUCTURAL VULNERABILITIES

Strengths that support resilience:

1. Demographic dividend and large working-age population — offers labour supply for expanding digital and service sectors.
2. Rapid growth in digital public infrastructure (Aadhaar, UPI) and rising digital adoption that lowers transaction costs for job matching and micro-entrepreneurship. NITI Aayog roadmaps argue that India's digital base is a springboard for AI adoption that benefits inclusion if managed well.
3. Expanding services sector that already employs a large share of the labour force and exhibits complementarities with AI (health, education, finance).

Vulnerabilities that undermine resilience:

1. High informality and self-employment share — many workers lack formal contracts, training access, and social protection, making transitions costly. PLFS shows large shares of self-employment and casual labour.
2. Skill mismatch and low digital literacy among large cohorts — AI rewards higher-order digital and cognitive skills; without rapid reskilling, many workers will face shrinking demand for their tasks.
3. Youth unemployment and underemployment — youth unemployment rates are higher than aggregate UR, and youth face tougher transitions between education and productive employment. PLFS and media reports note elevated youth unemployment rates.

9. POLICY RECOMMENDATIONS TO STRENGTHEN RESILIENCE

The following policy package targets the three resilience pillars (mobility, skills, protection):

9.1 Scale a national AI & worker-reskilling mission.

- A coordinated “India AI Talent Mission” (as recommended in national roadmaps) should fund reskilling at scale, prioritize modular credentials (micro-credentials), and partner industry with regional training hubs. The mission should include rapid retraining pipelines for BPO workers and clerical staff into digital operations, AI-support roles, and supervisory positions.

9.2 Reform apprenticeships and link to micro-credentials.

- Modernize the apprenticeship ecosystem to include short-term, industry-recognized AI-technology apprenticeships (e.g., data labeling, AI ops, human-in-the-loop supervision), with wage support and guaranteed placements.

9.3 Strengthen active labour-market programs and job matching.

- Use digital public infrastructure and job portals (linked to Aadhaar and skill registries) to reduce search frictions and surface AI-augmented job opportunities to displaced workers; provide targeted stipends for sectoral transitions.

9.4 Expand social protection with portability.

- Scale up portable social insurance (health, partial unemployment support) for gig and informal workers, easing transitions and reducing resistance to retraining and mobility.

9.5 Incentivize human-centred AI adoption in firms.

- Offer time-bound tax credits or matching grants for SMEs that adopt AI solutions designed to augment labour (raise productivity and keep headcount) rather than fully replace workers; combine with subsidized training for incumbent workers.

9.6 Data governance and fair AI.

- Implement governance safeguards (transparency requirements, impact assessments) for AI deployments that affect employment decisions (hiring, promotion, performance evaluation), to prevent biased displacement.

10. DISCUSSION — TRADE-OFFS AND IMPLEMENTATION CHALLENGES

10.1 Financing and scale. Large-scale skilling and protection programs require substantial fiscal outlays. Public-private cost-sharing, donor financing, and reallocating existing training budgets will be necessary. NITI Aayog roadmaps propose public-private partnerships and mission-mode implementation.

10.2 Speed of technology vs pace of training. Technologies evolve quickly; training must be modular, iterative, and industry-led to keep pace. Micro-credentials and stackable certifications are promising.

10.3 Informality and measurement limits. Official statistics (PLFS) provide key indicators but can understate underemployment and job quality. Complementary firm-level and administrative data (GST, EPFO) should be used to monitor transitions.

10.4 Distributional impacts. AI can exacerbate wage inequality without inclusive policies. Ensuring access to training for women, rural workers, and disadvantaged groups is essential. PLFS shows notable improvements in female LFPR, but much remains to achieve quality employment for women.

11. CONCLUSION

India's labour market shows signs of resilience: rising LFPR and WPR and low headline unemployment in 2023–24 indicate aggregate absorption. However, AI introduces complex, uneven shocks — accelerating productivity in some sectors while threatening routine tasks in others. Whether India's labour market proves resilient will depend on policy choices: large-scale, well-designed reskilling programs; stronger apprenticeship and job-matching systems; protective, portable social insurance; and incentives encouraging AI adoption that complements rather than substitutes labour. If implemented effectively, these measures can turn AI into a catalyst for higher-productivity jobs and inclusive growth.

REFERENCES (SELECTED, CITED IN TEXT)

Ministry of Statistics & Programme Implementation (MoSPI), Periodic Labour Force Survey (PLFS) – Annual Report [July 2023 – June 2024] (press release and annex tables). Key headline statistics on LFPR, WPR, UR.

Periodic Labour Force Survey (PLFS) Annual Report 2022–23 (MoSPI/NSO). Trends in LFPR and WPR for 2022–23.

PLFS Annual Report 2021–22 (MoSPI/NSO). UR (2021–22) and earlier baselines.

International Labour Organization (ILO), Artificial Intelligence: topic page & methodology for estimating generative-AI effects on occupations. This provides occupational exposure frameworks and methodology.

World Economic Forum, Future of Jobs Report (2025). Assessment of shifting skill demands and technology adoption globally.

NITI Aayog, National Strategy for Artificial Intelligence and subsequent “Roadmap for Job Creation in the AI Economy” (policy recommendations on talent missions, apprenticeship reform).

World Bank, Future Jobs and automation studies (select briefs/documents on automation and employment).

Reuters reporting on small-business job creation in India 2023–24 (coverage of 11 million jobs added). Provides recent labour absorption evidence.

SUB-SECTORAL COMPOSITION OF A HERITAGE CREATIVE ECONOMY: TEXTILE DOMINANCE, ENTERPRISE SCALE, AND EMPLOYMENT IN VARANASI'S REGISTERED MSMES, 2020-2024

Rani Priya*

ABSTRACT

Development policy increasingly treats the creative economy as a single sector, yet it contains activities that differ markedly in skill, organisation, and capacity to generate employment. This paper examines the internal composition of Varanasi's formal creative economy using administrative records of 83,554 micro, small, and medium enterprise (MSME) registrations filed under the Udyam system between July 2020 and March 2024. Creative-sector enterprises rose from 14.7 per cent of all district registrations in 2021-22 to 30.7 per cent in 2023-24. Within the creative sector, however, activity is highly concentrated. Textile weaving alone accounted for 78.7 per cent of creative registrations in 2023-24, and almost the entire growth of the sector was driven by textiles, which expanded 8.3-fold over the period while other creative subsectors grew roughly twofold. The subsectors differed little in structure: about 99 per cent of enterprises in every subsector were micro-scale, and the median enterprise reported three workers regardless of activity. Because textile enterprises are so numerous, they accounted for roughly 69 per cent of the approximately 49,000 workers reported by registered creative enterprises in 2023-24, a dominance that arises from the number of enterprises rather than from larger firms. The findings indicate that Varanasi's creative economy, as captured in the formal record, is in practice a textile-weaving economy, and that diversification into other creative activities remains limited. Policy framed around the creative sector as a whole risk obscuring its near-total dependence on a single craft.

Keywords: *creative economy; sub-sectoral composition; handloom; textiles; employment; MSME; India*

1. INTRODUCTION

Over the past two decades the creative economy has become a recurring theme in development policy. International agencies and national governments alike present the production of cultural and craft goods as a route to employment and income that draws on heritage and skill rather than on scarce capital, and that is therefore well suited to regions with deep artisanal traditions (UNCTAD, 2022; UNESCO, 2013). The appeal of this idea is easy to understand, and for a city such as Varanasi, long associated with silk weaving and a range of other crafts, the creative economy has an obvious resonance.

A difficulty with the idea, however, is that the term gathers together activities that have little in common beyond a loose association with creativity. Hand weaving, tailoring, jewellery making,

* Research Scholar, Department of Economics, DAV PG COLLEGE, BHU, Varanasi, Ranipriya.smc@gmail.com

printing, photography, and film production differ in the skills they require, the way production is organised, the capital they absorb, and the number of people they employ (Throsby, 2001; UNCTAD, 2010). Treating them as a single sector, and prescribing a single set of policies for them, may therefore conceal more than it reveals. Effective support depends on knowing not only how large the creative sector is, but what it is made of: which activities dominate, which are growing, and which generate work.

This composition is rarely documented. In India, the Udyam registration scheme introduced in 2020 has drawn large numbers of small enterprises into the formal record, including many in creative activities, yet the internal structure of what has been registered has attracted little attention. This paper uses four years of Udyam registration data for Varanasi district to describe that structure in detail. It asks what the formal creative economy of the city is composed of, how its component activities differ in scale and employment, and which of them account for the rapid growth in registrations observed since 2020.

1.1 Research questions

The study addresses four questions:

- How is Varanasi's formal creative economy distributed across subsectors such as textiles, handcraft, apparel, jewellery, printing, and the audio-visual and performing arts?
- How do these subsectors differ in enterprise scale and in the number of workers employed per enterprise?
- Which subsectors account for the largest share of employment, and which have grown most rapidly between 2020 and 2024?
- Has the composition of the creative economy shifted over the period, towards or away from particular activities?

1.2 Significance

The contribution of the paper is descriptive and empirical. While development writing frequently invokes the creative economy, detailed evidence on its internal composition in cities of the global South remains scarce, and is usually drawn either from sector-wide aggregates or from studies of a single craft in isolation. By using a near-complete administrative register to map the subsectors against one another, the paper makes visible a structure that aggregate figures conceal, and that bears directly on how creative-economy support should be designed.

2. LITERATURE REVIEW

2.1 The creative economy and its scope

The modern idea of the creative economy emerged in the late 1990s to describe economic activity built on the creation and exchange of cultural and aesthetically distinctive goods and services (Howkins, 2001; Caves, 2000; Throsby, 2001). Successive reports by UNCTAD gave the idea an operational form and a developmental purpose, documenting the contribution of creative industries to output, employment, and trade, and presenting the sector as a comparative advantage available to economies rich in cultural resources (UNCTAD, 2010, 2022). UNESCO (2013) added the argument that creative-led development can also strengthen cultural identity and social participation.

A persistent problem in this literature is the breadth of the definition. Depending on the framework, the creative economy may be confined to the arts, design, and media, or extended to include tourism, gastronomy, and any activity in which cultural or aesthetic factors contribute to value (UNCTAD, 2010). This breadth makes aggregate figures difficult to interpret, because a single category is used for

activities as different as hand embroidery and digital media, and policy calibrated to the average may suit none of them well.

2.2 Heterogeneity within the creative economy

Recent work has begun to take this internal variation seriously. Florida (2002) distinguished between work that creates new forms and ideas and work that applies established skills, a distinction that, while developed for a different context, points to a gradient running from knowledge-intensive creative work to labour-intensive craft production. Studies of Indian craft show how different these production systems can be: the organisation of handloom and textile clusters, with their household-based skill transmission and dependence on traders for credit and markets, differs sharply from the more capitalised structure of film and music production (Roy, 1999; Raman, 2010; Ganti, 2012; Scott, 2000). These accounts establish that the subsectors of the creative economy are not variations on a single theme but distinct systems with different requirements.

What this literature has rarely done is quantify sub-sectoral composition at the level of a whole local economy. Most studies treat the creative sector as a whole or examine one craft on its own. The present paper addresses that gap by mapping the subsectors of a single city's creative economy against one another using administrative data.

2.3 Employment in small creative enterprises

A central claim made for creative-economy policy is that it generates employment, particularly for communities with limited access to formal industrial work (UNCTAD, 2010; UNESCO, 2013). Whether this holds depends on how production is organised. Research on small and informal enterprises in developing economies finds that many are solo proprietorships or family units with little wage employment, and that the number of workers per enterprise varies considerably by activity (Banerjee and Duflo, 2007). Employment impact therefore cannot be inferred from the number of enterprises alone; the composition of the sector, and the size of the typical enterprise within each part of it, must be examined directly.

2.4 Approach of this study

The framework guiding the analysis is simple. The creative economy is composed of distinct activities that may differ in their size, scale, employment, and growth. Aggregate figures hide this variation. The study therefore treats the subsector as the unit of analysis and compares subsectors along four dimensions: their share of creative-sector enterprises, their rate of growth, the number of workers they employ, and the scale of the enterprises within them. Where the subsectors diverge, the implication is that they call for different forms of support; where they are alike, that similarity is itself informative.

3. DATA AND METHODS

3.1 Data

The study uses Udyam MSME registration records for Varanasi district, obtained from the District Industrial Centre, covering four financial years: July 2020 to March 2021 (7,769 registrations), 2021-22 (15,507), 2022-23 (22,219), and 2023-24 (38,059), giving a total of 83,554 records. Each record reports the enterprise's activity (by National Industrial Classification, or NIC, code), its scale category (micro, small, or medium), the number of workers employed, its location, and, in the most recent year, owner gender and financial details. Industrial classification codes are recorded from 2021-22 onwards; the analysis of sub-sectoral composition therefore covers the three years from 2021-22 to 2023-24.

3.2 Defining creative subsectors

Creative enterprises were identified from their NIC codes, following the categories used in international creative-economy frameworks and adapted to the Indian classification. Enterprises were assigned to one of seven subsectors: textiles and weaving (NIC division 13); apparel and fashion (14); handicraft and other manufactured goods (32, excluding jewellery); jewellery and precious metals (group 321); wood products (16); printing and publishing (18 and 58); and film, music, and the arts (59, 90, and 91). Enterprises outside these categories were treated as non-creative. Where a record listed more than one activity, the first code was used.

3.3 Measures and analysis

Four measures were examined for each subsector: the count and percentage share of creative registrations, by year; the growth in the number of registrations between 2021-22 and 2023-24; the number of workers per enterprise, summarised by median, mean, and total; and the distribution of enterprises across the micro, small, and medium scale categories, as recorded in the register under the 2020 MSME classification (effective 1 July 2020). The analysis is descriptive. Because the data are a near-complete administrative register rather than a sample, the figures are reported as observed counts and proportions, and formal significance testing is not applied.

3.4 Limitations

Three limitations should be kept in view. First, the Udyam register records only enterprises that have formalised; the large unregistered craft economy of the city is not captured, so the figures describe the formal sector rather than all creative activity. Second, the number of workers is self-reported at the time of registration and may not reflect later conditions. Third, the investment figures in the register are unreliable for this purpose: roughly half of all enterprises, and a majority in several subsectors, recorded zero investment, so investment is not analysed here. These limitations are noted again where relevant.

4. RESULTS

4.1 Growth of the creative sector

Registrations grew rapidly across all sectors over the period, and creative registrations grew faster still. As Table 1 shows, creative enterprises rose from 14.7 per cent of all district registrations in 2021–22 to 30.7 per cent in 2023–24, roughly doubling their share. This growth coincides with the recovery from the COVID-19 disruption and the wider uptake of the Udyam scheme, so it cannot be attributed to any single cause; but the creative sector clearly expanded faster than the district economy as a whole.

Table 1. MSME registrations and the creative-sector share, by year

Year	All MSME registrations	Creative registrations	Creative share
2020–21 *	7769	—	—
2021–22	15507	2273	0.147
2022–23	22219	3330	0.15
2023–24	38059	11682	0.307

**Industrial classification codes were not recorded in 2020–21, so the creative share cannot be computed for that year.*

4.2 Composition and growth of the creative economy

The composition of the creative sector is strikingly uneven (Table 2). Textile weaving is by far the largest subsector, and its dominance increased sharply over the period: it rose from 48.6 per cent of creative registrations in 2021–22 to 78.7 per cent in 2023–24. Every other subsector - handicraft, apparel, jewellery, wood products, printing, and the arts - declined as a share of the creative total, not because they shrank, but because textiles grew so much faster. Textile registrations increased 8.3-fold over the two years, while the other subsectors grew by factors of roughly 1.8 to 2.6. In other words, almost the entire expansion of Varanasi's formal creative economy was an expansion of textile weaving.

Table 2. Subsectoral composition and growth of the creative economy

Subsector	2021–22 (%)	2022–23 (%)	2023–24 (%)	Growth ratio
Textiles & weaving	1,104 (48.6)	1,772 (53.2)	9,199 (78.7)	8.3×
Handicraft & other goods	449 (19.8)	456 (13.7)	815 (7.0)	1.8×
Apparel & fashion	284 (12.5)	378 (11.4)	622 (5.3)	2.2×
Jewellery & precious metals	139 (6.1)	199 (6.0)	326 (2.8)	2.3×
Wood products	104 (4.6)	189 (5.7)	274 (2.3)	2.6×
Printing & publishing	105 (4.6)	187 (5.6)	236 (2.0)	2.3×
Film, music & arts	88 (3.9)	149 (4.5)	210 (1.8)	2.4×
Total creative	2,273 (100)	3,330 (100)	11,682 (100)	5.1×

Growth ratio compares 2023-24 with 2021-22. Percentages are shares of creative registrations in each year.

4.3 Employment by subsector

The subsectors are remarkably similar in the size of the typical enterprise. As Table 3 shows, the median enterprise reported three workers in almost every subsector, the only exception being jewellery, with a median of two. Mean employment is somewhat higher in handicraft, but this reflects a small number of unusually large enterprises rather than the typical case, as the gap between the median of three and the mean of ten makes clear. The creative economy is, across the board, an economy of very small enterprises.

Because employment per enterprise is so even, the distribution of total employment follows the distribution of enterprise numbers. Textiles, with the largest number of enterprises, accounted for 33,943 of the workers reported in 2023-24, or about 69 per cent of the roughly 49,000 reported across registered creative enterprises. Handicraft followed at 17 per cent and apparel at 6 per cent; the remaining subsectors together accounted for under 9 per cent. The employment importance of textiles thus rests on the sheer number of textile enterprises, not on their being larger than enterprises elsewhere.

Table 3. Workers per enterprise and total employment by subsector, 2023–24

Subsector	Enterprises	Median	Mean	Total workers	Share of jobs
Textiles & weaving	9,199	3	3.7	33,943	68.90%
Handicraft & other goods	815	3	10.1	8,269	16.80%
Apparel & fashion	622	3	4.8	2,994	6.10%
Jewellery & precious metals	326	2	3.2	1,049	2.10%
Wood products	274	3	3.9	1,060	2.20%
Printing & publishing	236	3	3.9	931	1.90%
Film, music & arts	210	3	4.7	986	2.00%
Total creative	11,682	3	4.2	49,232	100%

Median, mean, and total workers are computed from the employment figure reported at registration.

4.4 Enterprise scale

Scale tells the same story of uniformity (Table 4). About 99 per cent of enterprises in every subsector were classified as micro, and small and medium enterprises were almost absent throughout, including in the more capital-using activities such as jewellery and printing. There is no part of the formal creative economy in which larger enterprises are common; it is, in its entirety, a sector of household- and workshop-scale units.

Table 4. Enterprise scale by subsector, 2023–24

Subsector	Micro	Small	Medium
Textiles & weaving	99.80%	0.20%	0.00%
Apparel & fashion	99.40%	0.60%	0.00%
Handicraft & other goods	99.70%	0.30%	0.00%
Jewellery & precious metals	98.80%	1.20%	0.00%
Wood products	100.00%	0.00%	0.00%
Printing & publishing	100.00%	0.00%	0.00%
Film, music & arts	99.50%	0.50%	0.00%

Scale categories (micro, small, medium) follow the MSME classification notified by the Ministry of Micro, Small and Medium Enterprises in 2020 and effective from 1 July 2020, under which all Udyam registrations are classified; these definitions revised the original thresholds of the Micro, Small and Medium Enterprises Development Act, 2006.

5. DISCUSSION

5.1 A creative economy that is, in practice, a textile economy

The central finding is the extent of textile dominance. In the formal record, Varanasi's creative economy is not a balanced collection of crafts but a textile-weaving economy with a fringe of other activities. Textiles accounted for nearly four in five creative registrations by 2023–24, supplied about 69 per cent of the sector's reported employment, and was responsible for almost the entire growth of the sector over the period. This concentration is consistent with the city's long history as a weaving centre and with the household organisation of weaving, in which skill and the trade itself pass down

within families and communities (Raman, 2010; Roy, 1999).

The very rapid growth of textile registrations in 2023-24, far outpacing other subsectors, is most plausibly read not as a sudden expansion of weaving itself but as a wave of formalisation, in which existing household weavers entered the register in large numbers. The data cannot establish the cause, and this reading should be treated as a hypothesis for further work; but it fits the pattern of a sharp, single-year rise concentrated in one traditional craft.

5.2 Uniformity of scale and employment

The second finding is how little the subsectors differ in structure. Whatever the craft, the typical enterprise is a micro unit employing about three people. This uniformity qualifies a common expectation that creative activities differ widely in their employment intensity. In Varanasi's formal sector at least, they do not: the difference between subsectors lies almost entirely in how many enterprises there are, not in how large each one is. The employment weight of textiles is a matter of numbers, and the employment contribution of the smaller subsectors is correspondingly limited, however valued their products may be.

5.3 Implications for policy

Three implications follow. First, the label “creative economy” is, in this setting, close to a synonym for the textile-weaving economy, and policy that addresses the sector as a whole will in practice be policy for weaving. Recognising this allows support - in credit, design, raw materials, and market access - to be designed for the realities of handloom production rather than for an imagined diversity.

Second, if diversification is itself a goal, it will not happen on its own. The non-textile subsectors remain small and grew only modestly over the period; activities such as printing, photography, design, and the performing arts would need deliberate support - in premises, equipment, and digital access - if they are to grow into a larger share of the local creative economy.

Third, because the formal sector is composed almost entirely of micro enterprises, raising incomes will depend less on the number of registrations than on helping existing enterprises become more productive and move beyond the smallest scale. Registration brings visibility and access to schemes, but on this evidence it has not, by itself, been accompanied by any movement up the scale ladder.

5.4 Limitations

The findings describe the formal, registered creative economy, not the whole of creative activity in the city; the large unregistered craft workforce lies outside the data, and the true scale of weaving in particular is certainly greater than the register shows. The number of workers is self-reported, and the analysis captures the composition of registrations rather than the survival or growth of enterprises over time. A study tracking registered enterprises over several years, and a survey reaching unregistered producers, would both strengthen the picture offered here.

6. CONCLUSION

This paper has described the internal composition of Varanasi's formal creative economy using four years of MSME registration data. Behind a headline of rapid creative-sector growth lies a sector overwhelmingly composed of a single activity: textile weaving accounted for nearly four-fifths of creative registrations and about 69 per cent of reported creative employment by 2023-24, and drove almost all of the sector's growth. The subsectors were otherwise alike, consisting almost entirely of micro enterprises employing a few people each, so that the importance of textiles rests on enterprise numbers rather than firm size.

The wider lesson is that aggregate descriptions of the creative economy can mislead. In Varanasi the formal creative sector is, in effect, a weaving economy, and policy that names the sector as a whole is in practice policy for one craft. Whether the city's creative economy diversifies, or continues to rest on its historic strength in weaving, will depend in part on whether support is designed for the sector as it actually is. Further research - longitudinal tracking of registered enterprises, and primary survey of the unregistered - would help to refine this account and to test the interpretation, advanced here, that the recent surge in textile registrations reflects formalisation of an existing craft rather than new growth.

REFERENCES

- Banerjee, A. and Duflo, E. (2007) 'The economic lives of the poor', *Journal of Economic Perspectives*, 21(1), pp. 141–167.
- Caves, R. E. (2000) *Creative Industries: Contracts between Art and Commerce*. Cambridge, MA: Harvard University Press.
- Florida, R. (2002) *The Rise of the Creative Class*. New York: Basic Books.
- Ganti, T. (2012) *Producing Bollywood: Inside the Contemporary Hindi Film Industry*. Durham, NC: Duke University Press.
- Government of India (2006) *The Micro, Small and Medium Enterprises Development Act, 2006*. New Delhi: Ministry of Law and Justice.
- Granovetter, M. (1985) 'Economic action and social structure: the problem of embeddedness', *American Journal of Sociology*, 91(3), pp. 481–510.
- Howkins, J. (2001) *The Creative Economy: How People Make Money from Ideas*. London: Penguin Books.
- Ministry of Micro, Small and Medium Enterprises (2020) Notification S.O. 2119(E): Criteria for classification of micro, small and medium enterprises, 26 June 2020. New Delhi: Government of India.
- Raman, V. (2010) *The Warp and the Weft: Community and Gender Identity among Banaras Weavers*. New Delhi: Routledge.
- Roy, T. (1999) *Traditional Industry in the Economy of Colonial India*. Cambridge: Cambridge University Press.
- Scott, A. J. (2000) *The Cultural Economy of Cities*. London: Sage.
- Throsby, D. (2001) *Economics and Culture*. Cambridge: Cambridge University Press.
- UNCTAD (2010) *Creative Economy Report 2010: Creative Economy as a Path for Development*. Geneva: United Nations Conference on Trade and Development.
- UNCTAD (2022) *Creative Economy Outlook 2022*. Geneva: United Nations Conference on Trade and Development.
- UNESCO (2013) *Creative Economy Report 2013 Special Edition: Widening Local Development Pathways*. Paris: UNESCO and UNDP.

STATUS OF HIV/AIDS AND ITS RISK FACTORS IN THE NORTH-EASTERN REGION OF INDIA

Vikash Kumar*

ABSTRACT

Background : As of 2023, 25.44 lakh PLHIV in India, with an estimated 35,862 HIV-related deaths. The North Eastern region shows a disproportionately higher prevalence, with Mizoram (2.73%), Nagaland (1.37%), and Manipur (0.87%) far exceeding the national average (0.20%). **Aims & Objectives:** The main objective of this review paper was to assess the current status of HIV/AIDS and its risk factors in the North Eastern region of India. **Methods:** Review was done using PubMed, Scopus, Google Scholar, Sankalak 6th edition (NACO report), and policy documents. Literature and reports addressing status, risk-factors, emerging HIV epidemic, socio-economic and health factor, burden of HIV/AIDS in the NE States of India was included. Data were thematically synthesized under categories such as HIV status, progress of PLHIV, risk population and factors in Northeastern region. **Findings:** In 2018–19, only 46% of PLHIV in the North East knew their status, compared to 68% nationally. By 2023–24, this rose to 68.6% in the region but still lagged behind the national average of 80.5%. ART coverage and status awareness remain lower in NE, though viral suppression among those on ART is comparable to national levels. Key risk factors include unsafe sexual practices and injecting drug use. **Conclusion:** HIV prevalence in North Eastern India remains above the national average, with treatment access and awareness still inadequate. Targeted, region-specific strategies are essential to control the epidemic and reduce new infections.

Key Words: HIV, Antiretroviral Therapy, Prevalence, High-risk behaviour, North East India.

INTRODUCTION

Human immunodeficiency virus (HIV) is a virus which attacks the body's immune system. Acquired immunodeficiency syndrome (AIDS) occurs at the most advanced stage of infection(1).

Lack of knowledge and social taboos related to sex issues are the major contributing factors for the spread of HIV/AIDS. Young people are vulnerable to HIV due to unsafe sexual activities and drug abuse(2,3).

Despite continuous global efforts, HIV remains a significant public health challenge worldwide. Organizations such as the World Health Organization (WHO), the Global Fund, and UNAIDS have developed coordinated global HIV strategies aimed at achieving Sustainable Development Goal (SDG) 3.3 - which seeks to end the HIV epidemic by the year 2030.

According to UNAIDS (2023), an estimated 39.9 million people worldwide were living with HIV,

* Research scholar, Dept. of Statistics & Demography, NIHF, New Delhi, e-mail : vikashsco22@g.aail.com

while approximately 6.3 lakh individuals died due to HIV-related illnesses. The global adult (15-49 years) HIV prevalence was reported at 0.70%. Among those living with HIV, 86% were aware of their status, 77% were on antiretroviral therapy (ART), and 72% had achieved viral suppression (4).

As per the “SANKALAK – 6th Edition, 2024”, published under NACP by NACO, (MoHFW), Government of India, there were approximately 25.44 lakh PLHIV in India in 2023. Around 35.89 thousand deaths were attributed to HIV-related causes, and the adult (15-49 years) prevalence stood at 0.20%. Among PLHIV in India, 80.5% knew their HIV status, 87.6% were receiving ART, and over 95% had achieved viral suppression (5).

In the North-Eastern region of India, about 1.27 lakh individuals were estimated to be living with HIV in 2023, with roughly 1.3 thousand deaths linked to HIV-related complications. The adult prevalence rate (15-49 years) in this region was notably higher at 0.78%. Of these, 68.67% were aware of their HIV status, 83.21% were on ART, and more than 95% had suppressed viral loads (5).

6 out of 8 states of north eastern region have higher prevalence compare to national level including top 3 higher states prevalence in India like Mizoram (2.73%), Nagaland (1.37%), Manipur (0.87%), Meghalaya (0.43%), Tripura (0.37%), Arunachal Pradesh (0.25%) (5).

In India, ICTC established under NACP which provide HIV testing, counselling and promoting behavioural changes for improve the survival and quality of life (6).

AIMS AND OBJECTIVES

1. To know the HIV status of North Eastern region of India.
2. To assess the progress of PLHIV in North Eastern region of India.
3. To know the status of HIV risk population in the North Eastern region of India.
4. To know the HIV risk factors in North Eastern region of India.

MATERIAL AND METHODS

Study type and study design: This paper was conducted as a review, compiling evidence from published literature and government reports (Sankalak, NACO) to examine the status and risk-factors of HIV in the Northeastern region of India.

Study setting: The review was limited to the Northeastern states with particular focus on PLHIV, prevalence, annual infection and death, risk factors, progress 95-95-95, high-risk population such as FSW, MSM, IDU, transgender person, migrants, and truck drivers.

Study Duration: The review was completed over a period of two month (April-May, 2025).

Search Strategy: A detailed literature search was carried out using PubMed, Scopus, Web of Science, Google Scholar, and Shodhganga to identify relevant academic and policy literature. Additionally, official sources including UNAIDS Global Fact Sheets (2023, 2024) and NACO Sankalak report (6th editions) were reviewed to capture updated national statistics. Key search terms included: “*HIV, AIDS, Northeast India, prevalence, risk factor, high-risk population, annual infection, annual death, ICTC, and socio-demographic and economic factors*”. Boolean operators (AND/OR) were used to refine the search, and filters were applied to include only English language publications.

Selection Criteria: **Inclusion:** Peer-reviewed studies, national/international reports, survey data, and policy papers directly addressing prevalence, annual infection and death, risk factors, progress 95-95-95, high-risk population in the Northeastern state of India. **Exclusion:** Non-credible grey literature and literature or reports unrelated to Northeastern state HIV epidemic.

Data Extraction: Important information was extracted from peer-reviewed articles, national and

global reports (NACO, UNAIDS), and policy documents. Data were thematically organized into four domains: (i) Status of HIV/AIDS, (ii) Progress 95-95-95, (iii) Status of HIV among High-risk population, and (iv) Risk factors for HIV/AIDS. Each selected source was checked for reliability and contextual relevance to North Eastern India. The synthesized findings formed the basis for analysis of status of HIV and its risk factors in North Eastern region of India.

Data and Source: The data of this paper taken from the “SANKALAK 6th edition 2024” a report of NACP which is released by NACO, MoHFW, Govt of India.

RESULTS

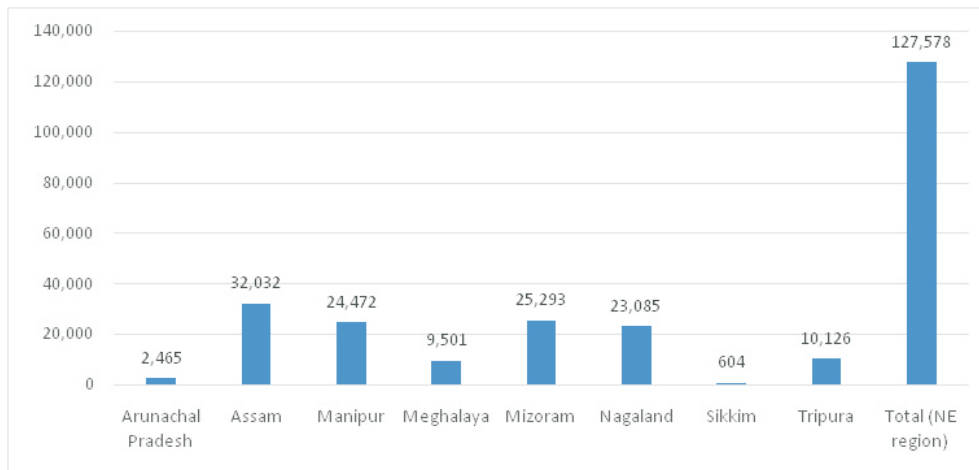
Table 1: Core characteristics of this review						
Refere- nce no.	Refere- nces	Methodo- logy	Study Area	Sample Size	Focused Group	Major Findings
3	Pachua et al. (2023)	Cross- Sectional study	Mizoram	2695	PWID	High prevalence of HIV among PWID with 1 in 5 PWID reported to have HIV
7	Bhatta- charjya et al. (2015)	Retro- spective study	Assam	380	HIV- positive & FSW	From 2007 to 2012, HIV positivity increased by 46.9% in North Assam
8	Sharma et al. (2019)	Analytical review	Manipur	26 articles	-	“Heroin” is the main cause of HIV
9	Bhatta- charjya et al. (2018)	Case- control study	Assam	19640	FSW, Migrants, Truckers	High level of unsafe sexual practice among these groups
12	Raja et al. (2025)	Retro- Spective cross- sectional	Assam	151	HIV seropositive patients	Significant rise in new HIV infection in IDU

16	Medhi Et al. (2013)	Cross- sectional study	Nagaland	426	FSW	The prevalence of syphilis was 21.1% and HIV prevalence was 11.7% among FSW
17	G et al. (2014)	Cross- sectional study	Manipur & Nagaland	3362	PWID	In both Manipur and Nagaland, younger PWID were more likely to engage in unsafe injecting practices, whereas older PWID in Nagaland were more prone to having unprotected sexual encounters.
18	Apum, A. (2025)	Descriptive analysis	Arunachal Pradesh	-	General Population	Overall increase in awareness and comprehensive knowledge from NFHS-3 to NFHS-5
19	Sirah, T. (2019)	Cross- sectional study	Arunachal Pradesh	550	Students	Risky behaviour patterns are major hindrance of preventing the rapid spread of HIV/AIDS
20	NACO (2022)	Cross- sectional study	Megha- laya	-	General Population	150% increase in HIV/AIDS cases in 2022 compared to 2010

21	NFHS-5 (2021)	Cross-sectional study	Meghalaya	-	General Population	Only 16% female & 17% male have comprehensive knowledge of HIV/AIDS
22	Rajapure et al. (2013)	Cross-sectional study	Sikkim	2000	General Population	The number of partners, addictions, especially alcohol and drug abuse, contribute to STD cases
23	Luck-som et al. (2016)	Cross-sectional study	Sikkim	220	Antenatal mothers	Only 2.66 % (6) mother knew that HIV can be transmitted to child through breast milk.
24	TSACS (2023)	Cross-sectional study	Tripura	42,454	General Population	HIV-positivity rate among general population is found 1.23%
24	TSACS (2023)	Cross-sectional study	Tripura	1056	General Population	HIV-positivity rate among IDU is found 15%

1. Status of HIV in North Eastern region of India.

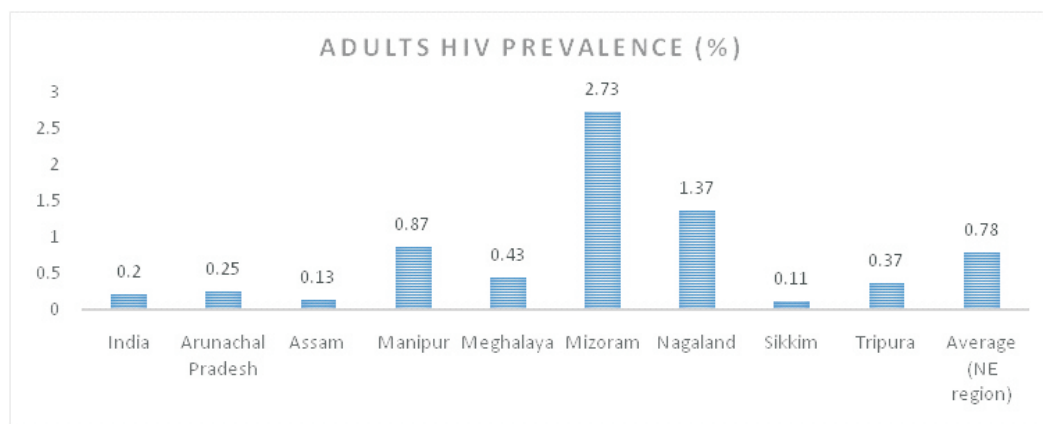
• Estimated PLHIV (2023) in North Eastern region of India.



Graph 1: Estimated PLHIV in Numbers (2023)

Among these eight North Eastern states of India total of 1,27,578 individuals living with the HIV. Assam records the highest number of cases (32,032), followed by Mizoram (25,293), Manipur (24,472), and Nagaland (23,085)-together forming the bulk of the HIV-affected population in the region. But, States like Sikkim (604) and Arunachal Pradesh (2,465) report significantly lower estimates, while Meghalaya (9,501) and Tripura (10,126) fall in the moderate range.

• Adults (15-49 Years) HIV Prevalence (%) 2023 of North Eastern Region of India.

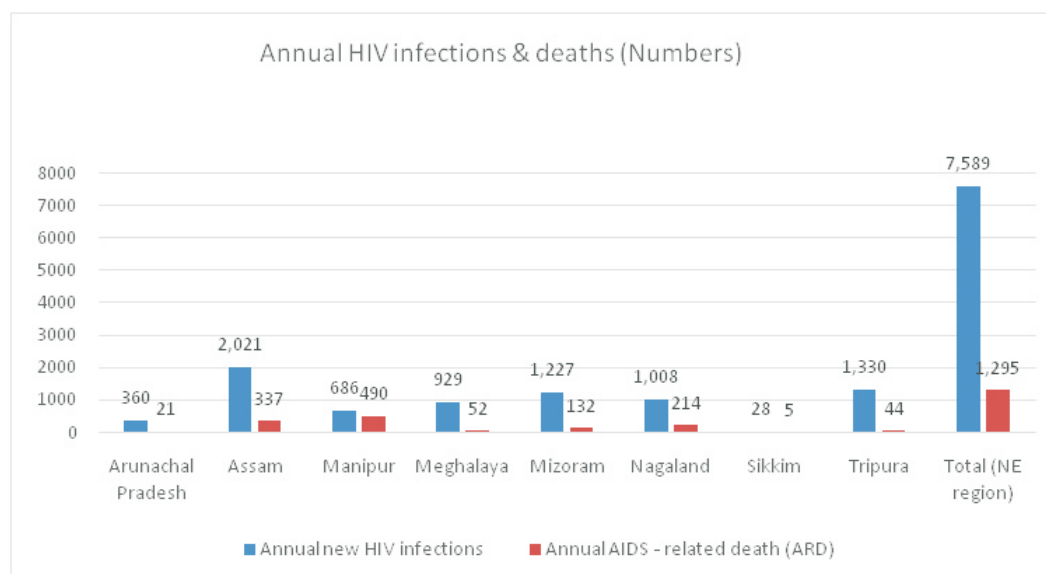


Graph 2: Adults HIV prevalence (2023)

The graph illustrates the adult HIV prevalence rates across the North Eastern states of India, in comparison to the national average. India's overall adult HIV prevalence stands at 0.2%, whereas the North Eastern region shows a significantly higher average of 0.78%. Among the states, Mizoram exhibits the highest prevalence at 2.73%, followed by Nagaland (1.37%) and Manipur (0.87%), all of which are well above both the national and regional averages. These states continue to face persistent

public health challenges related to HIV, often linked to injecting drug use, unsafe sex, stigma, and inadequate healthcare access. In contrast, states like Sikkim (0.11%), and Assam (0.13%) report lower prevalence rates, suggesting relatively better control or lower exposure risks. However, even these lower figures call for sustained prevention and awareness programs.

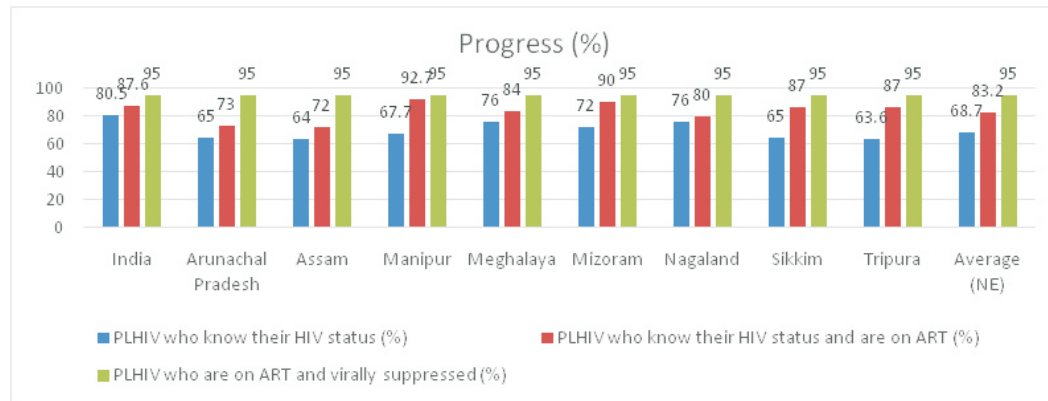
- **Annual new HIV infections & AIDS related death (2023) in North Eastern region of India.**



Graph 3: Annual HIV infections & deaths (2023)

The graph highlights the annual number of new HIV infections and AIDS-related deaths (ARD) across North Eastern states. The total new HIV infections in the region amount to 7,589, while AIDS-related deaths are 1,295. Among the states, Assam reports the highest number of new infections (2,021), followed by Tripura (1,330), Mizoram (1,227), and Nagaland (1,008). These figures suggest a sustained or rising trend in HIV transmission in these states. Notably, Manipur, despite its historically high prevalence, shows relatively fewer new infections (686), possibly indicating progress in prevention efforts or underreporting. In terms of AIDS-related deaths, Manipur (490), Assam (337), Nagaland (214) and Mizoram (132) have the highest mortality, suggesting challenges in access to antiretroviral therapy (ART), delayed diagnosis, or poor treatment adherence. Meanwhile, Sikkim (5 deaths) and Arunachal Pradesh (21 deaths) report the lowest AIDS-related mortality. This data points to a critical need for strengthened HIV care, early diagnosis, and sustained ART access across the region. It also reflects the importance of differentiating between incidence (new infections) and mortality to understand the epidemic's dynamics and tailor public health interventions accordingly.

2. Progress of PLHIV 2023 in North Eastern region of India.



Graph 4: Progress of PLHIV (2023)

The North Eastern states of India show mixed progress in the HIV care continuum. While treatment and viral suppression targets are largely being met, the region still struggles with early diagnosis and awareness. On average, 68.7% of PLHIV in the region know their HIV status. Meghalaya (76%), Nagaland (76%) and Mizoram (72%) show relatively better performance in diagnosis, while states like Tripura (63.6%), Assam (64%) and Sikkim (65%) remain below 65%, indicating limited testing coverage. Once diagnosed, treatment uptake is strong, with 83.2% of diagnosed individuals receiving antiretroviral therapy (ART). Most states have surpassed the 95% viral suppression target, showing effective ART adherence and program implementation. The major achievement lies in treatment and viral suppression, but the main gap remains in identifying undiagnosed cases. Strengthening HIV testing, awareness campaigns, and reducing stigma are key to improving outcomes for PLHIV in the region.

3. Status of HIV high risk population in the NE region of India.

- **Estimated size (2020-22) of High-Risk Populations in NE region of India**

Population Group	India	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
FSW	9,95,499	6,941	39,729	5,662	3,297	1,434	2,246	732	6,242
MSM	3,51,020	901	16,667	1,507	344	841	1,239	-	876
IDU	2,88,717	5,143	26,156	24,985	3,175	10,397	16,802	821	6,500
TP	96,193	140	2,481	468	110	-	82	-	159
Migrants	72,00,000	40,500	20,000	16,000	50,300	50,300	5,000	-	35,800
Truckers	20,00,000	-	25,000	-	4,150	15,000	5,000	-	1,000
PI	22,55,799	960	48,070	2,345	2,519	6,500	2,313	816	5,457

Table 2: Estimated size of High-risk populations (2020-22)

The NE region of India has a significant population of high-risk groups (HRGs) vulnerable to HIV transmission. The key groups include FSW, MSM, IDU, Transgender People (TP), Migrants, Truckers, and Prison Inmates (PI).

The NE region has a notable presence of high-risk groups contributing to HIV vulnerability. IDUs are highest in Assam (26,156), Manipur (24,985), Nagaland (16,802), and Mizoram (10,397), aligning with high HIV prevalence. Assam has the largest number of FSW (39,729) and MSM (16,667), transgender people (2,481), truckers (25,000) and prison inmates (48,070). Migrants and truckers, especially in Meghalaya, Mizoram, and Assam, add to the risk due to mobility. These trends underline the need for focused interventions on harm reduction, testing, and outreach among key populations.

- **HIV Prevalence (%) 2021-2023 among high-risk population in North Eastern region of India.**

Population Group	India	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
FSW	1.85	0.27	1.65	1.13	10.92	56.15	2.00	-	2.90
MSM	3.26	-	3.61	9.43	9.09	12.80	3.06	-	-
IDU	9.03	1.60	11.24	8.84	11.48	32.08	2.53	0.20	18.00
TP	3.78	-	-	-	-	-	-	-	-
Migrants	0.89	-	3.21	-	-	4.80	-	-	-
Truckers	1.00	-	2.12	-	-	-	1.20	-	-
PI	1.99	-	4.17	2.99	5.50	21.50	6.64	-	6.00

Table 3: HIV prevalence among high-risk populations (2021-23)

HIV prevalence is significantly high among IDUs in Mizoram (32.08%), Tripura (18%), Meghalaya (11.48%) and Assam (11.24%). Among FSWs, Mizoram again shows an alarming prevalence of 56.15%, followed by Meghalaya (10.92%). Men who have sex with men (MSM) show high prevalence in Mizoram (12.80%), Manipur (9.43%) and Meghalaya (9.09%). Prison Inmates (PI) in Mizoram (21.50%), Nagaland (6.64%) and Tripura (6.00%) also reflect considerable burden. Limited data is available for other groups. These figures highlight the urgent need for targeted prevention and treatment programs in the region.

4. HIV risk factors in North Eastern region of India.

- **Use of Condom (%) 2021 among high-risk population in North Eastern region of India.**

Population Group	India	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
FSW	97.80	65.50	99.0	99.6	91.7	77.3	98.8	93.50	99.3
MSM	94.60	-	77.0	98.10	89.2	100	97.4	-	-
IDU	-	-	-	-	-	-	-	-	-
TP	98.30	-	-	-	-	-	-	-	-
Migrants	53.60	-	33.50	-	-	50.0	-	-	-
Truckers	70.70	-	94.60	-	-	-	97.3	-	-
PI	62.9	-	17.60	100.0	33.3	-	-	-	-

Table 4: Use of condom among high-risk populations (2021)

Condom use is high among FSWs across most NE states, with Manipur (99.6%), Tripura (99.3%), and Assam (99%) leading. Among Men MSM, Mizoram (100%), Manipur (98.1%) and Nagaland (97.4%) show full or near-full usage. Limited data is available for other groups. Efforts should aim to increase awareness, improve condom access, and follow successful practices from high-performing states. Better data collection is also needed to plan targeted programs for all high-risk groups.

• **Use of New needle/syringe (%) 2021 among high-risk population in North Eastern region of India.**

Population Group	India	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Sikkim	Tripura
FSW	78.70	-	69.0	-	-	68.5	-	-	-
MSM	78.80	-	-	-	-	-	-	-	-
IDU	91.30	36.00	92.8	96.5	85.9	81.0	86.4	89.4	92.8
TP	-	-	-	-	-	-	-	-	-
Migrants	57.10	-	-	-	-	-	-	-	-
Truckers	50.0	-	-	-	-	-	-	-	-
PI	65.0	-	47.7	81.8	66.7	69.7	64.1	-	88.20

Table 5: Use of new needle/syringe among high-risk population (2021)

Among Injecting Drug Users (IDUs), new needle use is high in Manipur (96.5%), Tripura (92.8%), and Assam (92.8%), indicating strong harm reduction efforts. However, Arunachal Pradesh reports a significantly lower usage rate at 36%, highlighting a major gap. For Prison Inmates (PI), usage varies, with Tripura (88.2%) and Manipur (81.8%) showing better practices, while Assam (47.7%) lags. Limited data is available for other groups. The findings point to a need for targeted harm reduction interventions, especially in low-coverage states.

DISCUSSION

The review reveals that the NE region of India continues to face a disproportionately high burden of HIV/AIDS compared to the national average. Despite notable progress in treatment and viral suppression under the NACP, several interlinked socio-behavioural, demographic, and structural factors continue to sustain the epidemic in this region.

Regional Disparities and Epidemiological Patterns

HIV prevalence in the North East (0.78%) remains higher than the national average (0.20%), with Mizoram (2.73%), Nagaland (1.37%), and Manipur (0.87%) among the most affected states. These findings are consistent with previous studies (3, 7, 8, 9, 16) which attribute this trend to the region's geographic, cultural, and socio-political contexts. The proximity to the "Golden Triangle" - a known drug trafficking corridor - has intensified injecting drug use, one of the primary drivers of HIV transmission. Additionally, porous international borders, high mobility, and migration contribute to sustained risk among vulnerable populations.

Status of PLHIV and 95-95-95 Progress

While India has made commendable progress toward achieving the UNAIDS 95-95-95 targets, the North Eastern region continues to lag in the first "95" - status awareness. Only 68.7% of PLHIV in the

region are aware of their status compared to 80.5% nationally. This gap indicates limited access to HIV testing, social stigma, and low awareness, particularly in rural and tribal areas. However, the region performs relatively well in treatment coverage (83.2%) and viral suppression (over 95%), suggesting effective ART adherence and program delivery once patients are diagnosed. This emphasizes the need for enhanced community-based testing, linkage to care, and stigma reduction initiatives to improve early diagnosis.

High-Risk Populations and Vulnerabilities

The epidemic in the North East is largely concentrated among high-risk groups (HRGs) such as IDU, FSW, MSM, and Prison Inmates (PI). Among IDUs, HIV prevalence exceeds 30% in Mizoram and remains above 10% in Assam, Tripura, and Meghalaya, aligning with findings by Pachuan et al. (2023) and Armstrong et al. (2014). Similarly, HIV prevalence among FSWs is alarmingly high in Mizoram (56.15%) and Meghalaya (10.92%), reflecting unsafe sexual practices, gender-based vulnerability, and limited access to prevention services. The data also reveal high infection rates among MSM in Mizoram (12.8%) and Manipur (9.43%), signifying overlapping networks of sexual and drug-related transmission. Prison inmates and migrants represent emerging risk groups, with inadequate healthcare, limited harm reduction access, and high mobility exacerbating risk. The concentration of multiple high-risk groups within small geographic areas further complicates containment efforts.

Behavioural Risk Factors

Unsafe sexual practices, inconsistent condom use, and needle sharing remain central to HIV transmission in the North East. Although condom use among FSWs and MSM is relatively high in Manipur, Mizoram, and Tripura, states like Arunachal Pradesh and Meghalaya show lower adherence. Similarly, while new needle/syringe use among IDUs exceeds 90% in some states (Manipur, Assam, Tripura), it remains critically low in Arunachal Pradesh (36%). These behavioural differences highlight unequal implementation of harm reduction and behavioural change communication (BCC) programs across the region. Substance abuse, particularly heroin injection and alcohol use, continues to play a pivotal role in HIV transmission (8, 9). Drug dependence and poor access to rehabilitation services hinder consistent use of safe injecting practices. Furthermore, societal stigma, moral policing, and limited sexual health education restrict open discussion and early testing among youth and key populations.

Socio-Economic and Structural Determinants

Poverty, unemployment, gender inequality, and migration exacerbate HIV risk in the North East. Many districts have limited healthcare infrastructure, particularly in hilly and tribal areas. Stigma and discrimination against PLHIV remain widespread, discouraging individuals from accessing testing and treatment services. Studies (13, 14, 15) have emphasized the need for community engagement and socio-economic support systems to reduce vulnerability and improve adherence to treatment. Additionally, cultural diversity and linguistic barriers pose challenges in implementing uniform HIV awareness programs. Tailored interventions respecting local customs and community structures are therefore essential. States with better NGO participation and community-led interventions (e.g., Mizoram and Manipur) have shown higher ART adherence and viral suppression rates.

Policy and Programmatic Implications

The findings underscore the need for region-specific strategies rather than a uniform national approach. Strengthening Integrated Counselling and Testing Centres (ICTCs), expanding opioid substitution therapy (OST) coverage, and improving coordination between NACO, State AIDS Control Societies (SACS), and community-based organizations are crucial steps forward. Further, integrating HIV services with primary healthcare, reproductive health, and substance abuse programs can ensure a holistic response. Addressing gender-based violence, youth-targeted education, and migration-linked vulnerabilities should be prioritized. Data gaps, especially concerning transgender persons and migrants, need to be bridged through robust surveillance and periodic behavioural surveys.

CONCLUSION AND RECOMMENDATION

The present review concludes that the NE region of India continues to bear a disproportionately high HIV burden, largely driven by injecting drug use, unsafe sexual practices, stigma, and socio-economic vulnerabilities. While the region has achieved commendable progress in treatment coverage and viral suppression, particularly under NACP, significant gaps remain in early diagnosis, testing, and awareness - especially in rural and tribal areas. To address these challenges, it is essential to strengthen community-based HIV testing, integrate prevention and care services within the primary healthcare framework, and expand harm reduction measures such as Needle-Syringe Exchange Programs (NSEP) and Opioid Substitution Therapy (OST). Culturally sensitive behaviour change communication, targeted interventions for high-risk populations (including IDUs, FSWs, MSM, and prisoners, truck drivers, migrants), and strong anti-stigma initiatives are crucial to improve health-seeking behaviour. Furthermore, enhancing data surveillance, expanding ART and ICTC infrastructure, promoting livelihood opportunities for vulnerable groups, and fostering multisectoral collaboration among NACO, SACS, NGOs, and community-based organizations are vital for achieving equitable outcomes. Continued research on behavioural and structural determinants, coupled with digital innovations for monitoring and program evaluation, will help ensure sustainable progress. In essence, an integrated, inclusive, and region-specific approach - focusing equally on prevention, treatment, and social empowerment - is necessary to achieve the UNAIDS 95-95-95 targets and move closer to an HIV-free North East India.

CONSENT

This section is not required for the study.

ETHICAL APPROVAL

This section is not required for the study.

REFERENCES

- World Health Organization. (2024). HIV and AIDS.
- Malik, M., Girotra, S., Roy, D., Basu, S. (2023). Knowledge of HIV /AIDS and its determinants in India: Findings from the national family health survey -5 (2019-2021). *Population Medicine*
- Pachuan, LN., Tannous, C., Chawngthu, RL., Agho, KE. (2023). HIV and its associated factors among people who inject drugs in Mizoram, Northeast India. *PLoS ONE* 18(5).
- Joint United Nations Programme on HIV/AIDS. (2023 & 2024). Global Fact Sheet.

- Sankalak report. (2024). Status of national AIDS & STD response. *National AIDS control organization, Ministry of health and family welfare*.
- Gupta, A., Das, A., Agarwal, J. (2024). Socio-demographic and behavioural profile of HIV positive patients visiting ICTC at a tertiary care hospital in North India. *International Journal of Community Medicine and Public Health*. 11(7): 2715-2720.
- Bhattacharjya, C., Patel, SK., Panda, S., Deb, A.K. (2015). Changing HIV epidemic in north-eastern India and its relationship with development and programmatic indicators. *World Journal of AIDS*, 5, 265-274.
- Sharma, AL., Singh, TR., Singh, LS. (2019). Understanding of HIV/AIDS in the international border area, Manipur: Northeast India. *Epidemiology and Infection*. 147, e113, 1-7.
- Bhattacharjya, C., Pathak, G., Mahanta, TG., Singh, Y.M., Deka, R., Sen, M., Deb, AK. (2018). Emerging HIV epidemic in the north eastern state of Assam, India: An exploratory study using mixed methods approach. *World Journal of AIDS*, 8, 21-36.
- Bhagavathula, AS., Clark, CCT., Sharma, R., Chhabra, M., Vidyasagar, K., Chattu, VK. (2021). Knowledge and attitude towards HIV/AIDS in India: A systematic review and meta-analysis of 47 studies from 2010-2020. *Health Promotion Perspectives*. 11(2), 148-160.
- Astha., Agrawal, A., Soni, A., Chauhan, N., Sahu, P., Kumar, S. (2023). A study on prevalence of HIV and its associated risk factors in patients visiting tertiary care center of North India. *Asian Journal of Medical Sciences*. 14(1); 58-64.
- Raja, D., Nath, H., Engtipi, R., Medhi, D., Daimari, D., Mahanta, P. (2025). Risk factors among HIV seropositive cases attending a tertiary care hospital of a North-eastern state of India: A Hospital-based retrospective cross-sectional study. *Cureus: Part of Springer Nature*. 17(3); 1-10.
- Lalzarzoliani, J F., Sandhya, S. (2024). The burden of HIV/AIDS in India and its Northeastern States. *Journal of North East India Studies*. 14(1); 45-72.
- Moyon, S N. (2021). Influence of socio-economic and health factors on HIV/AIDS patient survival in Northeast India. *Webology*. 18(6); 9755-9763.
- Kumar, P., Das, C., Das, U., Kumar, A., Priyam, N., Ranjan, V., Sahu, D., Rai, S K., Godbole, S V., Arumugam, E., PVM, L., Dutta, S., Devi, H S., Pandey, A., Reddy, D C S., Mehendale, S., Rajan, S. (2023). Augmenting progress on the elimination of vertical transmission of HIV in India: Insights from spectrum-based HIV burden estimations. *Plos Global Public Health*. 3(8); 1-16.
- Medhi, G. K., Mahanta, J., Hazarika, I. (2013). Syphilis infection among female sex workers in Nagaland, Northeast India: Analyzing their vulnerability to the infection. *International Journal of STD and AIDS*. 24, 193.
- Armstrong, G., Nuken, A., Medhi, G K., Mahanta, J., Humtsoe, C., Lalmuanpuali, M., Kermode, M. (2014). Injecting drug use in Manipur and Nagaland, Northeast India: Injecting and sexual risk behaviours across age groups. *Harm Reduction Journal*. 11; 27.
- Apum, A. (2025). A Study of Awareness of HIV/AIDs and Knowledge of Prevention and Transmission in Arunachal Pradesh: Overview and Trends. *Journal of Research in Humanities and social science*. 13(7); 157-163.
- Sirah, T. (2019). Perception of HIV/AIDS among the senior students of Itanagar, Arunachal

- Pradesh. *International Journal of Social Science and Economic Research*. 4(2); 1-19.
- National AIDS Control Organization. (2022). 150% increase in HIV-AIDS cases in Meghalaya.
- National Family Health Survey - 5. (2021). Meghalaya: HIV prevalence higher than national average.
- Rajapure, V., Tirwa, R., Poudyal, H., Thakur, N. (2013). Prevalence and risk factors associated with sexually transmitted diseases (STDs) in Sikkim. *Journal of Community Health*. 38(1); 156-162.
- Lucksom, P G., Upadhya, R., Kharka, L., Dubey, S., Choudhary, N., Yadav, R. (2016). KAP Study on HIV/AIDS Among Antenatal Women Attending Central Referral Hospital of North East India. *The Journal of Obstetrics and Gynecology of India*. 66(1); 55-59.
- Tripura AIDS Control Society. (2023). Fact Sheet.

AN EMPIRICAL ASSESSMENT OF BHAGALPUR SILK'S EXPORT VALUATION AND PROTECTION AGAINST COUNTERFEITS

Dibyanshu Kumar*

ABSTRACT

Geographical Indication (GI) status was granted to Bhagalpur Silk in 2013, intended to authenticate the origin of this wild Tussar silk and protect it against counterfeit substitution—chiefly synthetic viscose blends and underpriced Chinese silk sold under Bhagalpuri-sounding names. This paper assesses, using only secondary published data, whether that registration corresponded with a measurable improvement in export valuation, price realisation, or counterfeit protection. Because no continuous official time series exists for the Bhagalpur cluster, the study triangulates the available quantitative claims, weighs each by source reliability, and benchmarks the findings against three comparable Indian GI-textile cases: Kashmir Pashmina, Banaras Brocade, and Darjeeling Tea. The central finding is that no source reports a measurable post-2013 improvement in Bhagalpur's trade value; the most frequently cited turnover estimate has remained textually unchanged since 2009, spanning the registration date without revision. This is consistent with the broader literature's finding that GI registration alone, without dedicated certification and enforcement infrastructure, does not reliably produce a producer-level income benefit – a pattern this paper finds replicated in the closely comparable Banaras Brocade case, and absent only where, as with Darjeeling Tea, sustained institutional investment accompanied registration.

Keywords: *Geographical Indication; Bhagalpur Silk; Tussar Silk; GI Act 1999; export valuation; counterfeit substitution; artisan livelihoods.*

1. INTRODUCTION

A Geographical Indication (GI) is a form of intellectual property that identifies a good as originating in a particular territory, where a given quality, reputation, or characteristic of the good is essentially attributable to that origin. In 2013, this protection was extended to Bhagalpur Silk – the wild Tussar (Tasar) silk woven predominantly in and around Bhagalpur district, Bihar – under India's Geographical Indications of Goods (Registration and Protection) Act, 1999. The registration had two principal objectives: to allow buyers to verify the product's geographical provenance, and to provide a legal means of excluding inferior substitutes, notably synthetic viscose blends and underpriced Chinese silk marketed under Bhagalpuri-sounding names, from trading on the reputation the GI was designed to protect.

More than a decade later, whether this protective function has been realised in practice remains an open empirical question. A recurring observation in the Indian intellectual property literature is that the pace of GI registration has outstripped the development of the enforcement infrastructure –

* Research Scholar, Department of Economics, BHU, Varanasi, kdibyanshu1@gmail.com

certification marking, supply-chain traceability, active market surveillance - needed to make a GI effective. Bhagalpur Silk is a useful case for examining this proposition: the 2013 registration provides a clear temporal boundary for before-and-after comparison, and the counterfeit threat the GI was meant to address is well documented in industry and trade sources.

This paper investigates one central question: *did the 2013 GI registration of Bhagalpur Silk correspond with a measurable improvement in export valuation, price realisation, or resistance to counterfeit substitution, or did pre-existing structural trends continue substantially unaffected?*

The investigation proceeds entirely from secondary, previously published sources; no primary survey or original dataset was constructed. This constraint is treated as a substantive feature of the analysis rather than a limitation to be minimised, and Section 3 sets out exactly which sources were used and where continuous data could not be located.

2. Literature Review

This section situates the Bhagalpur case within the empirical and case-study literature on Geographical Indications, across the theoretical rationale for GI price premiums, the evidence on whether such premiums are realised, two comparable Indian textile cases, and the distinct question of how legal protection reaches individual producers.

2.1 The Theoretical Case for GI Price Premiums

The economic rationale for GI protection rests on an information-asymmetry argument: where buyers cannot verify a product's origin or production method, they discount what they will pay for attributes they cannot confirm. A study of consumer purchase intention toward GI-tagged handloom apparel in Kerala frames this directly, noting that asymmetric information between traditional handloom producers and consumers leaves buyers unable to identify genuine handloom in the absence of a distinguishing label, so that high-quality producers face unfair price competition from low-quality sellers¹. A GI label is theorised to resolve this by giving buyers a verifiable signal, allowing genuine producers to capture a premium reflecting authentic provenance.

2.2 Mixed Evidence on Realized Premiums

Empirical testing of this expectation gives a more mixed picture than the theory implies. A systematic review of the global GI economics literature concludes that while some GI products in some regions achieve substantial price premiums, the evidence as a whole is inconsistent, and higher compliance costs combined with unequal distribution along the supply chain frequently erode whatever premium is captured before it reaches the primary producer. The pattern recurs in Indian case studies: a 2025 study of 388 GI-certified Kashmir Pashmina and Kani Shawl producers found that certification was associated with statistically significant gains in regional development, product pricing, and market accessibility, but had no statistically significant effect on producer income² - a dissociation between aggregate market effects and individual earnings that recurs throughout this literature.

2.3 A Closer Parallel: Banaras Brocade

The most directly relevant comparator for Bhagalpur Silk is Banaras Brocade, a GI-protected

¹Prathap, S. K., & Sreelakshmi, C. C. (2020). Determinants of purchase intention of traditional handloom apparels with geographical indication among Indian consumers. *Journal of Humanities and Applied Social Sciences*. <https://doi.org/10.1108/jhass-04-2020-0055>.

²Chaudhary, M., Agarwal, B., & Khandai, S. (2026). Economic impact of geographical indication certification on handicraft industry. *Journal of Revenue and Pricing Management*, 25(1), 53–66. Surveyed 388 GI-certified Kashmir Pashmina and Kani Shawl producers using structural equation modelling; significance at the 5% level.

handwoven silk from Uttar Pradesh registered in September 2009. A published study of that GI documents that registration explicitly restricts the 'Banarasi' designation to handloom product from six identified districts, yet finds that the GI's biggest practical challenge is undisclosed substitution by machine-made imitation - silk that takes a handloom weaver three to six months to produce being replicated on power looms within days - compounded by rising raw-silk prices, the import of cheaper Chinese silk, and falling demand³. This combination of threats is structurally identical to those documented for Bhagalpur, and the Banaras case shows that registration alone, without an enforced certification mark distinguishing handloom from machine-made product, did not resolve substitution in a closely comparable silk-handloom GI.

2.4 The Enforcement Question: Darjeeling Tea

A separate strand of the literature asks not whether a premium exists, but what infrastructure is needed to protect one. Darjeeling Tea - India's first registered GI, granted in October 2004 after an unsuccessful 1986 application - is the case most often cited as evidence that infrastructure, not the registration event itself, determines outcomes. The Tea Board established a certification trademark for the Darjeeling name and logo as early as 1983, registered it in major importing jurisdictions well before GI registration existed in India, made certification of export authenticity compulsory under the Tea Act, 1953 from February 2000, and engaged a dedicated international watch agency from 1998 to monitor unauthorised use worldwide. Over a four-year period it spent roughly US \$200,000 on international legal and monitoring costs alone, excluding administrative overhead⁴. This infrastructure - built independently of, and prior to, the GI registration - is generally credited with Darjeeling Tea's relative success, rather than the 2004 registration in isolation. No comparable monitoring agency, compulsory certification system, or sustained enforcement budget has been documented for the Bhagalpur Silks GI in any source reviewed here.

2.5 The Authorized User Mechanism

A legal distinction sharpens the enforcement argument considerably. Under the GI Act, 1999, registration of a GI confers no individual right to use the mark in trade. Section 21 restricts the exclusive right to use a registered GI to its registered authorised users, and Section 17 sets out a separate registration process - distinct from the GI registration itself - through which an individual producer must apply, demonstrate compliance with the specified production methods, and be entered on the Registry's authorised-user record before lawfully marketing goods under the protected name⁵. A GI registration and the extension of usable legal protection to individual producers are therefore not the same thing, and may diverge substantially in practice. The distinction has documented effect where actively pursued: in Mysore Silk vs. Karnataka Silk Industries (2010), a court restrained non-registered mills from using the Mysore Silk name, a ruling reported as protecting over 30,000 registered weavers - but the protection rested on the existence of a large, identifiable registered-user base. No equivalent evidence of a comparably sized, actively maintained authorised-user base, nor

³Verma, S., & Mishra, N. (2018). Recognition and marketing opportunities of a 'GI' tag in handloom product: A study of Banaras brocades and sarees. *Journal of Intellectual Property Rights*, 23(2-3), 101-110.

⁴WTO, "Managing the Challenges of WTO Participation," Case Study 16: Darjeeling Tea, https://www.wto.org/english/res_e/booksp_e/casestudies_e/case16_e.htm. Figures on Tea Board enforcement spend and certification-mark registration dates are drawn from this case study.

⁵The IP Matters, "Effects of Registration of Geographical Indication," citing Mysore Silk vs. Karnataka Silk Industries (2010). Section 21(1) of the GI Act, 1999 restricts the exclusive right to use a GI to its registered authorised users; Section 17 governs authorised-user registration as a process distinct from GI registration itself.

any public searchable list of Bhagalpur Silks authorised users, was located in the course of this research. This is reported as an evidentiary gap, not a confirmed count of zero. If the authorised-user base is indeed small relative to Bhagalpur's wider weaving population - independently estimated in the tens of thousands - then most genuine handloom product already reaches the market without GI-backed labelling, making it mechanically difficult for a buyer to use the GI mark to distinguish authentic handloom from synthetic substitution, since neither carries the mark in practice.

2.6 Positioning of the Present Study

Taken together, the literature yields four propositions against which the Bhagalpur case is assessed: a price premium is not automatically realised by registration alone, and where studied directly often is not; where a premium is realised at the regional level it does not reliably reach primary producers; the presence of dedicated, resourced enforcement infrastructure is the factor most plausibly distinguishing successful cases (Darjeeling Tea) from cases where substitution persists despite registration (Banaras Brocade, and, this paper argues, Bhagalpur Silk); and registration and usable legal protection are administratively distinct, mediated by authorised-user registration, such that a GI's nominal existence may overstate the protection actually available to a region's producers.

3. Data and Methodology

This study uses a secondary-data, comparative case-study design. Rather than constructing a single time series and applying inferential statistical testing - which the available data does not support - it compiles the publicly available quantitative claims concerning the Bhagalpur cluster, attributes each to its original source, and assesses them for internal consistency, direction of trend, and corroboration. Where claims conflict or cannot be corroborated, this is reported as a finding rather than resolved by choosing the most convenient figure.

Three categories of source were used. Official and administrative sources include the Geographical Indications Registry (CGPDTM); the Directorate General of Commercial Intelligence and Statistics (DGCI&S), which compiles national silk trade data; the Ministry of Textiles; and the One District One Product (ODOP) Bhagalpur portal. Academic and field-survey sources include a 2008 field survey of Bhagalpur weavers conducted under the VAMNICOM/ECO TASAR (PRADAN) programme, a 2022 statistical study of the Tussar silk trade, the 2025 study of Kashmir Pashmina and Kani Shawl producers, the 2018 study of Banaras Brocade, and WTO case-study material on the Darjeeling Tea Board - the last three used as comparators rather than as direct sources for Bhagalpur. Industry and investigative-journalism sources provide weaver testimony and industry-association claims.

The central limitation is stated plainly. No official body publishes a continuous, Bhagalpur-specific time series of export value, turnover, or weaver income spanning the pre- and post-2013 period. The figure most often cited - an annual trade volume of about Rs 100 crore, split roughly evenly between domestic and export markets - recurs with near-identical wording across sources from 2009 to 2023.⁶ Because it does not change across a fifteen-year period that other sources describe as one of substantial contraction, it is treated here as a static inherited estimate, not a measured statistic, and is not used as a trend input. This absence is itself a relevant empirical observation. The analysis applies three procedures: triangulating each claim against independent sources and reporting its reliability;

⁶Fibre2Fashion, "Bhagalpur Silk Industry, Uniqueness of Bhagalpur Silk, Silk City," 2009; ODOP Bhagalpur portal, bhagalpur.nic.in/odop-bhagalpur; LSI Finance, "Report on Bhagalpur Silk Industry," April 2019. The identical wording and figure across publications spanning 2009–2023 is treated here as an uncorroborated, unrevised estimate rather than a maintained statistic.

comparing qualitative directional claims across sources where a continuous figure is unavailable; and benchmarking the Bhagalpur findings against the Kashmir Pashmina, Banaras Brocade, and Darjeeling Tea cases. The approach cannot establish causation and does not claim to; it offers a disciplined, transparently-sourced account of what the existing evidence does and does not show.

4. FINDINGS

4.1 Cluster-Level Trade Value

The quantitative claims for Bhagalpur's trade value do not form a coherent series. The most frequently cited figure, approximately Rs 100 crore per year with roughly half exported, recurs unchanged from 2009 to 2023 and is therefore low-confidence - an estimate that is not being re-measured⁷. A 2014 Ministry of Textiles communication described Bhagalpur as a 'Rs 1,000 crore industry', an order of magnitude higher, from a single source whose basis is unstated⁸. Weaver-association testimony reported in 2023 describes a decline from around Rs 600 crore to around Rs 100 crore, but gives no comparison year and is best read as a directional claim of substantial decline rather than a dated figure⁹. The most recent district-level figure, from the ODOP portal, is approximately Rs 120 crore for FY 2022-23¹⁰. These figures are not directly comparable: they differ in vintage, in what they appear to measure, and in the years they describe. The persistence of the Rs 100 crore figure unchanged across fourteen years is, in itself, the most reliable observation available - it indicates the figure is not being re-measured, whatever it was originally meant to represent. The honest conclusion is not that Bhagalpur's silk economy has a clear trajectory, but that no public body currently maintains one.

4.2 The National and Tasar Trade Context

National-level data is more robust. For the product category that matters most here - Tasar (non-mulberry) silk, Bhagalpur's specialty - a 2022 statistical study reports that Tasar silk-goods exports rose from Rs 70.86 crore in 2004-05 to Rs 121.94 crore in 2013-14, a compound annual growth rate of about 5.58 percent, placing a dated, sourced figure squarely within the GI registration window¹¹. This establishes that the national Tasar-export climate was modestly rising, not falling, around the time of Bhagalpur's registration - which sharpens rather than resolves the puzzle: a rising national backdrop makes the complete absence of any upward revision to the Bhagalpur-specific estimate harder to attribute to a general sectoral downturn, and more consistent with the figure simply not having been re-measured.

For total silk across all types, the earliest available figures - roughly Rs 3,500 crore in 2007 falling to roughly Rs 2,000 crore in 2009 - rest on a single source and are reported here with correspondingly lower confidence¹². The more recent and better-corroborated DGCI&S figures show national silk-and-silk-goods export value rising from Rs 1,649.48 crore in 2017-18 to Rs 2,027.56 crore in 2023-

⁷Ibid. (Fibre2Fashion 2009; ODOP Bhagalpur portal; LSI Finance 2019). The recurring '~Rs 100 crore' estimate is cited again here as the central figure under examination.

⁸Ministry of Textiles, Government of India communication, 2014; basis for the figure is not specified in the source.

⁹NewsClick, "Weavers of Bihar's 'Silk City' Fight for Survival," 2023, quoting Alim Ansari, Secretary, Resham Bunkar Khadi Gramodyog Sangh (RBKGS). The Rs 600 crore figure is a stakeholder recollection of a past peak, not a dated official statistic. ODOP Bhagalpur District Portal, National Informatics Centre, Government of Bihar, figure cited for FY 2022-23.

¹⁰ODOP Bhagalpur District Portal, National Informatics Centre, Government of Bihar, figure cited for FY 2022-23

¹¹Rai, S., & Satyanarayana, K. (2022). Trend of tasar silk industry in India — A statistical approach. *Plant Archives*, 22(Special Issue VSOG), 265–273. Central Tasar Research and Training Institute, Ranchi; drawing on Central Silk Board and DGCI&S secondary data.

¹²Fibre2Fashion (2009) is the sole source located for the 2007 and 2009 national export figures; these are accordingly lower-confidence than the DGCI&S-sourced 2017–2024 figures, which are corroborated across multiple independent outlets.

24, about a 23 percent increase, alongside a rise in raw-silk production from 31,906 to 38,913 metric tonnes over the same period¹³. The broad picture is of a national silk sector recovering since the late 2010s, with no sign of a corresponding recovery reflected in any Bhagalpur-specific reporting - a divergence more informative than any single turnover figure, and one pointing toward cluster-specific constraints rather than a sector-wide demand problem.

4.3 Weaver Incomes

Wage evidence is sparse and inconsistent. A 2008 field survey recorded some job-work weavers earning as little as Rs 40 per day¹⁴, while a 2021 field report recorded an established weaver earning up to Rs 200–250 per day at best, under acute pressure during the pandemic¹⁵. No wage data point exists between 2008 and 2021, and none for any year after 2021. The two figures describe different weaver categories - job-work versus established - thirteen years apart, surveyed by different methods, and cannot be assembled into a trend. Neither suggests a wage trajectory consistent with a meaningful, broadly distributed GI-linked income premium, and the qualitative evidence of yarn-cost inflation, declining weaving charges, and out-migration of younger workers points toward continued precarity rather than post-2013 improvement.

4.4 Comparative Assessment

Set against the comparators, Bhagalpur's institutional position is clear. Darjeeling Tea, registered in 2004, has a compulsory certification mark, a dedicated international watch agency, and documented price and stability benefits. Banaras Brocade, registered in 2009, has neither a meaningfully enforced certification mark nor a watch agency, and shows documented displacement of handloom product by power-loom substitution. Bhagalpur Silk, registered in 2013, likewise has no certification mark and no watch agency - and, unlike Banaras, its income effect cannot even be characterised as negative, because the data needed to confirm any outcome does not exist. Bhagalpur's circumstances thus most closely resemble Banaras Brocade, where registration without certification or monitoring infrastructure failed to halt substitution, and least resemble Darjeeling Tea, where all three institutional features were in place. The 'unknown' status of Bhagalpur's income outcome is itself this paper's central empirical finding¹⁶.

5. DISCUSSION

The evidence permits a qualified answer to the research question. No data point allows a clean before-and-after comparison around the 2013 registration, but a set of modest, defensible conclusions follows. First, the Rs 100 crore estimate unchanged across 2009–2023 means there is no evidence in the public record of a measurable post-2013 uplift in Bhagalpur's trade value - whether because the figure did not move or because no one re-measured it, the conclusion is the same. Second, the contrast with a recovering national silk sector, and a specifically rising Tasar-export trend through the registration window, makes the absence of any Bhagalpur-specific improvement harder to attribute to general sectoral conditions. Third, the sparse wage evidence is consistent with the Kashmir Pashmina finding that GI pricing or market-access effects do not reliably translate into producer income.

¹⁴VAMNICOM / ECO TASAR (PRADAN), “Blueprint for Development of Weavers of Bhagalpur,” field survey report, May 2008.

¹⁵101Reporters, “Weavers of Bhagalpur struggle to sustain livelihood amidst pandemic,” 2021, reporting Rs 200–250/day for an established weaver.

¹⁶Geographical Indications Registry, CGPDTM, Government of India, “Bhagalpur Silks,” GI Application No. 180, <https://search.ipindia.gov.in/GIRPublic/Application/Details/180>.

Fourth, the comparative literature explains why a premium, even if captured somewhere in the supply chain, would not be expected to reach Bhagalpur's weavers: the Banaras Brocade parallel shows registration alone failing to resolve identical substitution threats, while Darjeeling Tea shows what a resourced response looks like - and no comparable response is documented for Bhagalpur. Fifth, the Authorized User mechanism adds an institutional layer to this: because the Act channels usable protection through individual authorised-user registration rather than the registration event itself, a GI can exist on the Registry while extending little practical standing to most of a region's producers. If, as the absence of any locatable authorised-user list suggests, only a small fraction of Bhagalpur's weavers hold that status, most genuine handloom product already reaches the market unlabelled, blunting the GI's value as a tool for distinguishing authentic product from substitution. These explanations are consistent with an enforcement-gap account operating through two channels - missing monitoring infrastructure and a probable shortfall in authorised-user registration - though they cannot rule out competing causes such as input-cost pressure or the pandemic, which the data cannot isolate from any GI-specific effect.

6. LIMITATIONS

The limitations follow directly from the method. No primary data was collected, and no continuous Bhagalpur-specific time series exists, so the before-and-after comparison central to the research question was tested only indirectly, through the absence of any reported change. The earliest national export figures rest on a single source and are lower-confidence than the DGCI&S figures. The wage evidence is two data points thirteen years apart, surveyed differently, and cannot establish a trend. The Authorized User argument rests on the absence of a publicly locatable registration list, which is suggestive of a small base but is not a verified count; the Registry's records were not directly queried, and an absence of search results does not rule out unpublished records. Finally, the study cannot separate a GI enforcement failure from other plausible causes of stagnation, because no source isolates these factors from one another. A credible next phase would involve a structured weaver and exporter survey, a systematic audit of 'Bhagalpuri silk' e-commerce listings against advertised fibre content, and a direct query of the GI Registry's authorised-user records for Bhagalpur Silks.

7. CONCLUSION

This paper asked whether Bhagalpur Silk's 2013 GI registration corresponded with a measurable improvement in export valuation, price realisation, or resistance to counterfeit substitution. Using only secondary data, it finds no evidence of such an improvement: the most-cited turnover figure has remained unchanged for over a decade across the registration date, national and Tasar-specific trade data show growth not reflected in any Bhagalpur-specific reporting, and the limited wage evidence does not suggest a broad income gain for weavers. These findings are consistent with the enforcement-gap explanation found elsewhere in the GI literature - most directly in the near-identical Banaras Brocade case - and with the contrast offered by Darjeeling Tea, where sustained institutional investment, not registration alone, appears to be the operative factor in success.

The paper's principal contribution is not a confirmed causal finding but a disciplined documentation of an evidentiary gap: more than a decade after a nationally significant handloom cluster received GI protection, no public body maintains the data needed to evaluate that protection's effect. Closing that gap - through a maintained cluster statistic, a primary weaver survey, and a direct check of authorised-user registration - is the necessary next step that this paper's method cannot itself complete.

REFERENCES

- Chaudhary, M., Agarwal, B., & Khandai, S. (2026). Economic impact of geographical indication certification on handicraft industry: Optimizing sustainable business growth through strategic revenue management. *Journal of Revenue and Pricing Management*, 25(1), 53–66. <https://doi.org/10.1057/s41272-025-00551-8>
- DD News / Ministry of Textiles, Government of India. (2024). India weaves growth: Silk production rises to 38,913 MT, exports cross Rs 2,000 crore. <https://ddnews.gov.in/en/india-weaves-growth-silk-production-rises-to-38913-mt-exports-cross-rs-2000-crore-benefiting-over-78000-under-government-schemes/>
- Fibre2Fashion. (2009). Bhagalpur silk industry, uniqueness of Bhagalpur silk, Silk City. <https://www.fibre2fashion.com/industry-article/4138/bhagalpur-silk-industry>
- Geographical Indications Registry, Intellectual Property India. Bhagalpur Silks, GI Application No. 180. <https://search.ipindia.gov.in/GIRPublic/Application/Details/180>
- NewsClick. (2023). Weavers of Bihar's 'Silk City' fight for survival. <https://www.newsclick.in/dipping-earnings-rising-costs-weavers-bihar-silk-city-fight-survival>
- 101Reporters. (2021). Weavers of Bhagalpur struggle to sustain livelihood amidst pandemic https://101reporters.com/article/development/Weavers_of_Bhagalpur_struggle_to_sustain_livelihood_amidst_pandemic
- ODOP Bhagalpur District Portal. (2024). <https://bhagalpur.nic.in/odop-bhagalpur/>
- Prathap, S. K., & Sreelakshmi, C. C. (2020). Determinants of purchase intention of traditional handloom apparels with geographical indication among Indian consumers. *Journal of Humanities and Applied Social Sciences*. <https://doi.org/10.1108/jhass-04-2020-0055>
- Rai, S., & Satyanarayana, K. (2022). Trend of tasar silk industry in India — A statistical approach. *Plant Archives*, 22(Special Issue VSOG), 265–273.
- VAMNICOM / ECO TASAR (PRADAN). (2008). Blueprint for development of weavers of Bhagalpur [Field survey report]. https://www.researchgate.net/publication/273651236_Blueprint_for_Development_of_Weavers_of_Bhagalpur
- Verma, S., & Mishra, N. (2018). Recognition and marketing opportunities of a 'GI' tag in handloom product: A study of Banaras brocades and sarees. *Journal of Intellectual Property Rights*, 23(2–3), 101–110.
- WTO. Managing the challenges of WTO participation: Case study 16 — Darjeeling tea. https://www.wto.org/english/res_e/booksp_e/casestudies_e/casel6_e.htm
- TheIPMatters. Effects of registration of geographical indication. <https://www.theipmatters.com/post/effects-of-registration-of-geographical-indication>
- Geographical Indications of Goods (Registration and Protection) Act, 1999 (India), ss. 17, 21.

DIFFERENTIAL REAL WAGE GROWTH ACROSS SOCIAL GROUPS IN INDIA: EVIDENCE ON SCHEDULED-CASTE WORKERS, 2011-2024

Satyendra Pratap Bharati* Pankaj Kumar Soni**

ABSTRACT

This paper documents how real earnings have grown across India's major social groups between 2011-12 and 2023-24, with particular attention to Scheduled-Caste (SC) workers. Using nationally representative unit-level data from the NSS Employment-Unemployment Survey (2011-12) and the Periodic Labour Force Survey (2017-18 to 2023-24), real average earnings are tracked separately for regular salaried, casual, and self-employed workers, and disaggregated by social group, broad industry, contract type, and enterprise ownership. Three patterns emerge. First, growth has been highly uneven across employment arrangements: casual real wages rose at about 3.7 per cent a year and converged near parity, but at a subsistence floor; whereas real regular salaried and self-employment earnings were broadly flat or declined. Second, the SC earnings disadvantage is concentrated at the upper end of the labour market: SC regular and self-employed workers earn roughly 65 per cent of their General-category counterparts, and these gaps persist within the same industries and contract tiers. Third, the disadvantage is widest in the private corporate sector (SC earns 56 per cent of General) and narrowest in the reservation-covered public sector (76 per cent). A Mincerian earnings function confirms a stable adjusted SC penalty of about 11 per cent in regular salaried work after controlling for education, experience, location and sector. The findings indicate that the recent period of overall wage growth has not narrowed caste-based earnings gaps in India's formal and self-employed labour markets.

Keywords: caste; Scheduled Castes; real wage growth; earnings inequality; Periodic Labour Force Survey.

JEL classification: J31; J71; J15; O53.

1. INTRODUCTION

India's labour market has expanded and formalised unevenly over the past decade, and the gains from growth have not been shared equally across social groups. For Scheduled-Caste (SC) workers, who have historically been confined to manual and stigmatised occupations (Deshpande, 2011; Thorat & Newman, 2012), the central question is whether a period of aggregate wage growth has translated into convergence with the General category, or whether it has merely reproduced older hierarchies in new forms. A substantial literature establishes that SC workers earn less than otherwise comparable upper-caste workers and that part of this gap reflects labour-market discrimination rather than differences in endowments alone (Banerjee & Knight, 1985; Borooah, 2005; Madheswaran & Attewell, 2007; Ito, 2009). This paper addresses the growth question directly by measuring real

*Research Scholar, Department of Economics, Banaras Hindu University, Varanasi

**Assistant Professor, Department of Economics, Banaras Hindu University, Varanasi), pnasatyendrapratap@gmail.com

earnings growth, separately by employment arrangement and social group, from 2011-12 to 2023-24. This analysis is descriptive in nature. It maps the structure of wage growth: where earnings rose, where they stagnated, and where caste gaps widened or held. This is a useful exercise in its own right because policy debates frequently assume that overall wage growth, formalisation, or movement into regular salaried work will mechanically reduce caste disparities. The data assembled here allow that assumption to be tested across the three employment types that account for almost the entire workforce, across broad industries, and across the institutional dimensions of contract security and enterprise ownership.

Three contributions follow. First, the paper separates genuine real wage growth from compositional and measurement effects by anchoring growth comparisons to the period in which earnings are measured on a consistent basis. Second, it shows that the SC disadvantage is overwhelmingly an upper-tier phenomenon, present in regular salaried and self-employed work but largely absent in casual labour. Third, it documents an institutional gradient in the gap, which is bounded in public employment but severe in the private corporate sector. Together these results sketch a labour market in which growth has lifted absolute earnings but has done little to compress caste-based inequality where the stakes are highest.

2. DATA AND METHODS

The study uses two nationally representative household surveys conducted by the National Statistical Office. Earnings for 2011-12 are taken from the 68th round of the NSS Employment-Unemployment Survey (National Sample Survey Office [NSSO], 2013); earnings for 2017-18, 2022-23 and 2023-24 are taken from successive rounds of the Periodic Labour Force Survey (PLFS; National Statistical Office [NSO], 2018-2024). All estimates apply the surveys' sampling multipliers so that they represent the working population. Workers are classified by usual principal and subsidiary status into three mutually exclusive categories, regular wage/salaried, casual labour, and self-employed and by social group into Scheduled Castes (SC), Scheduled Tribes (ST), Other Backward Classes (OBC), and a residual General category.

Nominal earnings are converted to real terms by deflating to a constant base year using the Consumer Price Index, CPI Rural and CPI Urban, base 2012. Earnings concepts follow each survey's reference period: daily wages for casual labour, and monthly earnings for regular salaried and self-employed workers. Average real earnings are computed for each social group and employment type, and growth is summarised by the compound annual growth rate (CAGR) -the ratio of end-year to base-year real earnings raised to the power of one over the number of intervening years, minus one. A wage ratio expresses each group's mean earnings as a percentage of the General-category mean in the same cell.

A note on comparability and the weekly-to-monthly conversion. Regular-worker earnings in the 2011-12 NSS round are recorded on a weekly basis, whereas PLFS records them monthly. To place the series on a common footing, the 2011-12 regular weekly figures are converted to a monthly basis using the standard factor of $52/12$ (≈ 4.33), i.e. weekly earnings annualised over 52 weeks and divided by twelve months; the converted values are the ones shown for 2011-12 in Panel A of Table 1. The result is robust to the alternative 30/7 day-based factor, which changes the implied growth rates by less than half a percentage point. After conversion, real regular earnings are broadly flat to mildly declining over 2011-24, and the 2011-12 to 2017-18 sub-period shows a real decline -a pattern consistent with independent estimates that regular real wages stagnated or fell over this window

(Srivastava & Padhi, 2020) and with subsequent PLFS-based analyses. Casual daily wages are measured consistently throughout and require no adjustment; the self-employed series is available only from 2017-18.

Finally, to summarise how the caste earnings gap evolved net of observable characteristics, a Mincerian(semi-log) earnings function (Mincer, 1974) is estimated separately for each employment type in 2017-18 and 2023-24. Log real earnings are regressed on social-group indicators (SC, OBC, ST, with General as the reference), years of education, potential experience and its square, and an urban indicator. This is a single-equation regression and is reported as the evolution of the adjusted gap.

3. RESULTS

3.1 Aggregate real earnings and growth by employment type

Table 1. Real average earnings by employment type and social group, 2011-12 to 2023-24

Social group	2011-12 (₹)	2017-18 (₹)	2022-23 (₹)	2023-24 (₹)	CAGR (%)†	Wage ratio 2023- 24
Panel A: Regular wage / salaried (monthly ₹)						
ST	10,348.40	10,232.20	10,217.00	9,588.20	-0.6	72.1
SC	8,529.30	8,824.60	8,581.80	8,666.50	0.1	65.1
OBC	9,384.70	10,100.70	10,035.60	10,319.00	0.8	77.6
General	14,674.80	12,901.20	13,005.90	13,304.60	-0.8	100
Total	11,368.90	10,933.10	10,780.20	10,923.90	-0.3	-
Panel B: Casual labour (daily ₹)						
ST	116.7	151.3	164	181.1	3.7	78.3
SC	142.7	182.4	197.7	220.2	3.7	95.2
OBC	151.7	192.7	210.9	231	3.6	99.9
General	144.9	188.2	211.5	231.2	4	100
Total	143.7	182.9	199.6	219.7	3.6	-
Panel C: Self-employed, earnings (monthly ₹)						
ST	-	5,151.90	5,037.90	5,054.90	-0.3	58.6
SC	-	5,641.20	5,358.50	5,585.50	-0.2	64.8
OBC	-	6,876.00	6,467.10	6,751.80	-0.3	78.3
General	-	8,766.80	8,037.80	8,623.40	-0.3	100
Total	-	7,098.40	6,565.30	6,893.40	-0.5	-

† For Panel A, the 2011-12 regular weekly earnings have been converted to a monthly basis ($\times 52/12$) to match the PLFS reference period, and the CAGR is computed over the full 2011-12 to 2023-24 period on the converted series. Casual CAGR (Panel B) is over 2011-12 to 2023-24; the self-employed series (Panel C) begins in 2017-18, so its CAGR covers 2017-18 to 2023-24. Source: authors' estimates from NSS EUS 2011-12 and PLFS 2017-18 to 2023-24.

Casual labour is the only segment to record clear real growth. Daily wages rose at roughly 3.6-4.0 per cent a year across all social groups, and the SC-General ratio reached 95.2 per cent by 2023-24. This near-parity, however, reflects compression at a low floor rather than equity: casual wages are anchored close to statutory minimums, leaving little room for variation, and the absolute level, about ₹ 220 a day for SC workers, remains far below the earnings available in regular employment.

Regular salaried earnings present a very different picture once the 2011-12 figure is placed on a monthly basis. Far from the rapid growth implied by the raw weekly-to-monthly comparison, real regular wages were broadly flat over the full period and fell for some groups: between 2011-12 and 2023-24 they declined at about 0.6 per cent a year for ST and 0.8 per cent for General workers, were essentially unchanged for SC (+0.1 per cent), and rose only modestly for OBC (+0.8 per cent). The stagnation was concentrated in the first sub-period: regular real wages declined between 2011-12 and 2017-18 before flattening thereafter, consistent with independent evidence on the post-2011 collapse in salaried-wage growth. By 2023-24 an SC regular worker earned ₹ 8,666 against ₹ 13,305 for a General worker, a ratio of 65.1 per cent, the widest of any employment type. Self-employment likewise shows real stagnation, with gross earnings drifting slightly downward for every group between 2017-18 and 2023-24 and an SC-General ratio of 64.8 per cent that mirrors the salaried penalty.

The overall picture is one of a dual burden. SC workers are concentrated in the one segment, casual labour, where growth occurred and parity is highest, but where absolute earnings are lowest; and where absolute earnings are higher, in salaried and self-employed work, they face a penalty of roughly 35 per cent that the recent growth episode did not erode.

3.2 Wage growth and gaps within industries

A natural question is whether the upper-tier gap simply reflects SC workers being clustered in low-paying industries. Table 2 addresses this by comparing earnings within broad industry groups (NIC 2008). The gap survives within sectors, which means industrial composition explains only part of it.

Table 2. Real earnings, growth, and the within-industry SC-General ratio by broad industry

Industry (NIC 2008)	SC ₹	SC CAGR %	OBC ₹	Gen ₹	Gen CAGR %	SC % of Gen
Panel A: Regular wage / salaried (monthly ₹ ; 2011-24)						
Agriculture	5,193.60	0.9	4,755.70	6,857.30	-2.3	75.7
Manufacturing	7,527.50	2	8,500.20	10,632.00	0.2	70.8
Construction	8,704.00	0.4	10,212.50	13,812.90	1.4	63
Trade, hotels & rest.	6,591.20	2.2	6,922.40	8,474.70	1.1	77.8
Transport, storage & comm.	9,812.10	0.5	13,137.00	17,784.60	0.8	55.2
Other services	9,397.10	-0.5	11,887.80	14,332.60	-1.2	65.6
Total salaried	8,671.70	0.2	10,323.30	13,310.60	-0.4	65.2
Panel B: Casual labour (daily ₹ ; 2011-24)						
Agriculture	181.3	3	180.5	178	3	101.9
Manufacturing	236.4	3.9	233.3	233.6	4.9	101.2
Construction	242.9	3	258.5	256.5	3.1	94.7
Trade, hotels & rest.	228.7	3.7	248.9	220.5	3.3	103.7
Transport, storage & comm.	256.7	3.9	291.7	285.3	3.7	90
Other services	242.2	5.6	242.3	235.6	3.4	102.8
Total casual	220.2	3.7	231.1	231.2	4	95.2
Panel C: Self-employed (monthly ₹ ;Gross 2017-24)						
Agriculture	4,574.40	-1.4	5,616.50	6,659.60	-0.6	68.7
Manufacturing	3,863.40	-4.4	5,617.50	6,706.80	-3.6	57.6
Construction	7,949.20	0.4	9,491.10	12,368.80	1	64.3
Trade, hotels & rest.	7,305.20	2.5	8,710.10	11,134.00	0.6	65.6
Transport, storage & comm.	7,482.00	1.4	8,551.60	9,753.50	1	76.7
Other services	6,768.30	0.9	8,939.10	11,435.90	-0.5	59.2
Total self-employed	5,586.20	-0.2	6,752.30	8,626.70	-0.3	64.8

CAGRs for regular (Panel A) and casual (Panel B) cover 2011-12 to 2023-24; the 2011-12 regular figures were converted to a monthly basis ($\times 52/12$) before computing growth, consistent with Table 1. Self-employed (Panel C) CAGRs cover 2017-18 to 2023-24, the period over which the series is available. Source: authors' estimates from NSSEUS 2011-12 and PLFS 2017-18 to 2023-24.

Among regular salaried workers the within-industry gap is largest in the higher-paying modern sectors. In transport, storage and communication the SC-General ratio falls to 55.2 per cent (₹9,812

against ₹17,785), and in construction to 63.0 per cent (₹8,704 against ₹13,813). Because these are comparisons within the same industry and employment type, the gap cannot be attributed to industrial sorting alone. Real regular-wage growth within industries was modest for both groups over 2011-24, generally between -2 and +2 per cent a year (Panel A), so these ratios reflect persistent structural gaps rather than divergent recent trends. In self-employment the sharpest intra-industry penalty is in manufacturing, where SC earnings are only 57.6 per cent of the General level, consistent with limited access to capital and scale. By contrast, casual labour is close to parity in every industry, and in construction, which absorbs a large share of SC casual workers, the ratio reaches 94.7 per cent, again reflecting a uniform low wage floor rather than equality of opportunity.

3.3 Contract security, enterprise type, and the institutional gradient

If sorting across industries explains only part of the gap, the terms of employment within the regular workforce may explain more. Table 3 examines non-agricultural regular workers by written-contract status and by enterprise ownership.

Table 3. Real monthly earnings of regular salaried workers by institutional protection, 2017-18 to 2023-24

Institutional metric & group	2017-18 (₹)	2023-24 (₹)	C A G R (%)	SC as % of Gen 2023-24
Panel A: By written contract type				
No written contract - SC	6,931.90	6,389.80	-1.35	70.7
No written contract - OBC	8,444.10	7,202.30	-2.62	79.7
No written contract - General	10,108.50	9,032.60	-1.86	Base
Contract □ 1 year - SC	7,151.00	8,519.30	2.96	73.6
Contract □ 1 year - General	10,579.00	11,579.90	1.52	Base
Contract 1-3 years - SC	10,519.60	8,602.60	-3.29	58.3
Contract 1-3 years - General	13,958.70	14,762.60	0.94	Base
Contract > 3 years - SC	16,257.30	15,073.60	-1.25	75.4
Contract > 3 years - General	21,114.80	20,000.70	-0.9	Base
Panel B: By enterprise type				
Public / government - SC	13,727.50	13,369.30	-0.44	75.5
Public / government - OBC	15,464.70	15,505.70	0.04	87.6
Public / government - General	18,618.40	17,698.10	-0.84	Base
Private Ltd. company - SC	9,080.20	9,261.50	0.33	56.3
Private Ltd. company - OBC	11,211.20	12,824.40	2.27	77.9
Private Ltd. company - General	15,004.40	16,454.30	1.55	Base

Non-agricultural regular salaried workers only. Source: authors' estimates from PLFS 2017-18 and 2023-24.

Formal contractual protection does not deliver wage parity. The SC penalty is present at every contract tier: SC workers without a written contract earn 70.7 per cent of the General wage, and even those with the most secure long-term contracts (more than three years) reach only 75.4 per cent. The gap is in fact widest in the 1-3 year bracket (58.3 per cent), where SC real wages fell at 3.3 per cent a year while General wages held steady.

The enterprise-ownership contrast is the most striking result. In public and government employment, where reservation policy applies, the SC ratio is comparatively bounded at 75.5 per cent. In the private limited-company sector, where reservation does not apply, the ratio falls to 56.3 per cent: SC corporate wages stagnated (0.33 per cent a year) while General wages grew robustly (1.55 per cent a year), so an SC regular worker in a private firm earns close to half of a General-category worker. This finding suggests that the institutional setting, and specifically the presence or absence of affirmative-action coverage, is associated with the size of the caste earnings gap. This pattern is consistent with earlier evidence that wage discrimination against lower-caste workers is more pronounced in the private than in the public sector (Madheswaran & Attewell, 2007).

3.4 The adjusted gap and its trend

To check whether the raw gaps survive adjustment for observable characteristics, Table 4 reports semi-log earnings regressions by employment type for 2017-18 and 2023-24. Coefficients on the social-group indicators are read relative to the General category; the implied percentage gap is $(e^{\beta} - 1) \times 100$.

Table 4. Mincerian earnings functions by employment type, 2017-18 and 2023-24 (dependent variable: log real earnings)

Variable	(1) Reg. 2017	(2) Reg. 2023	(3) Cas. 2017	(4) Cas. 2023	(5) Self 2017	(6) Self 2023
SC	-0.123*** (0.009)	-0.119*** (0.007)	-0.034*** (0.006)	-0.039*** (0.005)	-0.187*** (0.009)	-0.161*** (0.008)
OBC	-0.086*** (0.007)	-0.078*** (0.006)	-0.022*** (0.006)	-0.041*** (0.005)	-0.089*** (0.007)	-0.062*** (0.006)
ST	0.034*** (0.010)	-0.043*** (0.009)	-0.054*** (0.007)	-0.085*** (0.006)	-0.093*** (0.009)	-0.003 (0.009)
Education (years)	0.081*** (0.001)	0.057*** (0.001)	0.009*** (0.001)	0.007*** (0.001)	0.030*** (0.001)	0.023*** (0.001)
Experience	0.035*** (0.001)	0.026*** (0.001)	0.010*** (0.001)	0.010*** (0.000)	0.026*** (0.001)	0.029*** (0.001)
Experience ²	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
Urban	0.214*** (0.007)	0.184*** (0.005)	0.042*** (0.005)	0.068*** (0.004)	0.217*** (0.007)	0.198*** (0.006)
Constant	7.388*** (0.035)	7.576*** (0.025)	4.611*** (0.014)	4.797*** (0.012)	7.150*** (0.021)	7.007*** (0.017)
N	40,202	45,715	26,039	27,196	56,549	70,548
R ²	0.447	0.622	0.492	0.517	0.325	0.481

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Reference group: General category.
 Source: authors' estimates from PLFS 2017-18 and 2023-24.

The adjusted gaps confirm the descriptive picture. In regular salaried work the SC penalty is stable at about -11.6 per cent in 2017-18 and -11.2 per cent in 2023-24, even after holding education, experience, location and sector constant, so observable human capital explains much, but not all, of the raw 35 per cent gap. In casual labour the adjusted penalty is small but rising, from -3.3 to -3.8 per cent. In self-employment it is largest, easing from -17.1 to -14.9 per cent but remaining severe, consistent with non-wage barriers to enterprise such as capital and credit access. The ST coefficient for regular workers turns from positive in 2017-18 to negative in 2023-24, indicating a deterioration in relative position that warrants separate attention.

4. DISCUSSION AND POLICY IMPLICATIONS

Read together, the tables describe a labour market in which a phase of nominal wage growth left the caste structure of earnings largely intact. The benefits of growth in real terms accrued mainly to casual workers, the segment where SC workers are over-represented but where absolute pay is lowest and capped near subsistence. In the better-paid regular and self-employed segments, where escaping low pay is actually possible, real earnings stagnated over 2017-24 and the SC disadvantage of roughly one-third persisted.

The institutional results carry the clearest policy message. Because the SC gap is bounded in public employment but reaches its maximum in private limited companies, the extension of affirmative-action principles, transparent pay scales, and anti-discrimination monitoring into the private corporate sector emerges as a priority. The persistence of the gap across all contract tiers further suggests that simply formalising employment and issuing written contracts will not by itself secure wage parity. For self-employed SC workers, the depth and persistence of the earnings deficit, especially in manufacturing, points to credit access, asset support, and market linkages rather than wages per se as the binding constraints.

5. CONCLUSION

This paper has tracked real earnings growth across India's social groups from 2011-12 to 2023-24, distinguishing regular, casual and self-employed work and examining gaps within industries, contract tiers and enterprise types. The central finding is that recent wage growth has been concentrated in low-paid casual labour and has not narrowed the substantial caste gaps that dominate the salaried and self-employed segments, where SC workers earn about 65 per cent of the General level and where a stable adjusted penalty of around 11 per cent remains after controlling for human capital. The gap is widest precisely where institutional protection is weakest. These descriptive patterns motivate a fuller decomposition and causal analysis in subsequent work, but on their own they establish that growth, formalisation, and entry into regular employment have not been sufficient to deliver earnings convergence for Scheduled-Caste workers.

Limitations. The 2011-12 regular earnings have been converted from a weekly to a monthly basis to align with the PLFS reference period; while the resulting growth rates are robust to the choice of conversion factor and consistent with independent estimates, the two surveys also differ in coverage and method, so cross-round comparisons should be read as indicative rather than exact. The self-employed measure is gross enterprise income rather than a labour wage, and the regression residual reflects all unobserved factors, not discrimination alone. These issues are flagged where relevant and bound the interpretation accordingly.

REFERENCES

- Banerjee, B., & Knight, J. B. (1985). Caste discrimination in the Indian urban labour market. *Journal of development Economics*, 17(3), 277-307.
- Borooah, V. K. (2005). Caste, inequality, and poverty in India. *Review of development economics*, 9(3), 399-414.
- Deshpande, A. (2011). *The grammar of caste: Economic discrimination in contemporary India*. Oxford University Press.
- International Labour Organization. (2018). India Wage Report: Wage Policies for Decent Work and Inclusive Growth. *New Delhi: ILO Decent Work Team for South Asia and Country Office for India*.
- Ito, T. (2009). Caste discrimination and transaction costs in the labor market: Evidence from rural North India. *Journal of development Economics*, 88(2), 292-300.
- Madheswaran, S., & Attewell, P. (2007). Caste discrimination in the Indian urban labour market: Evidence from the National Sample Survey. *Economic and political Weekly*, 42(41), 4146-4153.
- Mincer, J. (1974). Schooling, experience, and earnings. *Human behavior & social institutions* no. 2.
- National Sample Survey Office. (2013). *Employment and unemployment situation in India, NSS 68th Round (2011-12)*. New Delhi: Ministry of Statistics and Programme Implementation, Government of India.
- National Statistical Office. (2018-2024). *Annual report, Periodic Labour Force Survey (PLFS), 2017-18 to 2023-24*. New Delhi: Ministry of Statistics and Programme Implementation, Government of India.
- Srivastava, R., & Padhi, B. (2020). Collapse in wage/salary income growth in India, 2011-12 to 2017-18. *Center for Employment Studies Working Paper Series*, 53(9).
- Thorat, S., & Neuman, K. S. (2012). *Blocked by caste: Economic discrimination in modern India*. Oxford University Press.

VIKSIT BHARAT 2047: A VISION FOR THE SUSTAINABLE DEVELOPMENT OF INDIA : AN EMPIRICAL FRAMEWORK FOR INDIA'S CENTENARY TRANSFORMATION

Dr. Archana Upadhyay*

ABSTRACT

The "Viksit Bharat 2047" Vision symbolizes India's premeditated road map to progression from a developing economy to a developed Nation with the celebration of its 100th year of independence. This paper pays an empirical framework to assess the possibility and the efficiency of this vision, converging mainly on four critical pillars of the outline which can namely be referred as economic growth, social inclusion, environmental sustainability, and technological innovation. By exploring current macroeconomic indicators—including a projected GDP of \$30 trillion and a move towards a green economy—this study categorizes the structural reforms which is necessary to sustain a 7–8% yearly growth rate. The results underline that India is on a high-growth path, as India approaches its centenary of independence, the "Viksit Bharat 2047" vision aims to renovate the nation into a \$30 trillion developed economy. The vision of Viksit Bharat 2047 signifies a momentous opportunity to transform India into a wealthy, equitable, and sustainable global leader. Empirical evidence specifies that the nation has already established a strong foundation through its Digital Public Infrastructure, rapid renewable energy adoption, and significant progress in multidimensional poverty reduction. However, the transition to a \$30 trillion economy requires more than just capital investment; it demands a radical structural shift toward higher-productivity manufacturing and a commitment to absolute decoupling from environmental degradation.

Keywords: *Viksit Bharat 2047, Green Economy, Economic Growth, Social Inclusion , Environmental Sustainability, Technological Innovation.*

INTRODUCTION

India's journey towards becoming a developed nation by 2047, the centenary of its independence, is encapsulated in the vision of "Viksit Bharat 2047." This ambitious goal envisions transforming India into a global powerhouse characterized by robust economic growth, social equity, technological innovation, and sustainable development. By 2047, India aims to be a key player in global affairs, contributing to peace, trade, and sustainable development. Strategic partnerships and active participation in international forums will reinforce India's stature as a responsible global power. Viksit Bharat 2047 is a multidimensional vision that requires coordinated efforts across government, industry, academia, and civil society. It embodies India's aspirations for prosperity, equity, and sustainability, setting a roadmap for the nation's future.

* Assistant Professor & Head , Department of Commerce , Rajendra College , Jai Prakash University , Chapra , Bihar

ECONOMIC GROWTH AND INDUSTRIAL DEVELOPMENT

Achieving Viksit Bharat 2047 requires sustained economic expansion driven by modernization of agriculture, growth of manufacturing, and a thriving services sector. Emphasis on Make in India initiatives, digital infrastructure, and skill development programs will create millions of jobs and enhance productivity. Encouraging entrepreneurship and innovation through start-up ecosystems will further fuel economic dynamism. A pivotal element of Viksit Bharat 2047 is sustained and inclusive economic growth. This will be driven by the modernization of agriculture through the adoption of advanced technologies such as precision farming, biotechnology, and improved irrigation methods. Enhancing agricultural productivity will ensure food security and increase farmers' incomes. Simultaneously, the manufacturing sector will be revitalized through initiatives like Make in India, focusing on high-value industries, export competitiveness, and supply chain resilience. The services sector, including IT, finance, and tourism, will continue to expand, leveraging India's demographic dividend and digital infrastructure. Policies that encourage innovation, entrepreneurship, and start-up ecosystems will create millions of jobs and foster a culture of creativity and risk-taking. Investment in infrastructure, ease of doing business, and regulatory reforms will further catalyze industrial growth.

EDUCATION AND SKILL EMPOWERMENT

A cornerstone of Viksit Bharat 2047 is a strong, inclusive education system that equips citizens with relevant skills for the future economy. Universal access to quality education, integration of technology in learning, and vocational training aligned with industry needs will empower the youth. Lifelong learning and upskilling will be key to adapting to evolving global trends. Education is the backbone of a developed society. Viksit Bharat 2047 emphasizes universal access to quality education that is equitable and inclusive. The education system will be transformed to focus on critical thinking, creativity, and problem-solving skills, moving beyond rote learning. Integration of technology in classrooms, digital learning platforms, and personalized education will bridge gaps in access and quality. Vocational training and skill development programs will be aligned with industry demands, preparing the youth for emerging sectors such as artificial intelligence, renewable energy, and biotechnology. Lifelong learning initiatives will enable continuous skill enhancement, ensuring adaptability in a rapidly changing global economy. Special focus will be placed on empowering women and marginalized communities through education and skill-building, fostering social mobility and economic participation.

HEALTHCARE AND WELL-BEING

Ensuring accessible, affordable, and quality healthcare for all citizens is fundamental to the vision. Strengthening primary healthcare infrastructure, promoting preventive care, and leveraging digital health technologies will improve population health. A healthy workforce will contribute significantly to national productivity and social development. A healthy population is essential for national progress. Viksit Bharat 2047 prioritizes accessible, affordable, and high-quality healthcare for all citizens. Strengthening primary healthcare infrastructure, especially in rural and remote areas, will be fundamental. Emphasis on preventive healthcare, nutrition, and awareness campaigns will reduce the burden of communicable and non-communicable diseases. The adoption of digital health technologies, telemedicine, and AI-powered diagnostics will enhance service delivery and patient outcomes. Investments in medical research, pharmaceutical innovation, and healthcare workforce training will position India as a leader in global health. Mental health and well-being will receive

greater attention, recognizing their impact on productivity and social harmony.

INFRASTRUCTURE AND URBANIZATION

Modern infrastructure including smart cities, efficient transportation networks, renewable energy systems, and digital connectivity will be pivotal. Sustainable urbanization strategies will address challenges of population growth, pollution, and resource management. Rural development will be enhanced through improved connectivity and access to basic amenities.

ENVIRONMENTAL SUSTAINABILITY

Balancing development with ecological preservation is essential. Viksit Bharat 2047 aims to integrate green technologies, promote renewable energy, and enforce stringent environmental regulations. Conservation of natural resources and climate resilience will ensure long-term sustainability. Sustainable development is central to the vision of Viksit Bharat 2047. India aims to harmonize economic growth with ecological preservation by integrating green technologies across sectors. This includes widespread adoption of renewable energy, energy-efficient practices, and circular economy models that minimize waste. Conservation of biodiversity, forests, and water resources will be prioritized to maintain ecological balance. Climate resilience strategies will be implemented to mitigate the impacts of climate change on vulnerable populations and sectors such as agriculture. Environmental regulations will be strengthened and enforced rigorously to prevent degradation. Public awareness and community participation in environmental conservation will be promoted to foster a culture of sustainability.

SOCIAL INCLUSION AND GOVERNANCE

Inclusive growth that reduces disparities across regions, genders, and communities is critical. Strengthening democratic institutions, transparency, and citizen participation will enhance governance. Social welfare programs aimed at poverty alleviation and empowerment of marginalized groups will foster equitable development. Inclusive growth is essential for a harmonious and equitable society. Viksit Bharat 2047 aims to reduce disparities across regions, genders, castes, and communities through targeted social welfare programs. Empowerment of marginalized groups will be facilitated by improving access to education, healthcare, and economic opportunities. Gender equality will be advanced through legal reforms, awareness campaigns, and support systems that promote women's participation in all spheres. Strengthening democratic institutions, transparency, accountability, and citizen participation will enhance governance quality. Digital governance platforms will improve service delivery, reduce corruption, and increase public trust. Social safety nets and poverty alleviation programs will ensure that no citizen is left behind in the development process.

TECHNOLOGICAL SOVEREIGNTY AND THE FRONTIER TECH HUB

A decisive lever for the Viksit Bharat transition is the pervasive integration of Artificial Intelligence (AI) and other frontier technologies across the economy. The NITI Aayog strategic roadmap positions AI as a catalyst capable of contributing towards the 2035 GDP goal. This technological jumping is categorized into two primary value-creation levers: accelerating AI adoption across traditional industries to improve efficiency and transforming Research and Development (R&D) to lead innovation-driven global opportunities. Connecting the power of AI, big data, and emerging technologies will drive efficiency across sectors. Digital India initiatives will bridge the digital divide, enhance governance, and provide access to services. The innovation hubs and the research institutions

will definitely position India as a global leader in the area of the science and Technology. There is need of heavy investment in the area of Research Development nurturing the innovation hubs, start-up incubators, and partnerships between academic institutions and the industries. Artificial intelligence, big data analytics, blockchain, and the Internet of Things will be integrated across sectors to improve efficiency and productivity of any institution. Digital India initiatives will bridge the digital divide by expanding internet access and digital literacy, enabling citizens to benefit from e-governance, online education, telemedicine, and digital financial services. Cybersecurity and data privacy will be prioritized to build trust in digital platforms. By positioning itself as a global leader in science and technology, India will attract investment, talent, and partnerships that drive sustained innovation.

AN OVERVIEW TOWARDS THE JOURNEY

India's journey towards becoming a developed nation by 2047, the centenary of its independence, is encapsulated in the vision of "Viksit Bharat 2047." This ambitious goal envisions transforming India into a global powerhouse characterized by robust economic growth, social equity, technological innovation, and sustainable development. Achieving this vision requires a comprehensive and integrated approach across multiple sectors, ensuring that progress is inclusive, resilient, and forward-looking. The vision of Viksit Bharat @ 2047 represents a fundamental reorientation of the Indian developmental trajectory, shifting from an era of incremental progress to a paradigm of transformative leapfrogging. This strategic framework, designed to coincide with the centenary of the nation's independence, articulates an ambitious roadmap to evolve India into a fully developed, self-reliant, and high-income economy. Central to this transition is the recognition that the status of a "developed nation" transcends mere fiscal metrics, encompassing advanced human development, robust technological sovereignty, and a sophisticated governance ecosystem that ensures equitable growth for all citizens.

There are 5 themes of Viksit Bharat, which are as follows:

- Empowered Indians (Health, Education, Nari Shakti, Sports, Culture, Caring Society)
- Thriving and Sustainable Economy (Industry, Energy, Agriculture, Infrastructure, Services, Green Economy, Cities).
- Innovation, Science and Technology (Research and Development, Startups, Digital)
- Good Governance and Security.
- India in the World.

CRITICAL CHALLENGES TO DEVELOPED STATUS

Despite rapid progress, researchers identify systemic hurdles that must be addressed to ensure the transition is inclusive and sustainable:

- **The Middle-Income Trap:** To avoid stagnation, India must successfully reallocate labor from low-productivity agriculture (which still engages 45.8% of the workforce) to higher-value manufacturing and technology sectors.
- **Social and Regional Disparities:** While multidimensional poverty has declined, inequality continues to reduce India's potential HDI by roughly 30.7%, particularly in areas of gender parity and rural-urban access.
- **Environmental Stewardship:** Achieving "Viksit Bharat" requires balancing growth with Net Zero 2070 goals, necessitating a forty-fold increase in non-fossil energy sources and significant investment in climate-resilient agriculture.

KEY PILLARS AND FOCUS AREAS

The Viksit Bharat initiative is underpinned by several key frameworks that guide its implementation. At its core are the four pillars identified by the government: Yuva (Youth), Garib (Poor), Mahilayen (Women), and Annadata (Farmers). These pillars represent the key demographic and occupational groups whose empowerment and progress are central to India's development. Additionally, Prime Minister Narendra Modi has articulated six pillars for Viksit Bharat, emphasizing specific areas of focus: making India a global manufacturing hub, reviving the glory of Indian knowledge systems, ensuring global presence of Indian products, powering green energy, expanding tourism, and promoting inclusive global development. This framework highlights both economic and cultural dimensions of the vision.

Furthermore, the initiative is structured around five broad themes that provide a comprehensive approach to achieving its objectives: Empowered Indians, Thriving and Sustainable Economy, Innovation, Science and Technology, Good Governance and Security, and India in the World. These themes encompass various aspects of national development, from human capital to economic growth and international relations. In terms of specific sectors, Viksit Bharat prioritizes agriculture, Micro, Small, and Medium Enterprises (MSMEs), investment, and exports as key drivers of economic transformation. The manufacturing and services sectors are also considered crucial for achieving the desired growth trajectory. The initiative also strategically focuses on 'sunrise sectors' such as digital public infrastructure, renewable energy, and overall technological advancement to propel India into the future. The existence of these multiple frameworks—four pillars, six pillars, and five themes—suggests a comprehensive and multifaceted strategy. However, ensuring effective coordination and coherence across these various layers will be paramount for the successful realization of the Viksit Bharat vision.

STRATEGIES AND POLICY FRAMEWORK

The National Institution for Transforming India (NITI Aayog) plays a central role in the Viksit Bharat initiative, functioning as the apex public policy think tank of the Government of India. NITI Aayog has been instrumental in preparing the foundational document, "Vision for Viksit Bharat @ 2047: An Approach Paper," which outlines the strategic direction for achieving developed nation status. The initiative emphasizes a collaborative approach with state governments, fostering a spirit of "Team India" to ensure coordinated action towards the shared vision.

Several national programs and initiatives are integral to the Viksit Bharat strategy. Key among these are Make in India and Aatmanirbhar Bharat, which aim to boost domestic manufacturing and reduce import dependence. The Digital India initiative seeks to expand internet access, promote digital literacy, and enhance e-governance. The Skill India Mission focuses on equipping the youth with relevant skills to enhance their employability. The PM Gati Shakti Master Plan aims to integrate infrastructure projects across sectors for expedited development. The National Education Policy (NEP) 2020 introduces transformative reforms in the education sector. These programs collectively aim to create a robust ecosystem for India's development.

The policy framework for **Viksit Bharat 2047** is implemented through a series of statutory overhauls and mission-mode initiatives established as of early 2026. The primary legislative and budgetary details are outlined below:

1. THE VB-G RAM G ACT, 2025 (RURAL DEVELOPMENT)

This legislation represents a fundamental restructuring of India's rural employment guarantee, replacing the MGNREGA with a supply-driven framework focused on high-quality asset creation.

- **Employment Guarantee:** It increases the statutory wage employment guarantee from 100 to 125 days per rural household per financial year.
- **Infrastructure verticals:** Works are categorized into four priority domains: water security (groundwater recharge), core rural infrastructure (roads/connectivity), livelihood infrastructure (markets/storage), and extreme weather mitigation.
- **Agricultural Alignment:** States must notify a 60-day "pause" in public works during peak sowing and harvesting seasons to ensure labor availability for farmers and prevent wage inflation.
- **Technology & Transparency:** The Act mandates AI-based fraud detection, biometric authentication, and weekly wage payments.
- **Funding Ratio:** Costs are shared 60:40 between the Centre and States (90:10 for North-Eastern/Himalayan states), with funding capped via normative allocations based on objective development parameters.

2. NATIONAL MANUFACTURING MISSION (NMM)

Launched to replace "Make in India," the NMM aims to raise manufacturing's contribution to GDP to 25% by 2025–2026.

- **Focus Sectors:** Specific incentives are provided for electronics, EV batteries, solar PV cells, toys, and leather.
- **MSME Support:** Investment and turnover limits for MSME classification have been enhanced by 2.5 and 2 times respectively to achieve efficiencies of scale.
- **Clean Tech:** The mission prioritizes domestic value addition in the green energy ecosystem, including wind turbines and grid-scale batteries.

3. URBAN CHALLENGE FUND (UCF)

With ₹1 lakh crore allocated, the UCF marks a shift toward performance-linked urban financing.

- **Funding Model:** The Centre finances up to 25% of the cost for "bankable" projects, while cities must raise at least 50% through municipal bonds, bank loans, or Public-Private Partnerships (PPPs).
- **Objectives:** Projects must focus on transforming cities into "Growth Hubs," creative city redevelopment, and sustainable water/sanitation systems.

4. NATIONAL MISSION: DIGITAL SHRAMSETU (INFORMAL WORKFORCE)

Targeting 490 million informal workers, this mission aims to formalize their livelihoods using frontier technologies.

- **Core Levers:** Use of voice-first AI interfaces to remove literacy barriers, blockchain-based smart contracts to guarantee payments, and micro-credentials to validate skills.
- **Impact Goal:** To prevent a scenario where informal incomes stagnate at \$6,000, aiming instead for the \$14,500 threshold required for high-income status.

5. GYAN BHARATAM MISSION (CULTURAL INFRASTRUCTURE)

This mission seeks to secure India's vast intellectual heritage through a ₹60 crore budget.

- **Digitization:** Identifies and digitizes over 1 crore manuscripts across 80+ languages using AI-assisted Handwritten Text Recognition (HTR).
- **Accessibility:** Establishment of a National Digital Repository of Indian Knowledge Systems (IKS) with a goal of 100% online accessibility by 2030.

6. INSTITUTIONAL & FINANCIAL REFORMS

The 2025–2026 framework introduces deep structural changes to fuel growth:

- **Financial Markets:** Reforms to deepen the corporate bond market and the creation of a 'Partial Credit Enhancement Facility' for infrastructure bonds.
- **FDI & Taxation:** Raising the FDI limit in the insurance sector from 74% to 100% (conditional on local premium investment) and raising the personal income tax exemption limit to ₹12 lakh.

RECOMMENDATIONS AND WAY FORWARD

To effectively pursue the Viksit Bharat vision and overcome the identified challenges, several policy recommendations emerge from the analysis. A continued and strengthened focus on bolstering the manufacturing sector and enhancing export competitiveness is crucial for driving economic growth and creating employment opportunities. The government must also maintain its strong emphasis on infrastructure development across all sectors, including physical and digital infrastructure, while actively seeking to attract greater private investment to supplement public funds.

Investing in human capital remains paramount. This requires a continued focus on improving the quality and accessibility of education at all levels, alongside robust skill development and vocational training programs to enhance the employability of India's youth. Promoting innovation, fostering a strong research and development ecosystem, and encouraging the adoption of advanced technologies across sectors will be crucial for enhancing productivity and global competitiveness. Strengthening governance mechanisms, continuing the efforts to reduce corruption, and further improving the ease of doing business will create a more conducive environment for economic activity. A strong emphasis on sustainable development and green growth is essential to ensure long-term environmental and economic well-being. Finally, intensive efforts are needed to address income inequality and ensure that the benefits of economic growth are shared by all segments of the population. A collaborative approach involving the government, private sector, and active citizen participation will be essential to navigate the complexities of this journey.

CONCLUSION: A ROAD TO CENTENARY

The vision of Viksit Bharat @ 2047 is a comprehensive blueprint that integrates economic ambition with social conscience and technological foresight. It acknowledges that the journey to a economy requires more than just fiscal growth; it requires the holistic empowerment of the Yuva, Garib, Mahilayen, and Annadata. By leveraging its demographic dividend, embracing the AI revolution, and committing to sustainable green growth, India is positioning itself as a global leader in the 21st century. The Viksit Bharat initiative represents a bold and ambitious vision for India's future, aiming to transform the nation into a developed country by its centennial year of independence in 2047. The

analysis indicates that while the targets set are challenging, they are potentially achievable with sustained commitment and effective implementation of well-defined strategies. The initiative's comprehensive approach, encompassing economic growth, social progress, environmental sustainability, and good governance, reflects a holistic understanding of development. The active engagement of various stakeholders, particularly the youth, in shaping this vision underscores the importance of a participatory approach. The economic growth projections, while ambitious, are deemed feasible by various experts and institutions, contingent upon the implementation of deep structural reforms and a consistent focus on key growth drivers such as manufacturing, services, exports, infrastructure development, and technological innovation. Addressing the existing social and environmental challenges, including inequality, access to quality services, and climate change, will be crucial for ensuring that the envisioned brighter future is inclusive and sustainable for all citizens. Realizing the bold vision of Viksit Bharat will require unwavering dedication, effective coordination between different levels of government, and the collective effort of all Indians. With sustained commitment and strategic action, India can indeed achieve its aspiration of becoming a developed nation by 2047, ushering in an era of greater prosperity and well-being for its people.

The vision of Viksit Bharat 2047 represents a historic opportunity to transform India into a wealthy, equitable, and sustainable global leader. Empirical evidence indicates that the nation has already established a strong foundation through its Digital Public Infrastructure, rapid renewable energy adoption, and significant progress in multidimensional poverty reduction. However, the transition to a \$30 trillion economy requires more than just capital investment; it demands a radical structural shift toward higher-productivity manufacturing and a commitment to absolute decoupling from environmental degradation.

REFERENCES

- Bhatia, A. K., Singhal, G., & Arora, M. S. (2024). Towards an Empowered India: Women's Role in Achieving the Viksit Bharat 2047 Vision. In *Proceedings of the 2nd ICSSR Conference on "India Towards Viksit Bharat (Vol. 2047, pp. 13th-14th)*.
- Chopra, R., & Bisht, C. (2024). Charting The Course Towards Viksit Bharat: A Comprehensive Exploration Of India's Path To Development. *Educational Administration: Theory and Practice*, 30(5), 9023-9033.
- Kaur, A., & Sharma, S. (2021). Gender disparities in education: A comparative analysis of Viksit Bharat's progress towards gender parity. *Gender & Society*, 35(3), 369-387.
- Desai, S., & Bhatt, E. (2020). Equity in education: An analysis of access to primary education in rural India. *International Journal of Educational Development*, 76, 102226.
- Kapoor, R., & Mehta, A. (2020). Bridging the digital divide: A study of internet access and usage patterns in rural India. *Information Technology for Development*, 26(3), 1-22.
- Mishra, A., & Mohanty, A. (2019). Teacher quality and student achievement: Evidence from India. *Economics of Education Review*, 72, 105-117.
- Kumar, A., & Kumar, A. (2017). Skill development in India: The challenge of reaching the unreached. *Journal of Vocational Education & Training*, 69(4), 516-535.
- India Vision 2020 – Planning Commission of India. (2002). *India Vision 2020*. Government of India.

National Institutional Ranking Framework (NIRF) – Ministry of Education, Government of India. (2024). NIRF Report.

Economic Survey of India 2023-24 – Ministry of Finance, Government of India. (2024).
Economic Survey of India 2023-24.

Sustainable Development Goals (SDGs) – United Nations. (2015). Transforming our World:
The 2030 Agenda for Sustainable Development.

The India Story: A Vision of a Developed India in 2047 – CII and KPMG. (2018). The India
Story: A Vision of a Developed India in 2047.

BRIDGING THE GENDER GAP THROUGH DIGITAL FINANCE: A STUDY ON WOMEN'S FINANCIAL INCLUSION IN INDIA

Akansha Singh* and Dr Bhartendu Kumar Chaturvedi**

ABSTRACT

Financial inclusion impacts the growth and productivity of women through digital transformation in India. The uneven distribution of the benefits of digital finance services has widened the gender digital divide. This paper analyses the usage and extent of the gender gap in digital financial inclusion in India. It includes multiple dimensions of empowerment, like social, economic, educational, digital inclusion, digital awareness, and financial empowerment. The key indicators, such as mobile phone ownership, bank account ownership, mobile phone use for financial transactions, bank account and mobile phone for financial transactions, media exposure, and decision-making, are analysed to understand the gender gap in digital financial inclusion. This study is based on secondary data from various sources, such as the National Family Health Survey-5 (NFHS-5), including the different initiatives and sources explained in this paper for the condition of women in India such as Pradhan Mantri Jan Dhan Yojana (PMJDY), Global Findex Report, Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMGDISHA), Jan Dhan-Aadhaar-Mobile (JAM), Pradhan Mantri Mudra Yojana (PMMY), and Stand-Up India. In the present study, descriptive statistics for percentages & growth trends, comparative analysis on digital financial inclusion of men and women are studied through graphs and charts for trend representation. This research paper used the qualitative comparative analysis and descriptive approach to examine the gender gap in India. The statistical tools STATA and MS-Excel are used for data analysis and interpretation. To understand the difference in digital access and gender gap among males and females, descriptive statistics and graphical analysis are used in this study. Also, figure and summary tables are used in this study to visualise the gender gaps across states and indicators. The findings of this reveal that northern states like Bihar, Rajasthan, Jharkhand, and Madhya Pradesh still lag in providing digital financial inclusion for women and even lag in socio-economic variables. In comparison to these southern states like Kerala, Goa, Mizoram, and Himachal Pradesh, outperform in digital financial inclusion and ownership of digital tools. The largest gender gap is seen in states like Rajasthan, Jharkhand, and Telangana in digital financial inclusion and media exposure, while the smallest gap is seen in Meghalaya, Sikkim, and Himachal Pradesh in digital asset ownership and digital financial inclusion. It will improve the internet penetration, smartphone ownership, digital literacy rates, and digital financial inclusion. Digitalisation of women will create a pathway for further opportunities and growth in all sectors.

*Research Scholar, University of Allahabad,

**Associate Professor, University of Allahabad

Keywords: *Women Empowerment, Digital India, Financial inclusion, NFHS reports, and Descriptive statistics.*

INTRODUCTION

India is becoming a digitalised country that empowers society and promotes digital inclusion in the economy. The challenges faced by Digital India are integrating digital awareness and accessibility with the digital financial services. **Mahatma Gandhi** says that "The soul of India resides in the villages." For India's development, the village must be developed. The development of villages is possible only when the participation of women as well as men in the village is equal, as the total population of India, which is 72.2%, resides in the village, out of which almost half of the population are women. Empowerment is a term understood by making decisions and choices, taking action and controlling one's life, control over resources, and ideology.

Empowerment of women has brought a positive change towards socio-economic and political progress in India (**Pardhasaradhi & Rao, 2014**). Women's Empowerment implies promoting social, economic, and political rights through equality and dignity, access to resources, opportunities, services, healthcare, education, banking, communication tools and so on. Information and Communication Technology (ICT) acts as a bridge between abundant access to ICT services (information-rich) and a lack of such access (information-poor) (**Khan & Ghadially, 2010**). Women face a lot of problems, like illiteracy, time scarcity, mobility barriers, along with cultural and religious taboos, which could be tackled by ICT (**Singh et al., 2018**). ICT acts as a tool to benefit women's empowerment with various ICT like computers, internet and software applications which work for women in education, health and adult literacy (**Patil et al., 2009**).

Digital transformation has made a remarkable place in the developed nations and is growing rapidly in developing countries like India. Government-like initiatives like the Digital India Program (DIP) increase the adoption and involvement of digital technology in day-to-day life (**Sindakis & Showkat, 2024**). India can drive economic growth through digital technology, which encourages access to and use of digital information and services to empower women. To encourage rural areas' digital inclusivity and reduce the gender digital divide, government initiatives like DIP provide digital accessibility, services and resources to women. All this effort will work positively in support of digital literacy, promoting cashless transactions, and financial inclusion of women to empower them digitally.

The availability of financial products and services to individuals and businesses in responsibly and sustainably is known as financial inclusion (**PIB Headquarters, 06 Aug 2025**). Digital financial services are widely adopted through digital devices (mobile phones and computers) and digital platforms (Paytm, PhonePe, or Google Pay). It's easily accessible for financial transactions through mobile phone, which brings transparency, flexibility, and payment transactions, and encourages women entrepreneurs to start their own businesses. As per the (**Global Findex 2025 report**) of the World Bank, females are 8% less likely to own a mobile phone than men. Also, **PMJDY** rose sharply in women's bank account ownership from 80% in 2017 to 89% in 2024. Further (**Global Findex 2025 report**) gender gap had come down from 15.79% in 2014 to 11.48% in 2024 in usage of digital payments. Also, usage of digital payments nearly tripled by women, while men usage increased from 29.98% to 54.15% over the same period. In Asia and the Pacific regions, women are less likely to have an account in financial institutions than men (**The Indian Forum, 2025**). (**India Brand Equity**

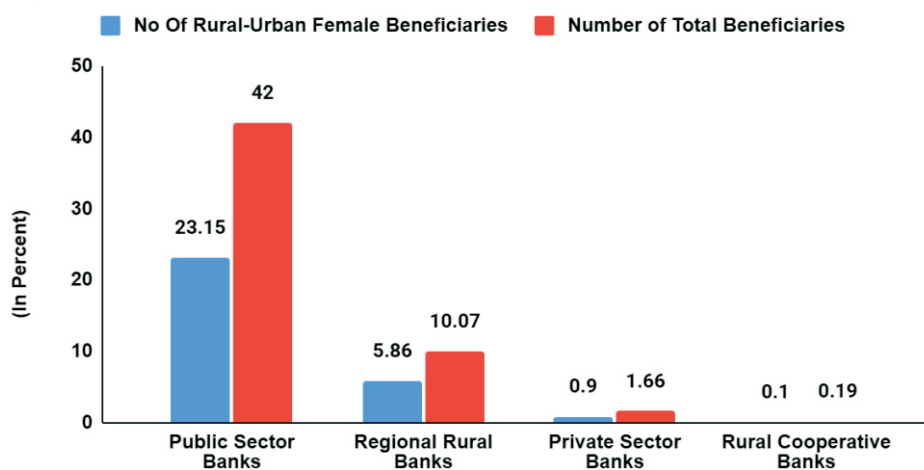
Foundation, 29 Aug 2025) 55% of accounts are held by women, and bridge the gender gap with 86% of Indian women owning an account under **PMJDY** as a financially inclusive program in India.

Gender equality in financial inclusion is important as it impacts women's economic opportunities, control over financial decisions, reduces cyber-crimes, prevents exploitation, and increases productivity. Until the early 2000s, women relied on informal credit sources- Self-help groups(SHG), local moneylenders, and community networks. They lack formal banking institutions, which remain unexplored. Financial inclusion began in the early 2000s when policymakers recognised that inclusive finance is a drive for economic development, productivity, and social empowerment. A major shift in the 2010s, seen by **Jan Dhan-Aadhaar-Mobile (JAM)** trinity transformed and also launched with **Pradhan Mantri Jan Dhan Yojana(PMJDY)**. **Pradhan Mantri Mudra Yojana (PMMY)** has sanctioned over 30.64 crore (69%) of its loans to women as of November 2023. The **Stand-Up India** Scheme has sanctioned over 75% of its loans to women entrepreneurs.

The government has initiated programs like Startup India, Stand-Up India, and Digital India Program, which significantly changed the scenario of women in the digital world. Along with these initiatives **Pradhan Mantri Gramin Digital Saksharta Abhiyan (PMDGISHA)** scheme is for digital literacy and skills to the rural population, particularly women. Through the DIP, there has been an increase in transparency, reduction of corruption, and improvement in the efficiency of public service delivery, which is a time and cost-effective process as the availability of government services is available to citizens.

In Figure 1, as per **Pradhan Mantri Jan-Dhan Yojana (PMJDY)**, the beneficiaries of banks in India show the rural-urban female beneficiaries and total beneficiaries provided by Pradhan Mantri Jan-Dhan Yojana. It indicates that the number of rural urban beneficiaries in public sector banks is 23.15%, regional rural banks is 5.86, private sector banks is 0.9%, and rural cooperative banks is 0.1%. While the total beneficiaries are 42% in public sector banks, 10.07% in regional rural banks, 1.66% in private sector banks, and 0.19% in rural cooperative banks. It reveals that the largest share is owned by public sector bank accounts for both total and female beneficiaries.

Figure 1 Bank Beneficiaries in India



Source: Pradhan Mantri Jan-Dhan Yojana (Beneficiaries as on 30/10/2024)

LITERATURE REVIEW

Studies indicate that to enable women's empowerment in the form of voice and participation in public discourse, ICTs play a crucial role (**Shirazi, 2012**), economic empowerment through labour market inclusion (**Nikulin, 2017**), or social and psychological empowerment through education and digital literacy (**Khan & Ghadially, 2010**). Benefitting women through ICT-driven empowerment, it's important to bridge the gender digital divide (**Singh et al., 2018**). While **Shirazi (2012)** adopts a socio-political lens to examine how Iranian women used blogging as a form of resistance, **Patil et al. (2009)** and **Pardhasaradhi & Rao (2014)** present case-study-based analyses of rural ICT initiatives in India, contrasting with large-scale cross-country statistical studies such as **Nikulin (2017)**. Similarly, the Nigerian case (**Obayelu & Ogunlade, 2006**) places emphasis on ICT as a poverty alleviation mechanism, whereas studies in India and Iran foreground political participation and socio-cultural empowerment (**Kenkarasseril Joseph, 2013; Singh et al., 2018**)

Sinha (2018) and **Potnis (2016)** women are trapped in low-value or survivalist roles because of inequality in education, professional training, and asset ownership, which could be improved by access to digital technologies by women. Findings from **Anjana (2023)**, **Antonio and Tuffley (2014)**, and **Acilar and Sæbø (2021)** further confirm that these barriers persist even when affordability improves, suggesting that social attitudes, gender norms, and digital literacy are as important as technological availability. Similarly, **Sonne Vyas (2025)** points out that even where cheap data plans and mobile phones are available, women's use remains constrained by family permissions and community-level restrictions, echoing **Potnis's (2016)** earlier findings on slum-dwelling women's inability to afford even basic mobile phones. Moreover, the type of divide analyzed differs—some concentrate on first-order divides (access and ownership, e.g., **Potnis, 2016; Anjana, 2023**), while others stress second-order divides (skills, usage, and benefits, e.g., **Acilar & Sæbø, 2021; Sharma & Ojha, 2025**)

Similarly, **Patel (2024)** and **Sindakis and Showkat (2024)** focus on the importance of digital inclusion in rural areas, noting its impact on education, healthcare, and economic growth. **Kedar (2015)** present descriptive overviews of Digital India's opportunities and challenges, while **Midha (2016)** emphasises barriers and remedies. **Nedungadi et al. (2018)** take a more applied approach by implementing a mobile-based literacy model for tribal populations, whereas **Sindakis and Showkat (2024)** conduct a quantitative analysis of adoption patterns in rural Odisha, discovering unexpectedly higher adoption rates among women. **Patel (2024)**, in contrast, highlights the stark rural–urban divide, citing only 29% internet penetration in rural India compared to 64% in urban areas.

Early work using NFHS-2 (1998–99) constructed four indices, which are household autonomy, mobility, gender attitude, and rejection of domestic violence and showed striking interstate and socio-cultural disparities, with education a robust predictor across all empowerment dimensions (**Gupta & Yesudian, 2006**). State- and district-level composite indices built from NFHS-4 and NFHS-5, typically via PCA and correlation matrices, reveal persistent regional clustering: southern districts/states often rank high, while central-eastern regions lag (**Chakrabarty & Kundu, 2024; Mukhopadhyay, 2025**). In the domain of health service use, state-level analyses find moderate positive associations between women's literacy/bank-account control and breast cancer screening; however, some high-literacy/high-account states underperform, indicating that literacy and financial inclusion are insufficient without attention to service availability, awareness, and cultural barriers (**Patil et al., 2023**). Using NFHS-3 and structural equation modelling, **Chakrabarti & Biswas (2012)** argue that education or employment policies have been inefficient in shifting

patriarchal norms, regional variation remains large, and behaviour change communications are needed.

India's rapid economic growth over the past decade has not translated into equitable financial participation for women, highlighting persistent gender gaps in access to formal financial systems. Financial inclusion is a key driver in developing countries for social welfare and women's empowerment. Studies focusing on Uttar Pradesh show that government-led initiatives such as PMJDY, PMJJBY, PMSBY, and APY have significantly improved women's social- economic and political empowerment, with PMJDY emerging as the most effective intervention (**Chauhan et al., 2023**). Policy-oriented research further emphasises that India's financial inclusion framework, guided by RBI definitions and strengthened post-2014 through PMJDY, has expanded access to formal banking and credit in rural Uttar Pradesh, though uneven outreach persists (**Dutta, 2025**). Collectively, the literature underscores the need for structured financial systems, enhanced digital capabilities, and targeted policies to bridge gender and regional gaps in financial inclusion.

RESEARCH GAPS

Existing literature focuses on domains such as ICT access, digital empowerment, or financial inclusion as separate. The unexplored study will analyse the intersection of the usage and access of digital devices for financial transactions, along with media exposure and digital financial inclusion. Addressing how education, employment, financial inclusion, and digital access help bridge the gender gap in India. This paper studies the multi-interrelated dimensions between access, usage, and autonomy of women's digital financial inclusion and the gender gap in India, which remains unexplored.

OBJECTIVE

To examine status-wise status and variation in female digital financial inclusion in India.

To analyse the impact of digital financial inclusion in bridging the gender gap in India.

DATA AND METHODOLOGY

Research Design: This research paper used the qualitative comparative analysis to examine the gender gap in India. . This dataset explains the comparative analysis includes 28 states and 8 union territories where state-wise data are used for males and females.

Data Source: This study is based on secondary data of **NFHS-5(National Family Health Survey Round),2019-2021**, by the **International Institute for Population Sciences (IIPS), Mumbai**, under the **Ministry of Health and Family Welfare, Government of India**.

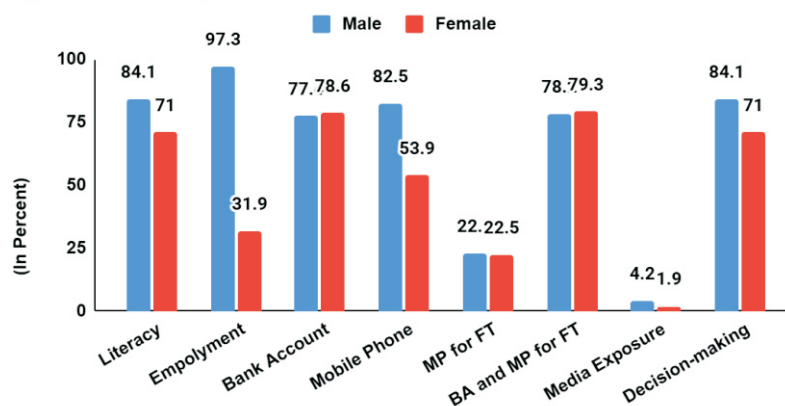
Variable Used: In this study, to examine the gender gap in India, some variables are used, such as socio-economic status, financial inclusion, digital access and awareness. To analyse this, indicators were used, which are literacy, employment, mobile phone ownership, media exposure, bank account, financial transaction, and decision-making. across various indicators such as literacy, employment, bank account ownership, mobile phone ownership, mobile phone for financial transactions, bank account and mobile phone for financial transactions, decision making, and media exposure.

Statistical Tools: To understand state-wise differences in digital access and the gender gap we applied descriptive statistics and graphical analysis in this paper. The statistical tools that are used here are STATA and MS-Excel for data analysis Also, figure and summary tables are used in this study to visualise the gender gaps across states and indicators.

RESULT AND FINDING

Figure 2 reveals the gender gap between males and females across multiple indicators in social-economic, financial inclusion, and digital indicators. The literacy gap shows a moderate but persistent gap between males(84.1%) and females(71%), indicating inequality where females lag behind males, which affects employment and education. There is the largest gender gap seen in employment, with males(97.3%) and females(31.9%), indicating low labour force participation of females compared to males. Females with a bank account (78.6%) are slightly ahead of males (77.4%), which indicates the effects of policies like **PMJDY** and **DBT** transfers.

Figure 2 Gender Gap in India



Source: NFHS-5 (2019-21)

A major gender divide is seen in mobile phone ownership, where males(82.5%) have a higher rate than females(53.9%), limiting them from accessing information and financial tools. Equality is seen in the usage of mobile phones for financial transactions, with males(22.9%) and females(22.5%). Also, usage of bank accounts and a mobile phone for financial transactions by women shows the success of financial inclusion with males(78.2%) and females(79.3%). A larger gender gap is seen in media exposure of males(4.2%) and females(1.9%), which shows females have lower access to newspapers, TV, or radio. Females' participation in decision-making is one step towards empowerment and breaking the patriarchal thoughts; the data shows that males (84.1%) and females(71%) are almost the same in literacy. Females outperform males in usage of bank accounts and mobile phones for financial transactions, but are still far behind in employment, mobile phone ownership, literacy, media exposure, and decision-making.

Table 1, descriptive analysis contains 36 observations for the gender gap in various indicators across 28 states and 8 union territories. The positive value indicates that females still lag behind males, and the negative value indicates better outcomes for females. The literacy gap is persistent but uneven, with females performing better in a few states. The most unequal gap is seen in employment across states. Financial inclusion policies have promoted women with the help of digital access, showing disparities across states. There are structural barriers to digital access for financial transactions. The gap is less but still present, but the women in decision-making are highly unequal and face societal barriers.

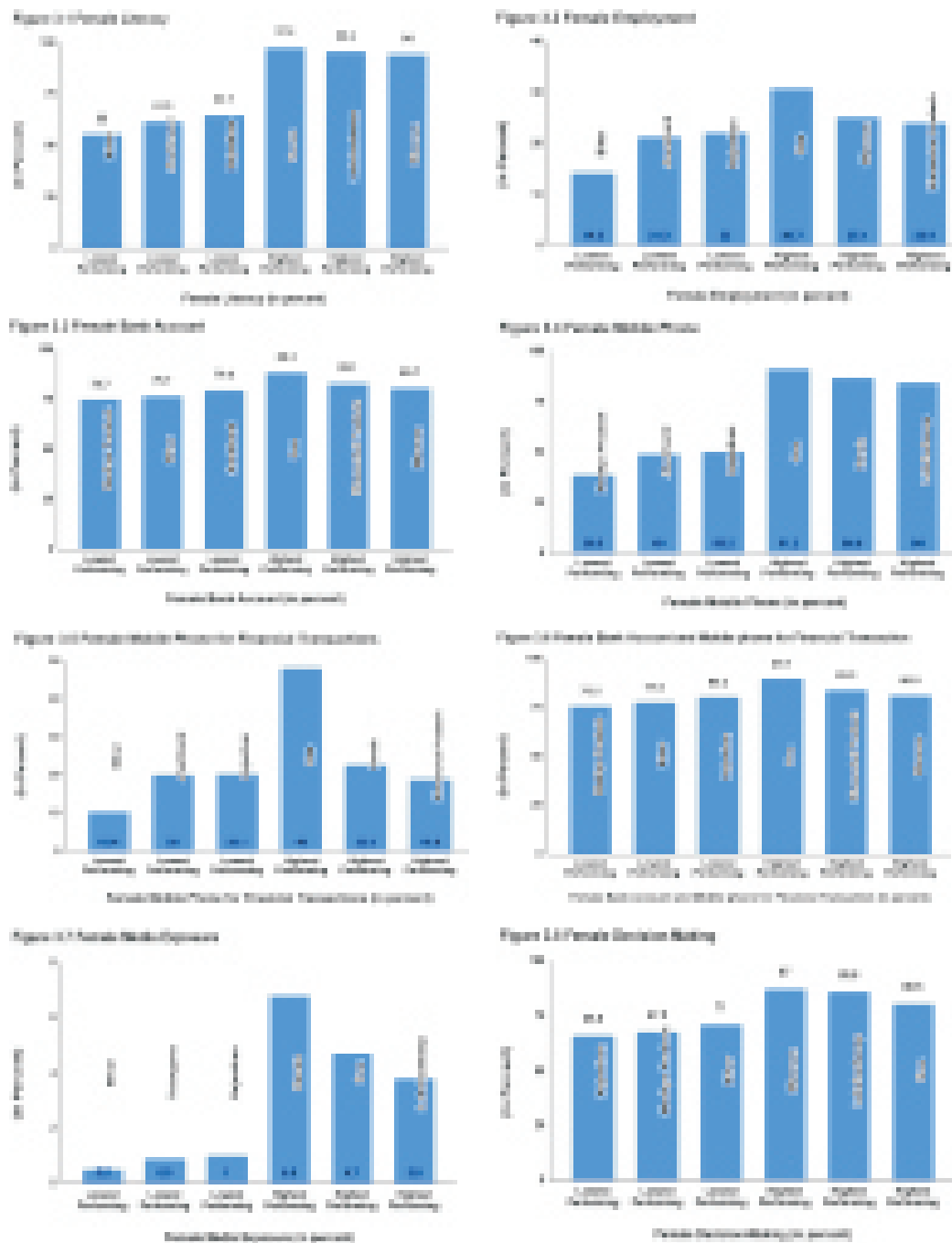
Table 1 Descriptive Analysis of Gender Gap

<i>Variable</i>	<i>Observation</i>	<i>Mean</i>	<i>Std. dev.</i>	<i>Min</i>	<i>Max</i>
Literacy Gap	36	9.90	6.5183	-4.40	24.2
Employment Gap	36	46.93	7.7831	32.6	65.7
Bank account Gap	36	-1.60	9.8632	-23.5	17.6
Mobile Phone Gap	36	19.76	17.0772	-10.6	49.5
MP for FT Gap	36	3.83	7.1281	-9.19	17.3
BA and MP for FT Gap	36	-1.63	9.4826	-23.8	16.6
Media Exposure Gap	36	2.11	2.3384	-3.4	7.30
Decision Gap	36	10.66	13.3445	-26.1	46.6

MP=Mobile phone BA=Bank Account FT=Financial Transaction

The dataset uses indicators on female literacy, employment, digital access, financial inclusion, media exposure, and decision-making to examine the variation across states in **figure 3**. In **figure 3.1**, female literacy in Kerala(97.4%), Lakshadweep(95.2%), and Mizoram(94%) performs well, while Bihar(55%), Jharkhand(61.5%), and Rajasthan(64.7%) show a long-term barrier in the upliftment of women and early marriage for girls. In figure 3.2, More social acceptance is seen in Goa(30.7%), Mizoram(25.1%), and Himachal Pradesh(23.9%), where the highest performance in female employment is seen, but in northern states like Bihar(14.3%), Jharkhand(21.3%), and Rajasthan(22%) shows a conventional society that limits job opportunities.

In **figure 3.3**, Madhya Pradesh(74.7%), Bihar (76.7%), and Jharkhand(79.6%) show lower awareness towards banking facility usage of female, but perform better in states like Goa(88.3%), Himachal Pradesh(83.1%), and Mizoram(80.7%), which have better banking infrastructure. The digital gender divide is lowest in states like Madhya Pradesh(74.7%), Bihar(76.7%), and Jharkhand(79.6%), which reflects cultural restrictions and limited digital literacy. But, in **figure 3.4**, the high-performing states Goa(91.2%), Kerala(22.6%), and Lakshadweep(84%) have empowered digitally and positively influenced accessibility in digital tools ownership. **Figure 3.5** shows that the usage of mobile phones for financial transactions by females has a positive impact on states Goa(48%), Kerala(22.6%), and Himachal Pradesh(18.8%), showing digital financial inclusion with better awareness and service availability. But a low level of digital financial participation is seen in Bihar(10.4%), Jharkhand(20%), and Rajasthan(20.1%).

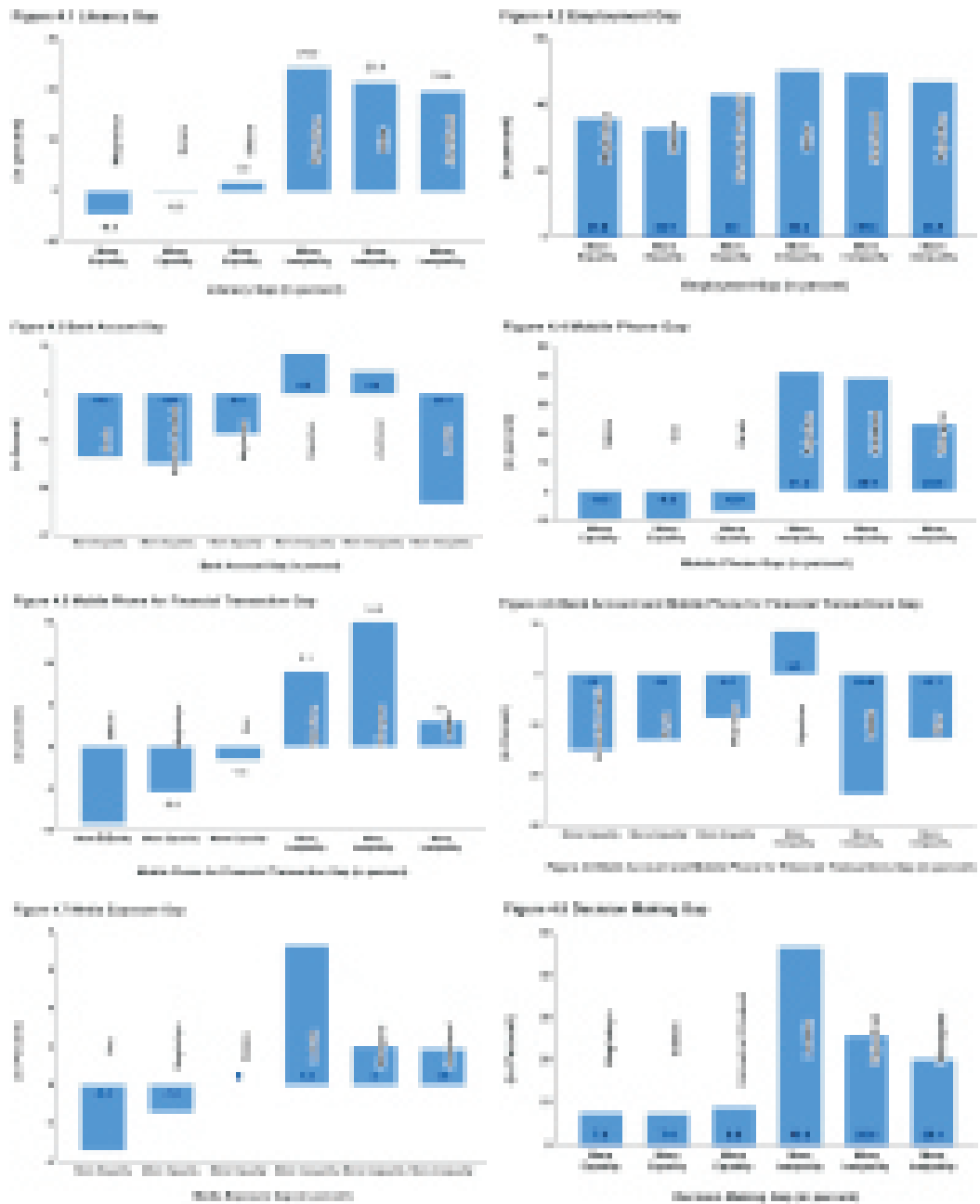
Figure 1 Female State-level data(in per cent)

Source: NFHS-5 (2019-21)

In figure 3.6, High-performing states in usage of mobile phones and bank accounts for financial transactions by females in Goa(89.7%), Himachal Pradesh(83.9%), and Mizoram(80.9%) show financial empowerment, while low digital financial inclusion is seen in states like Madhya Pradesh(75.5%), Bihar(77.5%), and Rajasthan(80.2%). **In figure 3.7**, female media exposure- access to TV, radio, and newspapers plays a vital role in social upliftment and participation. Kerala(6.8%), Goa(4.7%), and Lakshadweep(3.8%) shows more access to media, but states like Bihar(0.5%), Telangana(0.9%), and Rajasthan(1) are the lowest performing in women media exposure. Breaking the barriers of patriarchal norms, Mizoram(87%), Lakshadweep(85.8%), and Goa(80.5%) show the highest in decision-making by females, but Rajasthan(65.8%), Madhya Pradesh(67.5%), and Bihar(71%) show strong patriarchy with the least decision-making authority. States that show a consistent pattern of emerging as the highest performing are Goa, Kerala, Lakshadweep, Mizoram, and Himachal Pradesh. The states which still behind in female representation are Bihar, Jharkhand, Madhya Pradesh, and Rajasthan.

Figure 4 highlights the greater gender equality and greater gender inequality across various states in key indicators such as socio-economic, digital inclusion, and financial services. **In figure 4.1**, Meghalaya(-4.40%), Kerala(-0.30%), and Sikkim(1.5%) show the reverse literacy gaps, where girls perform better than boys, but states like Rajasthan(24.2%), Bihar(21.4%), and Jharkhand(19.6%) still have large gaps in literacy, which limits educational access for girls. **In figure 4.2**, female participation in employment shows more equality in states like Meghalaya(35.8%), Sikkim(32.9%), and Himachal Pradesh(43%) because of agriculture, tourism, and small enterprises. But, states like Bihar(50.2%), Jharkhand(49.6%), and Rajasthan(46.9%) show the largest gap in employment due to family restrictions, limited job availability for women, and low female labour force participation. **In figure 4.3**, Gaps in financial inclusion show more females hold bank accounts than males in states like Kerala(-13.5%), Himachal Pradesh(-14.9%), and Meghalaya(-8.6%), but a positive gap is seen in states like Rajasthan(8.5%) and Jharkhand(38.9%), where fewer females have bank access. **In figure 4.4**, Sikkim(-9.5%), Goa(-9.3%), and Kerala(-6.9%) show a higher number of females owning a mobile phone than males, but states like Rajasthan(41.3%), Jharkhand(38.9%), and Telangana(23.5%) show a large gap in female mobile phone ownership and usage. **In figure 4.5**, Sikkim(-9.2%), Meghalaya(-5.4%), and Goa(-1.5%) indicate females outperform males in financial transactions through mobile phone, while Rajasthan(9.1%), Telangana(14.9%), and Ladakh(3.1%) indicate more inequality among genders. **In figure 4.6**, usage of bank account and mobile phone transactions better in states like Himachal Pradesh(-15%), Kerala(-13%), and Meghalaya(-5.7%) in which females are better than males. While Rajasthan(5.5%), Ladakh(-23.3%), and Bihar(-12.7%) shows more inequality. **In Figure 4.7**, Goa(-3.4%) and Meghalaya(-1.4%) show more media exposure of females than males. But limited access to media for females, with the highest gap seen in Ladakh(7.3%), Telangana(2%), and Jharkhand(1.9%). **In figure 4.8**, the decision making in household and for their own life show least gap in states like Meghalaya(7.6%), Sikkim(7.4%), and Himachal Pradesh(8.8%), but patriarchal norms still over-power in the state like Ladakh(46.6%), Rajasthan(25.6%), and Telangana(20.1%) shows largest gap in decision-making for females.

Usage of mobile phone and bank account for financial transactions shows the smallest gender gap in states like Sikkim, Meghalaya, Himachal Pradesh, and Kerala, with strong digital financial services for women, but in states like Rajasthan, Telangana, Ladakh, and Bihar, it consistently shows a high gap in financial inclusion through digital tools.

Figure 2 State-level data on the Gender Gap

Source: NFHS-5 (2019-21)

CONCLUSION

In India, a clear regional divide in gender equality is seen across 28 states and 8 union territories. The NFHS-5 (2019-2021) data at the National level outperform in bank account ownership and use of mobile phone and bank account for financial transactions. But they still lag behind men in employment, literacy, mobile phone ownership, media exposure, and decision-making power. The outcomes are positive for the integration of financial inclusion, but it faces problems in socioeconomic and digital inequalities. The NFHS-5 state-level data of women shows a clear divide of north-south states in various women empowerment indicators such as literacy, employment, mobile phone ownership, bank account ownership, and use it for financial transactions, media exposure and decision making. The consistently low-performing states, Bihar, Jharkhand, Madhya Pradesh, and Rajasthan, face barriers in economic, education, and digital tools due to traditional norms. But consistent high-performing states are Goa, Kerala, Lakshadweep, Mizoram, and Himachal Pradesh with strong social and economic development, and inclusion of financial systems, and more progressive cultural norms. The gender gap across various indicators, showing smaller gaps (more equality) in literacy, mobile use, bank access, decision-making, employment in the northeast (Meghalaya, Sikkim) and south (Kerala, Goa, Himachal Pradesh), which show gender-progressive social norms, better education and public services. A few states show that women perform better than men in literacy, financial inclusion, mobile access, and media exposure. More inequality (a larger gender gap) in states like Bihar, Jharkhand, Rajasthan, Telangana, and Ladakh, which show socio-cultural barriers, limited women's workforce participation, and limited access to digital and financial resources. The financial empowerment in digital technology remains uneven.

The government should give priority to literacy programs by giving digital education initiatives to women, as the literacy gap is still high. To reduce the dropout rates of schools and college-going girls through scholarship programs. There's need for skill development programs for women in cooperative sectors, Self-help groups, and local enterprises, as the employment gap is high. The workforce participation could be increased by flexible jobs, better mobility services, and an environment for child-friendly workplaces. Better digital financial literacy could be achieved by collaborating with banks and fintech institutions. To reduce the digital divide gap, subsidy schemes for women-owned mobile phones and computers must be provided.

Overall, the study reveals that gender equality is seen in some parts of India with significant progress. To achieve inclusive growth in digital financial services the targeted policies and government intervention are required for those states and union territories where women's education, workforce participation, digital access, and household decision-making power are lagging.

REFERENCE

- Sharma, A., & Ojha, J. K. (2025).** Analyzing the gender digital divide through powercube framework: A systematic literature review. *Information Development*, 02666669251337064, <https://doi.org/10.1177/02666669251337064>.
- Dutta, R. (2025).** Financial Inclusion from a Gender and Caste Perspective: Evidence from Two Villages in Uttar Pradesh. *Review of Agrarian Studies*, 15(1), 65–86, <https://doi.org/10.25003/RAS.15.01.0006>.
- Sonne Vyas, L. (2025).** Digital revolution and the gender divide: Factors affecting mobile phone use in India. *Information, Communication & Society*, 28(3), 471-491, <https://doi.org/10.1080/1369118X.2024.2420034>.

Mukhopadhyay, D. (2025). Empowerment of women and its determinants in India: a state level analysis with NFHS-5 data. *International Journal of Social Economics*, 52(12), 1712-1724, <https://doi.org/10.1108/IJSE-01-2023-0015>.

The Global Findex Database. (2025, September 30). Connectivity and Financial Inclusion in the Digital Economy, *World Bank Group*. <https://www.worldbank.org/en/events/2025/09/30/global-findex-2025-connectivity-and-financial-inclusion-in-the-digital-economy>.

Press Information Bureau. (2025, August 6). 67 and Rising: India's Financial Inclusion Gains Momentum. *Government of India*. <https://static.pib.gov.in/WriteReadData/specificdocs/documents/2025/aug/doc202586601201>.

The India Forum. (2025, October 30). Closing India's Gender Gap in Financial Inclusion. *A Journal Magazine on Contemporary Issues*, <https://www.theindiaforum.in/gender/closing-indias-gender-gap-financial-inclusion>.

India Brand Equity Foundation. (2025, August 29). *Pradhan Mantri Jan Dhan Yojana*. IBEF. <https://www.ibef.org/government-schemes/pradhan-mantri-jan-dhan-yojana>

Sindakis, S., & Showkat, G. (2024). The digital revolution in India: bridging the gap in rural technology adoption. *Journal of Innovation and Entrepreneurship*, 13(1), 29, <https://doi.org/10.1186/s13731-024-00380-w>.

Chandra, R., Patel, J. K., Srivastava, S., Singh, A., & Mukherjee, S. (2024). An analysis of predictors and wealth-based inequality in internet use among women in India: aiming for better digital health outcomes. *BMC Digital Health*, 2(1), 38, <https://doi.org/10.1186/s44247-024-00090-z>.

Chakrabarty, M., & Kundu, A. (2024). Evolving Nature of Women Empowerment in India. In *Perspectives on Economics and Management* (pp. 250-275). Routledge India, <https://doi.org/10.4324/9781003509721>.

Anjana, L. (2023). Gender Digital Divide in India: Examining the Reality and Bridging the Gap. In *Empowering women in the digital economy*, (pp. 105-118), <https://doi.org/10.4324/9781003302346>.

Patil, P., Sarang, B., Bhandarkar, P., Ghoshal, R., Roy, N., & Gadgil, A. (2023). Does women's empowerment and their socioeconomic condition affect the uptake of breast cancer screening? Findings from NFHS-5, India. *BMC Women's Health*, 23(1), 7, <https://doi.org/10.1186/s12905-022-02147-5>.

Acilar, A., & Sæbø, Ø. (2023). Towards understanding the gender digital divide: A systematic literature review. *Global knowledge, memory and communication*, 72(3), 233-249, <https://doi.org/10.1108/GKMC-09-2021-0147>.

Chauhan, M., & Jindal, S. (2023). A case study on status of financial inclusion of women in Uttar Pradesh, India. *International Journal for Multidisciplinary Research (IJFMR)*, 5(1), <https://www.ijfmr.com/>.

Sinha, S. (2018). Gender digital divide in India: Impacting women's participation in the labour market. In *Reflecting on India's Development: Employment, Skill and Health* (pp. 293-310), https://doi.org/10.1007/978-981-13-1414-8_14.

Nedungadi, P. P., Menon, R., Gutjahr, G., Erickson, L., & Raman, R. (2018). Towards an inclusive digital literacy framework for digital India. *Education+ Training*, 60(6), 516-528, <https://doi.org/10.1108/ET-03-2018-0061>.

- Singh, C., & Naik, G. (2018).** Financial inclusion after PMJDY: A case study of Gubbi Taluk, Tumkur. IIM Bangalore Research Paper, (568), <https://ssrn.com/abstract=3151257>.
- Nikulin, D. (2017).** The impact of ICTs on women's economic empowerment. In *Catalyzing development through ICT adoption: the developing world experience* (pp. 15-24), https://doi.org/10.1007/978-3-319-56523-1_2.
- Potnis, D. (2016).** Inequalities creating economic barriers to owning mobile phones in India: Factors responsible for the gender digital divide. *Information Development*, 32(5), 1332-1342, <https://doi.org/10.1177/0266666915605163>.
- Kedar, M. S. (2015).** Digital India new way of innovating India digitally. *International Research Journal of Multidisciplinary Studies*, 1(4), 34-49, <http://www.irjms.in/>.
- Pardhasaradhi, Y., & Rao, V. N. (2014).** Women empowerment: Information Technology as a critical input. *Indian Journal of Public Administration*, 60(3), 515-526, <https://doi.org/10.1177/0019556120140311>.
- Antonio, A., & Tuffley, D. (2014).** The gender digital divide in developing countries. *Future Internet*, 6(4), 673-687, <https://doi.org/10.3390/fi6040673>.
- Kenkarasseril Joseph, M. (2013). Critical theory for women empowerment through ICT studies. *Qualitative Research Journal*, 13(2), 163-177, <https://doi.org/10.1108/QRJ-01-2013-0002>.
- Chakrabarti, S., & Biswas, C. S. (2012).** An exploratory analysis of women's empowerment in India: a structural equation modelling approach. *Journal of Development Studies*, 48(1), 164-180, <https://doi.org/10.1080/00220388.2011.615920>.
- Shirazi, F. (2012).** Information and communication technology and women empowerment in Iran. *Telematics and Informatics*, 29(1), 45-55, <https://doi.org/10.1016/j.tele.2011.02.001>.
- Khan, F., & Ghadially, R. (2010).** Empowerment through ICT education, access and use: A gender analysis of Muslim youth in India. *Journal of International Development*, 22(5), 659-673, <https://doi.org/10.1002/jid.1718>.
- Patil, D. A., Dhere, A. M., & Pawar, C. B. (2009).** ICT and empowerment of rural and deprived women in Asia. *Asia-Pacific Journal of Rural Development*, 19(1), 1-22, <https://doi.org/10.1177/101852912009010>.
- Gupta, K., & Yesudian, P. P. (2006).** Evidence of women's empowerment in India: A study of socio-spatial disparities. *GeoJournal*, 65(4), 365-380, <https://doi.org/10.1007/s10708-006-7556-z>.
- Obayelu, A., & Ogunlade, I. (2006).** Analysis of the uses of information communication technology (ICT) for gender empowerment and sustainable poverty alleviation in Nigeria. *International Journal of Education and Development using ICT*, 2(3), 45-69, <https://www.learntechlib.org/p/42240/>.

LARGE LANGUAGE MODELS AND THE FUTURE OF LITERARY INTERPRETATION IN ENGLISH STUDIES

Munna Kumar Singh*

ABSTRACT

The emergence of Large Language Models (LLMs) has significantly transformed the landscape of contemporary literary studies, creating new possibilities for literary interpretation within the discipline of English Studies. Traditionally, literary criticism has relied upon close reading, contextual analysis, and human-centred interpretative approaches to explore the multiple layers of meaning embedded in literary texts. However, recent advances in Artificial Intelligence (AI) have introduced machine-assisted reading as both an alternative and a complementary approach to literary analysis.

Generative AI systems, including ChatGPT and other Large Language Models, are capable of processing extensive textual corpora, identifying thematic patterns, generating interpretative responses, and facilitating comparative literary analysis. These capabilities have encouraged scholars to reconsider the future of literary interpretation in an increasingly digital academic environment.

The present study examines the influence of Large Language Models on literary interpretation in contemporary English Studies. It analyses the transition from traditional close reading to machine-assisted reading and evaluates both the opportunities and the challenges associated with AI-assisted literary criticism. Drawing upon scholarship in Digital Humanities, literary theory, and Artificial Intelligence, the study adopts a qualitative and conceptual research design based primarily on secondary sources.

The findings indicate that Large Language Models should not be regarded as substitutes for human literary critics. Rather, they function most effectively as interpretative tools that support and enrich human critical engagement. Accordingly, this study proposes a Human–AI Collaborative Interpretation Model, in which computational analysis and human judgement operate together to produce more comprehensive and nuanced literary interpretations.

The study concludes that the future of literary interpretation lies in achieving a balanced integration of technological innovation and humanistic inquiry. By combining computational efficiency with critical reflection, English Studies can successfully respond to the challenges of the digital age while preserving its commitment to cultural understanding, intellectual rigour, and interpretative depth.

Keywords: *Large Language Models (LLMs), Literary Interpretation, English Studies, Artificial Intelligence, Digital Humanities, Machine-Assisted Reading, Literary Criticism.*

* Assistant Professor, Department of English, Durgawati Mahavidyalay, Bichhiya, Dumri, Kaimur (Bihar)&Research Scholar, P. G. Department of English, Veer Kunwar Singh University, Ara (Bihar)

1. INTRODUCTION

The twenty-first century has witnessed unprecedented transformations in the production, dissemination, and interpretation of knowledge. Among the most influential technological developments of recent decades is the emergence of Large Language Models (LLMs) advanced Artificial Intelligence systems capable of generating human-like text, processing vast quantities of information, and responding effectively to complex linguistic enquiries (*OpenAI; Dwivedi et al.*). These developments have significantly influenced numerous academic disciplines, particularly the Humanities and English Studies (*Hayles; Liu*).

Traditionally, literary interpretation has been closely associated with the practice of close reading, through which literary scholars examine language, imagery, symbolism, narrative structure, and cultural context in order to uncover the meanings embedded within literary texts (*Tyson 137–145*). Such interpretative practices emphasise the importance of critical thinking, theoretical engagement, and informed human judgement. Literary meaning has therefore been understood not merely as an inherent property of the text but as something that emerges through the dynamic interaction between the text and its readers (*Ricoeur 76–81; Fish*).

The emergence of Digital Humanities has further expanded the methodological scope of literary scholarship by incorporating computational approaches into textual analysis. Digital tools have enabled scholars to examine extensive textual corpora, identify recurring patterns, and investigate literary developments across diverse historical and cultural contexts (*Burdick et al. 122–128; Schreibman et al.*). Building upon these advancements, Large Language Models represent a further stage in the evolving relationship between technology and literary studies. Unlike earlier computational tools, LLMs are capable of producing coherent summaries, identifying literary themes, explaining stylistic devices, and generating responses that closely resemble scholarly critical commentary (*OpenAI; Kasneci et al.*).

These technological developments have generated considerable debate within the discipline of English Studies. Advocates argue that Artificial Intelligence enhances literary research, improves accessibility, and promotes innovative pedagogical practices (*Kasneci et al.; Lund and Wang*). Critics, however, question the reliability of machine-generated interpretations and express concerns regarding algorithmic bias, contextual understanding, originality, and academic integrity (*Bender et al. 610–623; Floridi and Chiriatti 681–694*).

Although recent scholarship has explored the educational and technological implications of Large Language Models, comparatively little attention has been devoted to their broader impact upon literary interpretation in English Studies. Existing research has largely concentrated on technical capabilities rather than examining the changing relationship between human readers and machine-assisted interpretation. This gap highlights the need for a comprehensive critical investigation into the ways in which Large Language Models are reshaping contemporary literary interpretation (*Colella; Martens and De Greve*).

2. RESEARCH OBJECTIVES

The present study seeks to examine the transformative role of **Large Language Models (LLMs)** in literary interpretation within English Studies. It aims to explore the opportunities and challenges associated with AI-assisted literary criticism and to assess how Artificial Intelligence can complement traditional interpretative practices. The study also intends to propose a conceptual framework that supports the effective integration of human critical reasoning and AI technologies in literary

scholarship.

The specific objectives of the study are:

1. To examine the role of Large Language Models (LLMs) in transforming literary interpretation within English Studies.
2. To analyse the impact of Artificial Intelligence on traditional approaches to literary criticism, particularly close reading.
3. To identify the opportunities and challenges associated with AI-assisted literary interpretation.
4. To evaluate the significance of collaboration between human critical judgement and Artificial Intelligence in literary analysis.
5. To propose a Human–AI Collaborative Interpretation Model for strengthening literary research and future scholarship.

3. RESEARCH QUESTIONS

To achieve the above objectives, the present study addresses the following research questions concerning the application of Large Language Models in literary interpretation and their implications for English Studies.

The study seeks to answer the following questions:

1. How are Large Language Models transforming literary interpretation in English Studies?
2. How does Artificial Intelligence influence traditional methods of literary criticism, particularly close reading?
3. What opportunities and challenges do Large Language Models present for literary interpretation and research?
4. How can Artificial Intelligence complement human critical judgement in the interpretation of literary texts?
5. How can a Human–AI Collaborative Interpretation Model contribute to the future development of English Studies?

4. REVIEW OF LITERATURE

The relationship between technology and literary scholarship has attracted sustained academic attention over the past three decades. The emergence of Digital Humanities has significantly broadened the methodological framework of literary research by integrating computational techniques into textual analysis. Scholars within this interdisciplinary field have employed digital archives, text mining, corpus linguistics, and data visualisation to investigate literary texts from innovative perspectives. These developments have challenged the exclusive reliance upon traditional close reading and have created new opportunities for large-scale literary research (*Burdick et al. 122–128; Schreibman et al.; Price and Siemens*).

One of the most influential developments in this field is the growth of Digital Humanities, which integrates computational technologies with literary and cultural studies. *Burdick et al. (2012)* argue that Digital Humanities has transformed literary research by enabling scholars to employ digital archives, corpus analysis, and text-mining techniques for examining literary texts. Similarly, Schreibman, Siemens, and Unsworth (2004) emphasise that computational methods have broadened the methodological possibilities of literary scholarship while encouraging interdisciplinary research. These studies collectively demonstrate that digital technologies have become an integral part of contemporary literary research.

The application of computational approaches to literary analysis was further strengthened by the concept of Distant Reading proposed by *Moretti (2013)*. Unlike traditional close reading, distant reading examines large collections of literary texts to identify broader literary trends and historical developments. *Jockers (2013)* extended this perspective by demonstrating how computational methods can reveal linguistic, stylistic, and thematic patterns that may remain unnoticed through conventional textual analysis. Together, these studies established the theoretical foundation for the integration of computational techniques into literary criticism.

Recent advances in Artificial Intelligence have further transformed this field through the development of Large Language Models. The GPT-4 Technical Report (*OpenAI, 2023*) illustrates how generative AI systems can analyse complex textual data, generate coherent interpretations, and support diverse research activities. Similarly, Dwivedi et al. (2023) argue that generative AI has the potential to reshape research, teaching, and knowledge creation by improving analytical efficiency and expanding access to information. These developments indicate that AI has become an important resource for literary scholarship as well as higher education.

The educational implications of Large Language Models have also attracted considerable scholarly attention. *Kasneci et al. (2023)* observe that AI-powered language models can enhance learning by assisting students in textual analysis, summarisation, and critical engagement with literary texts. Such technologies provide opportunities for improving research productivity and encouraging innovative pedagogical practices. Nevertheless, scholars consistently emphasise that AI should support, rather than replace, independent critical thinking and scholarly interpretation.

Despite these opportunities, the growing use of Artificial Intelligence has raised significant ethical and interpretative concerns. *Bender et al. (2021)* argue that Large Language Models generate responses through statistical pattern recognition rather than genuine understanding, which may result in factual inaccuracies, algorithmic bias, and misleading interpretations. Likewise, Floridi and Chiriatti (2020) contend that AI lacks human consciousness, contextual awareness, and ethical reasoning, all of which remain essential for meaningful literary interpretation. These studies highlight the continuing importance of human critical judgement in evaluating AI-generated analyses.

From the perspective of literary theory, traditional interpretative approaches continue to provide the intellectual foundation for literary criticism. Tyson (2023) emphasises that close reading remains central to literary analysis because it enables readers to examine language, symbolism, narrative structure, and cultural context in depth. While computational tools can facilitate textual analysis, they cannot fully replicate the interpretative insight derived from human experience, historical awareness, and theoretical engagement. Consequently, many scholars advocate a balanced approach in which Artificial Intelligence complements rather than replaces established methods of literary criticism.

Although the existing literature provides valuable insights into Digital Humanities, Artificial Intelligence, and computational literary studies, most research has concentrated on the technological capabilities and educational applications of Large Language Models. Comparatively limited attention has been given to their implications for literary interpretation within English Studies, particularly concerning the relationship between AI-assisted analysis and traditional close reading. This gap provides the foundation for the present study, which critically examines the role of Large Language Models in literary interpretation and proposes a Human–AI Collaborative Interpretation Model that integrates computational efficiency with human critical reasoning.

5. RESEARCH GAP

Existing studies on Artificial Intelligence, Digital Humanities, and Large Language Models (LLMs) have primarily focused on their technological capabilities, educational applications, and computational text analysis. Although these studies have significantly advanced AI research, comparatively little attention has been given to the role of LLMs in literary interpretation within English Studies.

Furthermore, limited research has examined how AI-assisted interpretation can complement rather than replace traditional close reading and human critical judgement. The integration of computational analysis with established literary theories and interpretative practices remains insufficiently explored. This study addresses these gaps by critically examining the impact of Large Language Models on literary interpretation. It proposes a Human–AI Collaborative Interpretation Model that combines the analytical capabilities of Artificial Intelligence with human critical reasoning, contextual understanding, and literary theory. In doing so, the study contributes to the emerging discourse on the integration of Artificial Intelligence into English Studies and Digital Humanities.

6. RESEARCH METHODOLOGY

Research Design

The present study adopts a qualitative and conceptual research design to examine the role of Large Language Models (LLMs) in literary interpretation within English Studies. A qualitative approach is considered appropriate because the study focuses on critical analysis and theoretical interpretation rather than quantitative measurement (*Creswell & Creswell, 2018*).

Sources of Data

The study is based entirely on secondary sources, including peer-reviewed journal articles, scholarly books, conference proceedings, and research reports related to Artificial Intelligence, Digital Humanities, and English Studies (*Dwivedi et al., 2023; Kasneci et al., 2023*).

Method of Analysis

The study employs qualitative content analysis to examine existing literature on Large Language Models and literary interpretation. The analysis focuses on identifying major themes, opportunities, challenges, and emerging perspectives concerning AI-assisted literary criticism (*Bender et al., 2021*).

Scope and Limitations

The study is confined to the conceptual analysis of Large Language Models in literary interpretation within English Studies. It does not include empirical data, surveys, interviews, or experimental investigations. Consequently, the findings are based on the critical evaluation of existing scholarly literature and are intended to provide a theoretical foundation for future research.

7. LARGE LANGUAGE MODELS AND LITERARY INTERPRETATION IN ENGLISH STUDIES

The emergence of Large Language Models (LLMs) has fundamentally transformed the landscape of literary scholarship by introducing new approaches to textual analysis, interpretation, and academic research. Unlike earlier computational tools that were primarily designed for information retrieval or statistical analysis, LLMs are capable of processing extensive textual corpora, recognising linguistic patterns, generating coherent responses, and supporting scholars in various interpretative tasks (*OpenAI; Dwivedi et al.*).

Although literary interpretation has traditionally remained a distinctly human intellectual activity,

recent developments in Artificial Intelligence have encouraged scholars to reconsider the relationship between computational technologies and critical literary practice. Rather than replacing traditional methods, AI-assisted interpretation is increasingly viewed as an extension of established literary scholarship that complements human critical enquiry.

7.1 From Close Reading to Machine-Assisted Reading

For more than a century, close reading has served as one of the principal methodologies of literary criticism. This approach emphasises detailed examination of language, imagery, symbolism, narrative structure, and stylistic features in order to uncover multiple layers of meaning within literary texts (*Tyson 137–145*).

The emergence of Digital Humanities significantly expanded this methodological tradition by introducing computational approaches to literary analysis. Digital archives, corpus analysis, and text-mining techniques enabled scholars to investigate literary patterns across extensive collections of texts (*Burdick et al. 122–128*). Building upon these developments, Large Language Models now facilitate machine-assisted reading by generating summaries, identifying themes, recognising stylistic features, and suggesting interpretative perspectives.

Nevertheless, machine-assisted reading should not be regarded as a substitute for close reading. Rather, it functions as a complementary analytical approach that supports literary scholars while preserving the central role of human interpretation.

7.2 Large Language Models as Interpretative Tools

Large Language Models have emerged as valuable analytical tools within contemporary literary scholarship. Their ability to process extensive textual information enables them to identify recurring themes, analyse narrative structures, compare literary texts, and generate preliminary interpretative observations (*OpenAI*).

Within higher education, these technologies support both teaching and research. Students may utilise AI-generated summaries and contextual explanations to improve their understanding of complex literary texts, while researchers may employ LLMs to organise literature, compare critical perspectives, and explore large textual datasets more efficiently (*Kasneci et al.*).

Despite these advantages, the interpretative capacity of Large Language Models remains fundamentally different from that of human scholars. Their responses are generated through statistical relationships within training data rather than through historical consciousness, cultural awareness, emotional experience, or independent critical reasoning. Consequently, AI should be regarded as an analytical assistant rather than an autonomous literary critic (*Floridi and Chiriatti 681–694*).

7.3 Opportunities and Challenges of AI-Assisted Literary Interpretation

The integration of Large Language Models into literary studies presents both significant opportunities and important challenges.

Among the most notable advantages is the democratisation of literary knowledge. AI-powered technologies improve access to scholarly resources and enable researchers to analyse large collections of literary texts with greater efficiency (*Dwivedi et al.*). They also encourage interdisciplinary research by connecting English Studies with Digital Humanities, linguistics, and computational analysis.

Furthermore, Large Language Models have considerable pedagogical value. They can generate discussion questions, summarise literary works, explain difficult concepts, and provide alternative

interpretative perspectives, thereby supporting innovative teaching practices (*Kasneci et al.*).

However, these opportunities are accompanied by significant limitations. AI systems may reproduce algorithmic bias, overlook historical and cultural contexts, or generate inaccurate information. Since literary interpretation frequently depends upon ethical judgement, contextual awareness, and human experience, machine-generated analyses require careful scholarly evaluation (*Bender et al. 610–623*).

Questions concerning originality, authorship, and academic integrity also remain central to discussions regarding the responsible use of Artificial Intelligence in higher education. Consequently, AI-assisted interpretation should always be employed within a framework of critical reflection and ethical academic practice rather than as a replacement for independent literary analysis.

7.4 Human–AI Collaborative Interpretation

The growing integration of Large Language Models into literary studies has prompted considerable debate regarding the future role of human literary critics. While some scholars express concern that Artificial Intelligence may eventually replace traditional literary criticism, such assumptions overlook the fundamental differences between computational processing and human interpretation. Rather than viewing these two forms of intelligence as competitors, this study argues that they should be understood as complementary components of the interpretative process (*Floridi and Chiriatti 681–694*).

Literary interpretation has always depended upon human imagination, cultural awareness, historical understanding, ethical judgement, and emotional sensitivity. Readers approach literary texts through their personal experiences and theoretical perspectives, enabling them to identify meanings that extend beyond linguistic structures. Such interpretative capacities remain uniquely human and cannot be replicated entirely through computational systems (*Tyson 137–145*).

By contrast, Large Language Models possess remarkable analytical capabilities. They can process extensive textual collections within a short period, identify recurring themes, compare literary works, generate summaries, and organise scholarly information efficiently. These strengths make AI an effective analytical assistant for literary research (*OpenAI*).

Accordingly, this study proposes a Human–AI Collaborative Interpretation Model, in which Artificial Intelligence supports rather than replaces human literary criticism. Within this framework, AI performs preliminary analytical tasks, including thematic identification, textual comparison, and information synthesis, while the human scholar remains responsible for critical evaluation, contextual interpretation, and theoretical analysis. This collaborative approach combines computational efficiency with human intellectual judgement, resulting in more comprehensive and balanced literary interpretations (*Dwivedi et al.*).

8. THEORETICAL IMPLICATIONS

The present study contributes to the growing body of scholarship on Artificial Intelligence and English Studies by examining the role of Large Language Models (LLMs) in literary interpretation. While previous studies have largely focused on the technological capabilities and educational applications of AI, this study extends the discussion by exploring its implications for literary criticism and interpretative practices (*Dwivedi et al.; OpenAI*).

A major theoretical contribution of this study is the proposed Human–AI Collaborative Interpretation Model, which conceptualises Artificial Intelligence as an analytical partner rather than a replacement for human literary criticism. The model reinforces the continuing importance of close reading, critical

reasoning, and contextual interpretation while recognising the analytical advantages offered by computational technologies (*Tyson 137–145; Floridi and Chiriatti 681–694*).

The study also contributes to the field of Digital Humanities by demonstrating that Large Language Models can complement existing interpretative methodologies without undermining the fundamental principles of literary scholarship. By integrating computational analysis with human critical judgement, the proposed framework provides a balanced theoretical perspective for future research in literary criticism, comparative literature, and interdisciplinary humanities (Burdick et al. 122–128).

9. PRACTICAL IMPLICATIONS

The findings of this study have important practical implications for English Studies, higher education, literary research, and academic policy. They demonstrate that Large Language Models (LLMs) can serve as valuable supplementary tools for enhancing literary interpretation, provided that their use is guided by critical and ethical academic practices.

For teachers of English literature, LLMs may support classroom instruction by facilitating textual analysis, generating discussion prompts, and encouraging comparative interpretation. However, these technologies should complement rather than replace independent reading and critical thinking (*Kasneci et al.*).

For research scholars, Artificial Intelligence can assist in literature reviews, thematic analysis, and the organisation of scholarly information. Nevertheless, AI-generated content should always be critically evaluated, verified, and appropriately acknowledged to maintain academic integrity (*Bender et al. 610–623*).

For universities and academic institutions, the study highlights the importance of developing institutional policies and ethical guidelines for the responsible use of Artificial Intelligence in teaching, research, and assessment. Such initiatives should promote AI literacy while safeguarding originality, transparency, and scholarly responsibility (Dwivedi et al.).

Overall, the integration of Large Language Models into English Studies should be viewed as an opportunity to strengthen teaching, learning, and research through meaningful collaboration between Artificial Intelligence and human critical judgement rather than as a substitute for traditional literary scholarship.

10. CONCLUSION

The emergence of Large Language Models (LLMs) represents a significant development in contemporary literary scholarship. By integrating Artificial Intelligence into literary research and pedagogy, English Studies has entered a new phase in which computational technologies complement traditional approaches to literary interpretation. This study has demonstrated that LLMs provide valuable opportunities for enhancing textual analysis, comparative literary research, and academic enquiry while expanding the methodological scope of literary studies (*OpenAI; Dwivedi et al.*).

The findings suggest that, despite their analytical capabilities, Large Language Models cannot replace the human dimensions of literary interpretation. Critical reasoning, historical awareness, cultural understanding, ethical judgement, and contextual sensitivity remain essential for meaningful literary criticism. Consequently, AI should be regarded as an analytical resource that supports, rather than substitutes for, human interpretation (*Floridi and Chiriatti 681–694; Bender et al. 610–623*).

A major contribution of this study is the proposed Human–AI Collaborative Interpretation Model, which advocates a balanced relationship between Artificial Intelligence and human literary criticism. By combining computational efficiency with human critical judgement, the model offers a conceptual

framework for integrating AI into literary scholarship without compromising the fundamental principles of English Studies.

The study also highlights the growing importance of AI literacy in higher education. Teachers, researchers, and students should develop the ability to use Artificial Intelligence responsibly, evaluate AI-generated interpretations critically, and uphold the principles of originality and academic integrity (*Kasneci et al.*).

As a conceptual study based on secondary sources, this research provides a foundation for future empirical investigations into AI-assisted literary interpretation, digital pedagogy, and interdisciplinary humanities research. Overall, the study concludes that the future of literary interpretation lies in meaningful collaboration between human intelligence and Artificial Intelligence. Such collaboration has the potential to strengthen literary scholarship while preserving the central role of human creativity, critical enquiry, and interpretative insight (*OpenAI; Tyson 137–145*).

REFERENCES

- Bender, E. M., Gebru, T., McMillan-Major, A., & Shmitchell, S. (2021). On the dangers of stochastic parrots: Can language models be too big? *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency* (pp. 610–623). Association for Computing Machinery. <https://doi.org/10.1145/3442188.3445922>
- Bommasani, R., Hudson, D. A., Adeli, E., et al. (2021). *On the opportunities and risks of foundation models*. Stanford Center for Research on Foundation Models.
- Burdick, A., Drucker, J., Lunenfeld, P., Presner, T., & Schnapp, J. (2012). *Digital Humanities*. MIT Press.
- Colella, S. (2025). The language of the digital air: AI-generated literature and the future of literary studies. *Humanities*, 14(8), Article 164.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- Dwivedi, Y. K., Kshetri, N., Hughes, L., et al. (2023). So what if ChatGPT wrote it? Multidisciplinary perspectives on the opportunities, challenges, and implications of generative conversational AI for research, practice, and policy. *International Journal of Information Management*, 71, Article 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Fish, S. (1980). *Is there a text in this class? The authority of interpretive communities*. Harvard University Press.
- Floridi, L., & Chiriatti, M. (2020). GPT-3: Its nature, scope, limits, and consequences. *Minds and Machines*, 30(4), 681–694. <https://doi.org/10.1007/s11023-020-09548-1>
- Hayles, N. K. (2012). *How we think: Digital media and contemporary technogenesis*. University of Chicago Press.
- Jockers, M. L. (2013). *Macroanalysis: Digital methods and literary history*. University of Illinois Press.
- Kasneci, E., Sessler, K., Küchemann, S., et al. (2023). ChatGPT for good? On opportunities and challenges of large language models for education. *Learning and Individual Differences*, 103, Article 102274. <https://doi.org/10.1016/j.lindif.2023.102274>

- Liu, A. (2004). *The laws of cool: Knowledge work and the culture of information*. University of Chicago Press.
- Lund, B., & Wang, T. (2023). Chatting about ChatGPT: How may AI and GPT impact academia and libraries? *Library Hi Tech News*, 40(3), 26–29. <https://doi.org/10.1108/LHTN-01-2023-0009>
- Manovich, L. (2020). *Cultural analytics*. MIT Press.
- Martens, G., & De Greve, L. (2023). Annotation via large language models in digital literary studies. *DH Benelux Conference Proceedings*.
- Moretti, F. (2013). *Distant reading*. Verso.
- OpenAI. (2023). *GPT-4 technical report*. arXiv. <https://doi.org/10.48550/arXiv.2303.08774>
- Price, K. M., & Siemens, R. (Eds.). (2013). *Literary studies in the digital age*. Modern Language Association of America.
- Ricoeur, P. (1976). *Interpretation theory: Discourse and the surplus of meaning*. Texas Christian University Press.
- Schreibman, S., Siemens, R., & Unsworth, J. (Eds.). (2004). *A companion to digital humanities*. Blackwell Publishing.
- Seddone, G. (2025). LLMs and the increasing role of the humanities in the digital age. *AI & Society*.
- Tyson, L. (2023). *Critical theory today: A user-friendly guide* (4th ed.). Routledge.
- Underwood, T. (2019). *Distant horizons: Digital evidence and literary change*. University of Chicago Press.

DECOMPOSITION OF ENTREPRENEURIAL INTENTION IN INDIA: COMPARISON WITH BRICS NATIONS

Jitesh Kumar Nishad* and Dr. Hari Ram Prajapati**

ABSTRACT

This study seeks to examine the presence of entrepreneurial intention differential among the BRICS nations—Brazil, Russia, China, and South Africa—with reference to India. With the help of Adult Population Survey conducted by Global Entrepreneurship Monitoring, the research identifies factors shaping the gap in entrepreneurial intention in between the BRICS countries. The findings reveal a notable entrepreneurial intention gap, between India and other BRICS countries. This analysis highlights the need to understand the complex influences on Entrepreneurial intentions and offers valuable insights for policymakers and educators seeking to promote entrepreneurship in these emerging economies.

Key Words: Entrepreneurial Intention, BRICS, Decomposition analysis

JEL Code: M13, L26, J16

INTRODUCTION

The importance of entrepreneurship in encouraging growth (Audretsch et al. 2006; Audretsch and Thurik 2001) innovation, and most importantly, creating new jobs (Arenius and Kovalainen, 2006) is becoming more widely acknowledged. As a result, academics, politicians, and corporations are increasingly interested in entrepreneurship. The association between entrepreneurship and entrepreneurial intention (EI) is foundational to understanding how new ventures are initiated (Davidsson, 2006). EI represents the conscious decision to pursue the creation of a business, acting as a catalyst for actual entrepreneurial activities (Shane and Venkataraman, 2000). An individual's deliberate choice to embark on creating a new business or initiative as a career is tied to EI (Kautonen et al., 2015). Thus, entrepreneurial aspiration is a key driving force behind entrepreneurship, guiding individuals toward transforming ideas into viable business ventures.

Multiple researches have shown that entrepreneurship has been characterized by sharp regional differences. It has been identified that in some countries, entrepreneurship flourishes more than the other. The “Global Entrepreneurship Monitor 2023” noted that the volume of the population involved in activities related to entrepreneurship differs in various nations. Countries like Chile, Columbia, Uruguay, and Saudi Arabia have more than 20 percent of population involved in entrepreneurial activity. While countries like Morocco, Poland, Spain, and Greece, have barely 7 percent of the population involved in entrepreneurial activity. Rahman et al. (2023) have found significant differences in the EI of Japan with countries like China, Germany, France, UK. Similarly, Bogatyreva et al. (2019) found that the fundamental elements of national culture affect the relationship between the inclination towards entrepreneurship and subsequent action.

*Research Scholar, Department of Economics, Banaras Hindu University Varanasi, Uttar Pradesh, India
Email- jiteshnishad0321@gmail.com

**Assistant Professor, Economics Section, Mahila Mahavidyalaya, Banaras Hindu University Varanasi, Uttar Pradesh, India,
Email-harryeco@bhu.ac.in

Jim O'Neill, a global economist, originally used the acronym BRICs in 2001. The first summit of the four BRICs took place in 2009, and two years later, South Africa joined them, forming the five-member BRICS club. Since the BRICS nations are rapidly developing economies and are predicted to account for around 47% of the world's GDP by 2050, they are included in the discussion (Zouhair et al. 2014). These nations benefit from economies that offer raw materials and industry.

The study examines the gap in EI between the BRICS nations. It further decomposes the EI gap into the contributing factors. Hence, the focus of this investigation is to contribute to the current body of information by decomposing the factors influencing EI in the members of the BRICS to determine if interactions among TPB components are consistent across nations. It attempts to identify the essential variables that affects the difference in EI among countries.

The present study adds to the existing research in multiple capacities. Firstly, there is very limited study on decomposition of the entrepreneurial inclination. This is among the very first attempts that decompose the EI into its contributing factors. This will assist in determining the crucial elements that differentiate the entrepreneurial aspiration in BRICS countries. This study incorporates the two separate methods of Oaxaca decomposition firstly it incorporates the three-stage decomposition and the two-stage decomposition extension by Fairlie.

The discussion of empirical literature is the main topic of section two. Section three contains the models and techniques used for estimate. The empirical findings and discussion are presented in Section 4. The findings of causality are presented in the penultimate part, which is followed by the research's conclusion, implications, and limitations.

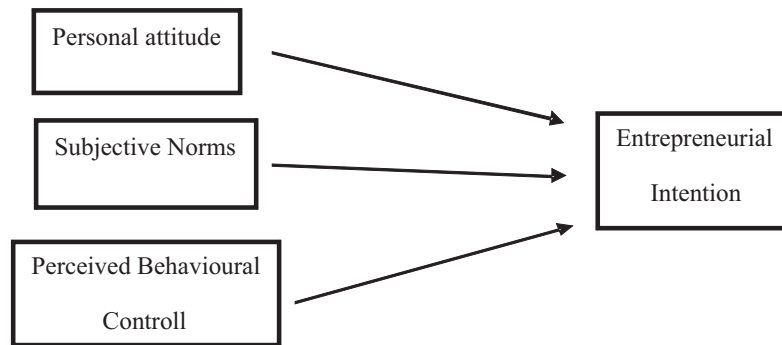
ANALYTICAL FRAMEWORK

In the study of human behaviour (Ajzen, 1988, 1991), the planned behaviour theory is the most suitable conceptual framework (Ajzen, 2001). As per the planned behaviour theory (TPB), behavioural intentions are guided by three key factors: attitudes toward the behaviour, perceived behavioural control (PBC) and social networks (SNs) (Ajzen, 1991). These intentions, in turn, shape actual behaviour. Attitudes reflect positive or negative evaluations of behaviour and encompass both evaluative and affective components (Linán and Chen, 2009). SNs represent the perceived social pressure to engage in or avoid certain behaviours, comprising normative beliefs about how one should act and the motivation to comply with those beliefs (Autio et al., 2001). PBC is a person's evaluation of how easy or difficult a behaviour is to execute, taking into account both controllability and ability (Ajzen, 2002).

The importance of these three precursors in guiding entrepreneurial inclination differs across behaviours and contexts. People are supposed to act on their intentions when confronted with an opportunity to act, given they have an adequate level of actual control over their conduct. Intention is thus regarded to be the primary cause of behaviour. Although many behaviours offer execution challenges that may hinder volitional control, it is essential to evaluate perceived behavioural control along with intention (Ajzen, 2002). Measures of PBC can be considered equivalent to actual control and assist with anticipating the behaviour in question, provided that individuals remain realistic in their appraisal of the challenges associated with a behaviour (Armitage & Conner, 2001).

The current study tries to cover the PBC aspect of the TBP. Research has shown that PBC is often as strong a predictor of behaviour as intention itself. This means that even when a person has strong intentions to engage in a certain behaviour, their belief in their ability to carry out the behaviour may play a critical role in whether they ultimately do it.

Figure 1: Analytical Framework



Source: Authors formulation

LITERATURE REVIEW

Studies have highlighted several internal and external variables that contribute to an individual's decision to establish a new company (Sharaf, 2018). These factors arise from personal characteristics and are interconnected with external influences, significantly affecting one's career path.

As per and Grilo and Thurik (2008) and Klyver et al. (2007), age harms one's likelihood of planning to start a business. According to Arenius and Minniti (2006), Ardagna and Lusardi (2008), Koellinger et al. (2005), and Davidsson (1995), there may be a non-linear or curved relationship between age and company start-up. The likelihood of being a nascent entrepreneur and education have a negative correlation with Koellinger et al. (2005). Few studies have observed that more educated people are better at assessing entrepreneurial opportunities whereas some others argue that higher education increases the opportunity cost in terms of finding the entrepreneurial opportunity. The motivation to establish a business is reduced by the high opportunity cost of searching for entrepreneurial opportunities. (Bates, 1995; Arenius and DeClercq, 2005; Fairlie and Meyer, 1996; Bates and Servon, 2000;).

The relationship between the income of a household and the entrepreneurial inclination remains ambiguous. Roper and Scott (2009) Grilo and Thurik (2008) and Davidsson (2006), have found no significant influence of household income with intention to start a business. However, Lusardi (2008) finds a nonlinear correlation between entrepreneurial inclination and household income.

Klyver et al. (2007), Elam and Terjesen (2007) and Koellinger et al. (2005) verify that belief in skills is the most influential factor in the entrepreneurial inclination of a person. Koellinger (2008) and Hayward et al. (2010) argue that a self-confident individual is more likely to be innovative in comparison to a less confident one. According to the previous research opportunity perception is a crucial characteristic of an entrepreneur (Shane and Venkataraman, 2000; Arenius and DeClercq, 2005). Opportunity perception is a strong indicator of entrepreneurial decisions as opposed to imitation business prospects, according to Klyver et al. (2007).

As per the previous literature fear of failure, is a kind of risk perception that adversely affects the entrepreneurial decision (Arenius and Minniti 2005). Previous studies have found evidence that a reduction in risk perception will enhance the likelihood of establishing a new enterprise (Arafat and Saleem 2017; Koellinger et al. 2013; Arenius and Minniti 2005)

Networking is a crucial aspect of entrepreneurial activities since it improves entrepreneurial

performance (Spigel et al., 2018; Chell & Baines, 2000). Acquaintance with an entrepreneur significantly influences the inclination to establish an enterprise (Ramos-Rodríguez et al. 2012; Arenius and Kovalainen 2006). People with a strong community of entrepreneurs are more likely to have access to the resources required to start a business. These resources may consist of emotional support, technology expertise for starting a business, and business class contact information. (Klyver and Hindle 2007; Neira et al. 2017; Afandi et al. 2017)

DATA

This research analyses the Adult Population Survey (APS) data collected by the Global Entrepreneurship Monitor (GEM) for the years 2001 to 2018. The prime focus of the GEM project is to explore the entrepreneurial frameworks, personal attitudes, and social values that support the expansion of entrepreneurship. An essential part of the GEM research endeavour, which looks into traits and viewpoints linked to entrepreneurial behaviour and new ventures, is the Adult Population Survey. In each participating nation and region, GEM collects approximately 2,000 random samples yearly from different categories of the adult population (ages 18 to 64). We merged cross-sectional data from 2001 to 2018 from each nation for our study.

OUTCOME VARIABLE

To determine the entrepreneurial attitude responsible for the gap in Indian entrepreneurial activity, this study employed a model for the entrepreneurial indicator known as Future Intention for Entrepreneurship. The topic of anticipation of starting a new entrepreneurial endeavour has been used to explore EIs in GEM data.

INDEPENDENT VARIABLES

This study looked at four major explanatory variables for perceptions and entrepreneurial attitude: confidence (inexperience, talent, knowledge), opportunity, and fear of failure network. In this case, Confidence and fear of Failure were examined by polling individuals about their self-belief and fear. Opportunity was computed by asking if you were thinking about starting your own. At the same time, the Network was assessed by questioning if you knew anyone who had established a business.

Table 1: Definition of variables used in the study

Variable	Description
Entrepreneurial Intension	Are you alone or with other expecting to start a business in next three years?
Self-efficacy	Do you possess the expertise, experience, and understanding needed to launch a new company?
Fear of failure	Would launching a company be hindered by a fear of failing?
Role model	Are you directly acquainted with someone who launched a company during the last 24 months?
Opportunity perception	Will there be favourable circumstances to launch a company in your neighbourhood in the next six months?
Demographic	
Age	Age of respondents in years
Gender	Male =1; Female = 2
Education	GEM harmonized educational attainment 0 = No education; 1 = some secondary; 2 = secondary; 3 = post-secondary; 4 = graduation
Household income	1 = bottom 33 percentile, 2 = middle 33 percentile, 3 = upper 33 percentile
Household size	Members in the household

METHODOLOGY

The study looks for factors that influence Indian people's aspiration to establish a new firm. As the dependent variable, the EI is binary, the study incorporates logistic regression to determine the factors influencing EI. The primary focus of the investigation is to inquire about the presence of the entrepreneurial gap in BRICS countries concerning India. Oaxaca blinder decomposition is a statistical method used to analyse the EI differentials between BRICS countries.

Three-fold decomposition

We have two groups OC and IND, explained variable EI and the explanatory variable X_j . The question for the difference in the mean outcome

$$RR = E(EI_{OC}) - E(EI_{IND}) \dots\dots\dots (1)$$

here $E(EI)$ represent the expected value of the EI, which is explained by group variations in the independent variables.

$$Y_j = X_j \beta_j + (\varepsilon_j) = 0 \dots\dots j \in (OC, IND) \dots\dots\dots (2)$$

here X is a vector containing the explanatory variables and β contains the slope parameters, and ε is the error, the mean outcome difference can be expressed as the difference in the linear prediction at the group-specific means of the regressors. That is the error, the mean outcome difference can be expressed as the variation in the linear prediction at the group-specific means of the independent variable.

That is

$$RR = E(Y_{OC}) - E(Y_{IND}) = E(Y_{OC})' (\beta_{OC}) - E(Y_{IND}) (\beta_{IND}) \dots\dots\dots (3)$$

To identify the contribution of group differences in predictors to the overall outcome difference, equation (3) can be rearranged

$$RR = [E(X_{OC}) - E(X_{IND})] + E(X_{IND})' (\beta_{OC} - \beta_{IND}) + [E(X_{OC}) - E(X_{IND})]' (\beta_{OC} - \beta_{IND}) \dots\dots\dots (4)$$

Eq(4) denotes the “three-folddecomposition”, where, the difference in outcome of the dependent variables is broken down into three components:

$$RR = EE + CE + 1$$

$$EE = [E(X_{OC}) - E(X_{IND})]' \beta_{IND}$$

represents the portion of the difference that results from group variations in the independent variable (also known as the "endowments effect").

$$CE = E(X_{IND})' (\beta_{OC} - \beta_{IND})$$

evaluates the impact of variations in the coefficients, including variations in the intercept.

$$I = [E(X_{OC}) - E(X_{IND})]' (\beta_{OC} - \beta_{IND})$$

is an interaction term that explains the simultaneous existence of endowment and coefficient disparities between the two groups.

The main issue with the three-fold decomposition is determining the reference group and understanding the interaction effect. If we change the reference group then the value of the decomposition gap will remain the same but the sign gets altered. To overcome this directional problem, the issue of the reference group selection has to be resolved by Applying the two-fold decomposition.

TWO-FOLD DECOMPOSITION

It separates the observed entrepreneurial gap into two components: one reflecting the difference in characteristics and the other capturing the impact of unobserved factors. The first component indicates the difference in the endowment between the two countries when they received similar treatment regarding entrepreneurship. While the second component measures the entrepreneurial inclination gap.

Assuming that a linear combination of explanatory variables X determines a dichotomous explained variable Y . The following is how the connection is expressed:

$$Y_i = F(X_i\beta_i) \dots\dots\dots (1)$$

Here, in this case Y_i is a $N \times 1$ matrix expressing the dichotomous explained variable, X_i is a $N \times K$ vector of explanatory variables and β_i is a $K \times 1$ matrix of coefficients. The function F maps the linear combination of X_i to $(X_i\beta_i)$ to Y_i , and it needs to be differentiable once.

In this case, the difference between groups OC and IND's expected means of Y may be broken down as follows:

$$Y_{OC} - Y_{IND} = [F(X_{OC}\beta_{OC}) - F(X_{IND}\beta_{OC})] + [F(X_{IND}\beta_{OC}) - F(X_{IND}\beta_{IND})] \dots\dots\dots 2$$

The equation shows that Y_{IND} is the expected mean of Y for India, and Y_{OC} is the predicted mean of Y for

group OC. For every combination of $OC \in \{\text{Brazil, Russia, China, South Africa}\}$ and India (IND), a

decomposition analysis is performed. Stated differently, the model is evaluated independently for every {OC, IND} pair.

Yun (2004) decomposition method considers both attitudes and coefficient effects to ascertain the relative contribution of each individual variable to the expected mean gap. In accordance with Yun (2004), Eq. (1)'s detailed decomposition equation may be written as follows :

$$Y_{OC} - Y_{IND} = \sum_{i=1}^K W_{\Delta\alpha}^i [F(X_{OC} \beta_{OC}) - F(X_{IND} \beta_{OC})] + \sum_{i=1}^K W_{\Delta\beta}^i [F(X_{IND} \beta_{OC}) - F(X_{IND} \beta_{IND})] \dots\dots\dots (3)$$

Where,

$$W_{\Delta\alpha}^i = (X_{OC}^i - X_{IND}^i) \beta_{OC}^i / (X_{OC} - X_{IND}) \beta_{OC}$$

$$W_{\Delta\beta}^i = (X_{OC}^i - \beta_{IND}^i) X_{IND}^i / (\beta_{OC} - \beta_{IND}) X_{IND}$$

$$\sum_{i=1}^K W_{\alpha}^i = \sum_{i=1}^K W_{\beta}^i = 1$$

Table2: Descriptive statistics

		Network	Opportunity	Self-efficacy	Fear to fail
Brazil	Mean	0.389	0.472	0.547	0.401
	SD	0.488	0.499	0.498	0.49
Russia	Mean	0.352	0.216	0.261	0.47
	SD	0.477	0.411	0.439	0.499
India	Mean	0.357	0.426	0.479	0.35
	SD	0.479	0.494	0.500	0.477
China	Mean	0.554	0.353	0.356	0.351
	SD	0.497	0.478	0.479	0.477
S. Africa	Mean	0.307	0.309	0.385	0.290
	SD	0.461	0.462	0.486	0.454

Source; Author calculation

RESULT AND DISCUSSION

Table 2 introduces the general characteristics of the variables in the research. 42 per cent of Indians believes that in six months there will be favourable entrepreneurial opportunity. While 35 per cent of population in China, 47 percent in Brazil, 21 percent in Russia and 30 percent of population in South Africa expects there will be an appropriate business opportunity in the next six months. 47 percent of Indians think that they possess the required expertise, experience and knowledge to establish a firm. In contrast, 38 of South Africans, 54 percent of Brazilians, 26 percent of Russians, and 35 percent of Chinese people anticipate that they have the skills, background, and information required to launch a enterprise.

35 per cent of Indians believes that they directly acquainted with someone who launched a company during the last two years. While 55 per cent of population in China, 38 percent in Brazil, 35 percent in Russia and 30 percent of population in South Africa is personally familiar with a person who started a business. According to 35 percent of Indians, the fear of failure would avert them from establishing a new business. In contrast, according to 29 percent of South Africans, 40 percent of Brazilians, 47

percent of Russians, and 35 percent of Chinese, starting a business would be hampered by a fear of failure.

Table 3 presents the results from the logistic regression model. It determines the factors that influences the EI in BRICS nations. Result of the Chi-Squared test reports that the variables used in the model significantly improve the likelihood of explaining the independent variable.

Table 3: Logistic Regression Result

	Africa	India	Brazil	China	Russia
futsup	Coef.	Coef.	Coef.	Coef.	Coef.
gender	0.786***	0.983	0.968	0.782***	0.954
age	0.985***	0.988***	0.975***	0.964***	0.971***
hhsiz	1.05***	1.02*	1.043***	1.061***	1.028
GEMHHINC	1	1	1	1	1
2	0.82***	0.858***	0.887***	0.945	1.015
3	0.713***	0.943	0.751***	.925*	1.17
GEMEDUC	1	1	1	1	1
1	1.109	.857*	1.017	1.141	2.131
2	1.004	0.963	1.061*	1.383***	1.351
3	1.19	0.894	0.946	1.453***	1.905
4		0.949	0.794*	1.375	1.761
knowent	1.648***	2.036***	1.145***	2.163***	2.249***
opport	2.178***	1.862***	1.431***	1.717***	1.431***
skill	2.887***	3.53***	1.987***	1.884***	6.229***
fearfail	0.877**	0.992	0.805***	0.942*	0.967
Constant	0.118***	0.105***	0.686***	0.568***	0.019***
Number of obs	13513	16784	29164	20808	9117
Prob > chi2	0.000	0.000	0.000	0.000	0.000
Pseudo r-squared	0.115	0.131	0.056	0.116	0.18
Chi-square	1257.663	2160.801	2048.509	2826.858	657.68

Source; Author calculation

***, **, and * indicate the 1%, 5% and 10%, level of significance respectively.

The result of logistic regression expresses the value of the odds ratio, that is the ratio between the favorable to unfavorable situation. The value of the odds ratio in gender remains significant in the case of South Africa and China but rather insignificant in Brazil, India, and China. (Fagenson and Marcus, 1991) finds that gender has a major impact on defining EI. They noticed that men are more likely to possess entrepreneurial inclination than female. The value of the odds ratio is less than unity for each of the BRICS countries indicates, males are more likely to have a positive aspiration to establish an enterprise than females. Verheul et al. (2012) have also found the similar result.

Additionally, the results of logistic regression indicate that an individual's age has a substantial impact on their inclination to establish their own business. The odds ratio less than unity, shows that with age, an individual becomes less prone to establish a new enterprise (Grilo and Thurik, 2008). For each member of BRICS countries except Russia, the household size significantly affects the EI of an individual. The household size has an odds ratio greater than one indicating that an individual belonging to a larger family size is more eager to be an entrepreneur.

Furthermore, household size also plays a significant role in guiding EIs, especially in all BRICS countries except Russia. The odds ratio greater than one implies that individuals from larger families are more likely to express an interest in entrepreneurship. This could be attributed to various factors, such as increased support networks, resource availability, and shared responsibilities, which may encourage entrepreneurial pursuits. Overall, these findings highlight the complex interplay of gender, age, and household dynamics in influencing EIs across different cultural contexts.

Income of the household is negatively associated with EI. With higher income individuals are less responsive to EI. The educational qualification of an individual partially affects the EI. In Russia and South Africa, education remains insignificant in affecting EI. (Fayolle, 2010; Hattab, 2014) Have found similar results that education positively affects the EI of a person. The study finds that acquaintance with fellow entrepreneurs significantly enhances the likelihood of being an entrepreneur soon in BRICS nations (Ramos-Rodríguez et al. 2012). The social network has a favourable and substantial influence on EI. The result indicates that each BRICS countries the better social networks significantly enhance EI. (Neira et al. 2017; Afandi et al. 2017)

The result shows that fear of failure notably affects the inclination to establish an enterprise. In South Africa, Brazil, and China fear of failure shows a significant as well as negative influence on EI. (Langowitz and Minniti 2007; Arafat and Saleem 2017; Arenius and Minniti 2005). In India and Russia, the fear of failure remains insignificant. The result says that opportunity perception (Arenius and Declercq, 2005; Shane and Venkataraman, 2000) as well as self-efficacy (Elam and Terjesen 2007; Koellinger et al. 2005) significantly affects EI. The odds ratio greater than unity indicates that an individual with affirmative self-efficacy is more eager to be an entrepreneur than one with negative self-efficacy. This indicates that self-efficacy and opportunity perception are positively related to EI.

Table 4: O-B decomposition of entrepreneurial intention gap

Threefold Decomposition				
futsup	Brazil	Russia	China	S. Africa
group_1	0.317	0.051	0.274	0.140
group_2	0.194	0.194	0.194	0.194
difference	0.124***	-0.143***	0.080***	-0.053***
endowments	0.015***	-0.058***	-0.014***	-0.015***
coefficients	0.122***	-0.118***	0.099***	-0.041***
interaction	-0.013***	0.033***	-0.005	0.002
Two-fold Decomposition				
group_1	0.316	0.053	0.264	0.130
group_2	0.194	0.194	0.194	0.194
difference	0.123***	-0.141***	0.070***	-0.063***
explained	0.021***	-0.077***	-0.012***	-0.024***
unexplained	0.101***	-0.063***	0.082***	-0.040***

Source; Author calculation

***, **, and * indicate the 1%, 5% and 10%, level of significance respectively.

ENTREPRENEURIAL INTENSION GAP IN BRICS COUNTRIES

Table 4 shows result of O-B decomposition. As per the findings of three-stage decomposition, India has significantly different EI than the BRICS countries. There is a significant variability in EIs between South Africa and India. The negative sign indicates that Indian are more eager to establish their own business than the South Africans. There are notable variations in the entrepreneurial aspirations of individuals of Brazil and China compared to India. The presence of a positive sign explains that both Brazil and China have higher EIs than India. There is significant disparity in the entrepreneurial inclination of India and Russia favouring the former.

The result of two stage decomposition shows similar conclusion. India has a positive and significant EI gap with Brazil and China that is Brazil and Chinese population are more eager to establish a new enterprise. India has negative and significant gap in entrepreneurial inclination with Russia and South Africa indicating the entrepreneurial inclination in favour of India. The EI gap is made up of significant explained and unexplained components.

OAXACA BLINDER DECOMPOSITION ANALYSIS

Table 5.A reports O-B decomposition the EI gap into coefficients, endowment, and interaction effects. The coefficient and the endowment effect explain the EI gap between South Africa and India. If India were to have endowments as South Africa has, then the gap in intention would widen. It suggests that India has higher endowments than South Africa. Similarly, the coefficient effect has a negative sign, indicating that if India had the coefficient of South Africa, it would increase the gap in EI. In terms of affecting the gap, the interaction effect remains insignificant.

Among the BRICS countries, India has the highest EI gap, followed by Brazil. Both the endowment and the coefficient effect exhibit a positive nature, suggesting that they could contribute to reducing the gap in EI. If India had endowments like Brazil, the gap would be reduced by 1.5 percent. Additionally, if India had coefficients like Brazil, the gap would shrink by 12 percent.

The EI gap between India and China is positive and significant. The endowment effect has a significant and negative sign. The negative sign indicates that if India had endowments similar to China, they would increase. The coefficient effect is significant and positive, indicating that if India had a coefficient like China, the gap would shrink by almost 10 percent. The coefficient and endowment effect are negative in the case of the EI gap with Russia. It suggests that, if India has the same endowment and coefficient as Russia, it will widen the gap in EI.

Table 5.B presents the O-B decomposition of entrepreneurial inclination in two parts explained and unexplained gap. In case with China the explained component of entrepreneurial gap is majorly constituted by entrepreneurial networks. With constant and similar coefficient value the EI gap is due to strong entrepreneurial networks in favour of China. Contrarily the explained component of self-efficacy and opportunity perception are significant but in favour of India. In case of Brazil, the positive explained component of EI gap is due to the opportunity perception, self-efficacy and entrepreneurial network in favour of Brazil. The Brazilian population are better in terms of opportunity perception, entrepreneurial network and self-efficacy than India. Majority share of EI gap is due to favourable self-efficacy of Brazilian population.

In case of Russia entrepreneurial network, self-efficacy and opportunity perception significant factors creating the explained component of entrepreneurial gap. There is positive value of entrepreneurial network which indicates, with given coefficient if India would entrepreneurially network like Russia, then, the EI gap would shrink. In case of South Africa, entrepreneurial network, self-efficacy and

opportunity perception are the major contributor in explained element of EI gap. With given coefficient the entrepreneurial gap is due to favourable opportunity perception, entrepreneurial network and self- efficacy in favour of India.

Table 5.A: O-B decomposition of entrepreneurial intention gap

	Brazil	Russia	China	South Africa
Endowment				
gender	-0.000	-0.000	-0.000	-0.000
age	-0.003***	-0.008***	-0.007***	-0.001***
hhsiz	-0.001	-0.003	-0.001	0.000
GEMHHINC	0.000	-0.000	-0.000	-0.000
GEMEDUC	0.001	-0.001	0.000	0.001
knowent	0.006***	0.002***	0.023***	-0.002***
opport	0.006***	-0.016***	-0.006***	-0.004***
suskill	0.013***	-0.030***	-0.022***	-0.009***
fearfail	-0.000	-0.000	-0.000	0.000
Coefficient				
gender	-0.008	-0.003	-0.049***	-0.047***
age	-0.050***	-0.050***	-0.130***	-0.009
hhsiz	0.015*	0.003	0.023*	0.016
GEMHHINC	-0.041***	0.018	-0.003	-0.040***
GEMEDUC	0.009	0.009	0.036***	0.006
knowent	-0.028***	0.003	0.003	-0.010***
opport	-0.006	-0.009*	-0.005	0.009
suskill	-0.017***	0.023***	-0.043***	-0.013**
fearfail	-0.014***	-0.001	-0.003	-0.006
Interaction				
gender	-0.000	0.001	-0.001***	0.001
age	-0.003***	0.032	-0.015***	0.000
hhsiz	-0.002	0.003	-0.003*	-0.001
GEMHHINC	0.000	-0.005	-0.000	0.002
GEMEDUC	-0.003	-0.019	-0.000	0.001
knowent	-0.005***	-0.001	0.002	-0.001
opport	-0.001	-0.019	0.001	0.001
suskill	-0.003***	0.040	0.012***	-0.001
fearfail	-0.002***	0.001	-0.000	-0.001

Source; Author calculation

***, **, and * indicate the 1%, 5% and 10%, level of significance respectively.

Table 5.B:O-B decomposition of entrepreneurial intention gap

	Brazil	Russia	China	South Africa
Explained				
knowent	0.003***	0.002***	0.023***	-0.002***
opport	0.006***	-0.014***	-0.004***	-0.005***
suskill	0.012***	-0.027***	-0.012***	-0.008***
fearfail	-0.001***	-0.001	-0.000	0.000
gender	0.000	-0.000*	-0.001***	-0.001***
age	-0.008***	-0.011***	-0.017***	-0.006***
hhsiz	-0.001***	0.001***	-0.001**	0.000
GEMHHINC	0.000*	0.000	-0.000	-0.001***
GEMEDUC	0.010***	0.002***	-0.001***	-0.002
Unexplained				
knowent	-0.028***	0.002	0.001	-0.008**
opport	-0.016***	0.002	-0.005	0.010***
suskill	-0.039***	0.002***	-0.040***	-0.011**
fearfail	-0.011***	0.003	-0.002	-0.005
gender	-0.002	0.009	-0.050***	-0.043***
age	-0.064***	0.010***	-0.139***	0.028
hhsiz	0.005	0.007	0.021*	0.019**
GEMHHINC	-0.021**	0.005	-0.002	-0.046***
GEMEDUC	-0.007	0.011	0.036***	0.014
cons	0.284***	0.020***	0.260***	0.000

Source; Author calculation

***, **, and * indicate the 1%, 5% and 10%, level of significance respectively.

This research adds to the pool of knowledge regarding entrepreneurship by breaking down the concept of EI. It also examines the factors that foster entrepreneurship within BRICS nations. By analysing the socio-demographic profiles of individuals interested in starting a business, the research provides valuable insights into how governments can better identify and support aspiring entrepreneurs through various initiatives. Given India's ongoing efforts to enhance its startup ecosystem, this information could help guide the realignment of its policies and programs to better match its strategic goals. In terms of predicting EIs in India, the study strongly supports the Theory of Planned Behaviour. Based on its findings, the research offers important insights into how the country can better support emerging businesses by addressing key challenges that affect entrepreneurial activity.

CONCLUSION

This study examined the BRICS nations' 2001–2018 entrepreneurial data that was collected from GEM. By applying the logistic regression model, the variables influencing EI have been determined. Second, the entrepreneurial attitudes (Self efficacy, Opportunity perception, Fear of failure, Network) underlying the gap in Indian entrepreneurial aspirations with BRICS nations were identified using the OB decomposition approach for explanatory variables (Yun, 2004). The study initially employed the explanatory variables of opportunity, confidence, network, and fear of failure as the most significant entrepreneurial attitudes for the mean differences of entrepreneurial intents in India. Then, in addition to entrepreneurial mindsets, we incorporated sociodemographic factors into the models for the robustness assessment.

The study confirms the presence significant entrepreneurial gap between India and other BRICS

nations. Compared to South Africa and Russia, Indians are keener to establish their firm, but China and Brazil are far more motivated to do so. Opportunity perception, self-confidence, and network are the major contributor in entrepreneurial gap.

REFERENCES

- Afandi, E., Kermani, M., & Mammadov, F. (2017). Social capital and entrepreneurial process. *International Entrepreneurship and Management Journal*, 13(3), 685-716.
- Ajzen, I. (1991). The Theory of planned behavior. *Organizational Behavior and Human Decision Processes*.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior 1. *Journal of applied social psychology*, 32(4), 665-683.
- Arafat, M. Y., & Saleem, I. (2017). Examining start-up Intention of Indians through cognitive approach: a study using GEM data. *Journal of Global Entrepreneurship Research*, 7, 1-11.
- Ardagna, S., & Lusardi, A. (2008). *Explaining international differences in entrepreneurship: The role of individual characteristics and regulatory constraints* (No. w14012). National Bureau of Economic Research.
- Arenius, P., & Clercq, D. D. (2005). A network-based approach on opportunity recognition. *Small business economics*, 24, 249-265.
- Arenius, P., & Kovalainen, A. (2006). Similarities and differences across the factors associated with women's self-employment preference in the Nordic countries. *International Small Business Journal*, 24(1), 31-59.
- Arenius, P., & Minniti, M. (2005). Perceptual variables and nascent entrepreneurship. *Small business economics*, 24, 233-247.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, 40, 471-499.
- Audretsch, D. B., & Thurik, A. R. (2001). *Linking entrepreneurship to growth*. STI working paper, Paris: OECD
- Audretsch, D. B., Keilbach, M., & Lehmann, E. E. (2006). *Entrepreneurship and economic growth*. Oxford: Oxford University Press.
- Autio, E., H. Keeley, R., Klofsten, M., GC Parker, G., & Hay, M. (2001). Entrepreneurial intent among students in Scandinavia and in the USA. *Enterprise and innovation management studies*, 2(2), 145-160.
- Bates, T. (1995). Self-employment entry across industry groups. *Journal of business venturing*, 10(2), 143-156.
- Bates, T., & Servon, L. (2000). Viewing self employment as a response to lack of suitable opportunities for wage work. *National Journal of Sociology*, 12(2).
- Blinder, A. S. 1973. Wage Discrimination: Reduced Form and Structural Estimates. *The Journal of Human Resources* 8: 436-455.
- Bogatyreva, K., Edelman, L. F., Manolova, T. S., Osiyevskyy, O., & Shirokova, G. (2019). When do EIs lead to actions? The role of national culture. *Journal of business research*, 96, 309-321.
- Chell, E., & Baines, S. (2000). Networking, entrepreneurship and microbusiness behaviour. *Entrepreneurship & regional development*, 12(3), 195-215.

- Davidsson, P. (1995). Determinants of EIs. In *RENT XI Workshop*.
- Davidsson, P. (2006). Nascent entrepreneurship: empirical studies and developments. *Foundations and trends® in entrepreneurship*, 2(1), 1-76.
- Dhaliwal, A. (2016). Role of entrepreneurship in economic development. *International Journal of scientific research and management*, 4(6), 4262-4269.
- Elam, A., & Terjesen, S. (2007). Institutional logics: Gender and business creation across GEM countries. In *Frontiers of Entrepreneurship Research 2007: Proceedings of the 27th Annual Babson College Entrepreneurship Research Conference* (pp. 1-15). Babson College.
- Fagenson, E. A., & Marcus, E. C. (1991). Perceptions of the sex-role stereotypic characteristics of entrepreneurs: women's evaluations. *Entrepreneurship theory and practice*, 15(4), 33-48.
- Fairlie, R. W., & Meyer, B. D. (1996). Ethnic and racial self-employment differences and possible explanations. *Journal of human resources*, 757-793.
- Fayolle, A. (2010). Insights from an international perspective on entrepreneurship education. *Handbook of research in entrepreneurship education*, 3, 1-9.
- Grilo, I., & Thurik, R. (2008). Determinants of entrepreneurial engagement levels in Europe and the US. *Industrial and Corporate Change*, 17(6), 1113-1145.
- Hattab, H. W. (2014). Impact of entrepreneurship education on EIs of university students in Egypt. *the Journal of Entrepreneurship*, 23(1), 1-18.
- Hayward, M. L., Forster, W. R., Sarasvathy, S. D., & Fredrickson, B. L. (2010). Beyond hubris: How highly confident entrepreneurs rebound to venture again. *Journal of Business venturing*, 25(6), 569-578.
- Kautonen, T., Van Gelderen, M., & Fink, M. (2015). Robustness of the theory of planned behavior in predicting EIs and actions. *Entrepreneurship theory and practice*, 39(3), 655-674.
- Klyver, K. et al. (2007). Influence of social network structure on entrepreneurship participation—A study of 20 national cultures. *International Entrepreneurship and Management Journal*, 4, 331-347.
- Klyver, K., & Hindle, K. (2007). The role of social networks at different stages of business formation. *Small Enterprise Research*, 15(1), 22-38.
- Koellinger, P. (2008). Why are some entrepreneurs more innovative than others? Erasmus Research Institute of Management (ERIM) Report Series Research in Management.
- Koellinger, P. et al. (2005). I think I can, I think I can: Overconfidence and entrepreneurial behavior. German Institute of Economic Research.
- Koellinger, P., Minniti, M., & Schade, C. (2013). Gender differences in entrepreneurial propensity. *Oxford bulletin of economics and statistics*, 75(2), 213-234.
- Krueger Jr, N. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of EIs. *Journal of business venturing*, 15(5-6), 411-432.
- Langowitz, N., & Minniti, M. (2007). The entrepreneurial propensity of women. *Entrepreneurship theory and practice*, 31(3), 341-364.
- Liñán, F., & Chen, Y. W. (2009). Development and cross-cultural application of a specific instrument to measure EIs. *Entrepreneurship theory and practice*, 33(3), 593-617.
- Neira, I., Calvo, N., Fernández, L., & Portela, M. (2017). Entrepreneur: do social capital and

- culture matter? *International Entrepreneurship and Management Journal*, 13, 665-683.
- Oaxaca, R. 1973. Male-Female Wage Differentials in Urban Labor Markets. *International Economic Review* 14: 693–709.
- Rahman, M., Uddin, M. & Masaru, I. Decomposition analysis of entrepreneurial activities in Japan: An international comparison. *J Glob Entrepr Res* 13, 10 (2023). <https://doi.org/10.1007/s40497-023-00353-5>
- Ramos-Rodríguez, A. R., Medina-Garrido, J. A., & Ruiz-Navarro, J. (2012). Determinants of hotels and restaurants entrepreneurship: A study using GEM data. *International Journal of Hospitality Management*, 31(2), 579-587.
- Roper, S., & Scott, J. M. (2009). Perceived financial barriers and the start-up decision: An econometric analysis of gender differences using GEM data. *International Small Business Journal*, 27(2), 149-171.
- Shane, S. (2000). The Promise of Entrepreneurship as a Field of Research. *Academy of Management Review*.
- Sharaf, A. (2018). Factors that influence EI within university students in Egypt. *Open Access Library Journal*, 5(10), 1.
- Spigel, B., Kitagawa, F., & Mason, C. (2020). A manifesto for researching entrepreneurial ecosystems. *Local Economy*, 35(5), 482-495.
- Verheul, I., Thurik, R., Grilo, I., & Van der Zwan, P. (2012). Explaining preferences and actual involvement in self-employment: Gender and the entrepreneurial personality. *Journal of economic psychology*, 33(2), 325-341.
- Yun, M. S. (2004). Decomposing differences in the first moment. *Economics letters*, 82(2), 275-280.
- Zouhair, M., Lanouar, C., & Ajmi, A. N. (2014). Contagion versus Interdependence: The Case of the BRIC Countries During the Subprime Crises. Elsevier.

NEXT-GENERATION GST REFORMS : A PATHWAY FOR VIKSIT BHARAT 2047

Dr. Anjali Agrawal*

ABSTRACT

The Goods and Services Tax (GST), introduced in 2017, marked a historic shift in India's indirect tax framework by rationalising a complex system of central and state levies into a unified, transparent and technology-driven tax regime. As India moves towards the vision of Viksit Bharat 2047, the recently announced Next-Generation GST Reforms (2025) represent a transformative step to strengthen the fiscal architecture, promote economic efficiency, and enhance citizen-centric governance. These reforms, anchored in simplification, digital integration, improved compliance, and sectoral rationalisation, are expected to deepen India's economic resilience and accelerate inclusive growth. Thus GST 2.0 can strengthen transparency, support cooperative federalism, optimise revenue efficiency, and become a pathway for Viksit Bharat 2047.

Keywords: Goods and Services Tax (GST), Viksit Bharat 2047.

INTRODUCTION

The Goods and Services Tax (GST) was implemented in India on July 1, 2017, marking one of the most significant tax reforms in the country's history. The 56th **Goods and Services Tax (GST) Council**, unveiled **GST 2.0 with next-generation reforms** to make the tax regime citizen-centric, boost agriculture, health, manufacturing, and improve ease of doing business. The changes in GST rates on services implemented with effect from 22nd September 2025. The GST is a comprehensive indirect tax that replaced a plethora of state and central taxes, including sales tax, excise duty, VAT, service tax etc. Its objective was to create a unified tax structure, simplify the tax system, and improve compliance.

OBJECTIVES

The objectives of this Research Paper can be listed as follows:

- 1- To study about the Key Tax Reforms Under GST 2.0.
- 2- To study the pros and cons of GST implementation on the nation's GDP and on other sectors like: industry, and entrepreneurship, agriculture, pharmaceuticals, education etc.
- 3- To analyse the inconsistencies in the regulatory framework and the gaps in the institutional machineries that affect the GST mechanism in India to make GST compatible for achieving the ideals of Vikshit Bharat 2047.

RESEARCH METHODOLOGY

Descriptive research with International secondary data from the different websites, Periodicals, National and Journals have been taken from different sources.

*Assistant Professor, Faculty of Law, Banaras Hindu University, Varanasi

THE STRUCTURE OF GST 2.0 IN INDIA

The structure of GST levies different types of taxes in India based on their sources and destinations. Here is an explanation of each type:

Tax Type	Full Form	Description
CGST	Central GST	The central government imposes CGST on the movements of goods or services within a state.
SGST	State GST	The state government imposes SGST in the state where the transaction
IGST	Integrated GST	IGST applies to all goods or services moving between two or more states or union territories.
UTGST	Union Territory GST	The central government imposes UTGST on goods or services moving within the Union Territories of India.

FRAMEWORK OF GST 2.0 IN INDIA**DUAL GST:**

India has adopted a Dual GST model in view of the federal structure of the country. Consequently, Centre and States simultaneously levy GST on taxable supply of goods or services or both which, takes place within a State or Union Territory. Thus, tax is imposed concurrently by the Centre and States, i.e. Centre and States simultaneously tax goods and services. Now, the Centre also has the power to tax intra-State sales & States are also empowered to tax services. GST extends to whole of India including the State of Jammu and Kashmir.

COMPOSITION SCHEME UNDER GST 2.0

The composition scheme under GST eases the process of indirect tax payment for small taxpayers. As per the CBIC, companies with an annual turnover within Rs. 1.5 Crore can opt for the scheme to pay their taxes. For North-Eastern states, the turnover limit is Rs. 75 Lakh. Registration under the scheme is, however, voluntary.

CONCEPT OF INPUT TAX CREDIT (ITC) UNDER GST 2.0 IN INDIA

An Input Tax credit means that when a business person or a trader is paying tax on output, he/she can reduce the tax already paid on input (purchase). This is one of the key advantages of GST because it helps businesses reduce the cascading effect of taxes (tax on tax) by allowing them to claim credit for the tax they have already paid on inputs.

GST REGISTRATION

GST registration is the process through which a business or individual becomes a taxpayer under the Goods and Services Tax (GST) regime. Registration is mandatory for certain businesses, while others can opt for voluntary registration. Here's a breakdown of the GST registration process:

WHO NEEDS TO REGISTER FOR GST?

GST registration is mandatory for businesses or individuals who meet the following criteria:

TURNOVER LIMIT

- 1- **For Normal Taxpayers:** If the aggregate turnover exceeds ₹40 lakhs in a financial year (₹20 lakhs for special category states like North-Eastern states and hill states).
- 2- **For Service Providers:** If the turnover exceeds ₹20 lakhs (₹10 lakhs for special category states).

VOLUNTARY REGISTRATION

Businesses with turnover below the prescribed limits can voluntarily register for GST if they wish to avail benefits like Input Tax Credit (ITC) or expand their business.

INTERSTATE SALES

Any business making interstate sales (i.e., selling goods or services to customers in other states) is required to be registered under GST, regardless of the turnover.

E-commerce Operators: All e-commerce operators are required to register under GST, even if their turnover is below the prescribed threshold.

STEPS FOR GST 2.0 REGISTRATION

1. **Visit the GST Portal:** Go to the official GST portal (www.gst.gov.in).
2. **Fill the Application:** Complete the GST REG-01 application form with necessary details such as business name, PAN (Permanent Account Number), business address, nature of business, etc.
3. **Verification:** Upload supporting documents (e.g., proof of identity, address, bank details).
4. **GSTIN:** After successful verification and approval, the business will receive a GSTIN (Goods and Services Tax Identification Number).

GST – A TAX ON GOODS AND SERVICES

GST is levied on all goods and services, except alcoholic liquor for human consumption and petroleum crude, diesel, petrol, ATF and natural gas.

Alcoholic liquor for human consumption: is outside the realm of GST. The manufacture/production of alcoholic liquor continues to be subjected to State excise duty and inter-State/intra-State sale of the same is subject to CST/ VAT respectively.

Petroleum crude, diesel, petrol, ATF and natural gas: As regards petroleum crude, diesel, petrol, ATF and natural gas are concerned, they are not presently leviable to GST. GST will be levied on these products from a date to be notified on the recommendations of the GST Council. Till such date, central excise duty continues to be levied on manufacture/production of petroleum crude, diesel, petrol, ATF and natural gas and inter-State/intra-State sale of the same is subject to CST/VAT respectively.

Tobacco: Tobacco is within the purview of GST, i.e. GST is leviable on tobacco. However, Union Government has also retained the power to levy excise duties on tobacco and tobacco products manufactured in India. Resultantly, tobacco is subject to GST as well as central excise duty.

Further, **real estate sector** has been kept out of ambit of GST, i.e. GST will not be levied on sale/purchase of immovable property.

OBJECTIVES OF NEXT-GENERATION GST

The key objectives of Next-Generation GST are-

1- 'One Nation, One Tax'

GST took the place of many indirect taxes that existed before. It was introduced with a core motive and

policy called the 'One Nation, One Tax'. It was introduced as so to provide set tax rates for a service/product that every state would follow. It even simplified administering taxes and compliances.

2-To Subsume Indirect Taxes in India

To create a centralised and unified tax system on goods and services, GST was introduced in India. Under its laws, the majority of indirect taxes were subsumed into one to simplify administration.

3-To Restrain Tax Evasion

Prior to the introduction of GST, the tax evasion rate was very high. In order to curb evasion and create a centralised tax surveillance system, GST was introduced in India. It has effectively contributed to reducing the number of tax defaulters.

FEATURE OF NEXT-GENERATION GST REFORMS

The Goods and Services Tax (GST) in India is a comprehensive indirect tax system that replaced multiple taxes previously levied by the central and state governments. It was introduced on July 1, 2017 to streamline the taxation process and make India's tax structure more unified. The GST system aims to eliminate the cascading effect of taxes and improve the ease of doing business in the country.

BELOW ARE THE KEY FEATURES OF NEXT-GENERATION GST REFORM IN INDIA

1.Single Indirect Tax System

GST replaced several central and state-level indirect taxes, including:

Central taxes like Excise Duty, Service Tax, and Customs Duty.

State taxes like VAT (Value Added Tax), Sales Tax, Entry Tax, and Entertainment Tax.

2. Dual GST Model

India follows a dual GST system, meaning GST is levied at both the Central and State levels. The structure includes: CGST (Central Goods and Services Tax): Tax levied by the central government on intra-state transactions. SGST (State Goods and Services Tax): Tax levied by the state government on intra-state transactions. IGST (Integrated Goods and Services Tax): Tax levied on interstate transactions, i.e., between two different states. The IGST is collected by the central government, and the amount is then distributed between the central and state governments.

3. Comprehensive Coverage of Goods and Services

GST is applicable on the supply of both goods and services, making it more comprehensive than earlier tax systems that applied to goods only or had multiple classifications for goods and services. It covers a wide range of goods and services, including:

Manufacturing goods

Trading goods

Services like banking, telecom, insurance, etc.

Intangible items like intellectual property

4. Destination-Based Taxation

GST is a destination-based tax system. This means that the tax is collected at the point of consumption, not at the point of origin. For example, if a product is manufactured in one state and sold in another, the tax will be paid in the state where the product is consumed, not where it was produced.

5. Input Tax Credit (ITC)

GST allows businesses to claim Input Tax Credit (ITC) for the tax paid on goods or services used in the

production of goods and services. This helps to avoid the cascading effect of taxes (tax on tax) by allowing businesses to offset their output tax liability against the tax already paid on inputs.

Example: A manufacturer pays GST on raw materials and claims credit for the tax paid, reducing the tax burden on the final product.

6-Two Tier Tax Rates

5% (merit rate) for essential items and **18% (standard rate)** for others), plus a **40% demerit rate** for luxury, sin, and demerit goods like tobacco and pan masala.

7-E-way Bill System

The E-way Bill system is introduced to ensure the smooth movement of goods within and across states. It is a unique document that must accompany the transportation of goods worth more than a certain value (usually ₹50,000) for both inter-state and intra-state movements. It allows businesses to transport goods more easily and efficiently, preventing tax evasion and ensuring compliance.

8-Technology-Driven System

GST in India is powered by technology. The GST portal serves as the backbone of the system, enabling businesses to:

Register for GST File GST returns Claim Input Tax Credit (ITC) Pay taxes online Track invoices and e-way bills This tech-driven approach reduces paperwork, speeds up processes, and ensures a more efficient and modern taxation system.

9- Composition Scheme for Small Businesses

Small businesses with an annual turnover below a certain threshold (₹1.5 crore for goods and ₹50 lakh for services) can opt for the Composition Scheme under GST. This scheme offers several benefits: Lower compliance requirements Simplified tax structure with a fixed percentage of turnover No need to maintain detailed records and file detailed returns However, businesses under the Composition Scheme are not eligible to claim Input Tax Credit (ITC)

7 PILLARS OF NEXT GENERATION GST REFORMS



Next-Generation GST Reforms

WHAT ARE THE KEY TAX REFORMS UNDER GST 2.0?

1- Simplified GST Structure:

GST 2.0 replaces four GST slabs (5%, 12%, 18%, and 28%) with a **two-slab system (5% (merit rate) for essential items and 18% (standard rate) for others)**, plus a **40% demerit rate** for luxury, sin, and demerit goods like tobacco and pan masala.

2- Tax Relief for the Essential Goods:

Full **GST exemption** on individual life and health insurance policies. **Essential goods** such as Ultra-High Temperature (UHT) milk, paneer, and Indian breads now carry **nil GST**.

3- Consumer Goods:

GST on small cars, TVs, air conditioners, cement, and auto parts has been reduced from 28% to 18%. GST on renewable energy devices has been reduced from 12% to 5%. These cuts are expected to stimulate manufacturing, promote green energy adoption, and boost domestic demand.

4- Medical and Health Devices:

GST on 33 lifesaving drugs has been reduced from 12% to nil. GST on three critical drugs used for cancer and rare diseases has been reduced from 5% to nil, strengthening healthcare access.

5- Support for Agriculture and Rural Sectors: Machinery like tractors, harvesters, and composters: GST reduced from 12% to 5%.

- Fertilizer inputs such as sulphuric acid, nitric acid, and ammonia: GST reduced from 18% to 5%.
- Labour-intensive goods like handicrafts, marble, and leather items: GST reduced from 12% to 5%.

6- Trade Facilitation and Dispute Resolution:

The Goods and Services Tax Appellate Tribunal (GSTAT) will be operational by December 2025.

- Process reforms for refunds and registration will improve dispute resolution, reduce litigation, and provide predictability for businesses, especially MSMEs.

ADVANTAGES OF NEXT-GENERATION GST REFORMS

Next-Generation GST Reforms are designed not just to reduce tax rates, but to create a virtuous cycle of growth. The following are the advantages of GST 2.0 reforms in India:

1- Lower Prices, Higher Demand: Cheaper goods and services increase household savings and stimulate consumption.

2- Support for MSMEs: Reduced rates on inputs like cement, auto parts, and handicrafts lower costs and make small businesses more competitive.

3- Ease of Living: A two-rate structure means fewer disputes, quicker decisions, and simpler compliance.

4- Wider Tax Net: Simpler rates encourage compliance, expanding the tax base and improving revenues.

5- Support for Manufacturing: Correcting inverted duty structures boosts domestic value addition and exports.

6- Revenue Growth: As seen in past reforms, lower rates with better compliance increase collections.

- 7- Economic Momentum:** Lower costs → higher demand → larger tax base → stronger revenues → sustainable growth.
- 8- Social Protection:** Exemption of GST on insurance and essential medicines strengthens household security and access to healthcare.
- 9- More Efficient Tax System** -Tech-driven GST 2.0 approach reduces paperwork, speeds up processes, and ensures a more efficient and modern taxation system.
- 10-Anti-Tax Evasion Measures- GST 2.0** includes several measures Like GSTIN, Matching of Invoices and E Way bill prevents tax evasion.

CONCLUSION

Next Generation GST Reforms have brought major change to India's indirect tax System by simplifying tax rates, speeding up tax compliance and supporting economic growth of india. Through reducing multiple tax slabs and lowering rates on many consumer goods GST 2.0 reforms have helped both household and business. Thus it is clear that Next generation GST reforms are a paradigm shift for Indian economy by more stable economic environment for companies and is expected to encourage high economic growth by more consumer spending.

REFERENCES

- Bhatia, H.L. Indirect Taxes including GST 22nd Edition, 2020, Vikas Publishing House.
- Ministry of Finance, Government of India Report of the GST Council Various years, available on the Ministry of Finance website (<https://www.finmin.nic.in/>).
- <https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=2163555>
- 4-<https://x.com/mygovindia/status/1963290806770450904?s=46>.

REVENUE PERFORMANCE OF GOODS AND SERVICES TAX IN INDIA

Parul Jain* & Jitendra Kumar**

ABSTRACT

The implementation of the Goods and Services Tax (GST) in India in July 2017 marked a transformative shift in the country's indirect tax regime, unifying federal and state levies under a single framework. This study examines the evolution of GST revenue collections from its inception to 2024, analyzing trends, challenges, and policy interventions that shaped its trajectory. The analysis highlights the severe impact of the COVID-19 pandemic in 2020–2021, which caused a sharp contraction in GST collections, followed by a V-shaped recovery driven by economic revival, enhanced compliance mechanisms, and structural reforms such as e-invoicing, rate rationalization, and technological advancements in the GST Network (GSTN). Using descriptive statistics and autoregressive integrated moving average (ARIMA) modelling using Eviews, the paper forecasts GST collections up to March 2027. The ARIMA (1,1,2) model, selected based on diagnostic tests and parsimony, predicts a steady upward trajectory, with monthly collections projected to rise from ₹1.87 lakh crore in January 2025 to ₹2.20 lakh crore by March 2027. The study underscores the role of continuous policy adjustments, including compensation mechanisms for states, simplification of tax slabs, and digital infrastructure improvements, in sustaining GST's growth. These findings emphasize GST's resilience as a revenue source and its critical role in India's fiscal stability, offering insights for policymakers to address future uncertainties through robust compliance frameworks and adaptive economic strategies.

Keywords: Goods and Services Tax (GST), GST Trends, ARIMA forecasting

INTRODUCTION

The rollout of the Goods and Services Tax (GST) on July 1, 2017, followed almost 17 years of discussions between the Union and the States, along with the suggestions from various committees, and is often viewed as a prime example of cooperative federalism. Both the Centre and the States collaborated to merge their taxation powers over goods and services to realize the vision of 'one country one tax'. GST in India has been referred to as 'a good and simple tax'. Key figures behind this reform include P. Chidambaram, Vijay Kelkar, Asim Das Gupta, Pranab Mukherjee, Arun Jaitley, Arvind Subramanian, Sushil Modi, and Nirmala Sitharaman. The GST has integrated a total of 17 different taxes from both the Centre and the States along with 13 cesses into a single tax. This includes central excise duty, excise duties for medicinal and toilet preparations, additional excise duties for goods of special importance, additional excise duties for textiles and textile products, additional

* Assistant Professor and corresponding author, Department of Economics, D.A.V. P.G. College, Banaras Hindu University, Varanasi-221001, Uttar Pradesh, India, [Email: jainparul486@davpgcvns.ac.in](mailto:jainparul486@davpgcvns.ac.in)

** Doctoral Scholar, Department of Economics, D.A.V. P.G. College, Banaras Hindu University, Varanasi-221001, Uttar Pradesh, India, Email: jitendra.bhu.999@gmail.com, ORCID ID: 0009-0003-2202-7802.

customs duties, special additional customs duties, service tax, as well as cesses and surcharges related to the supply of goods and services. The state taxes that are included in GST consist of State VAT, Central Sales Tax, Purchase tax, luxury tax, Entry tax, Entertainment tax, taxes on advertisements, taxes on lotteries, betting and gambling, and state cesses and surcharges that pertain to the supply of goods and services. Nonetheless, petroleum and alcoholic products are excluded from the scope of GST. GST consists of multiple parts: Central GST (CGST), State and Union Territory GST (SGST)/(UTGST), Integrated GST (IGST), along with the Compensation Cess, which is imposed on luxury and sin goods like carbonated beverages, coal, pan masala, cigarettes, and vehicles. CGST must be paid to the central government for the supply of goods and services within a state or union territory. SGST/UTGST is payable to the State or Union Territory Government for the supply of goods and services within the same area. In cases of inter-state supply of goods and services, IGST is applied. The Government of India imposes IGST. The revenue generated from IGST is kept in a distinct account to facilitate the adjustment of input tax credit, which is ultimately reconciled with the States based on final consumption through a clearinghouse system. A comparable IGST is also applied to goods imported into India. The IGST is divided between the Union and the States in a manner determined by Parliament through legislation based on the recommendations of the Goods and Services Tax Council. Consequently, GST in India is structured as a destination-based tax featuring a seamless input tax credit process. While both the Union and State Governments have implemented their own laws and regulations, they operate in alignment with the agreements reached within the GST Council. The GST Council makes suggestions regarding compliance and regime management, as well as the layout and design of the GST mode. The Union government promised the States a minimum annual income growth of 14% for five years based on revenue fees in 2015–16 in order to weaken the fees of the States with regard to the productivity of the tax regime revenue. The goal of this compensation is to resolve state problems without putting undue strain on the Allied government. In order to make up for the income loss, cesses were introduced to boost income.

The year 2020 threw a novel COVID-19 virus which threatened the entire world which adversely affected mobility, safety and normal life of the people. This, in turn, presented the most formidable economic challenge to India and the world. Governments across the world deployed a range of policy tools to support their economies and save people from the dangerous and evil effects of the pandemic. India also adopted several bold steps which, although resulted in short term pains but the measures were intended to long-term gains.

In India, a stringent nation-wide lockdown was imposed on March 24, 2020, and subsequently extended till May 31, 2020. India crossed its peak in mid-September 2020 when it had 11.12 lakh active cases. Covid-19 posed the most formidable economic challenges to India. Public health policy became central to tackling this all pervasive crisis. This crisis resulted in the policy dilemma of 'lives versus livelihoods'. There were some important consequences of the epidemic. **First**, there were widespread economic dislocations throughout the world, including India. **Second**, the pandemic caused incomes and demand to contract which affected sectors everywhere. **Third**, there was sharp decline in business income and confidence. **Fourth**, there was a downward spiral in demand for products and services. **Fifth**, with borders closing and supply chain disrupted, people got worse before getting better. **Sixth**, transport industries such as aviation, shipping and railways went through deep crisis. **Seventh**, there were also economic costs of virus. The slowdown in global trade and sharp decline in demand for employment tended to compound India's faltering growth. **Eighth**, there was

huge labour migration to respective home States which resulted in shortage of manpower in industries. **Ninth**, Covid-19 adversely impacted sales and bank credit growth and led several companies to shut operations. **Tenth**, the Indian economy, after subdued growth in 2019 witnessed a sharp contraction of 23.9 per cent in first quarter of 2020-21 and 7.5 per cent contraction in second quarter of 2020-21 due to stringent lockdown imposed during March-April 2020.

Under the aforesaid developments, government finances became extremely difficult and collapse in revenues of both Central and State governments and increased expenditures was witnessed. Therefore, the biggest challenge was to step up economic activity.

Amidst these fluctuating variations in the economy, it becomes important to analyse the growth rate which have been witnessed in the GST revenue collections. The questions which need to be addressed includes as what has been the monthly collection and annual growth rate of revenue from GST. Along with the descriptive statistics being used to present the absolute values from GST collections. Further, forecasting is done using ARIMA Forecasting to establish the future trends of GST in India.

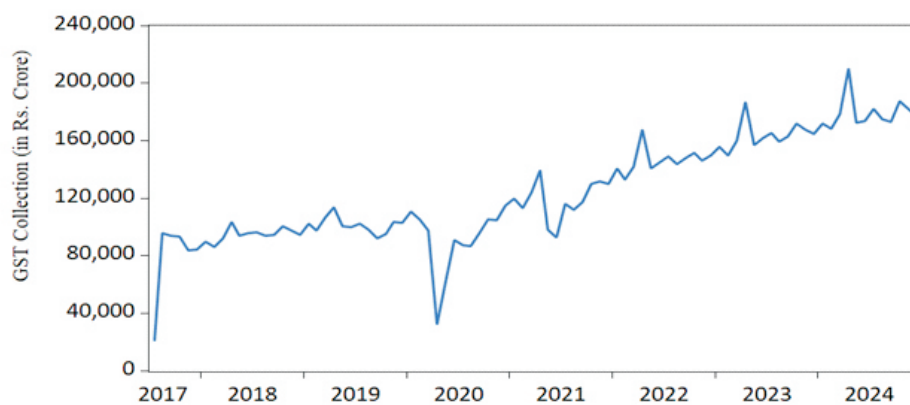
DESCRIPTIVE ANALYSIS

When GST subsumed in its ambit various indirect taxes in July 2017, it was expected that in the initial period the yield would be low. During the period July 2017 to March 2018 (9months), the yield from GST was below Rs.1 lakh crore every month and the total yield during this period was ₹7,40,587 crore (Table1). During the period April 2018 to March 2019, the yield improved a little but it was below ₹1 lakh crore in eight out of twelve months and the total yield from GST during 2018-19 was ₹11,77,348 crore-giving an average of ₹98,112.33crore per month. It is from now on that the yield from GST started crossing ₹1 lakh crore. It is happy to note that during 2019-20, gross collection from GST exceeded ₹1 lakh crore in seven out of twelve months and total collection from GST was ₹12,22,129 crore in 2019-20. It was highest at ₹1,13,865 crore in April 2019. It was below ₹1 lakh crore in 5 months of 2019-20. While the yield from GST was above ₹1 lakh crore in the months of January and February 2020, the yield sharply declined due to outbreak of COVID-19 in the month of March 2020. GST collections declined to ₹97,597 crore in March 2020. Revenue collections from GST continued to be below ₹1 lakh crore mark up to September 2020. Due to Government's efforts to reduce the impact of second wave of pandemic, a sustained resurgence in various indicators was witnessed. Indian economy started experiencing V-shaped economic recovery. With the revival of the economy, the Goods and Services Tax has emerged as a buoyant source of revenue for both the Centre and the States. (Economic Survey, 2021-22). There was quick recovery in the monthly GST collections. Over the last five years, GST revenue have steadily grown. From October 2020, gross GST collections exceeded ₹1 lakh crore in all the six months from October 2020 to March 2021. Similar increasing trend was observed during 2021-22 when GST collections exceeded ₹1 lakh crore in 10 out of 12 months during the year and were highest at ₹1,42,095 crore in the month of March 2022. This buoyant trend is witnessed in financial year 2022-23. The month of April 2022 saw a record GST collection of ₹1,67,540 crore and during first six months of the financial year 2022-23, the GST collections have exceeded ₹1.4 trillion every month. The average monthly collection of GST has also improved from ₹98,114 crore during 2018-19 to ₹1,01,843 crore during 2019-20 and further to ₹1,23,612 crore in 2021-22 and ₹1,50,502 crore in 2022-23. The average monthly collection was ₹1,68,022 crore during 2023-24 and it was ₹1,81,507 crore during the first nine months of financial year 2024-25.

TRENDS AND GROWTH IN GST IN INDIA (2017-2024)

Since its implementation on July 1, 2017, the Goods and Services Tax (GST) in India has undergone significant evolution and has had notable impacts on the economy. Revenue growth is witnessed due to steady increase in collections. The monthly GST collections have shown a consistent upward trend. Initial collections in 2017 averaged around ₹90,000 crore per month, which have now regularly surpassed ₹1.4 lakh crore in 2023. The highest monthly GST collection recorded was ₹1.67 lakh crore in April 2022 and ₹1.87 lakh crore in April 2023 and ₹2.10 lakh crore in April 2024. The reasons for this include improved compliance. The number of registered taxpayers has increased significantly from around 64 lakhs in 2017 to over 1.48 crore by November 2024 and the introduction of e-invoicing, e-way bills, and improved IT infrastructure has enhanced compliance and reduced evasion.

Figure 1. GST Collection in India from August 2017 to December 2024



In spite of these fluctuating trends and sharp decline in the collections, still a constant monthly growth rate was witnessed. These were due to structural changes and simplifications. These include :

- 1. Rationalization of Rates:**

- The GST Council has frequently revised tax rates to address industry concerns and economic needs. The number of items in the highest tax slab of 28% has been reduced.
- Simplification efforts included merging some tax slabs and reducing the burden on small and medium enterprises (SMEs).

- 2. Introduction of e-Invoicing:** e-Invoicing was introduced in phases starting from October 2020 for large enterprises and gradually extended to smaller businesses. It aims to streamline the invoice generation process and curb tax evasion.

- 3. GSTN Infrastructure Improvements:** The GST Network (GSTN) faced initial teething issues, but continuous enhancements have made the system more robust, handling increased traffic and improving user experience.

- 4. Boost to Formalization:** GST has contributed to the formalization of the economy by bringing more businesses into the tax net, thereby increasing transparency and accountability.

- 5. Impact on Logistics and Supply Chain:** The elimination of state border check posts has

reduced transit times and logistics costs, thereby improving efficiency in the supply chain.

6. Sectoral Growth: Sectors such as e-commerce, manufacturing, and logistics have benefitted from the streamlined tax regime and improved ease of doing business.

7. Policy Adjustments and Relief Measures:

- During the COVID-19 pandemic, the government provided various relief measures such as extending deadlines for filing returns, reducing late fees, and offering easier compliance norms for small businesses.
- The central government has consistently compensated states for any revenue loss due to the implementation of GST, ensuring states' cooperation and financial stability.

Due to the aforesaid measures and policy changes by the Central Government there was steady increase in collections. The monthly GST collections have shown a consistent upward trend after the post covid period and a steady monthly growth rate. An improved compliance was also witnessed as the number of registered taxpayers has increased significantly from around 64 lakhs in 2017 to over 1.48 crore by November 2024 and the introduction of e-invoicing, e-way bills, and improved IT infrastructure has enhanced compliance and reduced evasion.

FORECASTING GST TRENDS IN INDIA

For forecasting GST, the Autoregressive Integrated Moving Average (ARIMA) model, popularly known as the Box-Jenkins method, is used.

ARIMA Model

$$y_t = c + \phi_1 y_{t-1} + \phi_2 y_{t-2} + \dots + \phi_p y_{t-p} + \epsilon_t + \theta_1 \epsilon_{t-1} + \theta_2 \epsilon_{t-2} + \dots + \theta_q \epsilon_{t-q}$$

where y_t is the differenced value of the time series at time t ,

$\phi_1, \phi_2, \dots, \phi_p$ are the AR coefficients

$\theta_1, \theta_2, \dots, \theta_p$ are the MA coefficients

ϵ_t is the white noise error term

As per the data in Table 1, the test results are as follows:

Table 2. Unit Root Test Results of GST at Level

Null Hypothesis: GST has a unit root

Exogenous: Constant

Lag Length: 2 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.861555	0.7959
Test critical values:		
1% level	-3.507394	
5% level	-2.895109	
10% level	-2.584738	

*MacKinnon (1996) one-sided p-values.

Source: Authors' Calculation

The results of the Augmented Dickey-Fuller (ADF) unit root test for the GST series at the level are

presented in Table 2. p-value 0.7959 shows that the test fails to reject the null hypothesis of the presence of a unit root. Hence, at level, GST collection data is non-stationary.

Table 3. Unit Root Test Results of GST at 1st Difference

Null Hypothesis: D(GST) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=11)

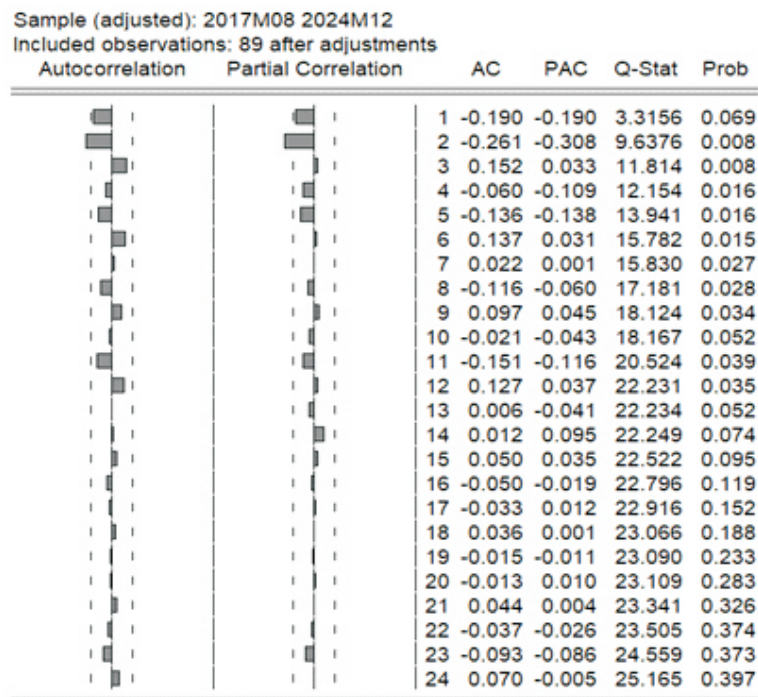
	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-11.13095	0.0001
Test critical values:		
1% level	-3.508326	
5% level	-2.895512	
10% level	-2.584952	

*MacKinnon (1996) one-sided p-values.

Source: Authors' Calculation

The results of the Augmented Dickey-Fuller (ADF) unit root test for the GST series at the level are presented in Table 3. p-value 0.00 shows that the null hypothesis is rejected, and unit root is absent. Hence data is stationary at 1st difference.

Figure 2. Correlogram of GST at 1st Difference



Source: Authors' Calculation

The Correlogram of GST collection at the first difference in Figure 2 shows that ACF has a significant spike at lag 2, and PACF also has a significant spike at lag 2. This helps in selecting the probable models up to a combination of AR (2) and MA (2). Then, we choose the appropriate ARIMA model following the principle of parsimony.

ARIMA Models	1,1,1	1,1,2
Significant Coefficients	2	2
Sigma^2 (Volatility)	205503247.6383	198994011.1119
Adjusted R^2	0.1549	0.1817
Akaike Info. Criterion (AIC)	22.07648	22.0443
Schwarz Bayesian Info. Criterion (SBIC)	22.1883	22.1562
Hannan-Quinn Criterion (HQC)	22.1216	22.0894

Based on the correlogram of differenced series of GST, the appropriate ARIMA Model is selected by observing the results of different possible ARIMA models.

ARIMA Models	2,1,1	2,1,2
Significant Coefficients	2	0
Sigma^2 (Volatility)	205154247.4378	223905790.7870
Adjusted R^2	0.1563	0.0792
Akaike Info. Criterion (AIC)	22.0728	22.1583
Schwarz Bayesian Info. Criterion (SBIC)	22.1846	22.2702
Hannan-Quinn Criterion (HQC)	22.1179	22.2034

Table 4. Evaluation of Various ARIMA Models

Source: Authors' Calculation

Table 5. Parameter Estimates of ARIMA(1,1,2)

Dependent Variable: D(GST)
Method: ARMA Maximum Likelihood (OPG - BHHH)
Date: 02/02/25 Time: 09:21
Sample: 2017M08 2024M12
Included observations: 89
Convergence achieved after 21 iterations
Coefficient covariance computed using outer product of gradients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1317.708	619.5176	2.126990	0.0363
AR(1)	-0.415947	0.136617	-3.044619	0.0031
MA(2)	-0.542783	0.110737	-4.901565	0.0000
SIGMASQ	1.99E+08	13164959	15.11543	0.0000
R-squared	0.209561	Mean dependent var	1744.775	
Adjusted R-squared	0.181663	S.D. dependent var	15956.57	
S.E. of regression	14434.63	Akaike info criterion	22.04431	
Sum squared resid	1.77E+10	Schwarz criterion	22.15616	
Log likelihood	-976.9719	Hannan-Quinn criter.	22.08939	
F-statistic	7.511727	Durbin-Watson stat	1.619961	
Prob(F-statistic)	0.000162			
Inverted AR Roots	-.42			
Inverted MA Roots	.74	-.74		

Source: Authors' Calculation

The estimated regression equation of ARIMA(1,1,2) model is

$$\Delta y_t = 1317.7080 - 0.4159\Delta y_{t-1} - 0.5428\epsilon_{t-2} + \epsilon_t$$

Diagnostic of ARIMA(1,1,2)

Figure 3. Correlogram of Residuals

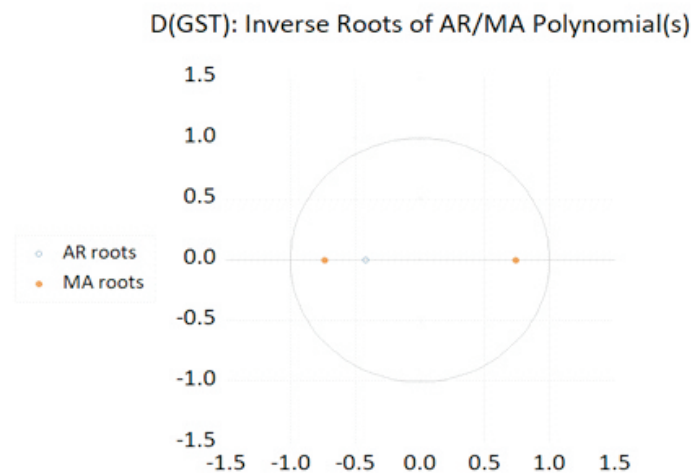
Sample (adjusted): 2017M09 2024M12
Q-statistic probabilities adjusted for 2 ARMA terms

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
		1 -0.007	-0.007	0.0040	
		2 -0.003	-0.003	0.0050	
		3 0.060	0.060	0.3405	0.560
		4 -0.034	-0.033	0.4490	0.799
		5 -0.180	-0.181	3.5307	0.317
		6 0.096	0.093	4.4225	0.352
		7 -0.042	-0.039	4.5982	0.467
		8 -0.143	-0.129	6.6086	0.359
		9 0.056	0.038	6.9250	0.437
		10 -0.024	-0.047	6.9842	0.538
		11 -0.127	-0.091	8.6380	0.471
		12 0.176	0.155	11.881	0.293
		13 0.059	0.024	12.247	0.345
		14 0.099	0.149	13.300	0.348
		15 0.077	0.034	13.944	0.378
		16 -0.000	-0.050	13.944	0.454
		17 -0.069	0.012	14.476	0.490
		18 0.024	-0.006	14.543	0.558
		19 -0.062	-0.048	14.990	0.596
		20 -0.042	0.016	15.197	0.648
		21 0.047	0.024	15.455	0.693
		22 -0.050	-0.029	15.753	0.732
		23 -0.112	-0.072	17.273	0.694
		24 0.032	-0.011	17.402	0.741

Source: Authors' Calculation

Figure 3 shows that p-values are greater than 0.05 hence we cannot reject the null hypothesis: residuals are white noise. Therefore, there is no significant autocorrelation in the residuals. This indicates that the model captured the time dependencies, and the residuals appear to behave like white noise, supporting the adequacy of the model.

Figure 4. Inverse Roots of AR/MA Polynomial(s)



Source: Authors' Calculation

Figure 4 shows all AR and MA roots lie inside the unit root circle. Thus ARIMA(1, 1, 2) Model satisfies both conditions of diagnostic.

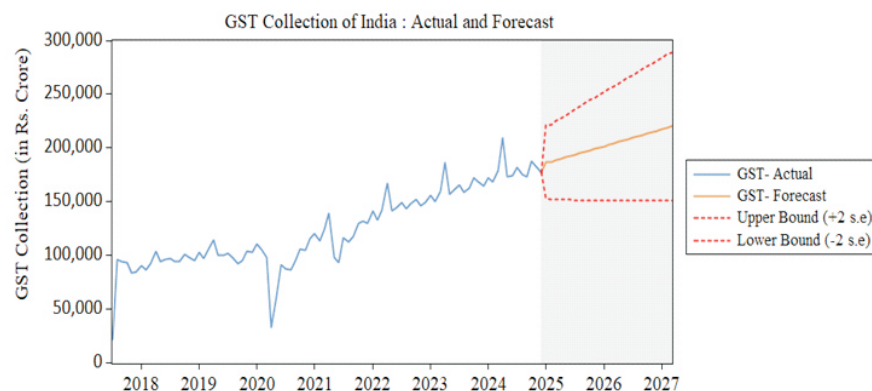
1. Residuals are white noise.

2. ARMA structure

Now, we can go for forecasting with the ARIMA(1, 1, 2) Model.

FORECASTING OF GST COLLECTION

Figure 5. GST Collection of India: Actual and Forecast



Source: Authors' Calculation

In Figure 5 illustrates the historical and forecasted trends in India's GST collections from July 2017 to March 2027. The blue line shows the actual GST collection up to December 2024 in which there is a dip around April 2020 due to the economic impact of Covid-19 pandemic and the orange line shows the forecasted value of GST collection from January 2024 to March 2027 and a red dotted line showing the upper and lower bound. The widening confidence bands towards the later years of the forecast period highlight increasing uncertainty as the forecasted horizon extends, a common feature of time-series forecasts. This analysis underscores the importance of monitoring GST revenue trends for fiscal planning and policy formulation.

Table 5. GST Collection Forecast (in Rs. Crore) in India from January 2025 to March 2027

Month	GST Forecast	Upper Bound	Lower Bound	Month	GST Forecast	Upper Bound	Lower Bound
Jan-25	187001.38	220972.4905	153030.2694	Mar-26	204215.3997	257501.1175	150929.6819
Feb-25	186571.9542	221277.7295	151866.1789	Apr-26	205533.0996	260168.6875	150897.5117
Mar-25	188616.3768	225206.6159	152026.1377	May-26	206850.8109	262831.1571	150870.4648
Apr-25	189631.8102	227521.9658	151741.6547	Jun-26	208168.5175	265488.8503	150848.1847
May-25	191075.2483	230485.682	151664.8147	Jul-26	209486.2261	268142.1098	150830.3423
Jun-25	192340.6593	233152.4728	151528.8458	Aug-26	210803.9338	270791.2252	150816.6425
Jul-25	193680.1201	235927.3264	151432.9138	Sep-26	212121.6419	273436.469	150806.8149
Aug-25	194988.7801	238639.6973	151337.8629	Oct-26	213439.3499	276078.0863	150800.6135
Sep-25	196310.2516	241363.9927	151256.5104	Nov-26	214757.0579	278716.3028	150797.813
Oct-25	197626.3941	244069.7272	151183.061	Dec-26	216074.7659	281351.3246	150798.2072
Nov-25	198944.7533	246771.1537	151118.3528	Jan-27	217392.4739	283983.3417	150801.606
Dec-25	200262.1904	249463.2019	151061.1789	Feb-27	218710.1819	286612.5283	150807.8354
Jan-26	201580.0111	252148.9752	151011.0469	Mar-27	220027.8899	289239.0452	150816.7345
Feb-26	202897.6722	254827.9626	150967.3818				

Source: Authors' Calculation

Table 5 presents the forecasted Goods and Services Tax (GST) collections for the period from January 2025 to March 2027. Alongside the forecasted values, it also provides a confidence range, with lower and upper bounds, to account for potential variations in GST Collection.

The forecast suggests a consistent rise in GST collections, from ₹1.87 lakh crore in January 2025 to ₹2.20 lakh crore in March 2027. This growth indicates a stable upward trend in GST collection. The range between the lower and upper bound highlights the uncertainty in forecasting. For instance, in March 2027, GST Collection could range between ₹1.50 lakh crore (pessimistic scenario) and ₹2.89

lakh crore (optimistic scenario), depending on economic conditions, policy changes, and compliance levels.

Future Outlook

1. **Continued Rationalization:** Ongoing efforts to further simplify the tax structure and reduce the number of tax slabs are expected.
2. **Enhanced Technology Integration:** The use of advanced technologies such as artificial intelligence and blockchain is anticipated to improve compliance, reduce fraud, and streamline processes.
3. **Focus on Compliance and Audits:** Increased focus on audits and scrutiny to ensure better compliance and detect tax evasion.

POLICY RECOMMENDATIONS

No doubt there are certain concerns about GST. But it needs to be noted that the benefits of GST system can only be reaped if challenges related to the design and structure of GST are addressed by the government. Several steps may be taken in this regard in the following areas:

1. It is desirable that the tax rates be harmonised across States to minimise the compliance burden.
2. Through a gradual inclusion or excluded goods under the GST system, the government can clean up and broaden the entire tax base.
3. There is need to keep the list of exemptions in GST small in order to have a more comprehensive trail of transactions.
4. Rate rationalisation should be on top of any agenda for GST reforms.
5. The priority of the government should be to nudge the GST council to adjust to the revenue neutral rate.
6. The GST Council should make an early decision on how the compensation cess should be handled after its withdrawal from April, 2026.
7. At present, GST is not imposed on crude oil, diesel, aviation turbine fuel (ATF) and natural gas among petroleum. The GST Council should give a serious thought to bring these items into GST net.
8. As GST moves to its next phase of growth, there is an urgent need to address some areas such as simplification of the rate structure, inclusion of items left out of GST as well as administrative issues, including an efficient appellate mechanism.

CONCLUSION

From the aforesaid analysis, it can be concluded that the introduction of GST is a significant step in the field of indirect tax reforms in India. Due to GST, cascading of taxes has been substantially alleviated and this tax has paved the way for a common domestic market. Due to introduction of GST, competitiveness of Indian products has increased. It will facilitate ease of doing business, simplify tax administration, encourage voluntary compliance and protect revenue without fuelling inflationary pressures in the economy. The GST collection has also increased with the passage of time. It was ₹4.4 trillion in 2017-18. It increased to ₹7.0 trillion in 2021-22, ₹8.5 trillion in 2022-23, ₹9.6 trillion in 2023-24 and ₹10.6 trillion in 2024-25 (RE). During 2025-26, its yield is expected to be ₹11.8 trillion. Further, the share of GST in total gross tax revenue of the Central Government has improved from 25.8 per cent in 2021-22 to 27.8 per cent in 2022-23 and is expected to be 27.6 per cent in 2025-

26(BE). The manifold increase in tax payer base and revenue buoyancy are two crucial indicators that show that GST has taken roots in the national psyche and ethos.

SELECTED REFERENCES

- Aljandali, A., & Aljandali, A. (2017). The Box-Jenkins Methodology. *Multivariate Methods and Forecasting with IBM® SPSS® Statistics*, 59-79.
- Bhattacharya, A.K. (2022, January 12). How Real is the GDP Boost?. *Business Standard*
- Chelliah, R.J. (1969). *Fiscal Policy in Underdeveloped Countries*, George Allen and Unwin Ltd, London
- Choudhary, S. (2022, April 2). GST mop-up hits new high of Rs. 1.42 trillion ,*Business Standard*
- Dhasmana, I. (2022, June 21). Indirect Tax reformed, but there's still some way to go, *Business Standard*
- Government of India (1985). *Long Term Fiscal Policy*. Ministry of Finance Delhi, p.40
- Government of India (1992). *Tax Reforms Committee*, Final Report, Part I. Ministry of Finance
- Government of India (2014). *Economic Survey 2013-14*. Ministry of Finance
- Government of India (2021). *Report of the Comptroller and Auditor General of India* for the year ended March 2019 and March 2020, Report No.1. Department of Revenue
- Government of India (2022). *Five Years of GST*. Ministry of Finance, p.94
- Government of India (2022). *Report of the Task Force on Indirect Taxes*. Ministry of Finance and Company Affairs, p.93
- Government of India. (2002). *Report of the Task Force on Indirect Taxes*. Ministry of Finance
- Government of India. (2002). *Report of the Task Force on Indirect Taxes*. Ministry of Finance
- Government of India. (2022). *Economic Survey 2021-22 and Statistical Appendix*. Ministry of Finance
- Government of India. (2022). *Five Years of GS*. Ministry of Finance, p.58
- Government of India. (2022). *Five Years of GST*. Ministry of Finance, p.59
- Jain, A. K. (1975). *Taxation of income in India: An empirical study since 1939*. Macmillan Company of India Ltd., New Delhi
- Jain, P. (2017). Goods and Services Tax in India. *Journal of Economics and Commerce*, Vol.8, Issue1, Jan-June.
- Jain, P. (2019). *Union Finances in India: An Empirical Study Since 1991*. RBSA Publishers.
- Kumar, M., & Anand, M. (2014). An application of time series ARIMA forecasting model for predicting sugarcane production in India. *Studies in Business and Economics*, 9(1), 81-94.
- Mampatta, S.P. (2022, June 6). GST's Revenue Challenge. *Business Standard*
- Pankratz, A. (2009). *Forecasting with univariate Box-Jenkins models: Concepts and cases*. John Wiley & Sons.
- Purohit, M. C., & Purohit, V. K. (2010). Goods and services tax in India: An empirical analysis of revenue implications. *The Indian Economic Journal*, 58(1), 33-59.
- Rao, R. K. (2018). A confused taxation narrative. *Economic & Political Weekly*, 53(9), 35-37.

Rao, R. K., & Chakraborty, P. (2010). Goods and services tax in India: An assessment of the base. *Economic and Political Weekly*, 49-54.

Streimikiene, D., Rizwan Raheem, A., Vveinhardt, J., Pervaiz Ghauri, S., & Zahid, S. (2018). Forecasting tax revenues using time series techniques—a case of Pakistan. *Economic research-Ekonomska istraživanja*, 31(1), 722-754.

Vasanthakumar, V. (2020). A TIME SERIES MODELING ON GOODS AND SERVICES TAX OF INDIA. *Mukt Shabd Journal* 9 (IV), 940-946

Appendix

Table 1. Monthly Gross Collection of GST (Rs. Crore)

Month	GST Collection	Month	GST Collection	Month	GST Collection
Jul-17	21572	Jan-20	110818	Aug-22	143612
Aug-17	95633	Feb-20	105366	Sep-22	147686
Sep-17	94064	Mar-20	97597	Oct-22	151718
Oct-17	93313	Apr-20	32172	Nov-22	145867
Nov-17	83780	May-20	62151	Dec-22	149507
Dec-17	84313	Jun-20	90917	Jan-23	155922
Jan-18	89817	Jul-20	87422	Feb-23	149577
Feb-18	85947	Aug-20	86449	Mar-23	160122
Mar-18	92148	Sep-20	95480	Apr-23	187035
Apr-18	103448	Oct-20	105155	May-23	157090
May-18	94005	Nov-20	104963	Jun-23	161497
Jun-18	95610	Dec-20	115174	Jul-23	165105
Jul-18	96483	Jan-21	119847	Aug-23	159068
Aug-18	93960	Feb-21	113143	Sep-23	162712
Sep-18	94442	Mar-21	123902	Oct-23	172003
Oct-18	100710	Apr-21	139708	Nov-23	167929
Nov-18	97637	May-21	97821	Dec-23	164882
Dec-18	94726	Jun-21	92840	Jan-24	172129
Jan-19	102503	Jul-21	116393	Feb-24	168337
Feb-19	97247	Aug-21	112020	Mar-24	178484
Mar-19	106577	Sep-21	117010	Apr-24	210267
Apr-19	113865	Oct-21	130127	May-24	172739
May-19	100289	Nov-21	131526	Jun-24	173812
Jun-19	99939	Dec-21	129780	Jul-24	182075
Jul-19	102083	Jan-22	140986	Aug-24	174962
Aug-19	98202	Feb-22	133026	Sep-24	173240
Sep-19	91916	Mar-22	142095	Oct-24	187346
Oct-19	95379	Apr-22	167540	Nov-24	182269
Nov-19	103491	May-22	140885	Dec-24	176857
Dec-19	103184	Jun-22	144616		

Source: Goods and Services Tax Portal

THE IMPACT OF CYBER CRIME IN RURAL ECONOMY.. MICRO STUDY IN SAHIBGANJ DISTRICT OF JHARKHAND

Dr. Tripta Sinha*

ABSTRACT

The rapid digitalization of Indian Economy has been accompanied by a surge in cyber crime. This paper explores impact of cyber crime in the rural economy specially villages and small towns. This crimes includes data breaches, phishing attack, identity theft, online banking fraud, impersonation. The study analyses how cyber crime undermines economy activity by increasing risk perception which affects investment in e-commerce, digital banking, financial technology. Insufficient cyber security infrastructure, lack of public awareness and legal framework, delays in cyber related case investigation and a very low conviction rate hinder the economy growth prospects in rural economy.

Cyber economic crimes are technological crimes in which economic transactions are misused for illegal gain. The result of cyber crime extend beyond financial losses. This crime affects employment, reduce consumer expanding and hinder the development of a safe inclusive digital ecosystem. This analysis examine how cyber crime contribute to economic inequality by disproportionately affecting small business and rural population. Suggestion in this paper enhances cyber security policies, raising awareness and promoting technological advancement to ensure long term economic sustainability in rural India.

Keywords: Cyber Crime, Digital Economy, Digitalization, Phishing, Rural Economy

INTRODUCTION

India is a country in which 63.64% of people live in rural area .Indian economy is affected by the affect of cyber crimes in rural areas. In the last few years India has seen an exponential increase in the use of internet and everything surrounding it. Digitalization has developed the country immensely and everything is now being done online which was earlier done quit traditionally . E-mails , social media , E-banking services , online government services are the integral part for the development of the country .There are two major pushes for digital transaction .The first came in the wake of demonstration in 2016. The next impetus came during the COVID -19 induced lockdown when physical currency was considered a potential carrier of the deadly virus. Digital transactions are meant to curb tax evasion, corruption and use of hand cash in crime.

But every good thing has its own disadvantages .With increase in the use of internet and mobile increases the risk of facing cyber attacks. Cyber crimes are those crimes that are done through online/computer means and the sources is generally hard to detect .The decision to promote digitalization was taken without putting in place adequate measures to prevent cyber fraud .Many people keep falling victim to new forms of online crimes .The awareness about cyber security has been spreading everywhere but we have not developed enough to make aware rural communities too.

* Email Id : triptasinha1978@gmail.com

Neglecting rural areas in this regard can raise graver concern in the future .Rural people not aware about the concept of cyber security due to lack of exposure, lack of technical expertise , uneducated , limited financial means etc .

Sahibganj district is situated in the northern part of Jharkhand and consists of 86.12% rural population.The literacy of this district is about 52.04%.The economy of this district is based on agriculture,animal husbandry,fishing,forest products and stone mining.Initially, the economy of this district was not directly affected by cybercrime. However, nowadays, with the increasing involvement of e-marketing, e-payments, and dependence on online trading, cybercrime has started impacting the economy.The merchants and the rural population are affected by the cyber crime.

RESEARCH METHODOLOGY

The researcher used secondary data analysis , a qualitative research technique to examine information from published papers ,journals ,official government publications, news stories and other secondary sources. Their careful examination of several studies and publications produced over the past few years in the form of a literature review .

DISCUSSION

The rural communities in the country in the most vulnerable when it comes to information technology and development as most of such regions are yet to develop. The ones who already have internet connectivity may not be educated on all aspects of it . This leaves the communities prone to greater threats which also acts as an aggregate threat to country and national security . It is necessary to strengthen every individual and community in the cyber world because it is a sensitive place where crimes can be committed in all ways .

As per the Future Crime Research Foundation (FCRE)-A white paper published under the heading 'A Deep Dive Into Cyber Crime Trends Impacting India '- Bharatpur (18%) ,Mathura (12%) , Nuh (11%) ,Deoghar (10%) ,Jamtara (9.6%) ,Gurugram(8.1%),Alwar (5.1%) ,Bokaro (2.4%) , Karma Tand (2.4%)and Giridih (2.3%) as the top contributors to cyber crime cases in India collectively accounting for 80% of reported incidence. In small cities like above cyber frauds jump 900% I last four years . A centre has developed a working on line 'suspect registry' which contains data of 1.4 million criminals linked to financial fraud and various crime.

A massive surge in cyber crime incidents was reported in India with fraudster cheating people of Rs. 33,165 crore in the last four years including Rs. 22,812 crore in 2024with Tier2 and Tier 3 cities identified as cyber crime hot spots. Under the ministry of Home Affairs data compiled by the National Cyber Reporting Platform (NCRP)shows fraudster cheated people of RS 551 crore in 2021, Rs. 2,306crore in 2022, Rs. 7,496 crore in 2023. Data also shows that 1,37,254 complaints were received in 2021 , 5,15,083 in 2022 , 11,31,649 in 2023 and 17,10,505 complaints were received last year. Indians lose 1.5 lakh to cyber criminals every minute.

EFFECTS OF CYBER CRIME ON RURAL ECONOMY

A. Financial losses

Online banking frauds

Similar to urban people , rural people relying on digital banking platforms for financial transactions are susceptible to phishing scams ,unauthorized account access and fraudulent transfers leading to direct financial losses. Online banking frauds are schemes that criminals used to steal money or personal information from bank by way of phishing , vishing , SIM swap , check fraud , money transfer fraud , account takeover , fake apps and loan frauds.

E-commerce scams

Rural consumers are targeted by fake market place or fraudulent sellers which lead to loss of money and goods purchased online .Due to lack of knowledge rural people do not understand the real facts and they are trapped .

Identity theft

Sometimes the personal information are stolen from online platforms and that can be used for identity theft. This causes financial damage and disturb the credit history of the business concern .Victim of this type of theft often end up with damaged credit and also misappropriate information added in their records.

B. Disruption of essential services

Government Services

Cyber breaches affecting government platforms can disrupt access to important services like social security benefits , land records and agriculture support programs.

Healthcare access

Cyber attacks on rural healthcare system can disrupt patient records , appointment scheduling with the doctor and hospitals, telehealth services hindering access to vital medical care .

Education Access

Online learning platforms in rural areas is affected by cyber attacks disrupting student access to educational materials and hindering learning progress.

C. Reduced investment and economic growth

Loss of trust in digital platforms

Rural resident's trust in online platform can be eroded by cyber crime incidents which discourage them from engaging in digital transactions and hindering the adoption of new technologies .Concern about online banking security can prevent people from adopting digital financial services .Potential investors may be hesitant to put money into rural business due to perceived cyber security risk. Victims of cyber crime may experience significant stress and anxiety and due to this affect, they further prevent other investors to invest. In other words they prevent other persons to rely on the digital world .

The swift transition to digital financial services in the rural area has yielded numerous benefits such as enhanced accessibility to banking, insurance and financial inclusion. But cyber crime encompassing phishing scams ,ransom ware and data breaches has significantly undermined consumer trust and confidence in financial institutions .Individual who fall victim to cyber fraud often endure anxiety, stress and a profound sense of insecurity adversely affecting their overall mental health. Individuals and small business of rural area suffer financial losses due to cyber crime, impacting profitability and subsequently reducing investment in customers oriented innovation.

Recommendation

Rural economy is directly or indirectly affected by the cyber crime. The faith in digitalization to be raised among the people of rural areas. There is a clear need to educate rural people and small businessmen on the nuances of cyber space and the impacts of attack on it. It can impact daily life in a drastic way the educating them will enable them to reduce risk and prevent possible damages.

1. It should be made a priority to initiate awareness program in the most rural part of the country to educate on the dos and don't of cyber security. People should also be taught preventive mechanism and be made aware of where and how to complain when they face cyber crime.

- The funds for educating the commodities could be come from sources like government, MNCs (CSR), politicians, NGO or any interested party.
2. A strict procedural laws in order to efficiency enforce cyber security in all places. Such laws should be useful to rural people. The legislator should urgently consider this aspect and act on it. Such laws should contain the complain procedures and investigation provisions.
 3. There should be improved co-ordination between centre and state for cyber security in order to create a safer space for rural communities. The state government should be given more discretion and authority who take actions favorable the communities.
 4. The media plays and important roll in any major development. The major TV and Radio Channels, Newspaper should be used to spread awareness about cyber crime and prevention methods. The large number of the rural people are used to mobile phone so preventive measures should be provided with the voice and written messages through mobile.
 5. Important tips to save from cyber crime.

CONCLUSIONS

Excess of anything is dangerous. Therefore excess dependency on online trading is dangerous for the economy. This dependency gives way for cyber [crime](#). So both merchants and customers must do transactions with open eyes such that they do not fall on the trap of cyber criminals. These crimes cause financial lossess, reduces trust in digital transactions and creates fear among rural people about using modern technology.

Awareness of the cyber space has reached to the most rural part of India. People may sleep with empty stomach but they can not live without connectivity though communication devices. Rapid development of cyber space carries it with major challenges. Financial cyber crimes are increasing daily and many people do not have the awareness, fall prey and are left with no recourse.

Cyber security should be the top priority for any country during these time, when anything is possible on the internet. The urban people may be educated and experience enough to handle online scam and offences, but the rural people may not handle the situation due to lack of awareness. Thus, this paper focused on bringing into light the need to educate rural communities on cyber space. Its also laid out the legal framework governing cyber security in India presently and necessary changes to be made, to sensitize the rural areas. Cyber security need of the hour and the government should take initiatives to promote it and established strong and robust mechanism to enforce.

REFERENCES

- Saini, H. Rao, Y.S. and Panda, T.C. (2012), Cyber Crimes in their impact : A review. *International Journal of Engineering Research and Application*, 2(2), 202-209.
- Goyal, N. & Goyal, D. (2017), Cyber Crime in the Society : Security Issues, Preventions and Challenges. *Research journal of Engineering & Technology*, 8(2), 73-80
- Syed Ubaid, Shakil, Mohmmad Talha Alam, Shahab Saquib Sohail. "Rising cyber crime in Rural India: A Review" *6IJARSCT* 199 (2021)
- Koshy, Reema. "Need for Cyber Security Awareness in Rural Communities : A Socio Legal Perspective" *IJARSCT* Vol. 2, Issue 2, December 2022.
- Yoganandham G, Kalaivani, M "Economy Impact of Cyber Crime on Society and Sustainable Economic Development in Tamilnadu with reference to trends, challenge and consequences – A Comprehensive Assessment". ISSN : 1308 – 5581 Vol. 16, issue 04-2024.

GEOPOLITICAL SHOCK AND STRATEGIC REALIGNMENT: THE U.S.–IRAN CONFLICT SCENARIO AND FIVE-YEAR ECONOMIC PROJECTIONS FOR INDIA (2026–2031)

Prof. Anup Kumar Mishra*

ABSTRACT

The geopolitical landscape of West Asia entered a new phase of strategic uncertainty during 2026 following the escalation of military confrontation between the United States and Iran. Although periods of military de-escalation have alternated with renewed tensions, the conflict has fundamentally altered global perceptions of energy security, maritime stability, and the future architecture of international power politics. For India, whose economic expansion remains significantly dependent upon imported crude oil and uninterrupted maritime trade through the Arabian Sea and the Strait of Hormuz, the evolving crisis represents far more than a regional security concern. It constitutes a multidimensional external shock capable of influencing macroeconomic stability, inflation, fiscal management, exchange rate dynamics, defence expenditure, and foreign policy choices over the medium term.

This paper develops a scenario-based analytical framework for evaluating India's economic prospects during the period 2026–2031 under alternative trajectories of the U.S.–Iran confrontation. Drawing upon theories of balance of power, strategic autonomy, energy security economics, geopolitical risk transmission, and macroeconomic vulnerability, the study examines how disruptions in global energy markets, financial capital flows, maritime logistics, and regional diplomatic alignments could reshape India's developmental trajectory. The paper argues that India's resilience will depend not only upon fiscal and monetary policy responses but also upon accelerated energy diversification, strategic petroleum reserves, maritime security modernization, diplomatic multi-alignment, and institutional preparedness against prolonged geopolitical uncertainty. Rather than viewing the crisis solely as a source of economic vulnerability, the study suggests that India possesses an opportunity to strengthen its position as a balancing middle power within an increasingly multipolar international order.

Keywords: *Geopolitical Risk; India; Iran; United States; Energy Security; Oil Prices; Strategic Autonomy; West Asia; Macroeconomic Stability; Multipolarity.*

1. INTRODUCTION

The international political economy has historically been shaped by episodic geopolitical shocks that redefine both the distribution of global power and the trajectory of economic development. From the oil embargo of 1973 to the Gulf War of 1991, the global financial crisis of 2008, the COVID-19 pandemic, the Russia–Ukraine conflict, and the continuing strategic rivalry between the United States

* Department of Economics, D.A.V. P.G. College, Varanasi

and China, major geopolitical disruptions have consistently demonstrated that economic globalization remains deeply intertwined with political stability. The renewed military confrontation between the United States and Iran during 2026 represents another critical inflection point in this evolving geopolitical landscape.

Unlike conventional bilateral conflicts, the strategic significance of the U.S.–Iran confrontation extends beyond military engagement. Iran occupies one of the world's most consequential geopolitical locations, connecting the Persian Gulf with the Gulf of Oman through the Strait of Hormuz, a maritime corridor through which roughly one-fifth of globally traded crude oil and a substantial share of liquefied natural gas are transported. Consequently, even limited military escalation has immediate implications for international shipping costs, energy prices, insurance premiums, financial market volatility, and global inflationary expectations.

The significance of the conflict is amplified by the changing nature of international power distribution. The post-Cold War unipolar order led by the United States has gradually evolved into an increasingly multipolar system characterized by the simultaneous rise of China, renewed Russian strategic activism, the emergence of middle powers such as India, Türkiye, Brazil and Saudi Arabia, and the growing influence of regional organizations. Within this evolving framework, conflicts in West Asia no longer remain localized events; rather, they influence the strategic calculations of multiple global powers whose economic and security interests intersect across energy markets, maritime trade routes, technological competition, and financial networks.

For India, the implications are particularly significant. India has emerged as the world's fastest-growing major economy while simultaneously becoming one of the largest importers of crude oil. Rapid industrialization, urbanization, expanding transportation networks, rising household incomes, and increasing manufacturing activity have substantially increased domestic energy demand. Despite notable progress in renewable energy generation and ethanol blending, petroleum continues to occupy a central position in India's energy basket. Consequently, sustained volatility in international oil prices directly affects inflation, fiscal deficits, external balances, exchange rate stability, industrial competitiveness, and household purchasing power.

India's strategic interests in West Asia extend beyond hydrocarbons. More than nine million Indians reside across the Gulf region, contributing significantly to India's remittance inflows. Bilateral trade with Gulf Cooperation Council (GCC) countries constitutes an important component of India's external sector, while maritime routes connecting the Arabian Sea to the Indian Ocean facilitate a substantial proportion of India's international commerce. Any prolonged disruption in these networks could therefore generate both immediate macroeconomic pressures and long-term structural adjustments.

The evolving geopolitical environment also presents an important foreign policy challenge. Since the end of the Cold War, India has increasingly pursued a doctrine of strategic autonomy, seeking constructive engagement with multiple competing powers without formal alliance commitments. This policy has enabled India simultaneously to strengthen strategic cooperation with the United States while maintaining historically significant relationships with Iran, Russia, Israel, and the Arab Gulf monarchies. However, intensified geopolitical polarization resulting from the U.S.–Iran confrontation could complicate this balancing strategy by increasing diplomatic pressures from competing power blocs.

Beyond immediate economic consequences, prolonged instability in West Asia may accelerate

broader structural transformations in the international system. Energy supply chains are increasingly becoming instruments of geopolitical influence. International payment systems are undergoing gradual diversification. Regional trade agreements are evolving in response to strategic competition. Defence cooperation is expanding beyond traditional alliance structures, while emerging technologies such as artificial intelligence, cyber warfare, and autonomous maritime systems are reshaping military capabilities. Together, these developments suggest that geopolitical competition is entering a more comprehensive phase in which economic security, technological leadership, energy resilience, and military preparedness have become mutually reinforcing dimensions of national power.

From the perspective of development economics, geopolitical instability functions as an external supply shock capable of simultaneously reducing aggregate demand, increasing production costs, disrupting investment flows, and altering expectations regarding future growth. Such shocks are particularly significant for emerging economies because they possess relatively higher dependence on imported commodities, external financing, and global trade networks. The transmission mechanism operates through multiple channels including commodity prices, exchange rates, financial markets, investor confidence, shipping costs, sovereign risk premiums, and supply chain disruptions. Consequently, understanding these interconnected transmission mechanisms is essential for designing effective macroeconomic policy responses.

This study therefore seeks to examine how alternative trajectories of the U.S.–Iran confrontation may influence India's economic performance during the period 2026–2031. Rather than attempting precise forecasting, which remains inherently uncertain under rapidly changing geopolitical conditions, the paper adopts a scenario-based analytical approach grounded in established theories of international political economy, energy economics, strategic studies, and macroeconomic policy analysis. Three broad scenarios—strategic stabilization, managed instability, and systemic escalation—are developed to evaluate the range of possible outcomes and their implications for India's growth, inflation, fiscal sustainability, external sector, defence policy, and diplomatic strategy.

The central argument advanced in this paper is that although geopolitical shocks initially increase economic vulnerability, they also create opportunities for structural transformation. If India successfully accelerates renewable energy deployment, expands strategic petroleum reserves, strengthens maritime capabilities, diversifies trade corridors, deepens regional diplomacy, and enhances macroeconomic resilience, the present geopolitical uncertainty may ultimately reinforce India's emergence as one of the principal stabilizing powers within the evolving multipolar international order. Conversely, inadequate institutional preparedness and delayed policy adaptation could amplify external vulnerabilities and constrain India's developmental aspirations over the coming decade.

The remainder of the paper proceeds by reviewing the theoretical literature on geopolitical risk, balance of power, energy security, and strategic autonomy before examining the geopolitical evolution of the 2026 U.S.–Iran confrontation. Subsequent sections analyze the transmission mechanisms affecting the Indian economy, develop alternative macroeconomic scenarios for 2026–2031, assess strategic implications for India's foreign policy and maritime security, and conclude with policy recommendations aimed at strengthening national resilience under conditions of prolonged geopolitical uncertainty.

2. LITERATURE REVIEW

The relationship between geopolitical conflict and macroeconomic performance has attracted sustained scholarly attention over the past five decades. Classical studies initially concentrated on the consequences of oil supply disruptions, whereas more recent literature has expanded the analytical framework to include geopolitical risk, financial market integration, strategic competition, supply-chain resilience, and energy transition. The emerging consensus is that modern geopolitical crises generate multidimensional economic effects that extend well beyond conventional military expenditures. They influence inflation, investment decisions, exchange rate movements, sovereign borrowing costs, trade flows, technological cooperation, and institutional credibility.

The pioneering contribution of Hamilton (1983) fundamentally altered the understanding of oil price shocks by demonstrating that almost every post-war recession in the United States had been preceded by a substantial increase in crude oil prices. Hamilton argued that oil should not merely be regarded as another commodity but rather as a strategic production input whose price movements influence virtually every sector of the economy through transportation costs, industrial production, and consumer expectations. His later work (Hamilton, 2009), incorporating the experience of the 2007–08 energy crisis, further established that uncertainty surrounding energy markets may have economic consequences independent of the actual magnitude of price increases. The expectation of prolonged instability often reduces investment, weakens consumer confidence, and delays corporate decision-making.

Kilian (2008) refined the analysis by distinguishing between supply-driven and demand-driven oil shocks. His empirical findings demonstrated that oil price increases resulting from geopolitical disruptions produce stronger inflationary pressures than those generated by rising global demand. Supply shocks simultaneously reduce productive capacity while increasing production costs, thereby creating stagflationary conditions characterized by lower economic growth accompanied by higher inflation. This distinction is particularly relevant for evaluating the contemporary U.S.–Iran confrontation because disruptions to maritime transport through the Strait of Hormuz primarily represent supply-side risks rather than demand-induced price adjustments.

International Monetary Fund research has similarly emphasized that geopolitical fragmentation increasingly constitutes a macroeconomic challenge. Recent World Economic Outlook publications argue that persistent geopolitical tensions may permanently reduce global output through trade fragmentation, declining investment efficiency, and increased duplication of production networks. Unlike temporary financial crises, geopolitical shocks often produce long-lasting structural changes because governments and firms redesign supply chains to reduce strategic dependence upon politically unstable regions.

The concept of geopolitical risk has received renewed attention through the work of Caldara and Iacoviello (2022), who developed the Geopolitical Risk Index (GPR). Their research demonstrates that heightened geopolitical uncertainty significantly affects investment, industrial production, employment, and international capital flows. Importantly, the economic effects are not confined to countries directly involved in conflict but are transmitted globally through interconnected financial markets, commodity prices, and investor expectations. For emerging economies, geopolitical shocks typically generate capital outflows, currency depreciation, and tighter external financing conditions.

Within international political economy, Susan Strange (1988) argued that structural power increasingly derives from control over finance, production, security, and knowledge rather than

territorial conquest alone. Contemporary geopolitical competition illustrates this transition. Energy supply chains, digital technologies, payment systems, and maritime logistics have become instruments through which states exercise strategic influence. The U.S.–Iran confrontation therefore represents not merely a military conflict but an episode within broader competition over regional influence, energy security, and international institutional authority.

From the perspective of strategic studies, Kenneth Waltz's structural realism remains highly relevant. Waltz (1979) argued that international instability emerges whenever shifts in the distribution of power disturb the existing balance among major states. In multipolar systems, uncertainty regarding future intentions increases strategic competition because no single power possesses sufficient capability to enforce systemic stability. The gradual transition from American predominance toward an increasingly multipolar order has therefore intensified competition among major powers across several geopolitical theatres, including West Asia.

John Mearsheimer's offensive realism further suggests that great powers continuously seek opportunities to maximize regional influence and prevent rival powers from establishing strategic dominance (Mearsheimer, 2001). Applied to contemporary West Asia, this perspective implies that any substantial weakening of Iran would inevitably attract responses from China, Russia, Türkiye, and regional Arab states seeking to preserve or expand their strategic interests. Consequently, the economic consequences of conflict cannot be understood independently of the broader geopolitical restructuring that accompanies changing power distributions.

A complementary perspective emerges from the literature on strategic autonomy, particularly in relation to India's foreign policy. Jaishankar (2020) argues that contemporary India has moved beyond the traditional doctrine of non-alignment toward a more flexible strategy of multi-alignment. Rather than maintaining equal distance from competing powers, India seeks issue-based partnerships while preserving decision-making independence. This approach reflects the realities of an increasingly fragmented international system in which rigid alliance commitments may reduce diplomatic flexibility.

Scholars examining India's external relations have noted that strategic autonomy has enabled India simultaneously to strengthen security cooperation with the United States through the Quad while maintaining defence partnerships with Russia, energy relations with Gulf countries, and historical civilizational links with Iran. Pant and Joshi (2022) argue that this diversified diplomatic engagement enhances India's bargaining power but also requires careful management during periods of intensified geopolitical polarization. Escalation in West Asia therefore presents a significant test of India's ability to sustain constructive relations with competing geopolitical actors.

The literature on energy security has also undergone significant transformation. Earlier approaches concentrated primarily upon ensuring uninterrupted physical supplies of petroleum. Contemporary research increasingly emphasizes resilience, diversification, affordability, technological transition, and environmental sustainability. The International Energy Agency (2024) argues that energy security in the twenty-first century depends upon diversified energy sources, strategic reserves, renewable technologies, resilient infrastructure, and stable international partnerships rather than dependence upon any single fuel or supplier.

For India, energy security possesses unique characteristics because of rapidly expanding domestic demand combined with limited hydrocarbon resources. Government policy has increasingly sought to diversify crude oil imports across multiple suppliers while simultaneously accelerating renewable

energy deployment, ethanol blending, electric mobility, green hydrogen production, and domestic natural gas infrastructure. Nevertheless, petroleum continues to occupy a central position in transportation, petrochemicals, fertilizers, aviation, and industrial manufacturing. Consequently, international oil price volatility remains an important determinant of domestic inflation and fiscal performance.

The Reserve Bank of India has contributed substantially to understanding these transmission mechanisms. RBI studies consistently indicate that crude oil price increases influence inflation through direct and indirect channels. Direct effects arise through higher fuel prices, whereas indirect effects operate through transportation costs, manufacturing expenses, agricultural inputs, logistics, and inflation expectations. Exchange rate depreciation often amplifies these effects because imported petroleum becomes more expensive in domestic currency terms.

Financial economists have similarly emphasized the role of the global financial cycle. Rey (2015) argues that international capital flows increasingly respond to global financial conditions rather than purely domestic macroeconomic fundamentals. During periods of geopolitical uncertainty, investors frequently shift capital toward perceived safe assets, strengthening the U.S. dollar while generating currency depreciation and capital outflows from emerging markets. Such developments increase external borrowing costs, reduce portfolio investment, and complicate monetary policy management. Another rapidly expanding body of literature concerns supply-chain resilience. The COVID-19 pandemic, semiconductor shortages, disruptions in the Red Sea, and the Russia–Ukraine conflict collectively demonstrated that excessive dependence upon geographically concentrated production networks increases systemic vulnerability. Governments worldwide are therefore promoting friend-shoring, near-shoring, strategic stockpiling, and diversified sourcing. India's initiatives under "Make in India," the Production Linked Incentive (PLI) programme, and logistics infrastructure modernization may thus be interpreted partly as responses to this evolving geopolitical economy.

Recent scholarship further recognizes that geopolitical competition increasingly intersects with technological transformation. Artificial intelligence, cyber security, satellite navigation, digital payment systems, quantum computing, and autonomous defence technologies are becoming integral components of national security. Consequently, economic resilience now depends upon technological capability alongside conventional macroeconomic indicators. India's investments in digital public infrastructure, semiconductor manufacturing, defence indigenization, and space technology therefore possess important geopolitical as well as developmental significance.

Although the existing literature provides valuable insights into individual aspects of geopolitical risk, relatively few studies integrate international relations theory, energy economics, macroeconomic modeling, and strategic policy analysis within a single analytical framework focused on India's medium-term economic prospects. Most available research examines either immediate oil price effects or broader geopolitical implications without systematically connecting these dimensions through scenario-based projections.

The present study attempts to address this gap by integrating insights from structural realism, strategic autonomy, energy security economics, geopolitical risk analysis, macroeconomic transmission theory, and development economics. Rather than viewing geopolitical conflict exclusively through the lens of military strategy, the paper conceptualizes it as a systemic external shock capable of reshaping economic development, foreign policy, technological modernization, and institutional adaptation over an extended period. This integrated perspective provides a more comprehensive basis

for evaluating India's strategic choices during the evolving transformation of the international political economy.

3. CONCEPTUAL AND THEORETICAL FRAMEWORK

The analytical foundation of this study rests upon the proposition that geopolitical shocks propagate through interconnected political, economic, financial, technological, and institutional channels. Contemporary international crises cannot be adequately understood using single-discipline explanations because globalization has created dense interdependencies among energy markets, financial systems, trade networks, and strategic alliances. Accordingly, this paper adopts an interdisciplinary framework combining structural realism, strategic autonomy, energy security economics, geopolitical risk theory, and macroeconomic transmission analysis.

At the systemic level, structural realism provides the principal explanation for changing patterns of international competition. Waltz (1979) argued that the structure of the international system is determined primarily by the distribution of capabilities among major powers. As relative power shifts over time, states respond by adjusting alliances, military capabilities, and strategic behaviour in order to restore balance. The transition from a predominantly unipolar system toward an increasingly multipolar order has therefore intensified geopolitical competition across several strategically important regions, including West Asia, the Indo-Pacific, Eastern Europe, and the Arctic.

Within this framework, the U.S.–Iran confrontation should not be interpreted merely as a bilateral military dispute. Instead, it represents one manifestation of broader structural competition involving the United States, China, Russia, regional Gulf powers, Israel, Türkiye, and emerging middle powers such as India. Military escalation influences not only regional security but also the future distribution of influence over global energy supplies, maritime transportation corridors, technological cooperation, and international financial institutions.

The second theoretical pillar is the concept of **strategic autonomy**, which has become central to India's contemporary foreign policy. Unlike classical non-alignment, strategic autonomy recognizes the necessity of maintaining productive relationships with multiple competing powers while preserving independent decision-making. This framework allows India to cooperate with the United States in defence and technology, engage Russia in strategic sectors, maintain energy partnerships with Gulf states, and sustain civilizational links with Iran. The effectiveness of this approach depends upon diplomatic flexibility rather than alliance commitments.

The third component of the framework is **energy security economics**, which views reliable, affordable, and diversified energy access as a prerequisite for sustainable economic growth. Energy insecurity operates as a supply-side shock affecting production costs, household welfare, industrial competitiveness, fiscal balances, and external accounts. The magnitude of macroeconomic impact depends upon import dependence, energy intensity, exchange-rate flexibility, and policy responsiveness.

4. EVOLUTION OF THE 2026 U.S.–IRAN CRISIS: FROM REGIONAL CONFRONTATION TO SYSTEMIC GEOPOLITICAL SHOCK

The geopolitical developments witnessed during 2026 have transformed the strategic landscape of West Asia more profoundly than any episode since the Gulf War of 1991. What initially appeared to be another cycle of military retaliation gradually evolved into a multidimensional geopolitical crisis affecting energy markets, maritime security, international finance, and the broader balance of power among major states. Although periods of military de-escalation and diplomatic engagement have

emerged, the crisis has not fundamentally disappeared. Rather, it has entered a phase characterized by intermittent military tensions, negotiations, disruptions to shipping, and strategic competition among global powers. Recent reporting indicates that while discussions aimed at reducing tensions have resumed, uncertainty over maritime security and energy transit through the Strait of Hormuz remains significant.

Unlike earlier confrontations, the 2026 crisis demonstrates that geopolitical competition has expanded beyond traditional military operations. Economic sanctions, cyber operations, maritime control, information warfare, financial restrictions, and energy diplomacy have become equally important instruments of strategic influence. The conflict therefore represents what may be described as **hybrid geopolitical competition**, where military actions interact continuously with economic and technological statecraft.

From an international political economy perspective, the significance of the crisis lies not merely in battlefield developments but in its capacity to reshape expectations regarding the stability of the global energy system. Financial markets increasingly price geopolitical risk alongside conventional macroeconomic indicators. Shipping companies adjust routes, insurance premiums rise, central banks reassess inflation forecasts, and multinational corporations reconsider investment strategies even before actual physical disruptions materialize. Consequently, geopolitical uncertainty itself becomes an independent macroeconomic variable.

Another notable characteristic of the present crisis is the growing involvement of multiple external powers. The United States continues to prioritize freedom of navigation and regional security. China remains deeply concerned about uninterrupted energy supplies from West Asia. Russia views the evolving balance of power through the lens of broader strategic competition with Western countries. European economies remain vulnerable to renewed energy inflation, while Gulf monarchies seek to preserve both regional stability and export revenues. India, Japan, and South Korea simultaneously confront energy security concerns while attempting to avoid strategic polarization.

This increasing complexity suggests that West Asia is gradually evolving from a regional conflict zone into one of the principal theatres of twenty-first century geopolitical competition. Military developments within the region therefore possess consequences extending far beyond the Middle East, influencing global trade, financial markets, technological cooperation, and diplomatic alignments.

5. THE STRAIT OF HORMUZ : GEOGRAPHY, ENERGY SECURITY AND THE POLITICAL ECONOMY OF MARITIME CHOKEPOINTS

Among all maritime corridors in the contemporary world economy, few possess strategic importance comparable to the Strait of Hormuz. Connecting the Persian Gulf with the Gulf of Oman and the Arabian Sea, the strait functions as the principal outlet for petroleum exports originating from Saudi Arabia, Iraq, Kuwait, the United Arab Emirates, Qatar and Iran. Approximately one-fifth of internationally traded crude oil normally transits this narrow waterway, making it one of the world's most strategically significant maritime chokepoints. Even temporary disruptions can generate disproportionate effects on global commodity markets because alternative transportation routes remain limited.

The importance of the Strait extends beyond oil. Liquefied natural gas exports, petrochemical products, fertilizers, industrial inputs, containerized cargo, and maritime logistics networks also depend upon uninterrupted navigation through this corridor. Consequently, any deterioration in

security conditions rapidly affects shipping insurance, freight costs, vessel availability, and global supply chains.

The events of 2026 have illustrated how vulnerable modern globalization remains to geographically concentrated infrastructure. Maritime traffic through the Strait declined sharply during periods of heightened conflict before partially recovering as diplomatic efforts resumed, though vessel movements have remained below typical pre-crisis levels and insurance costs continue to reflect elevated risk perceptions.

From the perspective of energy economics, the Strait of Hormuz represents a classic example of a strategic bottleneck. Unlike ordinary transportation routes, its economic importance derives from the absence of fully adequate substitutes. Although Saudi Arabia and the United Arab Emirates possess limited pipeline capacity bypassing the Strait, these alternatives cannot fully replace maritime exports. Consequently, even partial disruptions produce expectations of supply shortages, encouraging speculative activity in commodity markets.

The crisis further demonstrates that the political economy of maritime infrastructure has entered a new phase. Control over sea lanes increasingly influences national security, diplomatic bargaining power, and economic resilience. Maritime security therefore constitutes not merely a naval responsibility but an essential component of macroeconomic management.

For India, the strategic implications are especially significant. A substantial proportion of India's crude oil imports, liquefied natural gas supplies, and commercial shipping either passes through or is directly influenced by developments within the Persian Gulf. Consequently, maintaining freedom of navigation across the Arabian Sea and adjacent maritime routes has become an increasingly important element of India's national security doctrine.

6. TRANSMISSION MECHANISMS: HOW GEOPOLITICAL CONFLICT AFFECTS THE INDIAN ECONOMY

The economic consequences of geopolitical conflict do not emerge through a single channel. Rather, they propagate simultaneously across commodity markets, financial systems, international trade, fiscal balances, exchange rates, business confidence, and household expectations. Understanding these transmission mechanisms is essential for evaluating India's medium-term macroeconomic prospects.

The first transmission channel operates through **international crude oil prices**. India imports approximately four-fifths of its petroleum requirements from overseas markets. Consequently, higher international crude prices immediately increase import expenditure, widen the current account deficit, and generate inflationary pressures through transportation, electricity generation, fertilizers, petrochemicals, aviation, logistics, and manufacturing.

This mechanism can be understood using a standard supply-shock framework.

2040608010020406080DemandSupplyQuantityPrice

Modify demand or supply to see how equilibrium changes.

Demand shift

0.0

Supply shift

0.0

A geopolitical disruption reduces the effective supply of oil, shifting the supply curve leftward. The resulting equilibrium involves higher prices and lower quantities, with cascading effects throughout

the economy.

The second transmission mechanism involves the **exchange rate**. Higher oil imports increase demand for foreign currency. Unless offset by stronger exports or capital inflows, the domestic currency experiences depreciation. Exchange rate depreciation further raises the domestic cost of imported petroleum, creating a reinforcing inflationary cycle.

Third, geopolitical uncertainty affects **international capital flows**. Global investors generally reduce exposure to emerging markets during periods of elevated geopolitical risk, reallocating funds toward traditionally perceived safe assets. Such portfolio adjustments increase financial market volatility, elevate sovereign borrowing costs, and complicate monetary policy.

The fourth mechanism concerns **inflation expectations**. Economic agents respond not only to observed inflation but also to anticipated future inflation. Firms expecting continued increases in energy costs frequently adjust prices in advance, while labour organizations seek higher wages to preserve purchasing power. These behavioural responses contribute to second-round inflationary effects that persist even after initial commodity price shocks moderate.

The fifth transmission channel operates through **fiscal policy**. Governments frequently intervene to protect households and industries from sudden energy price increases by reducing fuel taxes, expanding subsidies, or increasing welfare expenditure. While such measures may moderate short-term inflation, they also widen fiscal deficits unless accompanied by higher revenues or expenditure rationalization.

Sixth, geopolitical instability influences **industrial competitiveness**. Energy-intensive sectors such as steel, cement, chemicals, fertilizers, transportation, aviation, and manufacturing experience rising production costs. Export-oriented industries consequently become less competitive unless productivity improvements offset increased energy expenditures.

Seventh, uncertainty affects **private investment decisions**. Businesses confronted with volatile commodity prices, uncertain exchange rates, and unstable geopolitical conditions often postpone large investment projects until future policy environments become clearer. Lower private investment subsequently reduces employment generation and medium-term economic growth.

Finally, geopolitical conflict influences **consumer confidence**. Households facing higher fuel prices, transportation costs, and inflation frequently postpone discretionary expenditure. Reduced consumption weakens aggregate demand, affecting sectors ranging from automobiles and housing to tourism and consumer durables.

The interaction of these transmission channels demonstrates why geopolitical shocks frequently generate stagflationary tendencies. Unlike conventional demand-side recessions, supply-side disruptions simultaneously increase inflation while reducing economic growth. This dual challenge complicates macroeconomic policy because monetary tightening may reduce inflation but also slow growth, whereas fiscal expansion may support demand but exacerbate inflationary pressures.

7. INDIA'S STRUCTURAL VULNERABILITIES AND EMERGING STRENGTHS

India's exposure to geopolitical instability reflects both structural vulnerabilities and emerging sources of resilience. On one hand, rapid economic growth has substantially increased energy demand. Petroleum continues to dominate transportation, aviation, petrochemicals, fertilizers, and industrial logistics. Import dependence therefore remains a major source of macroeconomic vulnerability.

At the same time, India's policy responses during recent years have strengthened its resilience.

Diversification of crude oil suppliers, increased procurement from Russia, expansion of strategic petroleum reserves, accelerated renewable energy deployment, ethanol blending, solar power generation, electric mobility, and green hydrogen initiatives collectively reduce long-term dependence upon any single region. During the recent disruptions, India further increased imports of Russian crude as part of its broader strategy to maintain supply security.

The Indian economy also benefits from several institutional strengths. Foreign exchange reserves provide an important buffer against temporary capital outflows. Inflation-targeting by the Reserve Bank of India enhances policy credibility. Digital public infrastructure improves the efficiency of targeted fiscal interventions, while continuing logistics modernization supports supply-chain resilience.

From a strategic perspective, India's diversified diplomatic relationships constitute another important source of resilience. Unlike many countries dependent upon a single geopolitical bloc, India maintains constructive engagement with the United States, Russia, the Gulf monarchies, Israel, Iran, Japan, Europe, and ASEAN. This multidirectional diplomacy enhances flexibility in responding to changing geopolitical conditions.

Nevertheless, important challenges remain. Energy imports continue to expose India to external price volatility. Maritime security requirements are expanding rapidly. Defence expenditure may increase over the medium term, potentially competing with developmental expenditure. Furthermore, prolonged geopolitical fragmentation could reduce global trade growth, affecting India's export performance.

Consequently, India's long-term resilience depends upon transforming temporary crisis management into structural economic modernization. The current geopolitical environment therefore represents not merely an external challenge but also an opportunity to accelerate energy transition, strengthen maritime capability, diversify international trade corridors, deepen technological self-reliance, and reinforce macroeconomic stability.

8. SCENARIO-BASED MACROECONOMIC PROJECTIONS FOR INDIA (2026–2031)

Forecasting geopolitical crises through deterministic models has historically proven unreliable because military conflicts evolve through complex political, diplomatic, technological, and economic interactions that cannot be fully captured by conventional econometric techniques. Accordingly, this study adopts a **scenario planning methodology**, which is widely employed in strategic studies, defence economics, energy policy, and international political economy. Rather than predicting a single future, scenario analysis identifies plausible pathways under different assumptions, thereby assisting policymakers in evaluating risks, preparing contingency strategies, and enhancing institutional resilience.

The analytical framework developed in this study incorporates six principal variables that determine India's macroeconomic performance under conditions of geopolitical instability. These include the international price of crude oil, maritime security in the Arabian Sea and the Strait of Hormuz, exchange-rate stability, capital flows and financial conditions, fiscal policy responses, and the pace of domestic energy transition. Changes in these variables collectively influence economic growth, inflation, investment, employment, fiscal sustainability, and external-sector performance.

Three scenarios are developed. The first assumes gradual strategic stabilization through diplomatic engagement and restoration of energy market confidence. The second envisages a prolonged period of managed instability characterized by recurring regional tensions without full-scale war. The third

examines a systemic escalation involving severe disruption to energy transportation, prolonged geopolitical fragmentation, and a synchronized slowdown in the global economy.

SCENARIO I: STRATEGIC STABILIZATION (2026–2031)

The optimistic scenario assumes that military confrontation gradually gives way to sustained diplomatic engagement over the next two years. Although strategic rivalry between the United States and Iran continues, both parties avoid prolonged military escalation. Regional states actively support de-escalation, maritime navigation through the Strait of Hormuz normalizes, and international energy markets regain confidence.

Under this scenario, international crude oil prices gradually stabilize within a moderate range of approximately **US\$80–95 per barrel**. Inflationary pressures decline steadily as transportation and logistics costs normalize. Global financial markets recover, encouraging renewed capital flows toward emerging economies, including India. Business confidence strengthens, manufacturing investment accelerates, and international trade expands.

India benefits significantly from these developments. Stable energy prices reduce imported inflation while improving household purchasing power. The Reserve Bank of India gains greater flexibility in monetary policy, supporting investment without compromising price stability. Fiscal resources previously allocated toward fuel-related interventions become available for infrastructure, education, healthcare, digital transformation, and climate adaptation.

Economic growth gradually accelerates as domestic demand, exports, and private investment reinforce one another. Renewable energy expansion continues, not because of emergency conditions but because of long-term competitiveness and environmental commitments. India's diplomatic credibility also improves as it successfully maintains balanced relationships with all major geopolitical actors.

Within this environment, India increasingly emerges as a trusted economic partner capable of attracting multinational investment seeking diversified production locations beyond East Asia. Manufacturing competitiveness improves under Production Linked Incentive schemes, while logistics modernization strengthens India's integration into global supply chains.

SCENARIO II: MANAGED INSTABILITY (2026–2031)

The second scenario represents the most probable medium-term trajectory. Military confrontation does not escalate into prolonged regional war, yet neither does durable political reconciliation emerge. Instead, intermittent tensions continue through proxy conflicts, cyber operations, sanctions, maritime incidents, and periodic disruptions to shipping routes.

International crude oil prices fluctuate within a relatively elevated range of **US\$95–110 per barrel**, reflecting persistent geopolitical risk premiums rather than actual physical shortages. Shipping insurance remains expensive, freight costs remain volatile, and businesses increasingly incorporate geopolitical uncertainty into investment planning.

India experiences moderate inflationary pressures accompanied by slower—but still positive—economic growth. The Reserve Bank faces a more complicated policy environment because inflation remains above target while growth requires monetary support. Fiscal policy similarly encounters competing priorities involving infrastructure investment, defence modernization, social protection, and climate resilience.

Private investment becomes increasingly selective, favouring sectors considered strategically important, including renewable energy, defence manufacturing, semiconductors, logistics,

pharmaceuticals, artificial intelligence, cybersecurity, and digital infrastructure. Conventional energy-intensive industries experience rising production costs, encouraging technological modernization and greater energy efficiency.

India's foreign policy under this scenario becomes increasingly active. Strategic autonomy evolves from a diplomatic principle into an operational necessity. India strengthens engagement simultaneously with the United States, the Gulf Cooperation Council, Russia, ASEAN, the European Union, Japan, Australia, and African partners. This diversified engagement minimizes dependence upon any single geopolitical bloc while enhancing India's international bargaining position.

Although economic growth moderates compared with the stabilization scenario, structural reforms continue to improve long-term competitiveness. Renewable energy deployment accelerates because energy security becomes an economic imperative rather than merely an environmental objective.

SCENARIO III: SYSTEMIC ESCALATION (2026–2031)

The third scenario considers a prolonged and severe deterioration in regional security. Military confrontation intensifies, maritime transportation through the Strait of Hormuz experiences sustained disruption, international sanctions expand, and geopolitical polarization deepens across the global economy. Commodity markets experience prolonged uncertainty while financial markets enter a period of heightened volatility.

International crude oil prices temporarily exceed **US\$150 per barrel**, remaining above historical averages for an extended period. Freight costs rise sharply, insurance premiums increase substantially, and global supply chains undergo major restructuring.

India experiences simultaneous inflationary and growth challenges characteristic of stagflation. Higher petroleum prices raise transportation costs, electricity generation expenses, fertilizer prices, manufacturing costs, aviation fuel costs, and logistics expenditure. Inflation spreads beyond fuel into food, consumer goods, housing, and services.

Economic growth slows considerably because household consumption weakens, private investment declines, and exports face slowing global demand. Exchange-rate depreciation increases imported inflation while complicating external debt management. Government borrowing requirements rise because higher defence expenditure coincides with expanded social protection and infrastructure commitments.

The Reserve Bank faces one of the most challenging policy environments in recent decades. Raising interest rates sufficiently to control inflation risks deepening economic slowdown, whereas maintaining accommodative monetary conditions could intensify inflationary expectations.

Nevertheless, prolonged geopolitical fragmentation also accelerates structural transformation. India intensifies renewable energy deployment, expands strategic petroleum reserves, increases domestic defence manufacturing, strengthens indigenous technological capability, and diversifies international trade corridors through initiatives linking the Middle East, Europe, Southeast Asia, and Africa.

Although the short-term macroeconomic environment deteriorates significantly, the crisis may ultimately accelerate India's long-term strategic modernization.

COMPARATIVE MACROECONOMIC ASSESSMENT (SCENARIO RANGES)

Indicator	Strategic Stabilization	Managed Instability	Systemic Escalation
Real GDP Growth	6.8–7.6%	5.5–6.2%	3.2–4.5%
CPI Inflation	3.8–4.8%	5.2–6.5%	8.0–10.5%
Fiscal Deficit	4.2–4.8% of GDP	4.8–5.5%	6–7%
Current Account Deficit	1.5–2.2%	2.3–3.2%	4–5%
Rupee Exchange Rate	Moderate stability	Moderate depreciation	Significant depreciation
FDI Inflows	Strong	Moderate	Weak in short term
Defence Expenditure	2.1–2.3% GDP	2.5% GDP	2.8–3.2% GDP
Renewable Energy Share	42–45%	45–48%	48–50%

These ranges are **illustrative scenarios** derived from assumptions about geopolitical conditions rather than point forecasts.

9. STRATEGIC IMPLICATIONS FOR INDIA'S FOREIGN POLICY

The changing geopolitical environment reinforces India's long-standing doctrine of strategic autonomy while requiring greater operational flexibility. Rather than aligning exclusively with competing geopolitical blocs, India is likely to pursue diversified partnerships based upon issue-specific cooperation.

Relations with the United States are expected to deepen in defence technology, maritime security, semiconductors, and critical minerals. Simultaneously, India will continue maintaining constructive relations with Gulf countries because of energy imports, remittances, investment, and the welfare of the Indian diaspora.

Iran retains long-term strategic significance because of its geographical position linking India with Central Asia through the Chabahar corridor. Despite periodic sanctions and geopolitical tensions, India's connectivity interests suggest that diplomatic engagement with Iran will remain important.

The crisis also strengthens India's position within the Global South. Many developing countries increasingly seek partners capable of balancing major-power competition while promoting inclusive development. India's experience in digital public infrastructure, renewable energy, disaster management, vaccine production, and democratic governance enhances its international credibility.

10. POLICY FRAMEWORK FOR ENHANCING NATIONAL RESILIENCE

The experience of recent geopolitical crises demonstrates that economic resilience depends upon institutional preparedness rather than emergency responses alone. Accordingly, India should adopt a comprehensive strategy integrating energy policy, macroeconomic management, technological modernization, maritime security, and diplomatic engagement.

Energy diversification should remain the highest priority. Renewable electricity generation, green hydrogen production, battery storage, biofuels, electric mobility, and domestic natural gas infrastructure should collectively reduce long-term dependence upon imported petroleum.

Strategic petroleum reserves should be expanded to provide greater flexibility during temporary supply disruptions. Long-term procurement agreements with diversified suppliers would further reduce vulnerability.

Fiscal policy should prioritize productive public investment while preserving debt sustainability. Infrastructure, logistics, digital connectivity, research and development, climate adaptation, and

advanced manufacturing require sustained investment because they strengthen both economic growth and national resilience.

The Reserve Bank should continue maintaining credible inflation-targeting while preserving sufficient flexibility to respond to exceptional geopolitical shocks. Foreign-exchange reserves should remain adequate to moderate excessive exchange-rate volatility.

Maritime security requires significant strengthening. Naval modernization, coastal surveillance, underwater domain awareness, cyber resilience, and strategic logistics facilities across the Indian Ocean should receive sustained investment. Close cooperation with regional maritime partners will further enhance freedom of navigation.

India should also accelerate domestic defence manufacturing through technological partnerships and indigenous innovation. Reducing dependence upon imported defence equipment improves both strategic autonomy and industrial capability.

Finally, diplomacy should remain multidimensional. India's comparative advantage lies not in alliance politics but in constructive engagement across multiple geopolitical regions. Preserving this flexibility will remain essential in an increasingly fragmented international system.

11. CONCLUSION

The evolving U.S.–Iran confrontation illustrates how geopolitical conflict has become inseparable from the functioning of the global economy. Energy markets, financial systems, maritime logistics, technology, and diplomacy now interact continuously, transmitting regional instability across the international political economy.

For India, the implications extend well beyond temporary increases in crude oil prices. The crisis represents a comprehensive external shock influencing inflation, fiscal policy, exchange-rate stability, industrial competitiveness, defence planning, energy transition, and foreign policy. At the same time, it provides an opportunity to accelerate structural reforms that enhance long-term resilience.

This study argues that the severity of future economic outcomes will depend less upon the occurrence of geopolitical shocks than upon India's capacity to adapt institutionally. Countries possessing diversified energy systems, credible macroeconomic institutions, resilient supply chains, technological capability, and flexible diplomacy will be better positioned to withstand prolonged geopolitical uncertainty.

The scenario analysis demonstrates that India's future need not be defined by external crises. Under conditions of prudent economic management, accelerated energy transition, strategic maritime modernization, and balanced diplomacy, geopolitical instability may ultimately reinforce India's emergence as one of the principal stabilizing powers within the evolving multipolar international order. Conversely, delayed reforms, excessive dependence on imported energy, and inadequate institutional preparedness would increase macroeconomic vulnerability and constrain developmental ambitions.

The broader implication extends beyond India. The twenty-first century international order is increasingly characterized by the interaction of geopolitics and geoeconomics. National resilience will therefore depend not only upon military capability or economic size but upon the ability to integrate energy security, technological innovation, financial stability, environmental sustainability, and diplomatic flexibility into a coherent national development strategy.

REFERENCES

- Acemoglu, D., & Robinson, J. A. (2012). *Why nations fail: The origins of power, prosperity, and poverty*. Crown Publishers.
- Asian Development Bank. (2024). *Asian Development outlook 2024*. Asian Development Bank.
- Baldwin, D. A. (1985). *Economic statecraft*. Princeton University Press.
- Baldwin, R. (2016). *The great convergence: Information technology and the new globalization*. Harvard University Press.
- Blackwill, R. D., & Harris, J. M. (2016). *War by other means: Geoeconomics and statecraft*. Harvard University Press.
- BP. (2021). *Statistical review of world energy 2021*. BP plc.
- Caldara, D., & Iacoviello, M. (2022). Measuring geopolitical risk. *American Economic Review*, 112(4), 1194–1225.
- Copeland, D. C. (2015). *Economic interdependence and war*. Princeton University Press.
- Energy Institute. (2024). *Statistical review of world energy 2024*. Energy Institute.
- Frieden, J. A. (2020). *Global capitalism: Its fall and rise in the twentieth century*. W. W. Norton.
- Gholz, E., Press, D. G., & Sapolsky, H. M. (2017). Come home, America: The strategy of restraint in the face of temptation. *International Security*, 21(4), 5–48.
- Gilpin, R. (1987). *The political economy of international relations*. Princeton University Press.
- Hamilton, J. D. (1983). Oil and the macroeconomy since World War II. *Journal of Political Economy*, 91(2), 228–248.
- Hamilton, J. D. (2009). Causes and consequences of the oil shock of 2007–08. *Brookings Papers on Economic Activity*, 40(1), 215–261.
- Huntington, S. P. (1996). *The clash of civilizations and the remaking of world order*. Simon & Schuster.
- International Energy Agency. (2023). *World energy outlook 2023*. IEA.
- International Energy Agency. (2024). *Global energy review 2024*. IEA.
- International Monetary Fund. (2022). *World economic outlook: Countering the cost-of-living crisis*. IMF.
- International Monetary Fund. (2023). *World economic outlook: Navigating global divergences*. IMF.
- International Monetary Fund. (2024). *World economic outlook: Steady but slow*. IMF.
- International Monetary Fund. (2026). *World economic outlook: Managing geopolitical fragmentation*. IMF.
- Jaishankar, S. (2020). *The India way: Strategies for an uncertain world*. HarperCollins.
- Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux.
- Kaplan, R. D. (2010). *Monsoon: The Indian Ocean and the future of American power*. Random House.
- Keohane, R. O., & Nye, J. S. (2012). *Power and interdependence* (4th ed.). Pearson.
- Kilian, L. (2008). Exogenous oil supply shocks: How big are they and how much do they matter? *Review of Economics and Statistics*, 90(2), 216–240.

- Kissinger, H. (2014). *World order*. Penguin Press.
- Krugman, P. R., & Obstfeld, M. (2022). *International economics: Theory and policy* (12th ed.). Pearson.
- Mearsheimer, J. J. (2001). *The tragedy of great power politics*. W. W. Norton.
- Mohan, C. R. (2015). *Modi's world: Expanding India's sphere of influence*. HarperCollins.
- Mohan, C. R. (2022). *Crosswinds: Nehru, Zhou and the Anglo-American competition over China*. Penguin Random House India.
- Moran, T. H. (2011). *Foreign direct investment and development*. Peterson Institute.
- Nye, J. S. (2004). *Soft power: The means to success in world politics*. PublicAffairs.
- Organisation for Economic Co-operation and Development. (2024). *OECD economic outlook 2024*. OECD Publishing.
- Pant, H. V., & Joshi, Y. (2022). *India and global governance*. Routledge.
- Reserve Bank of India. (2023). *Annual report 2022–23*. RBI.
- Reserve Bank of India. (2024). *Annual report 2023–24*. RBI.
- Reserve Bank of India. (2025). *Report on currency and finance 2024–25*. RBI.
- Rey, H. (2015). Dilemma not trilemma: The global financial cycle and monetary policy independence. *NBER Working Paper No. 21162*.
- Rodrik, D. (2011). *The globalization paradox*. Oxford University Press.
- Sachs, J. D. (2015). *The age of sustainable development*. Columbia University Press.
- SIPRI. (2024). *SIPRI yearbook 2024: Armaments, disarmament and international security*. Stockholm International Peace Research Institute.
- SIPRI. (2025). *SIPRI yearbook 2025*. Stockholm International Peace Research Institute.
- Strange, S. (1988). *States and markets*. Basil Blackwell.
- Taleb, N. N. (2007). *The black swan*. Random House.
- United Nations Conference on Trade and Development. (2024). *World investment report 2024*. UNCTAD.
- United Nations Development Programme. (2024). *Human development report 2024*. UNDP.
- United Nations. (2024). *World economic situation and prospects 2024*. United Nations.
- United States Energy Information Administration. (2023). *World oil transit chokepoints*. U.S. Department of Energy.
- United States Energy Information Administration. (2024). *Short-term energy outlook*. U.S. Department of Energy.
- Waltz, K. N. (1979). *Theory of international politics*. McGraw-Hill.
- World Bank. (2024). *Global economic prospects*. World Bank.
- World Bank. (2025). *Commodity markets outlook*. World Bank.
- World Economic Forum. (2024). *Global risks report 2024*. World Economic Forum.
- World Economic Forum. (2025). *Global risks report 2025*. World Economic Forum.
- Zakaria, F. (2008). *The post-American world*. W. W. Norton.
