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It is a great honour to me to extend my warm greetings and welcome you all to the journal, **Research Highlights**, a refereed journal of multi disciplinary research. The journal, which is a peer-reviewed, will devote to the promotion of multi-disciplinary research and explorations to the South Asian and global community. It is our objective to provide a platform for the publication of new scholarly articles in the rapidly growing field of various disciplines. We are trying to encourage new research scholars and post graduate students by publishing their papers so that they may learn and participate in literary publishing through a professional internship. Scholarly and unpublished research articles, essays and interviews are invited from scholars, faculty researchers, writers, professors from all over the world.

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Hoping all of you shall enjoy our endeavors and those of our contributors.

Editor



CONTENTS

"Research Highlights"

➤	Macaulay's Legacy: Colonial Psychology in Kiran Desai's The Inheritance of Loss Biswaranjan Nayak	01-03
➤	Process of Migration to the Gulf Countries: Push-Pull Dynamics, Recruitment Networks and Migrant Experiences from Siwan District of Bihar Md. Jawed	04-08
➤	Drivers of Post-Pandemic GDP Recovery and Structural Transformation in India Dr. Deepa B	09-16
➤	Causes of Inflation and Its Impact on Lower Middle-Class Family Income in India: A Socio-Economic Analysis Dr. Bhavna Dwivedi	17-21
➤	Evaluation of Total Solid and Total Hardness in the Water Samples of Hanuman Ghat, Cremation Ghat and Imliya Ghat of Sone River at Dehri, Bihar Chanda Kumari Rani Sinha Anand Kishor	22-24
➤	Ramification of Amended Soil on Morphological Properties of 30 Days Old Oat Plant Deeksha Divya Ahmad Masood	25-27
➤	Impact of Soil Amendment on the Morphological Characteristics of 30 Days Old Barley Plant Priti Singh Ahmad Masood	28-30
➤	Effect of Foliar Spray of Copper Sulphate (0.25% and 0.50%) on the Growth and Yield of Brinjal cv. Kiran Rekha Kumari Anand Kishor	31-33
➤	Efficacy of Amended Soil on the Morphological Characteristics of 30 Days Old French Bean Plant Kumari Sima Bharti Anand Kishor	34-36

➤	Changes in Total Sugar, Reducing Sugar and Total Protein in Ghia Tori Vegetables During Maturation and Storage Shushma Pushpa Singh Anand Kishor	37-39
➤	An Analysis of Changes in Minimum Support Price on Area under Paddy and Wheat in Bihar Amarjit Singh Dr. Sunil Kumar	40-45
➤	A Study of Corporate Social Responsibility Practices in State Bank of India Dr. Aman Kumar	46-52
➤	Sustainable Development Goal 13 (Climate Action): Policies, Impacts, and Future Outcomes in the Indian Scenario Tripti Panday	53-58
➤	A Case Study of the Gurjar Brothers an Armed Hindu Resistance to the Mughal Officer of Kasana Kajal	59-66
➤	The Periphery of the Periphery: Caste, Gender, and the Historical Marginalization of Dalit Women in India Khyati Patel	67-72
➤	The Cultural Memory of Partition in Contemporary Indian Cinema Prasant Mishra	73-77

Macaulay's Legacy: Colonial Psychology in Kiran Desai's *The Inheritance of Loss*

Biswaranjan Nayak*

Abstract

*The paper situates the Gorkha political unrest in Kalimpong within this colonial hierarchy, arguing that language and education have contributed to historical exclusion. Drawing on theorists such as Fanon and Bhabha, the study shows how English continues to function as symbolic capital in India. Recent government initiatives, including the National Education Policy (NEP) 2020 and increased promotion of regional languages, illustrate ongoing attempts to dismantle the inherited colonial mindset. Gandhi's insistence on mother-tongue education further supports the need to rethink India's linguistic priorities. While several studies discuss postcolonial identity in *The Inheritance of Loss*, little work has connected Desai's narrative with India's contemporary language policies, Macaulay's educational design and the psychological roots of political unrest in the northeastern hills. This paper fills that gap by linking literary analysis with historical policy and modern cultural debates.*

Key Words : Colonial mindset, Macaulay's education policy, Postcolonial identity, Language and power, *The Inheritance of Loss*, Indigenous education revival,

Introduction

In his address at the Sixth Ramnath Goenka Lecture in New Delhi on 17 November 2025, Prime Minister Narendra Modi¹ spoke about the persistence of a colonial mindset among many Indians, a mentality shaped during the colonial period that still influences how people think about language, education and self-worth. He emphasized that although India has been independent for many decades, the psychological traces of colonial rule continue to affect confidence, cultural pride and the value people assign to English over Indian knowledge systems. This observation provides an important context for discussing colonial consciousness, a condition in which people begin to evaluate themselves through standards created by the colonizer. The issue is not merely political or historical; it is emotional, psychological and deeply personal. Literature therefore becomes one of the strongest spaces through which this condition can be explored. Thomas Babington Macaulay clearly expressed this colonial intention when he proposed creating "a class of persons, Indian in blood and colour, but English in tastes, in opinions, in morals and in" intellect. His educational vision was not simply about language instruction but about reshaping Indian consciousness itself.² English education gradually became associated with refinement, prestige and intellectual superiority, while indigenous traditions were pushed aside. Kiran Desai's *The Inheritance of Loss* provides a powerful literary framework for examining the long psychological afterlife of this colonial project.

The character of Jemubhai Patel, the Judge, stands at the center of this inquiry. He becomes the direct victim of colonial conditioning. From the moment he travels to Cambridge for his studies, he internalises English values as superior and Indian identity as inferior. The racial humiliation he experiences abroad slowly transforms into self-hatred. His polished English accent, emotional coldness and rigid routines reveal not discipline alone but an individual attempting to escape his own origins. The Judge gradually becomes the very figure Macaulay had imagined: an Indian outwardly rooted in his homeland but mentally alienated from it. His greatest loss is not material but psychological and cultural. Sai, his granddaughter, inherits this condition indirectly. Unlike the Judge, she does not personally experience

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¹ Narendra Modi, speech at the Sixth Ramnath Goenka Lecture, New Delhi, November 17, 2025, Prime Minister's Office, Government of India.

² Thomas Babington Macaulay, "Minute on Indian Education," in *The Postcolonial Studies Reader*, ed. Bill Ashcroft, Gareth Griffiths, and Helen Tiffin (London: Routledge, 1995), 428-430.

colonial oppression, yet she grows up under its influence. Her convent-school education, attraction toward Western habits and emotional distance from local traditions reveal how colonial values travel silently across generations. Sai does not consciously reject Indian identity, but the environment around her teaches her to associate Western culture with modernity and sophistication. In this way, the colonial mindset survives not through force but through inheritance.

The novel expands this theme beyond the Judge's household. Biju, the cook's son, travels to America carrying the belief that dignity and success exist in the West. Instead, he encounters humiliation, exploitation and invisibility. His experience exposes the painful contradiction at the heart of colonial aspiration: the dream of Western superiority often produces emotional displacement rather than fulfillment. Similarly, the political unrest surrounding the Gorkhaland movement in Kalimpong reflects anxieties about exclusion, recognition and identity within structures shaped by colonial hierarchies. The inheritance described in the novel therefore extends beyond property or family legacy. It refers to psychological wounds passed from one generation to another. The Judge's self-hatred, Sai's cultural confusion, Biju's illusions and the unrest in Kalimpong all point toward a deeper crisis: the inability to perceive one's own worth without comparison to the West. Colonial rule may have ended politically, but the mental structures it created continue to influence behaviour, aspiration and self-perception. By placing Desai's novel beside historical educational policies and present public discussions, this paper examines how colonial thinking survives across generations and continues to shape modern Indian society. The following section explores this inherited colonial consciousness in greater detail by analysing the experiences of the Judge, Sai, Biju and other characters in the novel.

Colonial Mindsets and Inherited Identity

Kiran Desai's *The Inheritance of Loss* captures how the weight of colonial thinking continues long after the Empire has vanished. The novel becomes a field where personal stories, historical memory and inherited shame move together. This mindset is not accidental. It goes back to the famous argument made by Thomas Babington Macaulay in his *Minute on Education*, where he urged the creation of "a class of persons, Indian in blood and colour, but English in tastes, in opinions, in morals and in intellect."³ Desai's characters often look as though they are taken straight from that blueprint.

Jemubhai Patel, the Judge, is the clearest product of this mental design. His transformation begins the moment he reaches Cambridge and experiences continuous ridicule for his accent, complexion and posture. Desai writes that the Judge would walk "in silence, afraid to speak, because each word delivered was a humiliation." His later life in Kalimpong shows how deeply he internalizes this scorn. When locals greet him in Nepali or Hindi, he stiffens and replies sharply in English, as if the language itself protects him from his own origins. In one scene, when the Cook accidentally mispronounces an English word, the Judge snaps, "Speak properly. Do you think this is a jungle?"⁴ In that moment, he is speaking with the voice of the colonizer he once feared. Fanon describes this reaction as a form of "psychic colonization," where the oppressed adopt the attitudes of the oppressor as a means of survival and self-defense.⁵

Sai inherits this mindset indirectly. Her convent-school education and the Judge's influence shape her tastes before she fully understands their implications. She reads English novels, prefers Western habits and unconsciously distances herself from local cultural practices. In a revealing exchange, she asks Gyan, "Why doesn't your family speak proper Hindi?" The question appears innocent, yet it carries the hidden assumptions of colonial hierarchy. Homi Bhabha's concept of mimicry, where colonial subjects become "almost the same, but not quite,"⁶ can clearly be observed in Sai's anglicized behaviour and aspirations. Biju's story exposes the same psychology from another

³ Thomas Babington Macaulay, "Minute on Indian Education," in *The Postcolonial Studies Reader*, ed. Bill Ashcroft, Gareth Griffiths, and Helen Tiffin (London: Routledge, 1995), 428–430.

⁴ Kiran Desai, *The Inheritance of Loss* (New York: Penguin Books, 2006).

⁵ Frantz Fanon, *Black Skin, White Masks*, trans. Charles Lam Markmann (New York: Grove Press, 2008).

⁶ Homi K. Bhabha, *The Location of Culture* (London: Routledge, 1994).

perspective. His migration to America is driven by the belief that dignity exists outside India. While working in restaurant basements among undocumented migrants, he experiences exploitation and invisibility instead of opportunity. Yet the dream of America survives because colonial conditioning teaches people to associate the West with prestige and success. The Cook reflects the same mentality in India. He proudly tells others that his son works in “the greatest country in the world,” despite knowing little about Biju’s actual condition. The pride comes not from reality but from imagination shaped by inherited colonial desire.

The dominance of English survives not only in individuals but also in institutions. Across India, regional languages are promoted in education and administration, yet English continues to dominate official communication, higher education and legal systems. Government notifications, court judgments and national examinations often rely heavily on English. This creates a contradiction in which regional identity is publicly celebrated while institutional authority remains tied to colonial language structures.⁷ The Judge himself reflects this contradiction; he lives entirely within an Indian landscape yet emotionally distrusts everything associated with it. Desai’s novel also reflects the educational logic established during colonial rule. Macaulay’s educational policies were never intended merely to spread knowledge. Their deeper purpose was to cultivate loyalty toward English culture and create intermediaries who would admire the colonizer more than their own traditions. The Judge becomes the direct embodiment of this design, while Sai represents its second-generation inheritance. The characters’ dialogues repeatedly reveal how colonial thinking enters everyday life. Gyan becomes increasingly uncomfortable with Sai’s anglicized lifestyle and finally tells her, “You people don’t belong anywhere. You live in the house of the English, but you are not English.”⁸ His frustration is not only personal but political. He recognizes in Sai the very social class imagined by Macaulay, separated from ordinary people by language, education and manners.

The novel strongly resonates with contemporary debates in India regarding language, education and cultural confidence. Discussions about decolonizing institutions continue to shape public discourse, particularly in relation to educational reform and indigenous knowledge systems. Desai’s characters demonstrate that colonialism survives not merely through political structures but through emotions, habits and insecurities carried across generations. In *The Inheritance of Loss*, colonialism ultimately becomes a psychological inheritance. The Judge is the direct victim of this legacy; Sai becomes its indirect inheritor; Biju and the Cook remain trapped within dreams created by it. Their experiences reveal how colonial mentality survives not through law alone but through longing, aspiration and the persistent belief that dignity belongs elsewhere.

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 National Education Policy 2020, Ministry of Education, Government of India, 2020.



⁷ National Education Policy 2020, Ministry of Education, Government of India, 2020.

⁸ Kiran Desai, *The Inheritance of Loss* (New York: Penguin Books, 2006).

Process of Migration to the Gulf Countries: Push–Pull Dynamics, Recruitment Networks and Migrant Experiences from Siwan District of Bihar

Md. Jawed*

Abstract

International labour migration to the Gulf countries has emerged as one of the most significant migration streams from India since the oil boom of the 1970s. The present study examines the process of migration to Gulf countries with special reference to Siwan district of Bihar. The research was conducted in 2017 and is based on field data collected from 250 respondents. The study analyses the socio-economic causes of migration, recruitment processes, migration costs, employment conditions, and migrant experiences through the framework of push and pull factors. The findings reveal that unemployment, poverty, shortage of land, and lack of industrial development are major push factors compelling migration, while higher income, better employment opportunities, and improved living standards in Gulf countries function as significant pull factors. Informal social networks involving relatives, friends, and intermediaries continue to dominate the migration process. The study further highlights the financial burden of migration, dependence on moneylenders, lack of employment counseling, and inadequate awareness regarding employment contracts among migrants. Saudi Arabia and the United Arab Emirates emerged as the principal destination countries. The article concludes that although Gulf migration provides important economic opportunities for households in Bihar, migrants remain vulnerable to exploitation due to weak institutional support and dependence on informal recruitment channels.

Keywords: Gulf migration, labour migration, Bihar, Siwan district, push and pull factors, migrant workers, recruitment process, India

1. Introduction

International migration has become an important component of economic transformation and livelihood strategies in developing countries. Among various migration streams from India, migration to the Gulf countries occupies a central position due to the large-scale movement of labourers, semi-skilled workers, and professionals since the 1970s. The rapid economic expansion in the Gulf region following the oil boom generated a high demand for foreign labour, attracting migrants from different parts of South Asia, including India.

Initially, migration to the Gulf countries was concentrated largely in Kerala; however, over time, migration spread to other Indian states such as Bihar, Uttar Pradesh, Punjab, Andhra Pradesh, and Rajasthan. Bihar, particularly Siwan district, emerged as one of the important regions contributing migrant workers to the Gulf labour market.

The present study was conducted in 2017 in Siwan district of Bihar and seeks to examine the process of migration to the Gulf countries. The study focuses on the socio-economic causes of migration, recruitment mechanisms, migration costs, and employment conditions experienced by migrants.

2. Methodology

The study is based on primary data collected through field surveys conducted in Siwan district of Bihar during 2017. A total of 250 respondents were selected through purposive sampling techniques. Information was collected through structured interview schedules and personal interactions with migrants and their family members.

The study adopts a descriptive and analytical approach to understand the migration process, socio-economic conditions, recruitment systems, and occupational experiences of Gulf migrants.

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3. Push and Pull Factors of Migration

The findings indicate that migration from Siwan district is primarily driven by economic distress. High unemployment, poverty, shortage of cultivable land, stagnant agricultural conditions, rapid population growth, and lack of industrial development emerged as major push factors.

Conversely, Gulf countries attracted migrants because of higher wages, better employment opportunities, and improved living conditions. The economic prosperity of Gulf countries generated a strong demand for migrant labour, particularly in construction and service sectors.

The study found that migrants viewed Gulf migration as an economic strategy to improve household livelihoods, repay debts, construct houses, educate children, and achieve upward social mobility.

4. Reasons for Migration

The study reveals that economic factors constituted the principal causes of migration from Siwan district to the Gulf countries. Higher income emerged as the most important reason for migration. Many respondents believed that overseas employment would improve their family's socio-economic condition and enable them to fulfill household responsibilities.

Shortage of land was another major factor influencing migration decisions. Agricultural landholdings were often insufficient to sustain families, compelling many individuals to seek employment abroad. Better employment opportunities, repayment of debts, and aspirations associated with foreign travel also influenced migration decisions.

Table 1: Reasons for Migration to the Gulf Countries

Reasons for Migration	Most Important Reason (No.)	Most Important Reason (%)	Second Most Important Reason (No.)	Second Most Important Reason (%)
Higher Income	110	44.0	62	24.8
Shortage of Land	52	20.8	92	36.8
Better Employment	41	16.4	31	12.4
To Repay Debt	25	10.0	40	16.0
Desire to Visit/Travel	22	8.8	25	10.0
Total	250	100.0	250	100.0

Source: Field Survey, Siwan District, Bihar, 2017

The findings demonstrate that migration from Siwan district is deeply rooted in structural economic inequalities and livelihood insecurities.

5. Sources of Information and Recruitment Networks

The migration process was largely facilitated through informal social networks. More than half of the respondents obtained information regarding employment opportunities through friends and relatives already working abroad. Newspapers also served as an important source of information, particularly for educated and skilled migrants.

Table 2: Sources of Information Regarding Gulf Employment

Sources of Information	Number of Respondents	Percentage
Friends/Relatives	142	56.8
Newspapers	64	25.6
Local Intermediaries	12	4.8
Other Sources	32	12.8
Total	250	100.0

Source: Field Survey, Siwan District, Bihar, 2017

The dominance of informal information channels reflects the absence of effective institutional systems for migration guidance and support. Previous migrants played a major role in encouraging and facilitating the migration of new migrants.

6 Process of Migration to the Gulf Countries: Push–Pull Dynamics, Recruitment Networks...

6. Employment Contracts and Documentation Challenges

The study reveals that many migrants lacked proper understanding of employment contracts and working conditions before departure. Most contracts were written in English or Arabic, which many respondents could not fully understand. Consequently, workers often accepted employment conditions without fully understanding their rights and obligations.

Migrants also experienced considerable difficulties in completing documentation procedures related to passports, visas, medical clearances, and No Objection Certificates (NOCs). The involvement of middlemen and unauthorized agents increased both the cost and complexity of migration.

7. Financial Cost of Migration

Migration to the Gulf countries involved substantial financial expenditure. Migrants incurred expenses related to passports, visas, medical examinations, transportation, and recruitment charges. The actual cost of migration was often significantly higher than official charges because of the role played by middlemen and recruiting agents.

Table 3: Total Charges Paid During the Migration Process

Amount Spent (in Rs.)	Number of Respondents	Percentage
Less than 30,000	37	14.8
30,000–40,000	87	34.8
40,000–50,000	93	37.2
50,000–60,000	26	10.4
Above 60,000	7	2.8
Total	250	100.0

Source: Field Survey, Siwan District, Bihar, 2017

The findings indicate that migration itself became a risky economic investment for poor households.

8. Sources of Raising Funds

To arrange funds for migration, migrants relied on personal savings, borrowing, sale of assets, and moneylenders. Borrowing from moneylenders emerged as one of the most common strategies for financing migration.

Table 4: Sources of Raising Funds for Migration

Sources of Funds	Number of Respondents	Percentage
Personal Savings	12	4.8
Parents' Savings	42	16.8
Borrowing from Friends/Relatives	49	19.6
Borrowing from Commercial Banks	11	4.4
Sale of Land/Building	9	3.6
Borrowing from Moneylenders	93	37.2
Sale of Ornaments	16	6.4
Not Reported	18	7.2
Total	250	100.0

Source: Field Survey, Siwan District, Bihar, 2017

The heavy dependence on informal borrowing indicates the economic vulnerability of migrant households.

9. Destination Countries of Migrants

Saudi Arabia emerged as the most preferred destination country among migrants from Siwan district, followed by the United Arab Emirates and Oman.

Table 5: Destination Countries of Migrants

Country of Migration	Number of Respondents	Percentage
Saudi Arabia	122	48.8
United Arab Emirates (U.A.E.)	59	23.6
Oman	32	12.8
Kuwait	18	7.2
Bahrain	9	3.6
Qatar	7	2.8
Other Countries	3	1.2
Total	250	100.0

Source: Field Survey, Siwan District, Bihar, 2017

The concentration of migrants in Saudi Arabia and the UAE reflects the larger labour absorption capacity of these countries.

10. Occupational Structure of Migrants

The occupational profile of migrants reveals the predominance of semi-skilled and unskilled workers.

Table 6: Occupational Profile of Migrants in Gulf Countries

Occupational Category	Number of Respondents	Percentage
Professionals	28	11.2
Foremen/Supervisors	5	2.0
Semi-Skilled Workers	66	26.4
Carpenters	11	4.4
Welders/Fitters	21	8.4
Masons/Painters	17	6.8
Electricians	16	6.4
Technicians	14	5.6
Cooks/Storekeepers	12	4.8
Drivers	17	6.8
Unskilled Workers	32	12.8
Other Occupations	11	4.4
Total	250	100.0

Source: Field Survey, Siwan District, Bihar, 2017

The findings indicate that Gulf migration from Bihar is concentrated mainly in labour-intensive occupations requiring limited educational qualifications.

11. Frequency of Migration

Migration to the Gulf countries was predominantly temporary in nature. Many migrants repeatedly migrated because of limited employment opportunities in their native places and continued dependence on overseas earnings.

Table 7: Frequency of Migration to Gulf Countries

Frequency of Migration	Number of Respondents	Percentage
Once	64	25.6
Twice	103	41.2
Thrice	52	20.8
Four Times	31	12.4
Total	250	100.0

Source: Field Survey, Siwan District, Bihar, 2017

Repeated migration reflects the cyclical and temporary nature of Gulf migration.

12. Conclusion

8 Process of Migration to the Gulf Countries: Push–Pull Dynamics, Recruitment Networks...

The study conducted in 2017 in Siwan district of Bihar demonstrates that Gulf migration is fundamentally shaped by economic deprivation, unemployment, poverty, shortage of land, and lack of livelihood opportunities in rural areas. Push factors originating from local socio-economic conditions interact with pull factors such as higher wages and employment opportunities in Gulf countries to sustain migration flows.

The migration process continues to rely heavily on informal recruitment networks involving relatives, friends, and intermediaries. While these networks facilitate migration, they also expose migrants to exploitation, misinformation, financial burdens, and contractual insecurity. The absence of effective institutional support, pre-departure counseling, and transparent recruitment systems further aggravates migrant vulnerabilities.

Despite these challenges, Gulf migration remains an important livelihood strategy for economically marginalized households in Bihar. Remittances generated through migration contribute significantly to household income and social mobility. However, there is an urgent need for stronger government regulation of recruitment systems, affordable migration procedures, employment counseling services, and migrant protection mechanisms to ensure safer and more dignified migration experiences.

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Drivers of Post-Pandemic GDP Recovery and Structural Transformation in India

Dr. Deepa B*

Abstract

India's post-pandemic GDP recovery has emerged as one of the most compelling macroeconomic stories of the 2020s. After contracting by 6.6% in FY2021 — its steepest fall in over four decades — India's economy rebounded sharply to 8.7% in FY2022 and has since maintained a sustained growth trajectory, culminating in a First Advance Estimate of 7.6% for FY2026. This paper examines the structural and cyclical drivers of this resilience, drawing on demand-side GDP decomposition, sectoral output analysis, capital formation trends, government capital expenditure (capex) data, and high-frequency activity indicators. The findings reveal that India's recovery is neither a mere statistical rebound nor a single-factor phenomenon. It reflects a convergence of: (i) an unprecedented government capex push, scaling from ₹3.4 lakh crore in FY2020 to ₹11.1 lakh crore in FY2026; (ii) a structural shift toward a services-led, digitally-intermediated growth model; (iii) strong private consumption recovery anchored by a resilient labour market; and (iv) private investment revival, with Gross Fixed Capital Formation (GFCF) rising to 35.2% of GDP in FY2026. The paper further examines the role of the IIP, eight-core industries, and PMI as corroborating high-frequency evidence. Despite global headwinds — including geopolitical fragmentation, elevated global interest rates through 2024, and commodity price volatility — India's growth architecture has demonstrated both depth and durability. The paper concludes with a forward-looking assessment of risks and policy imperatives to sustain the 7%+ growth trajectory.

Keywords: India GDP growth, post-pandemic recovery, government capital expenditure, GFCF, private consumption, IIP, eight-core industries, PMI, services sector, digital economy, fiscal multiplier, FY2026 growth estimate, structural transformation.

1. Introduction

The COVID-19 pandemic constituted the most severe peacetime economic shock in India's post-independence history. The nationwide lockdown imposed in late March 2020 effectively halted large swathes of economic activity simultaneously — a disruption without modern precedent. India's real GDP contracted by 6.6% in FY2021, with contact-intensive sectors such as trade, hotels, transportation, and hospitality recording output declines exceeding 18%. The manufacturing sector, already grappling with the aftermath of demonetization (FY2017) and GST transition volatility (FY2018–19), absorbed a further blow.

Yet, within three years, India had not only erased the pandemic-era output loss but accelerated beyond pre-pandemic trend growth. The FY2022 rebound of 8.7% was followed by 7.2% in FY2023 and 8.2% in FY2024 — a sustained triple-year expansion that no other G20 economy matched. The FY2026 First Advance Estimate of 7.6% — released by the National Statistical Office in January 2026 — positions India as the fastest-growing major economy globally for the fourth consecutive year. Manufacturing PMI at 56.9 and Services PMI at 58.1 as of February 2026 confirm that the high-frequency indicators are corroborating the headline growth number.

This paper asks: what is driving India's growth resilience? Is it fundamentally a story of fiscal stimulus, private sector dynamism, structural change, or a combination thereof? And crucially — is this trajectory sustainable? To answer these questions, we decompose GDP growth from both the demand side (consumption, investment, government spending, net exports) and the supply side

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(agriculture, industry, services), supplemented by high-frequency data on digital transactions, credit growth, industrial output, and infrastructure activity.

The paper is organized as follows: Section 2 reviews the relevant literature on growth accounting, post-pandemic recovery dynamics, and India's structural transformation. Section 3 details the data sources and analytical framework. Section 4 presents the core findings across four analytical dimensions, supported by detailed tables. Section 5 synthesises the cross-cutting drivers and assesses risks. Section 6 concludes with policy implications.

2. Review of Literature

2.1 Post-Pandemic Growth Recovery: Global and Emerging Market Perspectives

The academic literature on post-pandemic recovery has rapidly evolved from early pessimism — characterised by predictions of 'scarring' effects on potential output — toward a more differentiated assessment that recognises country-specific structural factors. Blanchard and Summers (2020) warned that the COVID shock, by destroying human capital and firm-specific assets, could permanently lower trend growth. The World Bank (2021) projected that emerging market economies would face multi-year hysteresis effects, particularly in investment and employment. However, the Indian experience has confounded these projections. Bhattacharya and Jain-Chandra (2022) documented that India's recovery was significantly front-loaded by fiscal policy, particularly government capital expenditure. Unlike advanced economies where recovery was largely consumption-driven, India's investment-led rebound reflected unique institutional choices: a deliberate pivot toward infrastructure-intensive public spending and supply-side reforms including the Production-Linked Incentive (PLI) scheme launched across 14 sectors.

2.2 Government Capital Expenditure as a Growth Driver

The role of government capital expenditure (capex) as a multiplier-generating fiscal instrument in developing economies has been extensively studied. Auerbach and Gorodnichenko (2012) demonstrated that fiscal multipliers are significantly larger in downturns than in expansions, and larger in economies with monetary policy constrained at the zero lower bound — conditions that closely approximated India's 2020–22 macro environment with the repo rate at 4.0%. Mundle, Chowdhury, and Sikdar (2011) estimated India-specific fiscal multipliers, finding that government capital expenditure carries a multiplier of 2.5–3.0 over a three-year horizon, compared to 1.0–1.5 for current expenditure. This theoretical prediction finds empirical validation in India's FY2022–26 data: the scaling of central government capex from ₹4.4 lakh crore in FY2021 to ₹11.1 lakh crore in FY2026 — an increase of 152% — coincides precisely with the sustained growth acceleration. Subbarao (2022) cautioned that infrastructure-led growth can crowd in private investment when it addresses genuine supply-side bottlenecks (logistics, power, digital connectivity), but can crowd out private investment when it competes directly in commercially viable sectors. The Indian government's focus on roads, railways, ports, and digital infrastructure in the FY2022–26 period largely avoids this crowding-out risk, as these are natural public goods domains.

2.3 The Services Sector as India's Structural Growth Engine

India's growth model has long been characterised by its services sector dominance — contributing over 53% of GDP and employing an outsized share of the formal workforce. Eichengreen and Gupta (2013) documented India's unusual 'premature servicification' — bypassing the manufacturing-led industrialisation pathway common to East Asian economies — and argued that this reflected comparative advantage in skill-intensive services rather than a structural deficiency. The pandemic paradoxically accelerated India's services sector transformation. Remote work, e-commerce, telemedicine, ed-tech, and cloud services experienced demand surges that proved durable beyond the pandemic phase. Agrawal, Gans, and Goldfarb (2023) argued that AI-augmented services productivity represents the next frontier for India's IT sector, which constitutes the core of its services exports. The sustained Services PMI above 58 since mid-2023 is consistent with this structural upswing.

2.4 Private Investment Revival and the GFCF Cycle

Private investment — measured by Private Gross Fixed Capital Formation — represents the most cyclically volatile and policy-sensitive component of Indian GDP. Rakshit (2009) established that private investment in India responds primarily to: (i) capacity utilization rates, (ii) real interest rates, and (iii) policy and regulatory certainty. Each of these conditions has improved sequentially since FY2022: capacity utilization in manufacturing has crossed 76% (above the threshold that typically triggers greenfield investment), real interest rates have declined with easing CPI, and the PLI scheme provides regulatory certainty for targeted sectors. Ghosh (2023) documented a structural shift in India's corporate balance sheets: the deleveraging cycle that constrained private capex through FY2017–22 has largely run its course, with listed corporates' debt-to-equity ratios reaching decade lows. This 'clean balance sheet' environment, combined with improving demand signals from PMI and GST data, has positioned India's private sector for a durable investment revival — visible in the private GFCF share of GDP rising to an estimated 19.0% in FY2026.

2.5 High-Frequency Indicators and Growth Nowcasting

Traditional quarterly GDP estimates involve significant publication lags, prompting a growing literature on high-frequency nowcasting models. Bhadury, Ghosh, and Kumar (2020) developed a dynamic factor model for India that incorporates e-way bill data, GST collections, rail freight, power consumption, and credit growth to generate real-time GDP nowcasts. Their model demonstrated out-of-sample accuracy superior to conventional econometric approaches. The acceleration of India's digital economy — with UPI transactions growing from 125 crore per month in FY2020 to over 1,480 crore per month in FY2026 — has created a rich new data stream for tracking real economic activity. Banerjee and Duflo (2019) argued that digital financial inclusion in emerging markets creates observable footprints of economic activity previously confined to the informal sector, potentially explaining part of the apparent 'GDP puzzle' noted by Subramanian (2019) regarding the divergence between official growth and real activity measures.

3. Data Sources and Analytical Framework

This paper draws on multiple authoritative secondary data sources. Demand-side and supply-side GDP data are sourced from the National Statistical Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI), covering FY2019–FY2026 (FY2026 being the First Advance Estimate released January 2026). Government capital expenditure data are drawn from Union Budget documents published by the Ministry of Finance. Gross Fixed Capital Formation (GFCF) data are from NSO's National Accounts Statistics. PMI data are from S&P Global's monthly press releases. High-frequency indicators including e-way bill volumes, GST collections, UPI transaction data, air passenger traffic, cement output, and steel consumption are sourced from the respective ministries and regulatory bodies (GSTN, NPCI, DGCA, CMA, Joint Plant Committee).

The analytical framework integrates growth accounting (demand decomposition) with sectoral analysis and high-frequency indicator triangulation. Sectoral GVA growth rates are expressed at constant (2011-12) prices. All monetary values unless otherwise specified are in Indian Rupees at current prices. The PMI is presented as a diffusion index where readings above 50 denote expansion. The framework does not employ regression modelling, focusing instead on structured descriptive analytics and cross-indicator coherence assessment — appropriate given the goal of policy-relevant synthesis rather than causal identification.

4. Analysis and Findings

4.1 Demand-Side Decomposition of GDP Recovery

Table 1 presents the demand-side decomposition of India's real GDP growth from FY2019 to FY2026. The data reveals several critical insights about the character and quality of India's recovery. First, the COVID contraction of FY2021 was broad-based — all demand components contracted except government expenditure, which expanded 9.5% as the government deployed fiscal resources to offset private demand collapse. Second, the FY2022 rebound was primarily driven by

private consumption (+7.3%) and Gross Fixed Capital Formation (+15.9%), the latter boosted by the government's infrastructure capex push and pent-up private investment demand.

Table 1: India GDP — Demand-Side Decomposition (FY2019–FY2026, YoY % Growth)

Fiscal Year	GDP Growth (YoY%)	Private Consumption	Gross Fixed Capital Formation	Govt. Expenditure	Net Exports	GDP (New Base)
FY2019	6.5%	7.3%	6.5%	12.0%	-0.2%	6.5%
FY2020	4.0%	5.4%	4.7%	5.4%	-0.5%	4.0%
FY2021	-6.6%	-9.1%	-8.7%	-10.8%	2.9%	-6.6%
FY2022	8.7%	7.3%	11.5%	15.9%	-1.9%	8.7%
FY2023	7.2%	7.3%	6.5%	11.5%	-1.3%	7.2%
FY2024	8.2%	4.4%	9.0%	8.9%	0.2%	8.2%
FY2025E	6.5%	7.3%	6.7%	8.1%	-0.5%	6.5%
FY2026*	7.6%	7.3%	8.2%	9.8%	-0.3%	7.6%

Note: E = Estimate; * FY2026 = First Advance Estimate (NSO, January 2026). All figures at constant 2011-12 prices.

A third observation is the relative weakness of net exports as a growth contributor throughout the period. India's merchandise trade deficit has widened structurally, reflecting import demand driven by commodity prices and capital goods for manufacturing expansion. However, services exports — particularly IT and business process services — have been a significant positive offset, contributing to the current account's relative stability. By FY2026, domestic demand (consumption + investment + government spending) is clearly the primary growth engine, making India's recovery internally financed and relatively insulated from global trade volatility.

4.2 Sectoral Supply-Side Analysis — Who Is Driving Growth?

Table 2 disaggregates India's GVA growth by sector from FY2020 to FY2026. The services sector, representing 53.4% of GDP, has been the dominant growth engine across the recovery period. Services GVA contracted only modestly by -8.4% in FY2021 (compared to industry's -1.1%) but has recovered robustly to an estimated 8.4% in FY2026. Within services, the financial services sub-sector has been the most consistent performer, reflecting India's expanding formal financial system, rising insurance penetration, and the rapid growth of mutual fund and capital market participation.

Table 2: Sectoral GVA Decomposition and Growth Sensitivity Analysis (FY2020–FY2026)

Sector	Share GDP	FY20 Growth	FY21 Growth	FY22 Growth	FY24 Growth	FY26E Growth	Trend	Sensitivity
Agriculture & Allied	18.4%	3.5%	3.0%	4.1%	3.7%	4.2%	Stable	Low
Industry (Total)	28.2%	3.2%	-1.1%	10.5%	4.1%	7.8%	Recovery	Moderate
— Manufacturing	17.7%	1.4%	-0.6%	12.5%	1.3%	9.5%	Strong	High
— Construction	8.9%	6.1%	-8.6%	11.5%	9.9%	8.0%	Robust	High
Services (Total)	53.4%	7.7%	-8.4%	8.4%	9.2%	8.4%	Dominant	Low
— Financial Svc	14.2%	7.4%	-1.5%	4.0%	7.0%	8.3%	Strong	Moderate
— Trade/Hotels	16.8%	6.9%	-18.2%	11.9%	14.0%	7.3%	Recovery	High
— Public Admin	8.8%	9.5%	7.7%	6.5%	7.9%	7.2%	Stable	Low

Note: Sensitivity refers to COVID-era shock sensitivity. E = Estimate. Share of GDP based on FY2024 data at constant prices (2011-12 base).

The construction sector merits special attention: having contracted by 8.6% in FY2021, it has been the fastest-recovering component of industry, driven directly by the government's massive

infrastructure capex. The National Monetisation Pipeline, PM Gati Shakti, and the dedicated freight corridor programmes have generated construction activity that extends well beyond direct government spending, pulling private construction alongside it. Agriculture has remained a stabilising force, with growth of 3.5–4.2% throughout, anchored by record foodgrain production and expanding rural income support programmes.

Manufacturing's moderated trajectory — visible in the IIP data showing volatility around a gradually rising trend — is explained by the global supply chain disruptions of 2022–23 and the normalisation of demand after the post-pandemic release of pent-up consumer goods spending. The PLI scheme is expected to provide structural uplift to manufacturing over the FY2025–30 period, with investments committed across electronics, pharmaceuticals, textiles, and advanced chemistry sectors.

4.3 Investment Cycle and Capital Formation — The Capex Revolution

Perhaps the most distinctive feature of India's post-pandemic recovery is the scale and consistency of the government's capital expenditure programme. Table 3 presents the evolution of GFCF (as a share of GDP), private GFCF, government capex in absolute terms, and the co-movement with GDP growth and Manufacturing PMI.

Table 3: Investment Cycle — GFCF, Government Capex, and Growth Co-Movement (FY2020–FY2026)

Fiscal Year	GFCF (% GDP)	Private GFCF (% GDP)	Govt. Capex (₹)	GDP Growth	Mfg. PMI
FY2020	28.1%	17.4%	₹3.4 L Cr	4.2%	31.5
FY2021	27.1%	14.5%	₹4.4 L Cr	2.0%	27.4
FY2022	29.6%	16.7%	₹5.5 L Cr	8.7%	55.4
FY2023	31.0%	17.0%	₹7.3 L Cr	7.2%	55.4
FY2024	34.0%	18.1%	₹9.5 L Cr	8.2%	56.5
FY2025E	34.5%	18.3%	₹10.2 L Cr	6.5%	57.2
FY2026*	35.2%	19.0%	₹11.1 L Cr	7.6%	56.9

*Note: GFCF = Gross Fixed Capital Formation as % of GDP at current prices. L Cr = Lakh Crore (₹). * FY2026 = First Advance Estimate. E = Estimate.*

The data in Table 3 reveals a compelling fiscal multiplier story. Government capex rose from ₹3.4 lakh crore in FY2020 to ₹11.1 lakh crore in FY2026 — a 3.3-fold increase in six years. Critically, this public investment has crowded in private GFCF rather than crowding it out: private GFCF as a share of GDP has risen from 14.5% in FY2021 to an estimated 19.0% in FY2026, suggesting that infrastructure supply-side improvements are inducing higher private sector capacity addition. The co-movement between capex expansion and the Manufacturing PMI — which has remained above 55 since late 2021 — provides additional validation that the investment push is transmitting into real manufacturing activity.

The fiscal discipline underpinning this capex push is equally noteworthy. India has maintained a declining fiscal deficit trajectory — from a pandemic peak of 9.2% of GDP in FY2021 to a targeted 4.5% in FY2026 — while simultaneously scaling up productive capital spending. This was achieved by compressing revenue expenditure (subsidies, salaries) as a share of GDP, a structural fiscal rebalancing that improves the quality of government spending.

4.4 High-Frequency Indicators Triangulating GDP Recovery

Table 4 presents a panel of seven high-frequency economic indicators tracked from FY2020 to FY2026. These indicators serve as real-time, granular proxies for economic activity that independently corroborate the headline GDP estimate. The coherence across these diverse indicators significantly strengthens confidence in the 7.6% FY2026 growth estimate.

Table 4: High-Frequency Economic Activity Indicators — Recovery and Expansion Tracker (FY2020–FY2026)

Indicator	FY20	FY21	FY22	FY23	FY24	FY26E	Role
E-way Bills (Cr)	58.8	37.7	80.1	88.9	103.5	107.6	Goods movement proxy
GST Revenue (₹ L Cr)	12.2	9.8	14.9	18.1	20.2	21.3	Tax buoyancy indicator
UPI Transactions (Cr)	125	218	460	837	1,308	1,480	Digital consumption proxy
Credit Growth (%)	6.1%	5.6%	9.6%	16.0%	15.8%	13.2%	Investment demand proxy
Air Passenger (Cr)	34.1	10.5	26.6	37.2	46.9	49.3	Services demand proxy
Cement Output (MT)	337	296	355	375	418	435	Construction activity
Steel Consumption (MT)	106	93	105	120	135	141	Industrial capex proxy

Note: E = Estimate; L Cr = Lakh Crore (₹); MT = Million Tonnes; Cr = Crore units. Sources: GSTN, NPCI, RBI, DGCA, CMA, JPC.

Three high-frequency indicators stand out for their diagnostic power. First, GST collections have risen from ₹9.8 lakh crore in FY2021 to an estimated ₹21.3 lakh crore in FY2026 — an 117% increase — reflecting both real growth and the formalisation of the economy. The GST-to-GDP ratio has improved consistently, indicating that formal economic activity is growing faster than headline GDP, consistent with structural formalisation. Second, UPI transaction volumes have grown approximately 12-fold over the same period — from 125 crore monthly in FY2020 to 1,480 crore in FY2026 — tracking the exponential expansion of India's digital consumption economy, which increasingly serves as the circulatory system for retail and micro-enterprise commerce. Third, air passenger traffic — one of the most direct proxies for services sector demand — has fully recovered and exceeded pre-pandemic levels by an estimated 45%, consistent with the sustained Services PMI strength.

Steel consumption and cement output — the twin barometers of construction and infrastructure activity — confirm the capex narrative: both have grown steadily from their FY2021 lows, with cement output expected to reach 435 MT in FY2026, up 47% from FY2021 levels. This is consistent with the construction sector's strong GVA growth trajectory shown in Table 2.

4.5 Synthesis — The Architecture of India's Growth Resilience

Integrating the demand-side, supply-side, investment, and high-frequency evidence, India's growth resilience rests on four mutually reinforcing pillars. The first is fiscal architecture: the government's infrastructure capex programme has provided a durable demand floor while simultaneously improving supply-side productivity through logistics, power, and connectivity infrastructure. The second is services sector structural strength: India's comparative advantage in skills-intensive digital services has proved recession-resistant and is now expanding into new frontiers — AI services, fintech, healthcare technology, and global capability centres — that extend the demand runway. The third is formalisation dividend: the GST and digital payments infrastructure have brought significant informal economy activity into the formal measurable domain, generating a structural growth premium that is distinct from cyclical factors. The fourth is private sector balance sheet repair: the corporate deleveraging of FY2016–22 has created the financial conditions for a durable private investment cycle that is now visibly underway in GFCF data and credit growth.

5. Risks to the Growth Outlook

Despite the strong growth architecture, several material risks warrant monitoring. First, global demand conditions remain uncertain: a sharper-than-expected slowdown in the United States

or China — India's major trading partners — could suppress merchandise export growth and IT services revenues. Second, the precious metals-driven CPI uptick visible in early 2026 (with gold prices elevated above USD 3,000/troy ounce) could reignite inflation expectations if gold prices sustain, potentially constraining the RBI's monetary easing space. Third, the IIP's moderation — with industrial output growing below PMI signals — may foreshadow supply-side constraints in manufacturing capacity, particularly in electronics components and speciality chemicals. Fourth, El Niño weather patterns introduce agricultural production risk, which, given agriculture's large rural employment share, could dampen private consumption.

6. Conclusion and Policy Implications

This paper has demonstrated that India's post-pandemic growth resilience is not a statistical artefact or a single-quarter phenomenon. It reflects a structural transformation that has been building across multiple dimensions simultaneously — fiscal, sectoral, financial, and digital. The FY2026 growth estimate of 7.6% is deeply grounded in the convergent evidence from demand decomposition (Table 1), sectoral supply analysis (Table 2), the capex-investment cycle (Table 3), and high-frequency activity indicators (Table 4).

Three policy imperatives emerge from this analysis. First, the government must sustain the infrastructure capex programme through FY2027 and beyond, prioritising quality completion of existing projects (dedicated freight corridors, metro networks, renewable energy grid) over initiating new ones. Premature fiscal consolidation that sacrifices capital expenditure in favour of reducing the fiscal deficit would remove the primary growth stabiliser prematurely. Second, manufacturing requires targeted attention: while services growth is robust, a 7.5%+ sustainable growth rate over the long term demands a stronger industrial base. PLI scheme absorption rates must be monitored, and regulatory ease must be deepened to convert intent into investment. Third, the formalisation dividend — visible in GST and digital payment data — must be protected and deepened through consistent, non-disruptive tax policy, which enhances the private sector's planning horizon and investment confidence.

India's FY2026 position — a 7.6% growing economy with manufacturing PMI at 56.9, services PMI at 58.1, and an investment rate approaching 35% of GDP — represents a macro configuration achieved by very few economies of comparable size at this stage of development. Sustaining it will require not just policy continuity but policy quality: ensuring that the growth is inclusive, environmentally sustainable, and anchored in productive capacity rather than transient demand. The foundations are exceptionally strong; the challenge now is architectural rather than foundational.

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Causes of Inflation and Its Impact on Lower Middle-Class Family Income in India: A Socio-Economic Analysis

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Abstract

Inflation remains one of the leading economic challenges faced by both developed and developing countries. It refers to a persistent increase in the general price level of goods and services over time, resulting in a decline in the purchasing power of money. In India, inflation has emerged as a major socio-economic issue, significantly affecting the living standards of households, particularly those in the lower middle class. These families often depend on fixed or limited sources of income and are particularly vulnerable to rising costs of essential goods such as food, fuel, healthcare, education, housing, and transportation.

This research paper comprehensively examines the key factors contributing to inflation and its repercussions on the income, spending, savings, and living conditions of lower middle-class families in India. It explores various aspects of inflation, including demand-pull inflation, cost-push inflation, monetary expansion, fiscal deficits, increasing fuel prices, disruptions in supply chains, and the effects of globalization as primary contributors to rising inflation. Moreover, the study evaluates how inflation reduces real income, increases financial uncertainty, and affects both the social and psychological well-being of lower middle-class households.

The research is based on secondary data collected from books, government publications, academic journals, reports from the Reserve Bank of India, and economic surveys. Findings reveal that lower middle-class families bear a disproportionate burden from inflation, as their incomes do not rise alongside increasing prices. The rise in inflation results in reduced savings, higher levels of debt, and forces families to cut back on expenditures related to education, healthcare, and nutrition.

The paper concludes that while moderate inflation can stimulate economic growth, unchecked inflation can have detrimental effects on economic stability and social welfare. To protect lower middle-class families from the impact of inflation, it is crucial to implement effective monetary policies, uphold fiscal discipline, manage supply chains effectively, create job opportunities, and establish robust social security measures.

Keywords : Inflation, Lower Middle Class, Economic Growth, Price Rise, Fiscal Policy, Monetary Policy, Indian Economy

Introduction

Inflation is an essential macroeconomic phenomenon that influences the economic and social structure of a nation. It denotes a gradual increase in the overall price level of goods and services over a prolonged period. As inflation rises, the purchasing power of money decreases, meaning that individuals can buy fewer goods and services with the same amount of income. While moderate inflation is often regarded as an indicator of economic growth, excessive inflation can result in significant economic and social challenges, especially for low-income and lower middle-class families.

In India, inflation has become a persistent issue driven by factors such as population growth, increasing demand, climbing fuel prices, fiscal imbalances, global economic uncertainties, and limitations on the supply side. Inflation directly affects the daily lives of citizens, resulting in higher costs for food, transportation, housing, healthcare, education, electricity, and other essential items. Among various social groups, lower middle-class families are particularly at risk from inflationary pressures due to their constrained and often fixed incomes.

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The lower middle class plays a crucial role in the Indian economy and society. This demographic typically includes salaried employees, small business proprietors, junior government staff, private sector workers, teachers, clerks, drivers, and small entrepreneurs. Their earnings are generally adequate to cover basic needs in stable economic conditions, but surging inflation disrupts their financial stability.

Lower middle-class households typically depend on monthly salaries or wages that do not adjust to keep up with inflation. As prices continue to rise, these families find it increasingly difficult to manage their daily expenses. Essential goods such as vegetables, grains, cooking oil, milk, fuel, and medicines become more costly, forcing families to either reduce their consumption or settle for lower quality.

Inflation affects not only financial circumstances but also the social and psychological well-being of individuals. The financial pressure from rising prices often results in anxiety, insecurity, and dissatisfaction among lower middle-class families. Many households feel compelled to reduce spending on education, healthcare, nutrition, and leisure activities. In severe cases, families may accumulate debt as a consequence of escalating living expenses.

The causes of inflation are complex and interrelated. Economists often classify inflation into two main categories: demand-pull inflation and cost-push inflation. Demand-pull inflation occurs when the overall demand exceeds the available supply in the economy. Factors such as rising incomes, increased government expenditure, urbanization, and consumer spending play a significant role in this type of inflation.

Cost-push inflation occurs when production costs rise due to factors like increasing wages, soaring fuel prices, taxes, transportation fees, or shortages of vital raw materials. In India, the rise in crude oil prices has a direct impact on transportation, manufacturing, and agriculture, contributing to a general increase in inflation.

Monetary factors play a significant role in inflation trends as well. An inflated money supply in the economy can heighten the demand for goods and services, resulting in higher prices. Similarly, fiscal deficits and considerable government borrowing can exacerbate inflationary pressures.

The intricacies of globalization have further complicated the management of inflation. Changes in global oil prices, shifts in exchange rates, trade disruptions, and worldwide economic recessions can all influence domestic prices in India. Events such as the COVID-19 pandemic and international conflicts have severely affected global supply chains, leading to inflation in food, fuel, and essential commodities.

Inflation also affects individual saving and investment behaviors. Lower middle-class families often have limited savings, typically held in bank accounts or small savings schemes. As inflation escalates, the real value of these savings declines, threatening long-term financial security.

Wage disparity is another significant concern. Earnings for lower middle-class workers often increase more slowly than the rapid rise in living expenses. This results in a gradual decrease in real income, fostering economic inequality and reducing overall quality of life.

To address inflation, the Reserve Bank of India (RBI) and the Government of India employ various monetary and fiscal measures. Monetary tools include adjustments to the repo rate, management of the money supply, and changes to interest rates. Fiscal measures encompass tax policies, subsidies, control of public expenditure, and market interventions. Despite these efforts, inflation remains a major challenge due to the underlying structural weaknesses within the Indian economy.

Consequently, the relationship between inflation and the income of lower middle-class families is a critical area for both economic and social analysis. Understanding this connection is essential for developing policies that protect vulnerable households while fostering inclusive economic growth.

This research paper intends to thoroughly investigate the key causes of inflation and evaluate its effects on the income of lower middle-class families in India. The study will also look into policy interventions designed to manage inflation and improve the economic security of these households.

Objectives

The main objectives of this research paper are:

1. To explore the concept and causes of inflation in India.
2. To evaluate the impact of inflation on the income of lower middle-class families.
3. To analyze the effectiveness of monetary and fiscal policies in reducing inflation.
4. To identify the socio-economic challenges that lower middle-class families face due to inflation.

Review of Literature

John Maynard Keynes (1936) argued that inflation arises when aggregate demand exceeds aggregate supply. He highlighted that government spending and rising consumer demand significantly influence inflationary trends.

Milton Friedman (1963) maintained that inflation is primarily a monetary phenomenon resulting from an excessive money supply in the economy. He emphasized the importance of regulating the money supply to maintain price stability.

Amartya Sen (1999) examined the social implications of inflation, especially for low-income and middle-income groups, pointing out that increasing prices hinder access to food, healthcare, and education for vulnerable populations.

Bimal Jalan (2003) researched inflation management in India, emphasizing the role of the Reserve Bank of India in controlling inflation through its monetary policy strategies.

C. Rangarajan (2011) investigated inflation targeting and macroeconomic stability in India, arguing that achieving price stability is essential for sustainable economic growth and overall social welfare.

Methodology

This study is descriptive and analytical in nature.

Sources of Data

The study is based on secondary data collected from:

Reserve Bank of India reports
Government publications
Economic surveys
Research journals
Books and academic articles

Research Design

Historical analysis
Comparative analysis
Socio-economic analysis

Table: Major Causes of Inflation in India

Cause	Explanation
Demand-Pull Inflation	Excess demand over supply
Cost-Push Inflation	Rising production costs
Increase in Money Supply	Excess liquidity in economy
Fiscal Deficit	Excessive government expenditure
Fuel Price Rise	Increase in transportation and production costs

Supply Chain Disruptions	Shortage of essential goods
Global Economic Factors	Imported inflation and exchange rate fluctuations

Table: Impact of Inflation on Lower Middle-Class Families

Area	Impact
Food Expenditure	Significant increase
Education Costs	Higher school and tuition fees
Healthcare	Rising medical expenses
Savings	Decline in real savings
Housing	Increased rent and utility costs
Standard of Living	Reduction in quality of life

Results

The study reveals several important findings concerning inflation and the financial situation of lower middle-class families in India:

1. Inflation significantly reduces the purchasing power of lower middle-class households.
2. Rising costs of food and fuel create substantial financial pressure on family budgets.
3. During times of high inflation, savings and long-term financial security are likely to decline.
4. Managing expenses related to healthcare and education becomes more difficult.
5. Lower middle-class families often reduce their discretionary spending and overall consumption.
6. Inflation results in increased debt levels among households experiencing stagnant income growth.
7. Financial instability fosters increased psychological stress and economic uncertainty.

Discussion

The effects of inflation differ across various social strata, with lower middle-class families particularly vulnerable due to their slower income growth relative to the rising prices. These households spend a large portion of their income on essential goods and services, so even small price hikes can significantly impact their quality of life.

A major driver of inflation in India is food inflation. The rising costs of vegetables, cereals, milk, cooking oil, and pulses directly affect household budgets. Since lower middle-class families allocate a significant share of their income to food, inflation restricts their ability to save and invest.

Fuel inflation also has a widespread effect by increasing transportation and production expenses. When fuel prices rise, nearly all goods and services see a subsequent increase in costs. This ongoing situation consistently pressures household expenditures.

Wage stagnation presents another significant hurdle. The earnings of lower middle-class workers frequently do not keep up with inflation. As a result, real income decreases, making it challenging for families to maintain their previous standards of living.

Inflation also affects children's education and family health. As expenses increase, many households find themselves cutting back on quality education, private tutoring, nutritious food, and healthcare services. Such compromises can have detrimental effects on long-term human development.

Furthermore, psychological stress emerges as a major consequence of inflation. Financial instability, overwhelming debt, and uncertainty about future costs contribute to anxiety and social strain within families.

The government, alongside the Reserve Bank of India, plays a vital role in controlling inflation. Monetary policies such as raising interest rates and regulating the money supply are employed to manage inflationary pressures. Additionally, fiscal measures like subsidies, tax policies, and food distribution programs provide support to vulnerable households.

However, sustainable long-term inflation management requires structural reforms, including improving agricultural productivity, strengthening supply chains, creating more job opportunities, and reducing dependency on imported fuel.

Conclusion

Inflation is a complex economic issue that significantly affects the financial and social conditions of lower middle-class families in India. Rising prices diminish purchasing power, increase living expenses, reduce savings, and create financial insecurity.

The research concludes that lower middle-class households encounter disproportionate challenges due to inflation because of their limited and mostly fixed income growth. Key drivers of inflation in India include food inflation, escalating fuel costs, fiscal imbalances, and constraints on supply.

While moderate inflation can stimulate economic growth, unchecked inflation can have negative impacts on social welfare and economic stability. Therefore, a strong monetary policy, fiscal responsibility, effective supply chain management, job creation, and social welfare programs are essential to protect lower middle-class families from inflationary pressures.

An all-encompassing economic strategy focused on price stability, inclusive growth, and income security is crucial for improving the living standards of lower middle-class households in India.

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Evaluation of Total Solid and Total Hardness in the Water Samples of Hanuman Ghat, Cremation Ghat and Imliya Ghat of Sone River at Dehri, Bihar

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Abstract

Water samples collected from Hanuman ghat, Cremation ghat and Imliya ghat from November'2023 to April'2025 have been analysed as per experimental procedure. The observed value of total solid and total hardness in the water samples showed variations in the analytical results due to variation in the flow velocity of Sone river in different months and wastage discharge into Sone river . The quality of water is affected by flow of river since rivers have a wide seasonal fluctuation in flow . In wet period the water may be low in dissolved solids content but often a high turbidity. In dry periods river's flow is low and the load of dissolved solids is more. Total solids were present in the range of 115.10 to 415 mg/L, 205.12 to 1205.10 mg/L and 55.20 to 1605.10 mg/L in the water samples of Hanuman ghat, Cremation ghat and Imaliya ghat respectively. The higher concentration of total solid was found in summer months. The concentrations of total hardness were found to be in the range of 25.10 to 145.10 mg/L, 31.12 to 120.20 mg/L and 28.50 to 215.10 mg/L in the water samples of Hanuman ghat, Cremation ghat and Imliya ghat respectively. The highest value of total hardness was in the month of April and May.

Key words: Solid, hardness, water sample, Hanuman ghat, Cremation ghat, Imliya ghat, Sone river, Dehri.

Introduction

Aquatic life is severely affected by water pollution. Occurrence of massive fish kills and the destruction of lower aquatic life forms due to industrial pollutants, have become a common features in the county. Dead fish means loss of major source of protein and worse still a livelihood, for millions of Indians. The Sone river originates near Amarkantak in Madhya Pradesh state before turning sharply eastward where it encounters, the south west-north east-Kaimur range. In the past, the Sone river has been notorious for changing course, as it is traceable from several old beds near its east bank. In modern times this tendency has been checked with the ancient at Dehri and now more so with the Indrapuri Barrage. In the dry weather there is a vast expanse of sand, with a stream not more than a hundred yards wide and the hot west winds pile up the sand on the east bank , making natural embankments. Discharge of the industrial wastage into the water sources affect the metabolism of the aquatic animals and plants. A wide variety of animal and plant life , all of which require oxygen for respiration has been supported by healthy rivers and streams. Pollution reduces the dissolved oxygen because the polluting materials themselves require oxygen for their own destruction by bacteria. Lower oxygen levels shows adverse effects on animals and plants. A safe is one that can not harm the consumer when drunk under normal conditions. This technical guide is intended for field staff and gives a number of recommendations to provide a safe water supply in different field conditions . Water from river is important source for man, animals and plants . In tropical countries , rivers and streams often have a wide seasonal fluctuation in flow .This affect the quality of water. In

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wet periods, the water may be low in dissolved solid contents but often a high turbidity. In dry periods river flow are low and the load of dissolved solid less diluted. River water varies in hardness according to the proportion of water that reaches it from springs as against surfaces run-off water in the upland reaches of rivers collecting from upland catchments, is naturally soft, that of lower reaches is considerably harder but on the average not nearly so hard as average or well water. The quality of river water varies from place to place. A number of scientists viz. Klein (1962), McCarty and Asce (1980), Ray and David (1966) Carpenter *et al.* (2018) and Kalakar *et al.* (2016) have devised various parameters for measuring the pollution and purity of water.

Materials and Methods

The water samples were collected with utmost care to ensure that no contamination occurs at the time of collection or prior to examination. Sterilized plastic containers of 5 litre capacity with lid were taken for the collection of water samples. The containers were not opened till the time of filling. The containers were again washed with sample water at the sampling sites. The samples were taken on the bank of river at a depth of eight inches below the surface of the water of Hanuman ghat, Cremation ghat and Imliya ghat. The water samples were kept to the laboratory for experiment. Total solids and total hardness in water samples were evaluated by following the methods of IS:3025(1964).

Results and Discussion

Water samples collected from Hanuman ghat, Cremation ghat and Imliya ghat from November' 2023 to April'2025 have been analysed as per experimental procedure. The percentage of solids in the water samples indicates the concentration and physical state of its principal constituents. They are in solution and suspension, and include organic matter. The organic and inorganic solids combined are called 'total solids'. Total solids were present in the range of 115.10 to 415.10 mg/L, 205.12 to 1205.10 mg/L and 55.20 to 1605.10 mg/L in the water samples of Hanuman ghat, Cremation ghat and Imliya ghat respectively. Thus from the experimental results, higher concentration was found to be in summer months. The total solids mostly consists of chlorides, nitrites and other compounds causing hardness. The permissible limit is 500 to 1000 ppm but these should be preferably less than 500 ppm (Husain, 1979). For all the three ghats the high values were observed in the month of May' 2024. But on comparison, Imliya ghat has highest value with respect to Hanuman ghat and Cremation ghat because at this point Sone river receives heavy house hold discharge and agricultural wastes. According to Indian standard for inland surface water of industrial effluents, suspended solids should be less than 100 mg/L, but this limit is observed only in its violation. According to Indian standard the limits for suspended solid is 600 ppm for public welfare from industrial effluents.

"Total hardness" is the sum of the temporary and the permanent hardness. Temporary hardness is due to the presence of bicarbonates of calcium and magnesium and is so called because the carbonic acid remains with salts in solution can be driven off by boiling their precipitation as insoluble carbonates. Permanent hardness is due to the sulphates or chlorides of these metals and is not removable by boiling. The concentrations of total hardness were found to be in the range of 25.10 to 145.10 mg/L, 31.12 to 120.20 mg/L and 28.50 to 215.10 mg/L in the water samples for Hanuman ghat, Cremation ghat and Imliya ghat respectively. From the experimental results, it is clear that the highest value of hardness was in the month of April and May. The results indicate that Imliya ghat has high value of hardness in comparison to Hanuman ghat and Cremation ghat. A water having concentration less than 100 ppm is called soft and more than 200 ppm is called hard. 80-90 ppm is usually considered best, but from 200-300 is not excessive. Hardness in water, unless excessive, is not injurious to health and is not unfit for drinking but it consumes more soap in laundries.

Table 1. Total solid and total hardness in the water samples of Hanuman ghat, Cremation ghat and Imliya ghat of Sone river at Dehri, Bihar.

Sl. No.	Month and Year of Sampling	Sampling Time	Hanuman Ghat		Cremation Ghat		Imliya Ghat	
			Total Solid (mg/L)	Total Hardness (mg/L as CaCO ₃)	Total Solid (mg/L)	Total Hardness (mg/L as Ca CO ₃)	Total Solid (mg/L)	Total Hardness (mg/L as CaCO ₃)
1	November'2023	10:00	215.10	85.10	627.10	111.20	112.10	90.30
2	December'2023	10:30	185.12	75.14	275.12	89.12	110.20	190.20
3	January' 2024	09:30	153.12	65.10	352.10	85.10	140.10	90.10
4	April' 2024	10:10	165.10	115.12	405.12	93.12	205.20	92.20
5	May'2024	09:30	345.10	127.10	1205.10	119.10	1605.10	215.10
6	June' 2024	10.00	415.10	59.12	345.14	89.10	295.12	52.30
7	August' 2024	9:30	315.10	25.10	455.15	31.12	315.10	28.50
8	September'2024	10:00	215.12	35.15	205.12	35.20	115.10	35.10
9	November'2024	10:00	115.10	70.12	205.14	83.12	107.20	85.20
10	December'2024	10:30	117.13	66.10	255.12	95.10	105.10	185.40
11	January' 2025	10.20	195.12	68.14	325.10	96.20	291.60	100.30
12	March'2025	9:00	185.10	95.12	446.15	99.10	55.20	90.50
13	April' 2025	9:00	317.12	145.10	407.10	120.20	315.20	110.20

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Ramification of Amended Soil on Morphological Properties of 30 Days Old Oat Plant

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Abstract

Oat (*Avena sativa* L.) is a crop of humid temperate regions. Among the cereals oats are most nutritious food. Oat hulls are used in oil refining, synthetic rubber production and manufacture of antiseptics. The study was focused on the amendment of soil with vermicompost, compost and mustard cake with a view to explore the possibility of improving growth and productivity of oat. Length of root and shoot, number of node, internode, tiller and leaf were investigated in the 30 days old oat plants. The length of root and shoot, number of node, internode, tiller and leaf was more in the 30 days old oat plants grown in vermicompost amended soil and was less in the 30 days old oat plants grown in the soil amended with mustard cake. However, the number of node, internode and leaf in the 30 days old oat plants were almost same when grown in the plain soil and in the soil amended with compost. The length of shoot of 30 days old oat plant was more in the plants grown in the plain soil in comparison to compost amended soil.

Key words: Root length, shoot length, node, internode, tiller, leaf, plain soil, vermicompost, compost, mustard cake, oat plant.

Introduction

Oats are used as oatmeal. Oats are a nutrient rich food associated with lower the blood cholesterol and reduced the risk of human heart disease. Continuous application of chemical fertilizer create acidity resulting into phytotoxicity in crops (Randhawa, 1992). Hence modern Integrated Nutrient Management (INM) approach is need of the hour which involves efficient and judicious use of all the major components of plant nutrient resources viz. chemical fertilizer in conjunction with animal manures, compost, green manures, legumes in cropping system, biofertilizer, crop residues and other locally available nutrient sources for sustaining soil fertility, health and productivity. The application of organic amendment is an agronomically, environmentally and economically sound practice (Sarma and Gogoi, 2015). Ibrahim and Goh (2005) reported that the humic substance application increased pH, cation exchange capacity and organic carbon content of the soil. Krishnamoorthy and Vajrabhiah (1986) investigated that vermicompost produces plant growth regulators. This study was initiated to explore the possibility of improving growth and productivity of oat through yield target based on the organic fertilizer application in the Bhojpur district of Bihar.

Materials and Methods

Oat (*Avena sativa* L.) seeds were on-line purchased via Amazon. Plain soil was collected from the farm land and dried in the sun for one week. Amendment of plain soil with vermicompost, compost and mustard cake in the ratio of 3:1. The amended soil was kept in earthen pots having capacity of 4 Kg each. Seeds were sown nearly 5 mm below the surface of soil. Pots were placed in the open field. The seedling was cultured for 30 days. During this period the soil was moistened with tap water every alternate day. After 30 days of plant growth, oat plants were gently uprooted from

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the pots and washed it smoothly . The length of root and shoot , number of node, internode , tiller and leaf were determined .

Results and Discussion

The length of root and shoot, number of node, internode , tiller and leaf was more in the 30 days old oat plants grown in the soil amended with vermicompost and was less in the 30 days old oat plants grown in the soil amended with mustard cake. The number of node, internode and leaf in the 30 days old oat plants were almost same when grown in the plain soil and in the soil amended with compost. However, the length of shoot of 30 days old oat plants grown in the plain soil was slightly more in comparison to the 30 days old oat plants grown in compost amended soil.

Table 1. Ramification of amended soil on morphological properties of oat after attaining 30 days of plant growth.

Nature of Soil	Root Length (cm $\pm$ S.E.)	Shoot Length (cm $\pm$ S.E.)	Number of Node (Mean $\pm$ S.E.)	Number of Internode (Mean $\pm$ S.E.)	Number of Tiller (Mean $\pm$ S.E.)	Number of Leaf (Mean $\pm$ S.E.)
Plain Soil	4.7 $\pm$ 0.01	11.0 $\pm$ 0.03	3 $\pm$ 0.001	2 $\pm$ 0.001	--	4 $\pm$ 0.01
Plain Soil + Vermicompost	7.3 $\pm$ 0.02	17.5 $\pm$ 0.02	4 $\pm$ 0.01	3 $\pm$ 0.001	2 $\pm$ 0.001	9 $\pm$ 0.03
Plain Soil + Compost	5.0 $\pm$ 0.01	8.4 $\pm$ 0.02	3 $\pm$ 0.001	2 $\pm$ 0.001	1 $\pm$ 0.001	4 $\pm$ 0.01
Plain Soil + Mustard Cake	1.7 $\pm$ 0.02	4.2 $\pm$ 0.01	2 $\pm$ 0.001	1 $\pm$ 0.001	--	2 $\pm$ 0.001

Past studies suggest that vermicompost and compost has lingering effect on growth and development of the treated plant. Atiyeh *et al.* (2000 a), Tomati and Galli (1995) and Grappelli *et al.* (1987) have also reported almost similar trend of observation when vermicompost and compost was used as horticultural media. The effect of vermicompost amended soil seems to have better effect than compost and mustard cake amended soil.

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Impact of Soil Amendment on the Morphological Characteristics of 30 Days Old Barley Plant

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Abstract

A scheme was undertaken to explore the possibility of improving growth and productivity of barley (*Hordeum vulgare* L.) through yield target based fertilizer application in the Bhojpur district of Bihar. The study was focused on the amendment of soil with vermicompost, compost and mustard cake. Length of root and shoot, number of node, internode, tiller and leaf were observed in the 30 days old barley plants. The mean root length of 30 days old barley plants grown in vermicompost amended soil was more and was less in the soil amended with mustard cake. The mean shoot length of 30 days old barley plants grown in the soil amended with vermicompost was more and was less in the soil amended with mustard cake. The number of node and internode of 30 days old barley plants grown in the soil amended with vermicompost and compost was more and was less in the plain soil and the soil amended with mustard cake. Mean number of tiller was found more associated with the barley plants grown in the compost amended soil in comparison to the plants grown in vermicompost amended soil. Tiller was not found associated with the plants grown in the plain soil as well as mustard cake amended soil. The number of leaf of the 30 days old barley plants was more in the plants grown in vermicompost and compost amended soil and was less in the plants grown in mustard cake amended soil.

Key words: Root length, shoot length, node, internode, tiller, leaf, plain soil, vermicompost, compost, mustard cake, barley plants.

Introduction

Barley is a member of grass family and is a major cereal grain grown in temperate climate. Barley is known for its mild nutty flavor and chewing texture. Organic amendment of soil significantly improve barley growth by boosting nutrient availability, enhancing soil texture, and increasing water retention capacity of soil. Application of organic amendment is environmentally, economically and agronomically sound practice which has already been established (Sarma and Gogoi, 2015). To achieve agricultural sustainability, the use of organic amendment is getting prime importance in recent years, particularly under intensive cropping system (Eissa, 2015; Eissa, 2019). The tendency of decreasing soil quality can be managed by proper and careful soil management by organic farming. The long-term over cropping and over use of inorganic fertilizers without organic input degrades soil quality and health and cause environmental pollution as well (Albiach *et al.*, 2000). Organic matter input into the soil gives a long-term positive effect due to humus production that can increase the soil action exchange capacity and water retention (Weber *et al.*, 2007).

Keeping above details of fact the present study was undertaken to evaluate the effect of amended soil on morphological characteristics of 30 days old barley plants.

Materials and Methods

The seeds of barley (*Hordeum vulgare* L.) was collected from seed dealers of Ara (Bihar). Plain soil was collected from the farm land and dried in the sun for one week. Plain soil was mixed with vermicompost, compost and mustard cake in the ratio of 3:1. The amended soil was kept in earthen pots having capacity of 4 Kg each. Seeds were sown nearly 5 mm below the surface of soil. Pots were placed in the open field. The seedling was cultured for 30 days. During this period soil was moistened with tap water every alternate day. After 30 days of plant growth, barley plants

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were gently uprooted from the pots and washed it smoothly. The length of root and shoot, number of node, internode, tiller and leaf were determined.

Results and Discussion

The root length of 30 days old barley plants grown in the soil amended with vermicompost was more and was less in the soil amended with mustard cake. The length of shoot of 30 days old barley plants grown in vermicompost amended soil was more and was less in the plants growth in mustard cake amended soil. The number of node and internode of 30 days old barley plants grown in vermicompost amended soil was more and was less in the plants grown in vermicompost and compost amended soil and was same in the barley plants grown in the plain soil and mustard cake amended soil. The number of tiller was found more associated with the barley plants grown in the soil amended with compost in comparison to the plants grown in vermicompost amended soil. There was no tiller found to be associated with the barley plants grown in the plain soil as well as in the mustard cake amended soil. The number of leaf of the 30 days old barley plants was more in the plants grown in the soil amended with vermicompost and compost and was less in the plants grown in mustard cake amended soil. The number of leaf was equal in the 30 days old barley plants grown in vermicompost and compost amended soil.

Review of literature suggested that vermicompost and compost has lingering effect of growth and development of the treated plants. A number of workers including Atiyeh *et al.* (2000), Tomati and Galli (1995) and Grappelli *et al.* (1987) have also reported similar trend of result when vermicompost and compost was used as horticultural media. The effect of vermicompost amended soil seems to have better impact than compost and mustard cake amended soil.

Table 1. Impact of soil amendment on the root and shoot length, number of node, internode, tiller and leaf of 30 days old barley plant.

Nature of Soil	Root Length (cm $\pm$ S.E.)	Shoot Length (cm $\pm$ S.E.)	Number of Node (Mean $\pm$ S.E.)	Number of Internode (Mean $\pm$ S.E.)	Number of Tiller (Mean $\pm$ S.E.)	Number of Leaf (Mean $\pm$ S.E.)
Plain Soil	7.5 ± 0.01	11.0 ± 0.03	2 ± 0.001	1 ± 0.001	-	3 ± 0.001
Plain Soil + Vermicompost	10.7 ± 0.02	31 ± 0.01	3 ± 0.001	2 ± 0.001	2 ± 0.001	8 ± 0.02
Plain Soil + Compost	8.7 ± 0.02	30 ± 0.01	3 ± 0.001	2 ± 0.001	3 ± 0.001	8 ± 0.02
Plain Soil + Mustard Cake	1.6 ± 0.01	4 ± 0.01	2 ± 0.001	1 ± 0.01	-	2 ± 0.001

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30 **Impact of Soil Amendment on the Morphological Characteristics of 30 Days Old Barley Plant**

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Effect of Foliar Spray of Copper Sulphate (0.25% and 0.50%) on the Growth and Yield of Brinjal cv. Kiran

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Anand Kishor*

Abstract

Brinjal is widely used as vegetable in India. The present research work was conducted to find out the effect of 0.25% and 0.50% concentration of CuSO₄ on the growth and yield of brinjal cv. kiran. The experiment was designed in a Randomized Complete Block Design (RCBD) with three replicates. The experimental treatment included 0.25% CuSO₄ and 0.50% CuSO₄ and was sprayed on the plant twice i.e. before flowering stage and one week after flowering. The treatments had a substantial effect on the length of shoot, number of leaf, flower and fruit. The length of shoot, number of leaf and fruit was found more in comparison to the control in both treatments but 0.25% CuSO₄ had better performance in almost all the parameters. The weight of fruit of 180 days old brinjal plants sprayed with 0.50% CuSO₄ concentration was higher than that of control plants. These findings demonstrate that spraying CuSO₄ at 0.25% concentration can effectively increase the length of shoot, number of leaf and the number of flower while spraying with 0.50% CuSO₄ concentration increases the weight of fruit.

Key words: Copper sulphate, concentration, spray, shoot length, number, leaf, flower, fruit, fruit weight, brinjal.

Introduction

Brinjal (*Solanum melongena* L.) is grown worldwide for its edible fruits typically used as vegetable in cooking. The production of brinjal is governed not only by the inherent genetic yield potential of the cultivars but it is greatly influenced by several environmental factors and cultivation practices. Copper sulphate plays an integral role in many biochemical and physiological processes in plants, thereby regulating growth and development of crop plants. Copper sulphate may influence the hormone signalling or enzyme activity involved in fruit development (Ruiz *et al.*, 2021). The presence of water molecules in the copper sulphate pentahydrate crystals enhances its solubility in water, making it easier to dissolve and mix with other solutions. This improved solubility allows for better distribution and absorption of copper ions by plants when applied as foliar spray. The hydrated form of copper sulphate exhibits better stability, as the water molecules act as a protective layer around the copper sulphate molecule, reducing the risk of oxidation and degradation. This stability ensures that the copper sulphate remains effective and maintains its desired properties for longer periods, providing more consistent results. Application of copper sulphate will not only enhance productivity, but will also increase the production and efficiency of fertilizer used in brinjal crop (Kumar *et al.*, 2016 and Pandav *et al.*, 2016)). The main aim of this experiment was to observe the effects of two different concentrations of copper sulphate (0.25% and 0.50%) on growth and yield of brinjal.

Materials and Methods

The present investigation was conducted at V.K.S.University, Ara (Bihar) campus. The experiment was carried out in Randomized Block Design (RBD) with three replications. The 25 days old seedlings of brinjal cv. kiran were transplanted into earthen pots. Two concentration of CuSO₄ i.e. 0.25% and 0.50% were sprayed twice. The first spray was done before flowering stage and the second spray was done after one week of flowering. Tap water was sprayed on the control plants.

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32 Effect of Foliar Spray of Copper Sulphate (0.25% and 0.50%) on the Growth and Yield...

Length of shoot, number of leaf, flower, fruit and the weight of fruit was recorded at the interval of 60 days, 120 days and 180 days of plant age.

Results and Discussion

The length of shoot, number of leaf and fruit was found more in comparison to the control both in 0.25% and 0.50% CuSO₄ treatments but 0.25% CuSO₄ had better performance in almost all the parameters. The weight of brinjal cv. kiran fruits of 180 days old plants sprayed with 0.50% CuSO₄ concentration was more in comparison to the weight of fruit produced by 180 days old control brinjal plants. These findings suggest that spraying CuSO₄ at 0.25% concentration can effectively increase the length of shoot, number of leaf and the number of flower, while spraying with 0.50% CuSO₄ concentration increases the weight of fruit.

Table 1. Effect of foliar spray of CuSO₄ on shoot length, number of leaf, flower, fruit and weight of fruit of brinjal plants after attaining 60 days, 120 days and 180 days of plant growth.

Age of Plants	Concentration of CuSO ₄	Length of Shoot (cm/Plant)	Number of Leaf (Mean/Plant)	Number of Flower (Mean/Plant)	Number of Fruit (Mean/Plant)	Weight of Fruit (Mean g/Plant)
60 Days	Control	14.83	4.33	-	-	-
	0.25%	12.50	5.00	-	-	-
120 Days	Control	17.60	10.66	2	1	-
	0.25%	17.40	6.00	1.5	-	-
180 Days	Control	20.32	10.33	-	1	17.2
	0.25%	24.97	18.00	1.0	1	32.5
60 Days	Control	14.83	4.33	-	-	-
	0.50%	13.87	4.75	-	-	-
120 Days	Control	17.60	10.66	2	1	-
	0.50%	19.05	6.50	1.33	-	-
180 Days	Control	20.32	10.33	-	1	17.2
	0.50%	19.36	17.25	1.33	1	50.0

Saravaiya *et al.* (2014), Sivaiah *et al.* (2013) and Ali *et al.* (2013) have reported similar trend of results while they were worked on different crop plants. To maximize the benefits of copper sulphate, careful calibration and monitoring are necessary to determine the appropriate concentration for different crops and environmental conditions. The observed results may probably due to fungicidal properties of copper sulphate as well as their growth promoting nature for crop plants.

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Efficacy of Amended Soil on the Morphological Characteristics of 30 Days Old French Bean Plant

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Abstract

French beans are highly nutritious, low-calorie, low-fat, fiber-rich vegetable. French bean improves digestive health, strengthen bones via vitamin K and calcium, boost immunity with vitamin C, and support heart health by lowering cholesterol. They are beneficial for managing diabetes, blood pressure, and supporting pregnancy due to their folate content. In modern day agricultural practices attempts have been made to determine the efficacy of organic amendment of soil on various crops. The usefulness of organic amendment has been affected during the transfer of technology. During present study plain soil was amended with vermicompost, compost and urea. This study was initiated to explore the possibility of improving growth and productivity of french bean in the Bhojpur district of Bihar. Length of root and shoot, number of node, internode, branches, leaf and area of leaf were observed in the 30 days old french bean plants. The mean root length of 30 days old french bean plants grown in the soil amended with vermicompost was more and was less in the 30 days old french bean plants grown in the plain soil. The mean shoot length of 30 days old french bean plants grown in vermicompost amended soil was also more and was less in the french bean plants grown in the plain soil. The mean number of node and internode of 30 days old french bean plants grown in the soil amended with urea was more and was less in the 30 days old french bean plants grown in the plain soil. The mean number of branches, and leaf of the 30 days old french bean plants grown in the soil amended with compost and urea were more and were less in the 30 days old french bean plants grown in the plain soil. The area of leaf of 30 days in old french bean plants grown in compost amended soil was more and was less in the 30 days old french bean plants grown in the soil amended with urea.

Key words: Root length, shoot length, node, internode, branches, leaf, plain soil, compost, vermicompost, urea, french bean plant.

Introduction

French bean (*Phaseolus vulgaris* L.) offers a variety of health benefits due to their nutritional profile. The major constant limiting the productivity of french bean is that they are predominantly raised under energy starved conditions. Intensive cropping has made the soil deficient in macro as well as micronutrients. This has resulted in decline in productivity and deterioration in soil health. The application of organic manures may prove a viable option for sustaining productivity (Tejada *et al.*, 2009). Vermicompost application has been known to improve physical, chemical and biological properties of soil (Negavallemma *et al.*, 2004). Although there are numerous research about the changes in soil properties after organic amendments (Chaney *et al.*, 1992), there are not enough information about the main parameters to be monitored over time to assess the effects of vermicompost and compost applications on soil quality. Decreasing soil quality can be avoided by proper and careful soil management as practiced by organic farmers. The application of organic fertilizer is an important practice in organic farming to improve soil quality, enhance microbial activity and nutrient recycle to produce high quality crops. In this way organic farming system produce healthy plants (Dimitri *et al.*, 2012). Increase in microbial biomass activity also results changes in soil enzymes that play an important role in soil biochemical reactions (Garcia-Gill *et al.*,

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2000 and Ros *et al.*, 2006). Jat and Ahlawat (2006) investigated that vermicompost application enhanced soil nutrient status (N and P) in subsequent crops compared to plain soil.

Keeping above details of fact the present study was undertaken to evaluate efficacy of amended soil on morphological characteristics of 30 days old french bean plants.

Materials and Methods

The seeds of french bean (*Phaseolus vulgaris* L.) was collected from Saraswati Beez Bhandar, Ara (Bihar). Plain soil was collected from the farm land and dried in sun for one week. Plain soil was mixed with vermicompost and compost in the ratio of 3:1 respectively. The plain soil was mixed with urea at the rate of 2.5g/kg of plain soil. The amended soil was kept in earthen pots having capacity of 8 kg each.

Seeds were sown nearly 5 mm below the surface of soil. Pots were placed in the open space of garden. The seedling was cultured for 30 days. During this period the soil was moistened with tap water every alternate day. After 30 days of plant growth, french bean plants were gently uprooted from the pots and washed it smoothly. The length of root and shoot, number of node, internode, branches, leaf and area of leaf were determined.

Results and Discussion

The mean root length of 30 days old french bean plants grown in the soil amended with vermicompost was more and was less in the 30 days old french bean plants grown in plain soil. The mean shoot length of 30 days old french bean plants grown in the soil amended with vermicompost was also more and was less in the french bean plants grown in plain soil. The mean number of node and internode of 30 days old french bean plants grown in the soil amended with urea was more and was less in the 30 days old french bean plants grown in plain soil. The mean number of branches and leaf of the 30 days old french bean plants grown in the soil amended with compost and urea were more and were less in the 30 days old french bean plants grown in the plain soil. The area of leaf of 30 days old french bean plants grown in the soil amended with compost was more and was less in the 30 days old french bean plants grown in the soil amended with urea.

Table 1. Efficacy of amended soil on the morphological characteristics of 30 days old french bean plants.

Nature of Soil	Root Length (cm $\pm$ S.E.)	Shoot Length (cm $\pm$ S.E.)	Number of Node (Mean $\pm$ S.E.)	Number of Internode (Mean $\pm$ S.E.)	Number of Branches (Mean $\pm$ S.E.)	Number of Leaf (Mean $\pm$ S.E.)	Area of Leaf (cm ² $\pm$ S.E.)
Plain Soil	9 $\pm$ 0.03	21 $\pm$ 0.06	10 $\pm$ 0.03	9 $\pm$ 0.03	7 $\pm$ 0.02	12 $\pm$ 0.04	14 $\pm$ 0.04
Plain Soil + Vermicompost	16.2 $\pm$ 10.05	25.6 $\pm$ 0.02	11 $\pm$ 0.03	10 $\pm$ 0.03	8 $\pm$ 0.02	17 $\pm$ 0.05	29 $\pm$ 0.03
Plain Soil + Compost	13 $\pm$ 0.04	24.5 $\pm$ 0.07	12 $\pm$ 0.04	11 $\pm$ 0.03	16 $\pm$ 0.05	24 $\pm$ 0.07	37 $\pm$ 0.02
Plain Soil + Urea	10 $\pm$ 0.03	23 $\pm$ 0.06	24 $\pm$ 0.07	23 $\pm$ 0.07	16 $\pm$ 0.05	24 $\pm$ 0.07	11 $\pm$ 0.03

A number of authors viz. Malik *et al.* (2000), Gondek and Mazur (2003) and Schmidt (2003) reported that vermicompost act as a natural fertilizer. These experiments together with other reported in the literature, demonstrate that vermicompost and compost have considerable potential for improving plant growth significantly, when used as a components of horticultural soil or container media.

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Changes in Total Sugar, Reducing Sugar and Total Protein in Ghia Tori Vegetables During Maturation and Storage

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Abstract

Ghia tori is a popular nutritious summer vegetable. It is a low-calorie, fiber rich and good for digestion. It is known for its soft texture, mild flavor and quick-cooking. The vegetables contain maximum concentration of some of the metabolites at a particular age after which alteration or declination in their quality or quantity is expected. Like other vegetables ghia tori should have also a cardinal age where the accumulation of these contents is at maximum peak. The present investigation is therefore designed to study the changes in total sugar, reducing sugar and total protein contents during maturation and storage. The concentration of total sugar, reducing sugar and total protein was recorded to increase upto 10 days of maturation. Total sugar and reducing sugar exceptionally continued to increase upto 14 days, however total protein contents in the ghia tori vegetables showed declining trends after 10 days of maturation. The present findings clearly suggest that 10 days old ghia tori vegetables have maximum concentration of protein contents later on senescence phase starts resulting loss of some of the contents and also reduce the resistance of the vegetables. Softening of rind, loss of resistance, accumulation of sugars and artificial injuries are the reasons for the post harvest fungal spoilage of the ghia tori vegetables.

Key words : Total sugar, reducing sugar, total protein, field, age, storage, ghia tori.

Introduction

In recent years more emphasis is being given for the production of green vegetables with realization of growing population of the country. However, a good quality of short-lived and perishable vegetables like ghia tori is lost every year by fungal infection. Methods of transportation of longer distance, storage and marketing make them also prone to fungal attack. Rose *et al.* (1950) and Ramesey *et al.* (1953) reported that in soft rot, parenchymatous tissue was damaged during transportation and marketing besides, causing damage to fruits on the tree. The general practice adopted by the farmers is to harvest vegetables just after one week i.e. 6-7 days. Sometimes harvesting is done earlier to protect the vegetables from insects, birds etc. without taking their nutritive contents into consideration. Further, the vegetables are also retained in the market for 4-5 days or more. This period is physiologically important because it also determines the nutritive quality of the vegetables. It is therefore, desirable to estimate the changes in metabolic active components viz. sugar and proteins during maturation and storage. This would be helpful in suggesting the suitable age of fruits to be plucked and suitable period for their storage to minimize the nutritional degradation.

Materials and Methods

The ghia tori (*Luffa cylindrica* (L.) Roem.) growing area of old Bhojpur district ranges from Buxar to Dumraon occupies about 1500 acre of land. Quantitative estimation of total sugar, reducing sugar and total protein contents in the ghia tori vegetables during maturation and storage was done. The fruit of different physiological ages i.e. 2,4,6,8 and 10 days old were analysed to ascertain the changes in total sugar, reducing sugar and total protein contents during maturation. 10 days old matured fruits were harvested from the field and were stored under laboratory condition for 8 days to study the changes in total sugar, reducing sugar and total protein contents under storage. Total

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sugar was estimated by adopting the methods of Dubois *et al.* (1951). Reducing sugar was estimated by adopting the methods of Peach and Tracey (1959). Estimation of protein was done by following the method of Lowry *et al.* (1951).

Results and Discussion

It was evident from the results that 2 days old ghia tori vegetables had little amount of total sugar i.e. 0.045 mg/g fresh weight whereas 10 days old ghia tori vegetables had 2.11 mg/g fresh weight. Under storage further increased in amount (2.20 mg/g fresh weight) was recorded but only up to 4 days thereafter it declined (1.90 mg/g fresh weight).

Table 1 . Showing changes in total sugar, reducing sugar and total protein contents of ghia tori vegetables during maturation and storage. (Expressed as mg/g Fresh Weight).

Contents	Regions of Vegetables	Age of vegetables (In Field)					Under Storage	
		2 Days	4 Days	6 Days	8 days	10 Days	14 Days	18 Days
Total Sugar								
	Pedicellate	0.046	0.067	0.083	1.09	2.10	2.19	1.88
	Middle	0.044	0.068	0.082	1.11	2.12	2.22	1.92
	Stigmatic	0.045	0.066	0.084	1.10	2.11	2.19	1.90
	Average	0.045	0.067	0.083	1.10	2.11	2.20	1.90
Reducing Sugar	Pedicellate	0.06	0.07	0.15	0.95	1.05	1.09	0.94
	Middle	0.07	0.07	0.17	0.97	1.07	1.11	0.93
	Stigmatic	0.05	0.07	0.16	0.96	1.06	1.10	0.92
	Average	0.06	0.07	0.16	0.96	1.06	1.10	0.93
Total Protein	Pedicellate	0.46	0.096	0.16	0.38	0.48	0.46	0.36
	Middle	0.47	0.095	0.15	0.39	0.46	0.45	0.44
	Stigmatic	0.45	0.094	0.17	0.37	0.47	0.44	0.34
	Average	0.46	0.095	0.16	0.38	0.47	0.45	0.38

Two days old ghia tori vegetables showed minimum concentration of reducing sugar i.e. 0.06 mg/g fresh weight. As the age of ghia tori vegetables advanced the amount of reducing sugar also increased. The 10 days old ghia tori vegetables had maximum concentration (1.06 mg/g fresh weight) of reducing sugar in the field. Under storage the further changes were similar to that of total sugar.

A little amount of protein (0.46 mg/g fresh weight) was estimated in 2 days young vegetables which gradually increased with the advancement of age and at maturity it attained maximum amount i.e. 0.47 mg/g fresh weight. Under storage it lowered down gradually and finally was reduced to 0.38 mg/g fresh weight in the 8th day of storage.

The gradual increase in the concentration of total sugar and reducing sugar with the age might be correlated with the rate of photosynthesis and respiration during maturation and storage of ghia tori vegetables. The lower rate of carbohydrate synthesis in young ghia tori vegetables and its greater rate of break-down in respiration might be possible reason for less accumulation of protein. A number of earlier workers viz. Hulme (1958), Moore (1965) and Ramdayal and Joshi (1968) have also recorded similar trend of results as observed in ghia tori vegetables.

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An Analysis of Changes in Minimum Support Price on Area under Paddy and Wheat in Bihar

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Abstract

The study evaluates the efficiency of the minimum support price on paddy and wheat cultivation in Bihar. The data spanning from 2000-01 to 2020-21 on area and MSP of paddy and wheat in Bihar were collected from the secondary sources. For this study, data were collected from the Directorate of Economics and Statistics and the Commission for Agricultural Costs and Prices (CACP) underneath the Ministry of Agriculture and Farmers Welfare, Government of India. The descriptive statistics, correlation, and Compound Annual Growth Rate (CAGR) were used to analyse the collected data with appropriate analytical tools. The study showed that the MSP has significantly increased, the area under paddy has decreased, and the area under wheat has increased.

Keywords: MSP, Paddy Cultivation, Wheat Cultivation, Agriculture, and Bihar

Introduction

In India, agriculture performs as a primary pillar of economic growth. Since independence, this sector has helped the country reduce poverty and hunger and achieve food security. India has been primarily an agrarian economy since independence, and approximately 70% of the country's population indirectly or directly depends on agriculture for their livelihood. The agricultural sector is vital to the Indian economy, and its development is very important for a developing country. The Indian agriculture sector is the engine of the Indian economy because about 70% of the country's population lives in rural areas, which are mostly dependent on agriculture or its related activities; hence, the development of the agriculture sector is very essential for the Indian economy. The agriculture sector is a highly labor-intensive sector; according to the 2011 census, 54.6% of the country's workforce is interested in farming and related pursuits. Agriculture and related activities' contribution to the total Gross Value Added (GVA) is 18.8%, according to the Indian Economic Survey (2021-22.) Indian agriculture largely depended on rainfall and traditional agricultural techniques; therefore, agriculture is highly vulnerable to unfavourable climatic and weather conditions. Hence, peculiarity in climatic factors and non-remunerative prices for the agriculture crop result in diminution in the farmers' income (Dhananjaya et al., 2020).

Bihar, situated in Eastern India, is a state known for its fertile plains. The Ganga River separates Bihar into two parts, first North Bihar and second South Bihar, and its alluvial soil makes the land extremely prolific for farming. In Bihar, at least 88% of the state population resides in rural areas, as per the Periodic Labour Force Survey (PLFS) by the National Sample Survey Organisation (NSSO). Agriculture is the backbone of Bihar's economy, with around 77% of the working population engaged in agriculture, which is significantly higher than the national average (Bihar Economic Survey, 2022-23). The state has one of the highest proportions of cultivated land in India, and its cropping intensity is remarkable. Major crops, including wheat, paddy, maize, etc., are an important part of agricultural output. Agriculture and related activities' contribution to the total Gross Value Added (GVA) is 20%, according to the Bihar Economic Survey (2022-23). Agriculture not only sustains the livelihood of millions of people in Bihar but also contributes substantially to India's food security. With its hardworking farmers, abundant water resources, and fertile soil, Bihar holds

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massive potential for agricultural growth, especially if irrigation expansion, modern techniques, and mechanization are further adopted (Government of Bihar, Kumar, 2024).

Agricultural development is possible through increasing investment in the agriculture sector to meet the increasing capital needs of the modern day. The growth of the agriculture industry greatly benefits from institutional lending. Due to the passage of time, farmers tend to shift from traditional cultivation to modern farming practices to suit the growing needs of the people. This has urged the farmers to incline toward the cultivation of cash crops so as to reap the highest profitability. Since the colonial era, how the crop cost of production and farmer income have changed in India can be inferred from India, where a large section of the population lives in the rural area and depends on agriculture and allied industries to support themselves and their livelihood. It is very important to make a detailed investigation of costs incurred, returns, and farmers' income in order to formulate an appropriate farm policy. The argument has been made that agricultural price policy has also increased disparities in farm income (Singh et al., 1986). The agricultural sector development and the economy as a whole are significantly influenced by agricultural price policy. In order to advance and improve itself, the Indian government performs numerous actions that advance the agriculture situation in India, in which the agricultural price policy, like MSP, is one of the major components to protect both producer and consumer. Since independence, the Government of India has felt the need to construct a body that thinks about farmers, and the Agricultural Price Commission (APC) came into force on the first of January 1965. Later it was renamed as the Commission for Agriculture Costs & Prices (CACP) in 1985 to maximize productivity and create a production design that is consistent with all of the nation's demands (Acharya, 1997). In India, after crop harvest, the farmers often do not get their fair and reasonable prices for their crops. Further, due to the lack of marketing awareness, storage facilities, huge production, and pressure from creditors, the farmers of the country resort to distress sales of their crops at far below the cost of production of that crop. The government felt that to protect farmers from this distress sale, the MSP was presented by the Government of India in 1966–67. The MSP-driven price policies in Punjab led to a dominant wheat–paddy cropping pattern, which reduced the cultivation of pulses, maize, bajra, and oilseeds (Khowajazada et al., 2022).

The MSP is the price at which the government procures crops from farmers at whatever price prevails in the market. It protects farmers from distress sales and provides sufficient payment to the farmers. All facets of society have benefited from the MSP and input subsidies' vital contributions to achieving food security and faster economic growth (Acharya, 1997). The MSP is based on the calculation of the cost of production, demand and supply, and many other factors incurred by farmers. Over time, the MSP has aided Indian farmers in fending off the consequences of market swings. Thus, MSP helps farmers obtain profitable revenue and safeguard satisfactory food grain production in the country. Ironically, this is the basis on which the MSP has been declared to safeguard farmers by the Indian government. Therefore, the present study reveals the evaluation of paddy and wheat cultivation in Bihar and its methodology adopted by the Government of India in declaring the MSP and the scope in which the MSP meets the actual cost of production.

Data and Methodology

This study is based entirely on secondary data collected from various official sources. Information on paddy and wheat cultivation in Bihar was obtained from the Bihar Economic Survey, Directorate of Economics and Statistics, Department of Planning and Development, Government of Bihar, Agricultural Department, Government of Bihar, Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, Government of India. The MSP data for different time periods was sourced from the Commission for Agricultural Costs and Prices (CACP) Department of Economics and Statistics via its official website. A compound annual growth rate analysis was used to calculate the growth rate of cultivated land of paddy and wheat cultivation and the production and productivity of both crops. Descriptive statistics such as correlations were used to estimate the impact of MSP on the area of selected crops. This study was chosen to capture long-term trends and policy impacts on paddy and wheat cultivation and MSP in Bihar because this period offers a

comprehensive view of how MSP policies influenced cropping patterns, production, and costs and evaluates the MSP policy over time.

Compound Annual Growth Rate (CAGR)

The quantitative research approach for CAGR has been used to estimate the annual growth rate. The exponential function is used after altering the original data into a semi-log specification. Finally, the semi-log trend function has been used to evaluate the annual rate of growth in the cost of production, cultivation, input costs, and MSP. The semi-log function is used as follows:

There is an exponential form of the growth function as

$$y_t = a b^t e^{ut} \text{----- (i)}$$

Where;

y_t = dependent variable

a = intercept

b = regression coefficient $\{(1+g), \text{ and } g = \text{CGR}\}$

t_1 = time

The CAGR was intended as follows:

$$y = ab^t \text{----- (ii)}$$

Or

$$Y = A(1 + r)^t$$

$$\ln Y = \ln A + t \ln(1+r)$$

Let,

$$\ln(A) = a$$

$$\ln(1+r) = b$$

Then,

$$\ln Y = a + b^t$$

$$(1+r) = \text{anti } \ln \text{ of } b^t$$

$$r = \{(\text{anti } \ln \text{ of } b) - 1\} \times 100$$

Where;

a = coefficient

b = slope,

t = time and

$$r = (b-1) \times 100$$

When $r \times 100$, it gives the percentage growth rate based on the dependent variable. Therefore, $r = (\text{Antilog of } b-1) \times 100$ is the CAGR in percentage.

Results and Discussions

Bihar is a state with fertile land, and its economy is mostly based on agriculture and its allied activities. Bihar places sixth rank in wheat production after Uttar Pradesh, Madhya Pradesh, Punjab, Haryana, and Rajasthan. In paddy production, Bihar places eighth rank after Uttar Pradesh, Telangana, West Bengal, Punjab, Chhattisgarh, Odisha, and Madhya Pradesh (Economics, Statistics & Evaluation Division, Department of Agriculture & Farmers Welfare Department GoI, 2024-25).

Table-01: Growth in Area, Production and Productivity of Paddy and Wheat Cultivation in Bihar

Area in 000' hec., production in 000' tonnes, and yield in kg/he c.

Year	GCA	Area Under Paddy	Paddy Production	Yield of Paddy	Area Under Wheat	Wheat Production	Yield of Wheat
2000-01	7292	3657	5444	1489	2067	4438	2147
2001-02	7897	3552	5203	1465	2124	4391	2067
2002-03	7957	3581	5085	1420	2127	4041	1900
2003-04	7882	3577	5445	1522	2079	3688	1774
2004-05	7399	3189	2625	823	2021	3277	1621
2005-06	7396	3251	3706	1140	2002	2819	1408
2006-07	7719	3462	5133	1483	2070	4149	2004
2007-08	7765	3575	4459	1247	2131	4979	2336
2008-09	7671	3500	5773	1649	2158	4571	2118
2009-10	7671	3122	3640	1166	2112	4404	2085

2010-11	7296	2845	3113	1094	2009	5094	2536
2011-12	7647	3347	8238	2461	2141	6531	3050
2012-13	7778	3300	8322	2522	2209	6174	2795
2013-14	7580	3151	6650	2110	2149	6135	2855
2014-15	7672	3263	8242	2526	2154	3570	1657
2015-16	7572	3232	6802	2105	2111	4736	2243
2016-17	NA	3340	8239	2467	2106	5986	2842
2017-18	7525	3307	8093	2447	2101	6104	2905
2018-19	7406	3307	6156	1862	2157	6466	2998
2019-20	7297	3307	6156	1862	2150	5579	2595
2020-21	7265	3307	6156	1862	2222	6635	2986
CAGR	-0.20	-0.42	+2.84	+1.12	+0.23	+2.72	+1.66

Source: CACP and Directorate of Economics and Statistics GoB.

Agriculture sectors play an important role in the socioeconomic and comprehensive development of Bihar. Bihar contributes 7.6% of the country's paddy production and 7.1% of wheat production (Government of Bihar, 2023). This study examines the minimum support price of paddy and wheat cultivation in Bihar and analyses the growth pattern from the last two decades, from 2000-01 to 2020-21. Table no. 01 illustrates the paddy and wheat farming in Bihar from 2000-01 to 2020-21. The CAGR results show that the Gross Cropped Area (GCA) has slightly declined at the rate of – 0.20% per year, which means the total cultivated land in Bihar is gradually reducing over time. Similarly, the cultivated area under paddy has also declined at –0.42% per year, signifying that farmers are gradually reducing the land devoted to paddy cultivation.

On the other hand, paddy production has been increased at 2.84% per year, even though the area has declined. This clearly indicates that the increase in production is mainly due to improvements in paddy productivity, rather than expansion of land. Paddy productivity increased at 1.12% per annum; that means farmers are producing more output per hectare through high-quality seeds, appropriate fertilizers, timely irrigation, or enhanced farming practices.

For wheat, the area under wheat in Bihar has slightly increased at 0.23% per annum, showing a minor expansion in wheat cultivation in Bihar. Wheat production has been increasing significantly at 2.72% per year, due to an increase in wheat productivity at 1.66% per year. This suggests that wheat output increase is driven both by small area expansion and better productivity performance of wheat.

Overall, the results show that agricultural growth in Bihar is mainly productivity-led rather than area-led, especially for paddy. Wheat shows a stronger productivity growth compared to paddy, which explains its steady rise in production over the time period.

Table No. 02

Correlation between MSP of Paddy and GCA, Net Cropped Area and Area Under Paddy

S.No.	Correlation Between	Correlation (r)
01	MSP ↔ GCA	-0.448
02	MSP ↔ Net Cropped Area	-0.950
03	MSP ↔ Area under Paddy	-0.414

Sources: Calculated by Researcher

The correlation results show that the minimum support price of paddy has a mixed relationship with area and output variables. First, MSP has a moderate negative correlation with gross cropped area ($r = -0.448$) and a moderate negative correlation with area under paddy ($r = -0.414$), which suggests that as MSP of paddy increased in the study period, the overall cropped area and paddy area inclined to decline rather than expand. The strongest result is for Net Cropped Area ($r = -0.950$), which indicates a very strong inverse relationship—meaning MSP rose during the period when net cropped area was declining sharply, likely due to factors like diversification, land pressure, or non-price constraints.

Table No. 03
Correlation between MSP of Wheat and GCA, Net Cropped Area and Area Under Wheat

S.No.	Correlation Between	Correlation (r)
01	MSP ↔ GCA	-0.448
02	MSP ↔ Net Cropped Area	-0.944
03	MSP ↔ Area under Wheat	0.579

Sources: Calculated by Researcher

The correlation results indicate that MSP of wheat has a contrasting relationship with land-use indicators and wheat performance indicators. MSP shows a moderate negative correlation with GCA ($r = -0.448$) and a very strong negative correlation with Net Cropped Area ($r = -0.944$), suggesting that MSP increased during a period when the overall cultivated area and net sown area were declining—so higher MSP did not coincide with expansion of total cropped land. However, for wheat-specific indicators, the relationships are clearly positive. MSP has a moderate positive correlation with area under wheat ($r = 0.579$), implying that as MSP rose, farmers tended to allocate relatively more area to wheat, possibly because wheat became more attractive or secure in price terms. Overall, these results suggest that MSP is linked with wheat expansion, while broader land availability (GCA and net cropped area) is likely shaped by structural factors such as land fragmentation, urbanization, climatic risks, or diversification into non-crop activities.

Conclusions

The government agricultural price policy for agricultural crops wheat and paddy has been designed to provide a remunerative price to farmers. The MSP has a public procurement system, which has served well in the country since the 1960s. Indian agriculture is the dominant source of livelihood of the people, where about 70 percent of the population live in rural areas, which primarily depend upon agriculture and related pursuits for their livelihood. The economic condition of the farmers has not been very good; thus, MSP is an essential tool to boost their income and improve the production and productivity. The primary objectives of the study have analysed the trend of MSP and its relationship to gross cropped area, net cropped area, and area under wheat and paddy in Bihar state. The study reveals that from 2000–01 to 2020–21, Bihar experienced a slight decline in Gross Cropped Area (-0.20%) and area under paddy (-0.42%), reflecting structural constraints such as land fragmentation and changing land use. In contrast, wheat showed relatively stronger growth, with increases in area under wheat (0.23%). Correlation results suggest that MSP mainly positively influenced the area and negatively influenced the area under paddy. The correlation analysis shows that Minimum Support Price (MSP) does not necessarily lead to expansion of the total cultivated area in Bihar. Both paddy and wheat MSP show negative relationships with Gross Cropped Area and Net Cropped Area, suggesting that broader land-use patterns are influenced more by structural factors such as land fragmentation, urbanization, and climatic risks. However, MSP appears to influence crop choice, particularly for wheat, where higher MSP is associated with an increase in the area under wheat cultivation.

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A Study of Corporate Social Responsibility Practices in State Bank of India

Dr. Aman Kumar*

Abstract:

CSR are those groups of activities which are performing by corporate sector for the welfare of society out of its profits. When an organisation's net profit, net worth, annual turnovers equal to or exceed 5 crores, 500 crores, 1000 crores respectively, it becomes mandatory to spend CSR activities for community development under company act 2013.. Many organisations voluntarily spend on CSR Activities and play significant role in community development. This paper investigates level of CSR practices and level of CSR expenditure on different CSR activities in SBI. Descriptive study conducted to investigate level of CSR practices and for this purpose secondary data from 2020-21 to 2024-24 have been collected through annual reports of SBI. This study revealed that, alongside the growth in profits at SBI, there has been a continuous increase in total CSR expenditure and the total number of CSR activities has risen nearly fourfold in 2024-25 compared to 2020-21. SBI continues increased emphasizes on some specific CSR activities. These CSR activities are rural development, health care, livelihood and entrepreneurship, education, environment, war veterans and protection of national heritage & misc and various other activities.

Key Words: SBI, CSR Practices, CSR Activities, CSR Expenditures, Banks, rural development, health care, livelihood and entrepreneurship, education, environment, war veterans and protection etc.

Introduction:

Banks are the backbone of any economy, it helps providing financial assistance to business and other sectors of economy. CSR is an important tool of government for social welfare which is levied on corporate worlds. CSR is compulsory charged on business and other organisations, but many organisations are doing CSR activities voluntarily. Banks are also actively participated in the CSR practices. So that researcher thinks that it is very necessary to know the volume of CSR practices by banks and its impact on social welfare and economic development. This study conduct to investigate the level and role of CSR practices by selected public and private sector banks.

A. Corporate Social Responsibility:

The term "Corporate Social Responsibility" refers to the practices and policies that companies implement with the intention of enhancing society. Every business operates in society, benefits from society, and makes use of resources of society. In exchange, every company has an obligation to serve society. With the help of CSR, corporate, banks and any other organisations make higher community development through spending on health, education, infrastructure, employment, poverty reduction, women empowerment etc. CSR is the duty of business CSR as "A commitment to improve community well-being through discretionary business practices and contributions of corporate resources." **Philip Kotler and Nancy Lee define** "CSR as a multilayered concept that can be differentiated into four interrelated aspects economic, legal, ethical and philanthropic responsibilities" (**Archie Carroll in 1991**).

CSR Concept is very old, it was also discusses in Vedas, Mahabharat, Ramayana and other Hindu Mythology, Quran and other religions mythology. But the term CSR was firstly used by Howard Bowen in the year 1953; he is also known as father of CSR.

The notion of Corporate Social Responsibility among companies has been regarded as more structured, formal, organized, and systematized, in light of the integration of compulsory CSR in the

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Companies Act, 2013 by the Ministry of Corporate Affairs. Clause 135 of the New Companies Act, 2013 incorporates the following criteria for CSR:

- a) Net worth Rs. 500 Crores or more OR
- b) Turnover Rs. 1000 Crores or more OR
- c) Net profit Rs. 5 Crores or more.

If a company meets any of the foregoing conditions in any financial year, it is required to establish a CSR committee within the board and create a CSR policy, allocating at least 2% of the average net profit from the last three financial years for expenditures according to the CSR policy. Outstanding service acts as a profit strategy as it leads to an increase in new customers, greater business from current customers, a reduction in customer loss, enhanced protection against price competition, and a decrease in errors that necessitate the re-execution of services (Parasuraman et al. , 1987).

The companies Act of 2013's schedule VII lists the categories of CSR activities

The eligible listed firms under the firms Act 2013 have the ability to participate in the following kinds of CSR activities in India:

- a) Contribution made to the prime minister's national relief fund and any other federally created fund that aims to help advance and improve the lives of women, minorities, schedule castes, tribes and other marginalized groups.
- b) Ending malnutrition unemployment, poverty and hunger
- c) Encourage education
- d) Encourage gender
- e) Environmentally connected Corporate Social Responsibility program
- f) Preservation of art, culture, historical sites and national heritage
- g) Action can be taken to support and assist military staggers, war widows, and their families
- h) Contributions or funding made to academic institutions recognized by the federal government for the development of technology

B. Banks:

The banks are the lifeline of any modern economic development. It's provided finance to Business, industrialist, formers and individuals to for many objectives and provides investment opportunities. It is one of the important financial pillars of the financial sector, which plays an important role in the economic development through development though development of financial system. Thus, the development of any country is basically connected with the banking development. In modern economy, Banks are to be considered as a leader of development not only as a dealer in money. Banks play an important role in mobilizing the deposits and credit distribution to various economic sectors. The banking system expresses the economic health of the country. The strength of an economy, depend on the strength and efficiency of the financial system, which becomes capable to mobilized the saving and deposits in productive work which generate employment and help in health of country economy.

A Bank is an institution which deals with money and credit, it accepts deposit from the public and makes the funds available to those who need them and help in the remittance of money from one place to another. In India, Banking in modern sense originated in the last decades of 18th century. The first bank was Bank of Hindustan (1770-1829), and General Bank of India, established in (1786-1791). The East India Company established three presidencies Bank; first was Bank of Calcutta (1806), second was Bank of Bombay (1840) and third was Bank of Madras (1843). These three banks were merged in 1921 as Imperial Bank of India, which, after independence of India it become State Bank of India in 1955.

In 1865, Allahabad Bank was established and first time exclusively by Indians. Many types bank were established but some banks were failed. Finally RBI came in 1935, which was nationalised in 1949. In 1969 the Indian government nationalised 14 major Banks and in 1980 nationalised 6 more bank.

The HDFC (Housing Development Finance Corporation) Bank was incorporated on August 1994 by the name of HDFC bank Ltd, with registered office in Mumbai. HDFC bank commenced operations as a scheduled commercial bank in January 1995.

This Study is conducted to know level of CSR Practices in SBI. SBI is the most profitable banks of public sector, that's why SBI is selected for the investigation. SBI reports that 502.31 crore spends on CSR activities in the financial year 2023-2024.

Public and Private Sector Banks:

Public sector banks are those banks in India, where a majority stock is held by the government (more than 50%). There are 12 public sector banks such as; State Bank India, Bank of Baroda, Panjab National Bank, Canara Bank, Union Bank of India, Bank of India, Indian Bank, Indian Overseas Bank, UCO Bank, Bank of Maharashtra, Central Bank of India and Panjab & Sind Bank out of above 4 banks government wants to sell some share to private sector. Private sector banks are those banks in India, where a majority stock is held by the private sector (more than 50%). Some major private banks in India are; HDFC Bank, ICICI bank, Axis Bank, Kotak Mahindra Bank, IndusInd Bank, Yes Bank, Federal Bank, IDFC First Bank, South India Bank, Bandhan Bank, RBL Bank etc.

Banks are also classified as; cooperative banks, Indian and foreign banks, scheduled and non-scheduled, development banks, regional rural banks and many more types of banks. But this study investigates only CSR Practices of Public and Private Sector Banks.

C. Corporate Social Responsibility and Public Sector Banks:

CSR broadly refers to commitment of banks and other institutions to undertake activities that go beyond a certain level of earning and legal obligations which focus on environmental, social, ethical goals. Banks are spending on many CSR activities that help in community development, education, healthcare, rural development, skill development, digital literacy, women empowerment, sustainable development, environmental protection, disaster management, sport promotions and financial inclusions etc. Most of the banks are practices CSR due to legal obligations as their profits are above a certain limit. State Bank of India is the highest spender on CSR activities among all public sector banks in the year 2024 – 25. This is a study conducted to evaluate the level of Corporate Social Responsibility Practices in State Bank of India.

1. Review of Literature:

Thakur (2016), this study is attempted to make a detailed by SBI and HDFC bank about corporate social responsibility. The study revealed that both banks are actively engaged in CSR activities. However, as SBI have less CSR activities as per its market capitalization. Also, in the top companies list based on CSR activities HDFC bank is ranked higher than SBI.

Juman (2016), the researcher has done a content analysis to study corporate social responsibility practices by banks. For the investigation, three Public and two Private Banks were selected. Secondary data has been taken from annual reports of the banks, the study was conducted, and findings show that Banks are far behind other top companies in the matter of CSR. The study also finds that banks are spending more on social issues than environmental issues as they do not harm the environment directly.

Kaur (2016) the researcher has tried to study various CSR activities carried out by Indian banks. Various bank are taken under different categories such as Axis Bank, IndusInd Bank, Yes Bank, Union Bank of India, Punjab National Bank, ICICI, IDBI, HDFC, SBI, and SIDBI are taken into consideration. The findings suggest that though the Indian banks are making efforts in the CSR areas, still there is a requirement of more emphasis on CSR. The results refers that public sector banks have a higher contribution in CSR activities than Private sector and foreign banks. The study concluded that most of the banks are use CSR practices as a marketing tool.

Kewlani and Bhatt (2019), In this study researcher investigate A Comparative Study on Corporate Social Responsibility Practices in Selected Public and Private Sector Banks in India. For this study SBI, Canara Bank, Yes Bank, IndusInd Bank. For this study secondary data has been selected. This study evaluate that Public sector banks have a changing trend in increase and decrease

of CSR expenditure and Net profit whereas Private sector banks have a much static upward trend. Out of the selected banks only Yes bank shows a positive change in both CSR expenditure and Net profit. It appeared that Private sector banks show an increase in share price whereas share price of public sector banks were decreased from the year 2014-15 to the year 2017-18. Hence, it can be said that CSR has a positive impact on the share price of private sector banks whereas CSR has an adverse impact on the share price of public sector banks. Both the public and private sector banks have performed various activities under Education, Health and Environmental programme.

2. Research Problems:

After reviewed of many literatures, it's found that most of the research has conducted to study the conceptual background of banks, profit and loss and its importance. Through this research an attempt will be made to study what level of Corporate Social Responsibility practices in State bank of India, how much is it spending through CSR in different activities and what is the level of change in them.

- What is the CSR Practices in SBI?
- How much amounts spending through CSR in different activities?
- What is the level of change in amounts spending through CSR in different activities?

3. Objective of the Study:

- To examine the Corporate Social Responsibility Practices in SBI.
- To examine the spending through Corporate Social Responsibility in different activities.
- To make comparison amounts spending through CSR in different activities in selected financial years.

4. Research Hypothesis:

H₀₁: There is no significant difference in CSR Practices in different financial year in SBI.

H₀₂: There is no significant difference in CSR Practices in different activities in SBI.

5. Research Design:

- Scope of Study:** Present study confined to the present CSR Practices of SBI and CSR Practices in different areas in SBI.
- Period of Study:** The study covers the time period of ten financial years from 2020-21 to 2024-25.
- Research Method and Data Sources:** This is Descriptive and Analytical research based on secondary data. Therefore, the secondary data has been collected from annual report of official websites of bank, various journal, magazine, RBI bulletin etc. If there is need Primary data will be collected from structured questionnaire.
- Variables:** The study will be conducted from taken all variables of Corporate Social Responsibility Practices by SBI.
- Analysis Design:** Some Statistical Tools Used in This Study like; Mean, Trend Analysis, Index for Behavioural Analysis.

6. Corporate Social Responsibility Practices in SBI bank:

6.1. Corporate Social Responsibility Activities of SBI bank:

This head shows the net profit, CSR expenditures, number of activities of CSR, state covered, number of village covered and number of people benefited by the CSR activities in State Bank of India. CSR

Table 1: CSR Practices of State Bank of India in Different Years

Year	Net Profit	CSR Expenditures	No. of Activities of CSR	States Covered	No. of Village Covered	No. of People Benefited
2020-21	20410	144.88	380	Pan India	3886	197551
2021-22	31676	204.10	380	Pan India	3886	197551
2022-23	50232	316.76	854	Pan India	19074	5400000
2023-24	61077	502.32	1306	Pan India	20000	5500000
2024-25	70901	610.77	1408	Pan India	20000	6500000

(Sources: Annual Reports)

Table 1 shows different heads related with CSR practices in SBI such as; Years, Net Profits, CSR Expenditures, Numbers of Activities, State Covered, Numbers of Village Benefited and Number of People Benefited. Here five years data of CSR Practices from 2020-21 to 2024-25 are presented and analysed. It revealed from table that profit in 2020-21 was 20410 Crores and it increased by 3.474 times and became 70901 crores in 2024-25. CSR Expenditures was 144.88 Crores in 2020-21 and it increased by 4.216 times and became 610.77 crores in 2024-25. The data clearly indicate that SBI has increased Expenditure on CSR Activities at a faster than growth in its profits and has devoted greater attentions to CSR spending compare to past years. SBI Spent 0.71% of its net profit on CSR Activities in 2020-21, while this figure rose to 0.861% of net profit in 2024-25. In the year 2020-21 SBI spent its CSR amounts on only 380 CSR Activities in all over India which are increased to 1408 CSR Activities in 2024-25 in all over India and here Pan India mean all over India. In the year 2020-21 3886 village and 20000 people benefited from expenditure on CSR Activities of SBI. This numbers are continued to increase steadily and statistics indicate that in 2024-25 20000 villages and 6.5 million people began benefited from expenditure on CSR Activities of SBI.

Hence prove that **there is significant difference in CSR Practices in different financial year in SBI. So that null hypothesis is rejected.**

Table No. 2: Allocation of CSR Expenditures in Different Activities in SBI

Name of Activities	Year wise Expenses in Percentage				
	2020 – 21	2021 – 22	2022 – 23	2023 – 24	2024 – 25
Rural Development	30	30.78	9	4	11
Livelihood and Entrepreneurship	0		21	29	
Health Care	28	19.84	30	29	35
Welfare of Girls	14	0	0	0	0
Sports	7	3.99	1	0	5
Education	8	8.82	12	12	27
Environment	3	5.62	13	9	11
Clean India	2	0	0	0	0
Women Empowerment	1	3.91	4	5	2
Animal Welfare	1	0	0	0	Same Sports
PwD Welfare	1	0	4	0	0
War veterans	0	15.85	3	6	6
Disaster Management	0	0		0	2
Protection of National Heritage & Misc	0	10.19	3	0	1
Others	5	1	0	6	0
Total	100	100	100	100	100

(Sources: Annual Reports)

Table 2 shows the CSR Expenditure incurred by SBI on Various CSR activities in percentage. Allocation of CSR Expenditure change every year by SBI depending on social needs and priorities. But major focus areas of CSR Expenditure by SBI in during selected financial years are; Rural Development, Health Sector, Education, entrepreneurship and environment. SBI spent CSR on 380 activities in the year 2020-21, out of which SBI spent highest 30% amount of CSR on Rural Development, second highest 28% on health care, then significant focus and spent 14% on welfare of girls, then moderate focus on education and sports and spent on education 8% and on sports 7%. SBI also spent on clean India, women empowerment, animal welfare, Pwd Welfare and balance 5% on remaining CSR Activities during the financial year 2020-21.

In the financial year 2021-22 SBI put still top priority on rural development and spent 30.78% of total CSR Expenditure on it, SBI comparatively less focus on health care in comparison to previous financial year and spent 19.84% which is approximately 10% less than previous financial

year but still on the second priority, SBI significantly spends on war veterans of CSR and spent 15.85%, then on Protection of National Heritage & Misc 10.19, then on education 8.82%, focus on environment on 5.62% and than women empowerment on 3.91% etc.

In the financial year 2022-23 SBI more focus on health care and spent 30% of total CSR Expenditures, second priority is Livelihood and Entrepreneurship and spent 21%, then spent 13% on environment, then on education on 12% and then on rural development, women empowerment, PwD welfare, war veterans etc.

In the financial year 2023-24 SBI spent CSR amount on 1306 activities, out of which highly focus in Livelihood and Entrepreneurship and health care equally 29% respectively. Third, fourth, fifth and sixth priority is Education, environment, war veterans and women empowerment and spent CSR 12%, 9%, 6% and 5% respectively. Then after focus on rural development and others remaining CSR activities.

SBI spent CSR on 1408 activities in the year 2024-25, out of which SBI spent highest 35% amount of CSR on health care, second highest 28% on education 27%, then significant focus on rural development and environment and equally spent 11% on both activities. Then moderate focus on war veterans and sports and animal welfare and spent 6% and 5%.

Hence prove that **there is significant difference in CSR Practices in different activities in SBI and null hypothesis is rejected.**

Major Findings:

- CSR Expenditure pattern of SBI is dynamic and flexible. Initially focus on rural development, then health care and Livelihood and Entrepreneurship development and in financial year 2024-25 focus on education.
- SBI was spending on 380 CSR activities of total CSR Expenditure in the financial year 2020-21. This figure continued to rise and become 1408 CSR Activities in the year 2024-25 in all over India.
- SBI made focuses situational based CSR expenditure on different CSR activities.
- SBI Spent 0.71% of its net profit on CSR Activities in 2020-21, while this figure rose to 0.861% of net profit in 2024-25
- Net Profits increased by 3.474 times and CSR Expenditures increased by 4.216 times from the financial year 2020-21 to 2024-25.

Conclusion:

SBI is highest CSR expenditure bank from the public sector banks. Conclusively net profit of SBI and CSR expenditure of SBI are continuously increased from the financial year 2020-21 to 2024-25. Most centric CSR Expenditure of SBI is Rural Development, health care and Livelihood, Entrepreneurship development, women empowerment, education, environment, war veterans etc. But SBI change its CSR Expenditure on different CSR Activities with change in need and situations of society. SBI increases its coverage area in the form of number of CSR Activities, Village Benefited and People Benefited from CSR Expenditure day to day.

Recommendations:

From the above study some recommendations for SBI regarding CSR Expenditure are;

- It is a need for balanced allocation of CSR Expenditure on different CSR Activities.
- SBI need to more focuses on Rural Development and Entrepreneurial Development that is the demand of modern India.
- SBI Should increase focus on neglected area of CSR Activities.
- SBI Should analysed impact of CSR Expenditure on different activities.
- Need to more expend on environmental and sustainable development.

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Sustainable Development Goal 13 (Climate Action): Policies, Impacts, and Future Outcomes in the Indian Scenario

Tripti Panday*

Abstract

Climate change has emerged as one of the greatest threats to sustainable development in the 21st century. Sustainable Development Goal 13 (SDG 13), adopted as part of the United Nations' 2030 Agenda, underscores the need for urgent action to combat climate change and its impacts. India—which ranks among the world's fastest-growing economies while simultaneously being among the nations most vulnerable to climate change—faces a dual challenge: sustaining its economic development while mitigating environmental degradation. This research paper critically examines India's climate change policies, its institutional frameworks, its socioeconomic and ecological impacts, as well as the country's future climate trajectories within the context of SDG 13. The study employs a qualitative analytical approach based on secondary data derived from government reports, international organizations, and recent academic literature. The findings indicate that India has made significant strides through the expansion of renewable energy, climate adaptation programs, and policy innovations, such as the National Action Plan on Climate Change (NAPCC). Nevertheless, various challenges—including implementation gaps, urban pollution, biodiversity loss, climate-induced migration, and financial constraints—continue to hinder this progress. The article concludes that achieving SDG 13 in India requires integrated governance, technological innovation, climate finance, community engagement, and strengthened international cooperation.

Keywords: SDG 13, Climate Change, India, NAPCC, Renewable Energy, Climate Policy, Sustainable Development, Environmental Governance

1. Introduction

Climate change constitutes a major global environmental crisis affecting ecosystems, economies, and human societies. Rising global temperatures, erratic precipitation patterns, floods, droughts, heat waves, and rising sea levels have exacerbated vulnerabilities in developing nations. The United Nations introduced SDG 13 to encourage nations to undertake urgent climate action grounded in mitigation, adaptation, awareness-raising, and institutional strengthening. India occupies a strategic position in the landscape of global climate governance due to its vast population, rapid industrialization, reliance on agriculture, and growing energy demands. While its per capita greenhouse gas emissions remain lower than those of many developed nations, India remains highly vulnerable to climate-related disasters. Consequently, the Indian government has adopted various policies and missions aimed at aligning national development with global climate commitments. This article evaluates the effectiveness of India's climate action strategies within the context of SDG 13 and explores future environmental and socioeconomic prospects.

2. Objectives of the Study

The main objectives of this research are as follows:

1. Analyze the concept and importance of SDG 13.
2. Examine India's policies and institutional mechanisms regarding climate change.
3. Assess the environmental, economic, and social impacts of climate change in India.
4. To evaluate the effectiveness of India's climate action initiatives.
5. To explore future climate scenarios and formulate policy recommendations in support of

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sustainable development.

3. Research Methodology

This study is based on qualitative and analytical research methods. Secondary data were collected from the following sources: United Nations reports on the SDGs, Government of India policy documents, NITI Aayog reports, research journals and academic articles, as well as climate and sustainability databases.

The study employs descriptive and public policy analysis approaches to understand India's climate governance, as well as the implementation of SDG 13.

4. Understanding SDG 13: Climate Action

SDG 13 aims to: Strengthen resilience and adaptive capacity in the face of climate-related disasters; integrate climate policies into national planning; enhance awareness and institutional capacity; and mobilize financial and technological resources for climate action. Climate change mitigation focuses on reducing greenhouse gas emissions, while adaptation emphasizes resilience to climate impacts, such as floods, droughts, and rising temperatures.

5. Climate Change in the Indian Context

India experiences highly varied climatic conditions, making it extremely vulnerable to climate variability. Key climate-related concerns include:

5.1 Rising Temperatures

India has recorded an increase in average temperatures, leading to severe heat waves in states such as Rajasthan, Uttar Pradesh, and Delhi.

5.2 Water Scarcity

Erratic monsoons and the depletion of groundwater resources have intensified water crises in both urban and rural regions.

5.3 Agricultural Vulnerability

Agriculture contributes significantly to India's economy and employment. Climate change impacts crop productivity, food security, and the livelihoods of farmers.

5.4 Coastal and Himalayan Risks

Rising sea levels threaten coastal cities such as Mumbai and Chennai, while melting glaciers in the Himalayas disrupt river systems and biodiversity.

5.5 Increased Natural Disasters

Over the past decade, India has faced an increased frequency of cyclones, floods, and droughts, resulting in significant economic losses and population displacement. These impacts underscore the urgency of effectively implementing SDG 13.

6. India's Climate Policies and Institutional Framework

6.1 National Action Plan on Climate Change (NAPCC)

The National Action Plan on Climate Change was launched in 2008 and forms the backbone of India's climate governance framework.

The NAPCC consists of eight national missions:

1. National Solar Mission
2. National Mission for Enhanced Energy Efficiency
3. National Mission on Sustainable Habitat
4. National Water Mission
5. National Mission for Sustaining the Himalayan Ecosystem
6. Green India Mission
7. National Mission for Sustainable Agriculture
8. National Mission on Strategic Knowledge for Climate Change.

6.2 Paris Agreement Commitments: India is a signatory to the Paris Agreement and has committed to reducing its emissions intensity while simultaneously increasing its renewable energy generation capacity.

India has announced its intention to reduce its emissions intensity by 47% relative to 2005 levels by the year 2035, as well as to significantly expand its clean energy infrastructure. The country also aims to derive 50% of its total installed electricity capacity from non-fossil sources by 2030—a decisive transition toward cleaner, more renewable energy systems. Furthermore, India has pledged to create an additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through the expansion of its forests and tree cover. These targets underscore India’s dual priority—mitigation and adaptation—balancing developmental imperatives with environmental responsibility. These Nationally Determined Contributions (NDCs) also align perfectly with the objectives of SDG 13 (Climate Action), reflecting India’s commitment to integrating climate considerations into its national planning, energy policy, and land management. These commitments have served to bolster renewable energy policies and electric mobility initiatives, as well as to increase climate finance, thereby consolidating the national and regional efforts undertaken within the framework of SDG 13.

A critical Analysis of India’s Climate Action Policies

Strengths	Weaknesses / Gaps
Reduction in Emissions Intensity: India reduced the emissions intensity of its GDP by 33% between 2005 and 2019, thereby making progress toward its NDC target—namely, a 45% reduction by 2030 (MoEFCC, 2023).	Delay in afforestation: forest and tree cover has increased only marginally, reaching 22% of the total geographical area (2021); this figure remains below the national target of 33%, as well as the requirement of SDG 13, which establishes a threshold exceeding 25% by the year 2030 (ISFR, 2021).
Energy Efficiency Achievements: Thanks to the UJALA program, more than 370 million LED bulbs have been distributed, reducing electricity consumption by 47 billion kWh per year and preventing the emission of 38 million tons of CO ₂ .	Climate Finance Gap: India requires \$2.5 trillion by 2030 to implement climate actions; however, actual flows amount to less than \$20 billion annually, resulting in a significant financing gap (UNFCCC, 2022).
Alliance (ISA) now counts more than 110 International Leadership: The International Solar member countries—with India as a founding leader—thereby strengthening global climate cooperation.	Uneven performance among states: while Gujarat has reached a renewable energy capacity exceeding 14 GW, some states—such as Bihar and Jharkhand—have less than 2 GW, reflecting political disparities (MNRE, 2023).
Expansion of Renewable Energy: In June 2023, 40.9% of total installed generation capacity came from non-fossil sources, representing progress toward the 50% target set for 2030 (MNRE, 2023). Carbon Sink Deficit	In light of the target of 2.5 to 3 billion tons of CO ₂ equivalent in carbon sinks by 2030, current progress represents less than 30% of the requirements, underscoring the slow pace of afforestation.

The Table summarizes India’s objectives regarding SDG 13, as well as its achievements in this area. This table highlights the progress India has made toward achieving SDG 13 (Climate Action) by comparing the targets set for 2030 with current results. India aims to reduce the emissions intensity of its GDP by 45% relative to 2005 levels by the year 2030; as of 2019, a reduction of approximately 33% had already been achieved. Regarding the energy transition, India had set a target to increase the share of non-fossil fuel sources in its installed electricity generation capacity to 50% by 2030—a threshold it has already surpassed, reaching 50.08% in June 2025. The objective concerning carbon sinks is to generate an additional absorption capacity of between 2.5 and 3 billion tonnes by 2030; since 2005, approximately 2.29 billion tonnes have been added. The target for forest and tree cover is to exceed 25% of the country's geographical area; this cover stood at 25.17% in 2023, although the loss of primary forests remains a cause for concern. With respect to disaster-related mortality, India strives to reduce the number of deaths attributable to extreme weather events;

however, more than 2,500 fatalities were reported in 2022. Climate finance requirements are estimated to amount to US\$2.5 trillion by 2030; nevertheless, securing such funding remains a major challenge. Sources such as reports from the MoEFCC, MNRE, ISFR, and ISDR provide the official data necessary to monitor progress.

6.3 Renewable Energy

Policies India has become a global leader in the development of solar and wind energy thanks to initiatives such as the International Solar Alliance, the PM-KUSUM program, the Green Hydrogen Mission, and the National Electric Mobility Mission.

Renewable energy production in India has recorded a substantial improvement in recent years.

6.4 State Action Plans on Climate Change

Indian states have developed localized climate strategies focusing on agriculture, forestry, water management, and disaster preparedness.

7. Effectiveness of Climate Policies in India

7.1 Positive Outcomes

1. Renewable Energy Growth
2. India has rapidly expanded solar and wind energy infrastructure, reducing dependency on fossil fuels.
3. Improved Global Climate Leadership
4. India has gained recognition for promoting sustainable development while maintaining economic growth.
5. Increased Awareness
6. Climate literacy and environmental awareness have improved through educational campaigns and policy discourse.
7. Disaster Preparedness

Technological advancements in forecasting and disaster management have reduced mortality from cyclones and floods. NITI Aayog reported improvements in India's SDG 13 performance score between 2020 and 2025

7.2 Major Challenges

Gaps in Policy Implementation

Many climate programs suffer from bureaucratic delays, deficient monitoring systems, and a lack of coordination between the central and state governments.

Urban Pollution

Rapid urbanization and industrial growth continue to exacerbate air pollution and greenhouse gas emissions.

Financial Constraints

Climate change adaptation and renewable energy infrastructure require substantial investments, which remain insufficient.

Social Inequalities

Marginalized communities, tribal populations, and small-scale farmers remain disproportionately vulnerable to the impacts of climate change.

Dependence on Coal

India continues to rely heavily on coal for electricity generation due to rising energy demand.

8. Socio-Economic Effects of Climate Change in India

Climate change affects multiple dimensions of Indian society:

1. Sector Major Impacts
2. Agriculture Crop failure, reduced productivity
3. Health Heat stress, vector-borne diseases
4. Economy Infrastructure damage, productivity loss
5. Water Resources Droughts, groundwater depletion
6. Biodiversity Species extinction, ecosystem imbalance

7. Migration Climate-induced displacement

Climate-related economic losses are expected to rise substantially if mitigation and adaptation measures remain insufficient.

9. Future Climate Outcomes in India

9.1 Environmental Projections

Future climate scenarios indicate: Increased frequency of extreme weather events ,Greater water stress, Declining biodiversity ,Higher temperatures and heat waves ,Coastal inundation due to sea-level rise

9.2 Economic Consequences

Climate change may reduce GDP growth through: Agricultural decline, Health expenditure increases, Infrastructure losses, Energy insecurity.

9.3 Social Consequences

Climate migration, food insecurity, and inequality may intensify, especially among vulnerable populations.

10. Recommendations

To strengthen SDG 13 implementation in India, the following measures are recommended:

10.1 Strengthening Renewable Energy

India should accelerate investments in solar, wind, green hydrogen, and energy storage technologies.

10.2 Climate-Resilient Agriculture

Promoting drought-resistant crops, sustainable irrigation, and precision agriculture can reduce vulnerabilities.

10.3 Green Urbanization

Urban planning should prioritize sustainable transport, waste management, and green infrastructure.

10.4 Climate Finance

India requires stronger domestic and international climate financing mechanisms.

10.5 Community Participation

Local communities should be actively involved in climate adaptation and environmental conservation programs.

10.6 Technological Innovation

Artificial intelligence, remote sensing, and climate modeling should be integrated into environmental governance.

10.7 Education and Awareness

Environmental education must be strengthened across schools, universities, and public institutions.

11. Conclusion

SDG 13 constitutes an essential framework for combating climate change and ensuring sustainable development. India has demonstrated substantial commitment, notably through the expansion of renewable energy, the implementation of climate missions, and international cooperation. Policies such as the National Action Plan on Climate Change have laid the groundwork for climate governance, while advancements in disaster resilience and renewable energy capacity serve as evidence of measurable progress. Nevertheless, significant challenges persist, including implementation inefficiencies, pollution, socioeconomic inequalities, and a reliance on fossil fuels. Climate change threatens India's ecological balance, economic stability, and social well-being—particularly among vulnerable populations. Achieving SDG 13 in India will require integrated governance, scientific innovation, climate finance, and the active engagement of governments, industries, civil society, and the citizenry. Sustainable and inclusive climate action is indispensable—not only for environmental protection but also for safeguarding the future of India's long-term development.

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A Case Study of the Gurjar Brothers an Armed Hindu Resistance to the Mughal Officer of Kasana

Kajal*

In the vicinity of the western districts of Uttar Pradesh especially in those of Gautam Buddha Nagar (Noida), Hapur, Ghaziabad and Bulandshahr, there exists an oral tradition of history¹ that prevails in higher degree of intensity among the local Gujars irrespective of age, gender and 'gotra'.

This oral tradition of history prevalent among some more than 100 Gujar villages runs as follows² :

There was a Gujar family at some place named Bharatpur in Jaisalmer in Rajasthan which had migrated to 'Tugalka-bad' (the original pronunciation that is still intact in local Gujar's tongue) means 'Tughlakabad' now in Delhi situated near to Purana Qila (Old Fort of Delhi). In one of oral traditions, these Gujars as other Hindus of Delhi were devotees of the Kalka Devi Temple of Delhi. Initially these belonged to the 'Bagchash' *gotra* but being related Jaisalmer owned by the 'Bhati' Rajputs these were called 'Bhati' in Delhi to have their specific identity. among the Gujars already inhabited in and around Delhi and the Yamuna phadir.

In due course of time after few generations these 'Bhati Gujars' had a small family which was consisted of two brothers and one sister. The names of the brothers were Rana Roa Kosal and Rana Prava but the name of their sister is not known. The brothers gave their sister in marriage to a boy of Dankaur who belonged to Vidhuri 'gotra'.

Once, when the bride was going to her 'Sasural' with her bridegroom for the first time after the 'gauna' ceremony, an unpleasant episode occurred. on the way from Tughlakabad to Dankaur. That place was Kasamgarh situated in the *Doab*.

The party consisted of close relatives of the bridegroom had to stay on the way at Kasamgarh. The relatives were all male members and were worried of a bad and immoral practice having been imposed upon any Hindu brides '*dola*'. It was forcibly imposed by the Mughal officer posted at Kasamgarh. He was one of the most infamous and was hated by all the Hindu subject. The girl was told that she had to spend one night in the Mughal Officer's haveli to follow the tradition in which each newly wedded Hindu girl's *dola* was kept in that Mughal's haveli. Hearing it she was shocked hearing it but she did not lose her heart and tried to flee then and there. It is possible that she had fled from Kasamgarh successfully keeping her virginity intact. She straightly, went to her brothers and catching the throat of her elder brother wept bitterly and had asked him, "with whom you had married me ? with a Musalman or a Hindu."

Watching some thing black at bottom, the brothers asked her what had happened and they had come to know that "every newly wedded Hindu girl's *dola* passing through Kasamgarh after marriage had to spend one night in the harem of the Mughal officer." She also told them that it was a common practice to be followed by every Hindu girls passing through Kasamgarh, that was a 'dastur'

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of the place during that period as a measure to dishonour the Hindus at large. Hearing that from her, they took an oath in the name of Kalka Devi to destroy the Mughal, the most immoral culprit.

Both of the brothers gave their land and belongings at Tughlakabad to their sister and her husband and had started a short journey on a mission to take the revenge. They decided the Mughal's full destruction along with all his family. They reached 'Devlaghat' on the bank of the Yamuna and crossed the river.

They sent spies to gather maximum information about the Kasamgarh township. They were told that two Hindu '*jatis*' of Chamar and Bhangi and Musalmans were the inhabitants. Receiving all necessary details, they planned a night attack and destroyed the Mughals killing all of them. Thus the most infamous devil Mughal was punished in leadership of both of the brothers and their team.

They not only destroyed the Mughals at Kasamgarh but they also renamed the township as 'Kasna'.³

Presently the town of 'Kasna' is situated at longitude 28° 43' 68" N and latitude 77° 53' 76" E⁴, It lies in the Tehsil of Dadri in the district of Gautam Buddha Nagar (Noida) in Uttar Pradesh⁵. It lies in between the famous Pari Chowk and the Eastern Periferial Express Way. Another famous Yamuna Express Way is not far from it.

The '*Bhat ki Pothi*' gives a graphic description of that historical event of much importance regarding the local history⁶. Rana Rao Koshal and his descendants took the area from Kasna to Dankaur under their control⁷ while the younger brother Rana Prava and his descendants had to flee towards the Ganga and crossing the river they had entered in the jungles the '*Ganga-paar*'⁸.

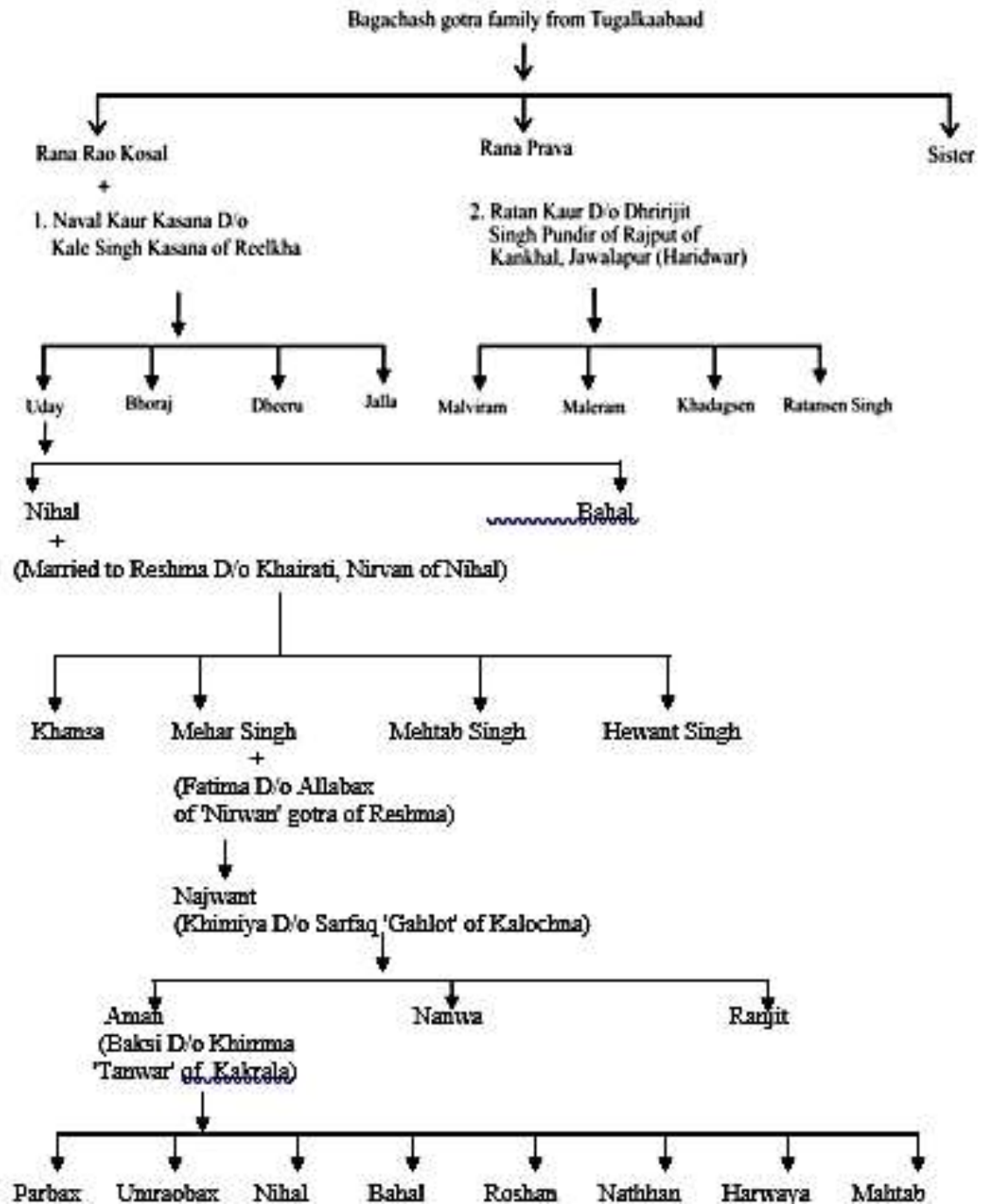
It seems a historical fact that the Mughal administration was not ready to ignore such an incident so close to Delhi. They sent the force to punish the Gujar.^{*} The Mughal contingent was given resistance them some considerable time but ultimately the Gujar were caught and killed to a great number^{**}. Perhaps Rana Rao Koshal and some of his supporters were caught or killed or both.

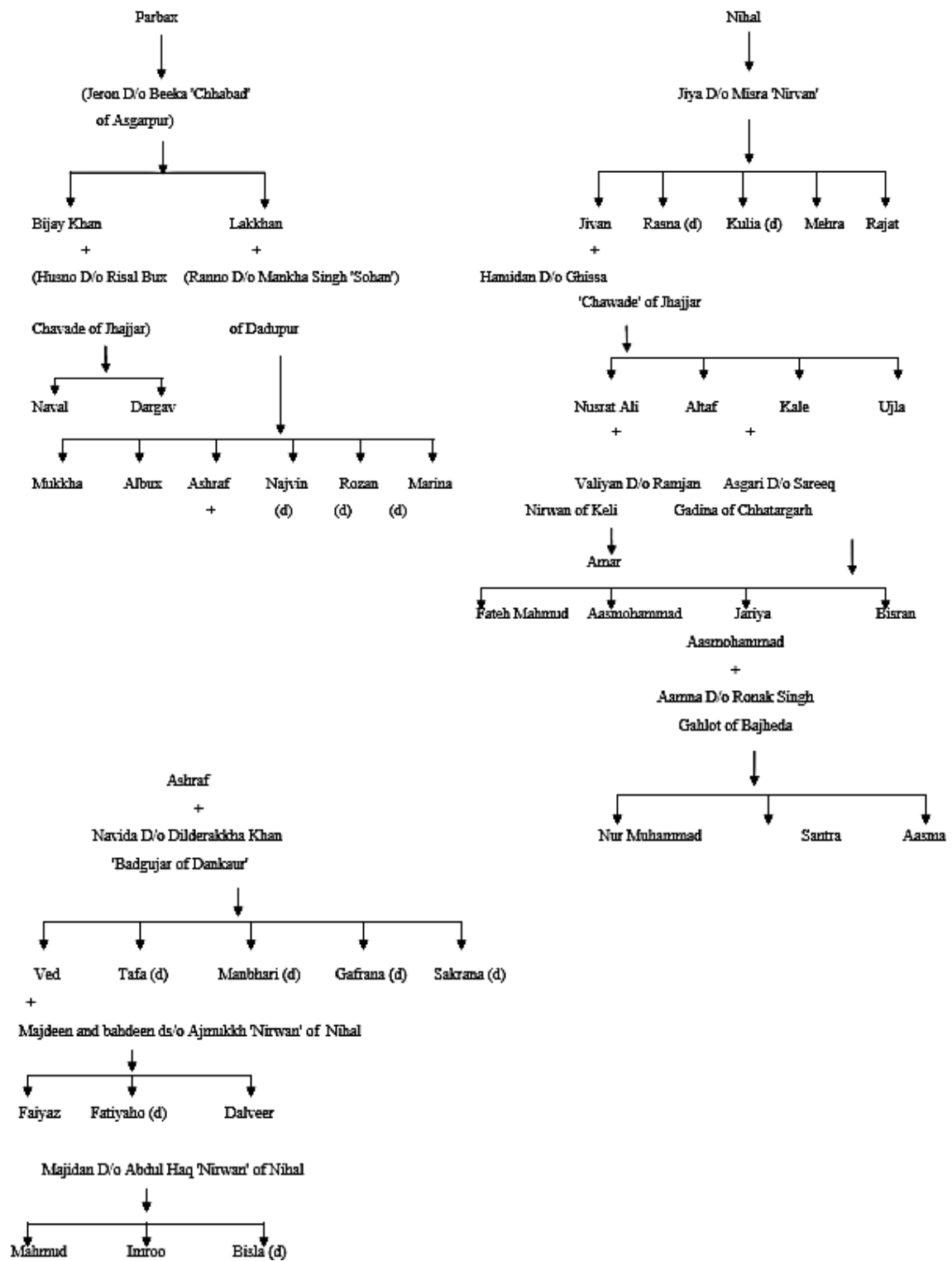
Rana Rao Koshal's eldest son named Uday⁹ also got same fate. He was caught by the Mughals and was given option to life if converted to Islam¹⁰. Thus in that critical situation Uday had no option other than to embrace Islam¹¹. But as usual and general, the converted brother made a safe passage to his co-brothers! No other Gujar was suppressed to forcible religious conversion after him. The result is visible in the fact that a greater number of 360 Gujar villages is considered to be of Bhati gotra in this geographical area.

Uday started living at the village of Palla¹² and his descendents still are living at 'Khodna'¹³ that is still mentioned as 'Khodna Kalan' in the revenue records¹⁴.

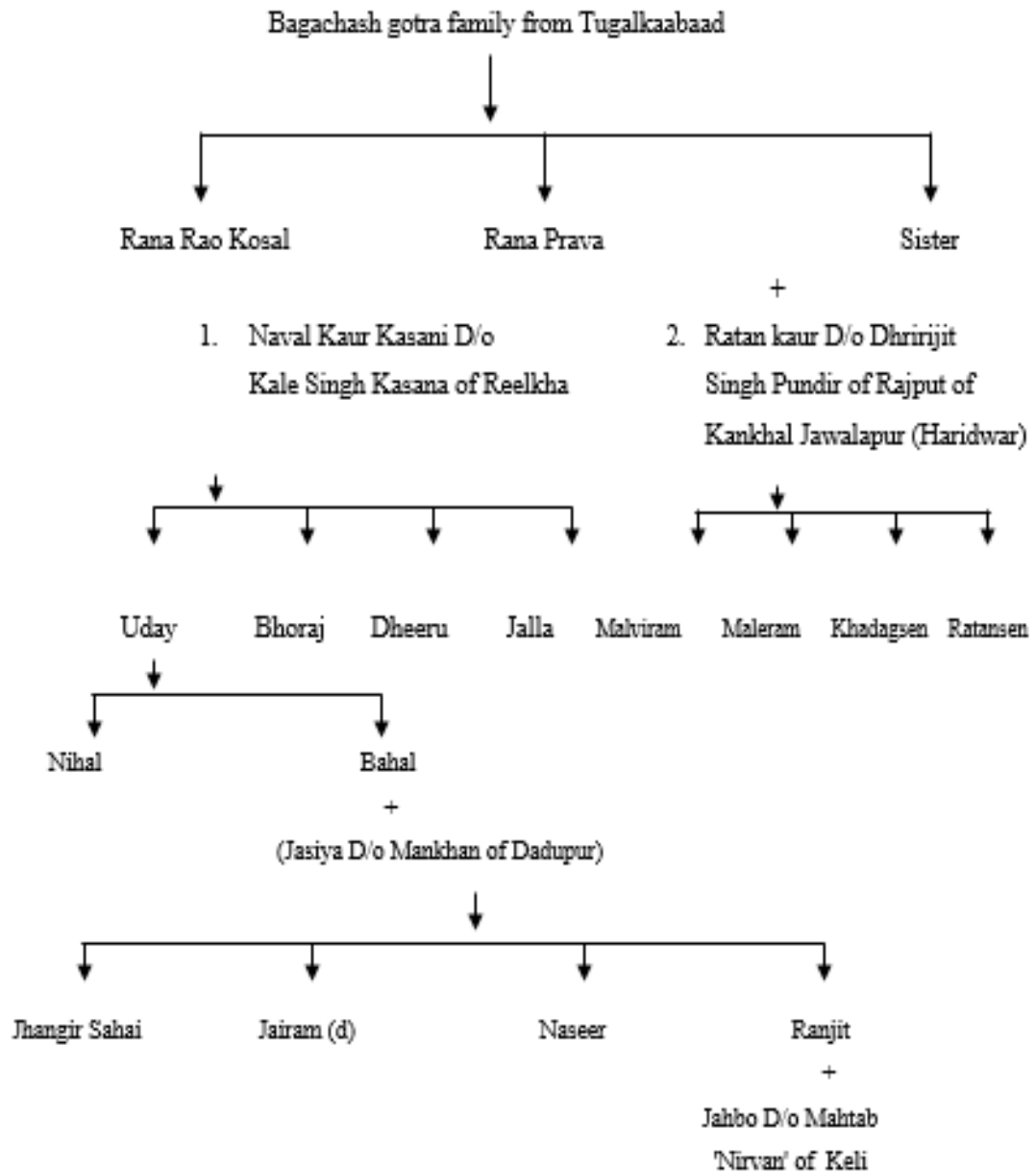
The Bhat ki Pothi mentions that 4 sons of Rana Rao Kaushal from Gujar were Uday, Bhoraj, Dheeru and Jall. Each one inhabited 4 Villages of Khodna, Pali, Gulista and Palla respectively¹⁵.

The genealogical table of Rana Rao Koshal through his eldest son named Uday is as follows:

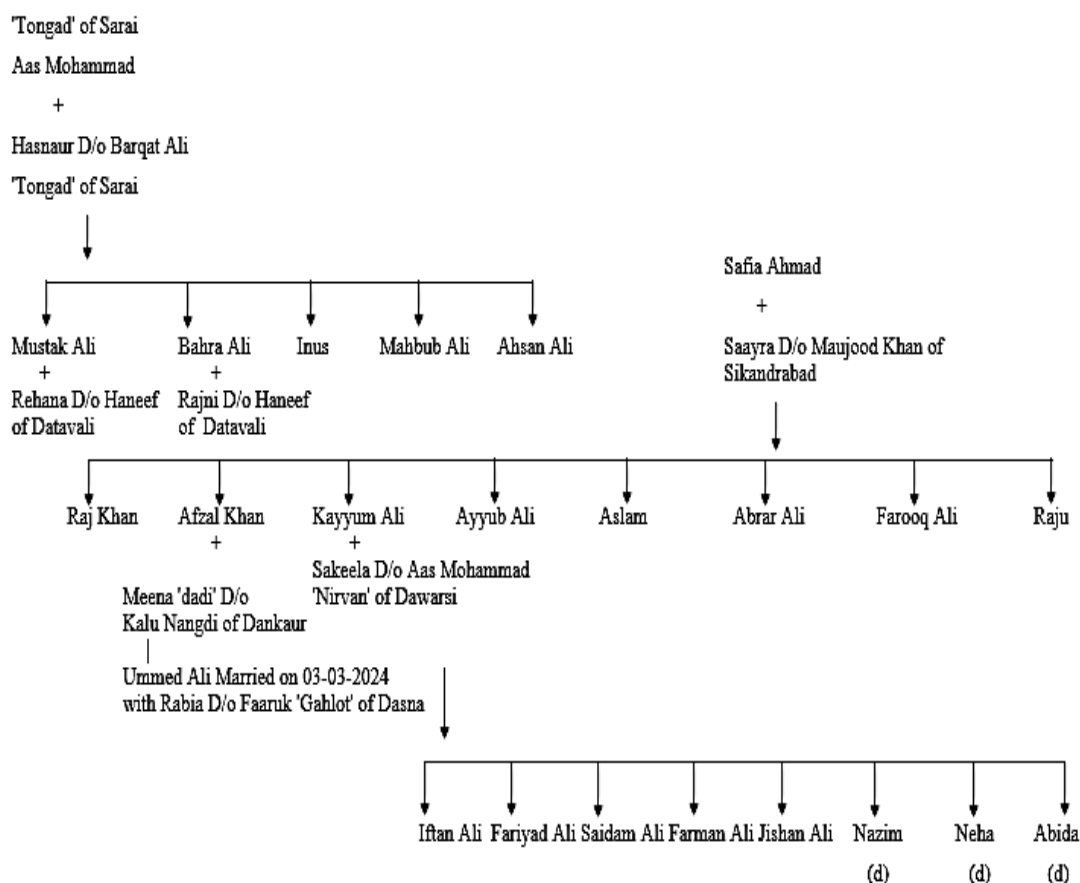




It is unfortunate that the genealogical table of Faiyyz's sons seems unrecorded due to various reasons mainly ignorance of the historicity towards their ancestral heritage. But it is a matter of pleasure that this table is available as far as Uday's younger son Bahal Singh is concerned. The following is the genealogical table right from Rana Rao Kaushal to Razia the eldest female child of Ummed Ali and Rabia, the daughter of parook/Faruq Gahlot of Dasna.







13

Number of generations from Rana Rao Kosal to Ms. Razia, daughter of Ummad Ali and Mrs. Rabia is in 14th¹⁶. generation Razia's grand parents are alive. Her grand mother Meena 'Dadi' in interview tells the family traditions to celebrate Dewali, Holi, Godhan and almost all the lot of their Hindu ancestry as their forefathers used to celebrate¹⁷. She claims to sing all the '*geets*' traditionally having been sung in '*shadi*', '*janma*', '*Bhaat*' etc¹⁸. If we consider a time bracket of 25 years for one generation, then the total time period for 14 generations comes $25 \times 14 = 350$ years. Now to find the accurate date of the event occurred with Rana Rao Kaushal's sister can be calculated subtracting 350 from 2022. Thus the date feared is $2022 - 350 = 1672$ A.D

The date thus calculated is 1672 A.D for Rana Rao Kaushal. It is clear that around 1672 A.D¹⁹, the *Dola* episode would be taken place. Historically this is the very period of Mughal Emperor Aurangzeb. Aurangzeb Alamgir, the most fanatic ruler reigned over India from 1656 AD to his death in 1707 CE²⁰. Hence it seems fit to fix the incidence during Accangzeb's reign or just few years after his death in 1707 CE.

If a time period of 22 years is taken, than a total period of $22 \times 14 = 308$ years comes. In that case $2022 - 308 = 1714$ A.D. is the year in Christian Era which falls the year during the reign of Emperor Farrukhsiyar.

If an average time period of 20 year for each generation is taken, than a total of $20 \times 14 = 280$ years is found. In that case $2022 - 280 = 1742$ A.D. is found in the christian Era, It is the year during the Mughal Emperor Muhammad Shah 'Rangila'. As a matter of fact it is well known to people of Syana in Bulandshahr District that the Sumer Singh, the younger brother of Chaudhary Sher Singh

(Tyagi) was converted in 1735 A.D. and was given the name of Chaudhary Shamsheer Khan. Dr. Rahat Ali Chaudhary and others are his direct descendants.

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The Periphery of the Periphery: Caste, Gender, and the Historical Marginalization of Dalit Women in India

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Abstract

The intersection of caste and gender remains one of the most significant yet understudied dimensions of social inequality in India. Dalit women occupy a unique social location characterized by simultaneous oppression through caste hierarchy, patriarchal structures, and economic deprivation. While mainstream feminist discourse has often prioritized gender inequality and Dalit movements have historically emphasized caste oppression, the specific experiences of Dalit women have frequently remained invisible. This paper examines the historical evolution and contemporary manifestations of the double marginalization of Dalit women through the theoretical frameworks of Brahmanical patriarchy, Dalit feminist standpoint, and intersectionality. Drawing upon qualitative analysis of Dalit women's autobiographies, scholarly literature, and contemporary reports, the study argues that Dalit women experience a distinct form of structural violence that cannot be understood through single-axis analyses of either caste or gender. The paper further highlights the agency, resistance, and intellectual contributions of Dalit women in challenging oppressive structures. It concludes that meaningful social justice requires an integrated approach that addresses caste, gender, and economic inequalities simultaneously.

Keywords: Dalit Women, Intersectionality, Brahmanical Patriarchy, Caste, Gender, Dalit Feminism, Social Exclusion, Resistance

Introduction

Indian society has historically been structured through multiple systems of hierarchy and exclusion. Among these, caste and patriarchy have emerged as two of the most enduring mechanisms of social stratification. While caste organizes society through hereditary hierarchy and exclusion, patriarchy regulates gender relations through male dominance and control over women's bodies, labor, and sexuality. The intersection of these systems has produced a unique experience of oppression for Dalit women, who occupy the lowest position within both caste and gender hierarchies.

The concept of "double marginalization" refers to the simultaneous experience of discrimination based on both caste and gender. Dalit women face exclusion not only from dominant caste groups but also within patriarchal structures operating in their own communities. Their experiences reveal the limitations of approaches that examine caste and gender separately. Traditional feminist analyses often fail to account for caste-based discrimination, while caste-based analyses frequently overlook gender-specific forms of oppression.

Historically, Dalit women have been subjected to economic exploitation, sexual violence, social exclusion, and denial of educational opportunities. At the same time, they have actively participated in social reform movements, anti-caste struggles, and feminist activism. Their experiences challenge dominant narratives that portray marginalized women merely as passive victims. Rather than viewing Dalit women as merely 'doubly marginalized,' this paper argues that caste and patriarchy operate as mutually reinforcing structures that produce a qualitatively distinct experience of subordination. The historical control of Dalit women's labour, sexuality, and mobility reveals how Brahmanical patriarchy has functioned not only as a gendered system of domination but also as a mechanism for sustaining caste hierarchy across time.

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Dalit women's autobiographical narratives should be understood not merely as personal testimonies of suffering but as alternative historical archives. These narratives reveal how caste, gender, and economic exploitation have functioned together across different historical periods while simultaneously documenting forms of resistance often absent from conventional historical records. By placing Dalit women's voices at the center of analysis, the study challenges dominant historiographical traditions and demonstrates that any understanding of Indian society remains incomplete without incorporating Dalit women's perspectives.

Historiography

The study of caste and gender in India has undergone significant transformation over the past several decades. Early scholarship on caste was largely dominated by sociological and anthropological analyses that focused on the structure and functioning of the caste system. Scholars such as M. N. Srinivas and Louis Dumont examined caste as a system of social hierarchy and ritual status. While these studies contributed substantially to the understanding of caste relations, they paid limited attention to the specific experiences of women, particularly those belonging to marginalized castes.

The emergence of feminist historiography in the 1970s and 1980s shifted scholarly attention toward women's experiences and the operation of patriarchy in Indian society. Historians and feminist scholars such as Uma Chakravarti, Kumkum Sangari, and Sudesh Vaid highlighted the historical construction of gender inequality and the relationship between patriarchy, social institutions, and power structures. Uma Chakravarti's concept of "Brahmanical Patriarchy" was especially influential in demonstrating how caste hierarchy was maintained through the regulation of women's sexuality, marriage, and reproduction. However, much of the early feminist scholarship was criticized for its tendency to universalize women's experiences and insufficiently address caste-based differences among women.

Parallel to feminist scholarship, Dalit studies emerged as a distinct field focusing on caste oppression, social exclusion, and resistance. The writings of B. R. Ambedkar provided the intellectual foundation for understanding caste as a system of graded inequality and social domination. Later scholars examined the political, economic, and cultural dimensions of Dalit marginalization. Nevertheless, Dalit movements and scholarship were often criticized for privileging male experiences and failing to adequately represent the concerns of Dalit women.

The intervention of Dalit feminist scholars marked a significant turning point in the historiography of caste and gender. Gopal Guru's influential essay "Dalit Women Talk Differently" argued that Dalit women experience a distinct form of oppression that cannot be reduced either to caste or gender alone. Building upon this insight, Sharmila Rege developed the concept of the Dalit Feminist Standpoint, emphasizing that Dalit women's lived experiences constitute an important source of knowledge capable of challenging both mainstream feminism and male-centered anti-caste discourse. Dalit women's autobiographical writings, including those of Baby Kamble, Bama, and Urmila Pawar, further expanded the historiographical field by foregrounding voices historically excluded from academic narratives. This also provides powerful insights into everyday experiences of caste and gender oppression. These narratives reveal how discrimination operates not only through institutional structures but also through daily interactions, labor practices, and cultural norms.

More recent scholarship has increasingly employed the framework of intersectionality, originally developed by Kimberlé Crenshaw, to analyze the interconnected nature of caste, gender, class, and other forms of social inequality. Scholars have argued that Dalit women occupy a unique social location characterized by multiple and overlapping structures of oppression. This approach has enriched understanding of issues such as labor exploitation, sexual violence, educational exclusion, and political participation. Uma Chakravarti's concept of Brahmanical patriarchy offers another important framework. She demonstrates how caste purity is maintained through the control of women's sexuality and reproductive capacities. According to Chakravarti, caste and patriarchy are mutually reinforcing systems that cannot be separated analytically.

Together, these scholars have contributed to the development of a distinct field of Dalit feminist scholarship that foregrounds intersectionality and challenges universalizing approaches to gender and social inequality.

Despite these important contributions, significant gaps remain in the historiography. Much of the existing literature either focuses on caste or gender as separate categories, while fewer studies examine their historical and contemporary intersections in a comprehensive manner. This paper seeks to contribute to this growing body of scholarship by examining the historical evolution and contemporary manifestations of the double marginalization of Dalit women through the combined lenses of intersectionality, Brahmanical patriarchy, and Dalit feminist thought.

Methodology

To analyse the experiences of Dalit women, this study draws upon three theoretical perspectives: Intersectionality, Brahmanical Patriarchy, and the Dalit Feminist Standpoint. Kimberlé Crenshaw's theory of intersectionality argues that multiple forms of oppression interact to create unique experiences of marginalization. In the Indian context, caste and gender intersect to produce forms of discrimination that are qualitatively different from either caste-based or gender-based oppression alone. The concept of Brahmanical patriarchy explains how caste hierarchy is maintained through the regulation of women's sexuality. Endogamy, restrictions on marriage, and control over women's mobility function as mechanisms for preserving caste boundaries. The Dalit Feminist Standpoint emphasizes that marginalized groups possess unique epistemological insights derived from their lived experiences. Dalit women's narratives therefore serve not merely as sources of data but as alternative frameworks for understanding Indian society. The focus is on understanding lived experiences, historical processes, and structural forms of domination rather than measuring statistical trends. Primary sources include autobiographical writings by Dalit women such as Baby Kamble's *The Prisons We Broke*, Bama's *Sangati*, and Urmila Pawar's *The Weave of My Life*. These texts provide valuable insights into everyday experiences of discrimination and resistance. Secondary sources include academic journal articles, books, human rights reports, and contemporary discussions on caste and gender. The study employs thematic analysis to identify recurring patterns related to labor exploitation, sexual violence, social exclusion, education, and resistance.

Historical Evolution of Dalit Women's Marginalization

The roots of Dalit women's marginalization can be traced to the consolidation of caste hierarchy in ancient India. As social divisions became increasingly hereditary, caste-based occupations and social exclusion were institutionalized. Simultaneously, patriarchal norms intensified control over women's sexuality and reproductive capacities. Classical texts such as the *Manusmriti* contributed to the codification of both caste hierarchy and gender inequality. Women's autonomy was restricted through norms governing marriage, inheritance, and social behavior. These restrictions were particularly severe for women belonging to marginalized castes.

"Pita rakshati kaumare, bharta rakshati yauvane,

Rakshanti sthavire putrah, na stri swatantryamarhati." (*Manusmriti*)

(In childhood, a woman is protected by her father; in youth, by her husband; and in old age, by her sons. Therefore, a woman is not considered deserving of independence)

During the medieval period, caste hierarchy became further entrenched through feudal social relations. Dalit women were subjected to forms of labor exploitation and sexual vulnerability that reflected both caste and gender inequalities. Unlike upper-caste women, whose mobility was often restricted through practices such as *purdah*, Dalit women remained engaged in public labor but without social protection or recognition. The colonial period introduced new opportunities through education, legal reform, and social movements. Reformers such as Jyotirao Phule, Savitribai Phule, and B.R. Ambedkar challenged caste oppression and advocated women's rights. Ambedkar in particular emphasized the central role of women in maintaining caste structures through endogamy and argued that caste annihilation required gender equality.

Economic Exploitation and Labor

One of the most persistent dimensions of Dalit women's marginalization is economic exploitation. Historically, caste-based occupations confined Dalit communities to stigmatized forms of labor. Dalit women frequently occupied the lowest positions within these occupational hierarchies. Manual scavenging remains a stark example of caste and gender intersection. Despite legal prohibitions, many women continue to perform sanitation-related labor under degrading conditions. Such work is not merely economically exploitative but also symbolically reinforces notions of impurity and social exclusion. In agricultural settings, Dalit women often work as landless laborers. They perform physically demanding tasks while receiving lower wages than men and facing discrimination from dominant caste employers. Their labor contributes significantly to rural economies, yet it remains undervalued and largely invisible. Urbanization has transformed rather than eliminated exploitation. Many Dalit women now work in domestic service, construction, sanitation, and informal-sector employment. These occupations often lack legal protections, social security, and opportunities for advancement.

Sexual Violence as a tool of Caste Power

Sexual violence represents one of the most visible manifestations of caste and gender oppression. Numerous studies have demonstrated that violence against Dalit women frequently serves as a mechanism for asserting caste dominance. Unlike gender-based violence that occurs solely within patriarchal structures, violence against Dalit women often carries a collective and symbolic dimension. It is used to punish communities, reinforce social hierarchies, and suppress demands for equality. The persistence of such violence reflects broader structural inequalities. Limited access to justice, social stigma, and institutional bias often prevent survivors from obtaining legal remedies. As a result, sexual violence functions not only as an individual crime but also as a political instrument of social control.

Education and Social Mobility

Education has emerged as a crucial site of both exclusion and empowerment. Historically, Dalit women were denied access to formal education. Social stigma, economic hardship, and institutional discrimination restricted educational opportunities across generations. However, educational advancement has also become an important source of resistance. Inspired by the legacy of Savitribai Phule and B.R. Ambedkar, increasing numbers of Dalit women have entered schools, universities, and professional fields. Despite these gains, significant barriers remain. Experiences of caste discrimination, lack of resources, and underrepresentation continue to affect educational outcomes. Nevertheless, education remains a powerful tool for challenging entrenched inequalities and creating new forms of social mobility.

Resistance and Agency

A key contribution of Dalit feminist scholarship is its emphasis on agency rather than victimhood. Dalit women have consistently resisted oppressive structures through social activism, literature, education, and political participation. The writings of Dalit women constitute important acts of resistance. By documenting lived experiences, these narratives challenge dominant representations and create alternative histories. They transform personal experiences into collective political consciousness. Grassroots movements led by Dalit women have also addressed issues such as land rights, violence, labor exploitation, and access to public resources. Their activism demonstrates that marginalized communities are not merely subjects of oppression but active participants in social transformation.

The findings of this study demonstrate that the marginalization of Dalit women cannot be understood through isolated categories of caste or gender. Rather, it emerges from the intersection of multiple structures of power. The concept of intersectionality provides a valuable framework for understanding these dynamics. Dalit women's experiences reveal how different systems of oppression interact and reinforce one another. Economic exploitation, social exclusion, and violence are not separate phenomena but interconnected dimensions of structural inequality. Furthermore, the

analysis highlights the limitations of both mainstream feminism and traditional anti-caste politics. A genuinely inclusive framework must recognize the specific experiences and voices of Dalit women.

Contemporary Continuities of Caste and Gender Oppression

This study shows that the experiences of Dalit women cannot be understood by looking at caste and gender separately. These two systems of inequality work together and shape the everyday lives of Dalit women in different ways. The historical analysis suggests that caste and patriarchy have developed alongside each other, and both have played an important role in controlling women's labour, sexuality, and social position.

The concept of Brahmanical patriarchy helps explain this relationship. As Uma Chakravarti points out, the maintenance of caste has depended on controlling women's roles and behaviour. However, the experiences of Dalit women show that the impact of this system has not been the same for all women. While upper-caste women faced restrictions related to caste purity, Dalit women were also subjected to hard labour, social exclusion, and various forms of exploitation. This highlights the fact that women's experiences are shaped not only by gender but also by caste.

The autobiographies of Baby Kamble, Bama, and Urmila Pawar provide valuable insights into these realities. Their writings show how caste and gender discrimination are present in everyday life, including within families, workplaces, and communities. At the same time, these narratives also reveal the strength, resilience, and resistance of Dalit women. By sharing their experiences, these writers challenge dominant historical narratives and bring forward voices that have often been ignored in mainstream history.

This also points to the limitations of both mainstream feminist and anti-caste approaches. Mainstream feminism has often focused on women's issues without giving enough attention to caste, while anti-caste movements have not always addressed the specific problems faced by women. The experiences of Dalit women show the importance of an intersectional approach that considers both caste and gender together.

Despite constitutional guarantees of equality and various legal reforms, many Dalit women continue to face violence, discrimination, and economic inequality. This suggests that historical patterns of exclusion continue to influence present-day social relations. Therefore, the condition of Dalit women can only be fully understood by examining the close relationship between caste and patriarchy.

Overall, this study argues that the lives of Dalit women provide an important perspective for understanding social inequality in India. Their experiences highlight the need to move beyond separate discussions of caste and gender and adopt a more inclusive approach to questions of justice, equality, and social change.

Conclusion

Dalit women occupy a unique position within India's social hierarchy, shaped by the simultaneous operation of caste and patriarchy. Their experiences illustrate the inadequacy of single-axis approaches to understanding social inequality. The experiences of Dalit women cannot be understood by looking at caste and gender separately. Their lives are shaped by the combined impact of both caste discrimination and patriarchy, which have worked together over time to create multiple forms of exclusion and inequality. The study has argued that the control over Dalit women's labour, sexuality, education, and social mobility has played an important role in maintaining caste hierarchies in Indian society.

By examining both historical developments and contemporary realities, the paper highlights how many of the challenges faced by Dalit women today are deeply rooted in historical structures. Issues such as economic exploitation, violence, educational barriers, and social discrimination continue to affect their lives despite legal and constitutional protections. At the same time, Dalit women have not remained passive victims of oppression. Through education, social activism, literature, and political participation, they have continuously challenged systems of inequality and asserted their rights.

The writings and experiences of Dalit women offer important insights into the relationship between caste and gender in India. They also demonstrate the limitations of approaches that focus only on gender or only on caste. Understanding the realities of Dalit women requires an intersectional perspective that recognizes the interconnected nature of these forms of oppression.

In conclusion, the study emphasizes that the struggle for social justice in India cannot be separated from the experiences of Dalit women. Their voices and histories are essential for understanding both the persistence of inequality and the possibilities for social change. Further research can explore regional differences, contemporary Dalit women's movements, and new forms of resistance that continue to reshape debates on caste, gender, and equality in India.

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The Cultural Memory of Partition in Contemporary Indian Cinema

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Abstract

Contemporary Indian cinema plays a crucial role in shaping the cultural memory of the 1947 Partition. The Partition of India in 1947 remains one of the most devastating events in South Asian history, and its memory continues to shape literature, politics, and cinema. Moving beyond dry historical archives, films use emotive storytelling and personal narratives to help modern audiences digest the trauma of displacement, gendered violence and communalism. Contemporary Indian cinema revisits the Partition not only as a historical event but also as a continuing emotional and political experience. Films such as *Earth* (1998), *Pinjar* (2003), *Garam Hava* (1973), *Train to Pakistan* (1998), *Manto* (2018), *Bhaag Milkha Bhaag* (2013), and *Begum Jaan* (2017) show how Partition is remembered through loss, displacement, identity crisis, migration, communal tension and gender violence.

This paper explores how contemporary Indian cinema navigates this memory, moving beyond simple political narratives toward a deeper, subjective engagement with the human tragedy of 1947. It studies cinematic techniques, the representation of trauma, role of women, religious identity, and intergenerational memory. Indian filmmakers recreated the emotional realities of Partition and encourage audiences to reflect upon nationalism, humanity, and coexistence through visual storytelling.

Keywords: Partition, Cultural Memory, Indian Cinema, Trauma, Identity, Migration, Collective Memory, Contemporary Cinema, Nationalism.

Introduction

The Partition of India in 1947 was a massive human catastrophe and one of the largest forced migrations in world history. The division of British India led to widespread violence, communal riots, displacement, abduction of women, and the destruction of families and communities. Historians estimate that nearly one million people lost their lives and more than 14 million were displaced during this period.

Partition memories are passed from one generation to another through stories, family histories, novels, memoirs, documentaries, and cinema. Cinema occupies a special place in preserving and shaping public memory because films combine visuals, music, emotions, and storytelling. Early films after Independence rarely addressed Partition directly due to political sensitivity and social instability. However, later filmmakers began to explore the emotional and psychological impact of Partition more openly. Films such as *Pinjar*, *Earth*, *Manto*, and *Begum Jaan* show how Partition continues to influence religious relations, gender identities, nationalism, and collective consciousness.

This paper studies how contemporary Indian cinema represents cultural memory of Partition and how films become spaces for remembering trauma, negotiating identity, and preserving historical consciousness. The central argument is that films about Partition often work in two ways at once: they preserve the pain of displacement and violence, but they also reorganize that pain into narrative form. As a result, cinema creates memories, but it also controls them.

Research Objectives

1. To examine the representation of the Partition in contemporary Indian cinema.
2. To analyze how cinema preserves cultural and collective memory of Partition.

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3. To study themes of trauma, displacement, gender violence, and identity crisis in Partition films.
4. To understand the role of cinema in shaping historical consciousness and public memory.
5. To evaluate the relevance of Partition narratives in present-day India.

Research Methodology

This research paper follows an analytical and qualitative approach. This study is based on a textual and thematic analysis of selected Indian films related to the Partition. Secondary sources such as journal articles, books, research papers, online archives and film criticism were also consulted.

The selected films included:

- *Garam Hava* (1973)
- *Earth* (1998)
- *Train to Pakistan* (1998)
- *Pinjar* (2003)
- *Begum Jaan* (2017)
- *Manto* (2018)
- *Bhaag Milkha Bhaag* (2013)

This study uses theories of cultural memory, trauma studies, and cinematic representation to understand how films recreate historical experiences. This study also examines dialogues, symbols, visual imagery, characterization, and narrative structures in the films.

Understanding Cultural Memory and Cinema

Cultural memory refers to the way societies remember their past through shared cultural forms; according to cultural theorists, societies preserve memory through stories, rituals, monuments, literature, and visual media.

Cultural memory is collective and is transmitted across generations. Partition memory has been carried through family narratives, literature, official history and film. Therefore, the trauma of the Partition is not frozen in 1947; it continues to be reinterpreted in later decades.

Unlike official historical documents, films focus on personal experiences and emotional truth. Cinema allows audiences to connect with the past visually and psychologically also experience fear, migration, violence, and loss associated with historical events. Films about Partition show broken families, ruined houses, deserted trains, and borders that divide lives.

Partition cinema often combines personal traumas with collective histories. The memories shown in films are not only limited to individual suffering but they often represent national and cultural anxieties. Many filmmakers use memory to question nationalism, communal politics, and historical violence.

Cultural memory is not neutral. A film may present itself as historical truth, but it still chooses which voices to include and which to exclude. This is especially important in Partition narratives, where women, refugees, minorities, and the poor are often represented through limited or symbolic forms. Scholars have argued that Indian Partition Cinema functions as site of memorialization where trauma is revisited and interpreted through cinematic language.

Partition in Cinema

The partition has appeared in Indian cinema in different ways over time. Earlier works often focused on the immediate violence of migration and communal hatred. Later films began to use Partition as a background for stories about identity, masculinity, nationalism, and survival. It portrays violence, migration, and emotional distress. Trauma appears not only in physical violence but also in silence, memory, and emotional disintegration. This shift shows that the Partition has moved from being a direct historical subject to becoming a broader cultural symbol.

In Indian Films, trauma is represented through broken homes, refugee experiences, disrupted families and communal hatred. Cinema shows characters struggling to rebuild identities after displacement. The cinematic portrayal of trauma reflects the inability of language to fully express suffering.

Muslim Identity & Garam Hava

M. S. Sathya's film *Garam Hava* is considered one of the most important Partition films in Indian cinema. The film focuses on the struggles of Muslim families in post-partition India. *Garam Hava* presents emotional trauma and social alienation unlike many films that show physical violence.

The film highlights the uncertainty faced by Indian Muslims after the Partition. It captures the psychological atmosphere of fear and isolation through realistic storytelling and subtle performance. The film also critiques communal politics and shows how ordinary people suffer because of political decisions. It remains relevant today because it addresses questions of citizenship, belonging, and secularism.

Representation of Women in Partition Cinema

During Partition, women experienced unique forms of violence such as sexual assault, forced conversion, abduction and honour killings became tragic realities. Contemporary Films often uses women to represent the violence inflicted upon communities and nations.

Pinjar

CP Dwivedi's, *Pinjar* is based on a novel by Amrita Pritam. The film tells the story of Puro, a Hindu woman abducted by Rashid, a Muslim man. Puro's suffering symbolizes the larger trauma experienced by women during Partition. *Pinjar* also questions patriarchal ideas of honor and purity. Puro's family refuses to accept her after abduction because they fear social shame. The film criticizes communal hatred and patriarchal structures.

Earth

Deepa Mehta's *Earth* is based on *Cracking India*. The film presents Partition through the eyes of a child. This perspective makes the violence more disturbing because innocence gradually collapses in front of communal hatred. *Earth* visualizes trauma through cinematic techniques such as fragmented storytelling, unstable framing, symbolic imagery, emphasizes memory and emotional loss. The narrative demonstrates how Partition shattered human relationships and transformed social identities.

Displacement and Refugee Experience

Migration is a recurring theme in partition cinema. Millions of people lost their homes, property, and social networks during the division of India and Pakistan. Refugees are forced to rebuild their lives in unfamiliar places.

Cinema often portrays trains, borders, refugee camps, and abandoned homes as symbols of displacement. These visual elements create emotional memories associated with loss and migration.

Train to Pakistan

This Khushwant Singh's novel presents a village divided by communal violence. The film shows how peaceful coexistence suddenly collapses due to political tension and rumours. The arrival of trains carrying dead bodies becomes one of the most terrifying visuals in Partition narratives. The train functions as a cinematic metaphor for death, migration, and the destruction of humanity.

Begum Jaan

These films connect the Partition with present-day politics, nationalism, and identity debates. Srijit Mukherjee's *Begum Jaan* portrays a brothel on the border during the Partition. The women living there become victims of political division because the Radcliffe Line passes through their homes and the film symbolically presents the female body as divided territory. These characters resist displacement and challenge patriarchal power structures.

Manto

Nandita Das's *Manto* focuses on the life of writer Saadat Hasan Manto, whose stories exposed the brutality and hypocrisy surrounding Partition. Manto's writings challenged both Indian and Pakistani nationalism by focusing on human suffering rather than on political ideology. The film suggests that memory survives through stories and artistic expression.

Nationalism and Popular Cinema

Popular Indian cinema often uses the Partition not only as a site of mourning but also as a way to produce patriotic feelings. In films such as *Bhaag Milkha Bhaag*, Partition becomes the traumatic starting point for a story of national achievement. The film turns suffering into motivation and personal success into a symbol of collective strength. This does not remove the pain of Partition, but it does reshape that pain into a larger narrative of triumph.

These films show that the Partition is not only remembered as a historical event. It is also used as a narrative device to explain identity, motivate character development and create emotional intensity. This is one reason why Partition cinema remains culturally powerful as it connects private suffering with national history.

Cinematic Techniques and Representation of Memory

Contemporary Partition films use several cinematic techniques to recreate memories and trauma:

1. Symbolism

Objects such as trains, borders, abandoned houses, torn photographs, and refugee camps symbolize displacement and fractured identity.

2. Flashbacks and Non-linear Narratives

Many films use fragmented narratives to represent unstable memories and psychological trauma.

3. Music and Sound

Background music, silence, and folk songs create emotional intensity and connect the audience with historical suffering.

4. Realistic Visual Style

Film Makers often use realistic settings, natural lighting, and documentary-like visuals to increase authenticity.

5. Human-Centred Narratives

Instead of focusing only on political leaders, films emphasize ordinary individuals and families affected by violence, which helps transform historical events into emotional experiences for viewers.

A Collective Memory

Films play an important role in shaping collective memory. Many younger generations know about the Partition primarily through films and literature rather than through direct experience. Therefore, cinema is a cultural archive that preserves emotional and historical memories.

Partition films also influence public's understanding of nationalism and communalism. They encourage audiences to reflect on the consequences of hatred, intolerance, and political violence. Scholars have argued that Indian cinema contributes to the memorialization of the Partition by reconstructing traumatic experiences for contemporary audiences.

Relevance and Limitations

Therefore, the cultural memory of the Partition in contemporary Indian cinema is complex. On the hand, cinema preserves the emotional reality of 1947 for new generations. However, it reshapes reality into a form suitable for modern audiences. This means that films do not simply recall the past; they also reinterpret it accordance with current social values.

The strongest partition films are those that show both memory and silence. They recognize that trauma cannot be fully represented, but they still attempt to give it an image and voice. Simultaneously, commercial cinema often turns the Partition into a dramatic backdrop rather than a subject of sustained historical reflection. This is why some films feel emotionally powerful but are historically selective.

The gendered dimension is particularly important. Women's experiences are often central to Partition cinema, but they are not always represented with equal depth or complexity. Films may highlight suffering, however, they sometimes stop short of questioning the patriarchal structures that

make suffering possible. Therefore, a serious study of Partition cinema must pay attention to whose memory is being represented and whose memory is being left out.

Conclusion

Contemporary Indian cinema has played an important role in preserving the cultural memory of the Partition and interpreting this traumatic historical event by turning a historical catastrophe into a living narrative of trauma, identity, and national belonging.

Films such as *Garam Hava*, *Earth*, *Pinjar*, *Train to Pakistan*, *Bhaag Milkha Bhaag*, *Begum Jaan*, and *Manto* demonstrate that Partition is not merely a historical event confined to textbooks but also shown how Partition continues to shape the emotional life of India. This remains a living memory that continues to influence identity, politics, and cultural consciousness in South Asia.

At the same time, these films reveal the limitations of cinematic memory. Cinema can remember, but it can also simplify things. It can give voice to trauma, but it can also reshape trauma to fit the needs of nationalism and commercialized storytelling. Therefore, the cultural memory of the Partition in Indian cinema is both valuable and incomplete. It keeps the past alive but also shows how the past is continuously rewritten in the present.

Cinema has become both a memorial space and a medium of social reflection and the cultural memory of the Partition in Indian cinema reflects the continuing struggle to understand trauma, preserve humanity, and imagine coexistence beyond borders and divisions.

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