Registration No. V-36244/2008-09 **ISSN :- 2350-0611**

The journal has been listed in 'UGC Approved List of Journals' with Journal No. – 48441 in previous list of UGC

JIFE Impact Factor – 7.23

Research Highlights

A Multidisciplinary Quarterly International Peer Reviewed Referred Research Journal

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Sevapuri, Varanasi

Volume - XIII **No. - 1** **(Jan. – Mar. 2026)**

(Part-III)

Published by
Future Fact Society
Varanasi (U.P.) India

Research Highlights - *A Referred Journal, Published by : Quarterly*

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ISSN : 2350-0611

Printed by
Interface Computer, B 31/13-6, Malviya Kunj, Lanka, Varanasi-221005 (U.P.)

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EDITOR'S NOTE

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 Scholarly and unpublished research articles, essays and interviews are invited from scholars, faculty researchers, writers, professors from all over the world.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

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"Research Highlights"

Socio-Economic Factors Influencing Savings Pattern in Bihar: A Comparative Study

Dr. Md. Ejaz Aslam*

Abstract

The present study "Socio-Economic Factors Influencing Savings Pattern in Bihar: A Comparative Study" dealth with. Savings constitute a fundamental pillar of economic development, as they contribute significantly to capital formation, investment expansion, and long-term financial stability. In developing economies, household savings play a critical role in enhancing socio-economic welfare and supporting sustainable growth. Bihar, one of India's economically emerging states, has experienced notable growth in recent years; however, it continues to face persistent challenges such as low per capita income, widespread poverty, labor migration, financial exclusion, and limited penetration of formal financial institutions. These structural constraints have a substantial impact on the saving behavior of households across the state. The present study examines the socio-economic factors influencing savings patterns in Bihar through a comparative analysis of rural and urban households, income groups, occupational categories, and educational levels. The study is based on secondary data and an extensive review of existing empirical literature. It investigates the influence of key determinants such as income, education, occupation, family size, gender, financial literacy, and access to banking services on household saving behavior. The findings reveal that income level, educational attainment, financial inclusion, and employment security are the most significant factors affecting household savings. Urban households demonstrate greater participation in formal financial instruments, including bank deposits and insurance schemes, whereas rural households continue to depend largely on informal saving mechanisms. The study concludes that strengthening financial literacy, expanding banking infrastructure, promoting digital financial services, and generating stable employment opportunities are essential for enhancing savings mobilization and fostering inclusive economic development in Bihar.

Keywords- Savings Pattern, Bihar Economy, Financial Inclusion, Socio-Economic Factors, Financial Literacy, Rural Savings, Urban Savings, etc.

Introduction

Savings represent one of the most fundamental pillars of economic development and financial stability. In both developed and developing economies, household savings constitute a major source of domestic capital formation, which in turn facilitates investment, employment generation, technological advancement, and sustainable economic growth. Economists have long recognized the importance of savings in the development process. Classical economists viewed savings as a prerequisite for investment, while Keynesian economists emphasized the role of income, consumption behavior, and marginal propensity to save in determining aggregate savings levels. Modern development theories continue to stress that higher savings rates contribute significantly to economic transformation by providing resources for productive investments.

In the context of developing countries such as India, household savings play an especially important role because they account for a substantial share of national savings. Unlike advanced economies where corporate and government savings contribute significantly to capital formation, household savings remain the backbone of India's financial system. These savings not only support individual financial security but also contribute to the broader economy through banking institutions, insurance schemes, pension funds, and capital markets. Consequently, understanding the

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determinants of household savings has become a crucial area of economic research and policy formulation.

The savings behavior of individuals and households is influenced by a complex interaction of socio-economic, demographic, cultural, and institutional factors. Income level, educational attainment, occupation, family size, age composition, gender, social status, financial literacy, and access to financial institutions are among the most important determinants that shape saving decisions. The impact of these factors varies across regions and socio-economic groups, creating significant disparities in savings patterns within a country. Therefore, regional-level studies are necessary to identify location-specific determinants and formulate targeted policy interventions.

Bihar, one of the most populous states in India, presents a distinctive socio-economic environment for examining household savings behavior. Historically, Bihar has been characterized by low levels of industrialization, high population density, widespread poverty, and limited access to formal financial services. Although the state has witnessed considerable economic progress during the last two decades, several structural challenges continue to affect household income and saving capacity. The predominance of agriculture, informal employment, seasonal migration, and relatively low levels of financial literacy significantly influence the financial decisions of households[1].

According to various socio-economic indicators, Bihar continues to lag behind the national average in terms of per capita income, urbanization, industrial development, and financial inclusion. A substantial proportion of the state's population resides in rural areas, where dependence on agriculture and informal occupations often results in unstable income flows. Such income uncertainty directly affects the ability of households to accumulate savings. Furthermore, the prevalence of large family sizes and high dependency ratios places additional pressure on household expenditure, reducing the amount available for savings. One of the most significant developments in recent years has been the expansion of financial inclusion initiatives. Government programs such as the Pradhan Mantri Jan Dhan Yojana (PMJDY), Direct Benefit Transfer (DBT), Digital India, and various microfinance schemes have enhanced access to formal banking services among previously excluded populations. The rapid expansion of banking infrastructure, mobile banking, and digital payment systems has created new opportunities for households to participate in formal financial markets. However, access alone does not guarantee effective utilization of financial services. Financial awareness, literacy, and trust in formal institutions remain critical determinants of actual saving behavior.

Migration constitutes another important socio-economic factor influencing savings patterns in Bihar. The state has long been a major source of migrant labor for different parts of India. Remittances sent by migrant workers serve as an important source of household income and often contribute significantly to savings and investment decisions. In many rural households, remittance income is utilized for education, healthcare, housing construction, agricultural investment, and precautionary savings[2]. Therefore, migration-related income flows have become an important component of household financial planning in Bihar.

The relationship between education and savings is also particularly relevant in the Bihar context. Education enhances earning capacity, improves financial literacy, and increases awareness regarding various saving and investment options. Individuals with higher educational attainment are generally more likely to use banking services, insurance products, mutual funds, and pension schemes. Conversely, limited educational opportunities may restrict awareness of formal financial instruments and encourage dependence on traditional saving practices such as cash holdings, gold, and livestock.

Gender dimensions further contribute to variations in saving behavior. Women's participation in Self-Help Groups (SHGs), microfinance institutions, and community-based savings programs has expanded significantly across Bihar. These initiatives have promoted financial inclusion among women and strengthened household savings habits. The growing role of women in

household financial decision-making has generated new opportunities for improving financial security and economic empowerment.

Rural-urban disparities also represent a crucial aspect of savings behavior in Bihar. Urban households generally benefit from better employment opportunities, higher incomes, greater educational attainment, and easier access to financial institutions. Consequently, they tend to save more through formal channels such as banks, insurance schemes, and investment products. Rural households, on the other hand, often rely on informal savings mechanisms and face greater challenges related to financial accessibility and income stability. Examining these differences is essential for understanding the broader dynamics of household savings in the state.

From a policy perspective, understanding the socio-economic determinants of savings is vital for designing effective development strategies. Higher savings rates enhance financial resilience, reduce vulnerability to economic shocks, and support long-term economic growth. Policymakers can utilize insights from savings behavior studies to develop targeted interventions aimed at promoting financial literacy, strengthening financial inclusion, improving employment opportunities, and encouraging productive investment among households.

Against this background, the present study seeks to examine the socio-economic factors influencing savings patterns in Bihar through a comparative analysis of different socio-economic groups. The study focuses on identifying the key determinants of household savings and assessing the extent to which income, education, occupation, family characteristics, financial literacy, migration, and financial inclusion influence saving behavior. By providing a comprehensive understanding of the savings dynamics in Bihar, the study contributes to the existing literature on household finance and offers valuable policy recommendations for enhancing savings mobilization and promoting inclusive economic development.

Income Level : Income is universally recognized as the most important determinant of savings. Households with higher disposable income possess greater capacity to save. In Bihar, large sections of the population depend on agriculture and informal employment, resulting in irregular income streams that limit savings potential.

Educational Attainment : Education influences financial awareness, investment decisions, and understanding of formal financial products. Educated households are more likely to maintain bank accounts, invest in insurance schemes, and participate in formal saving instruments.

Occupational Structure : Government employees, salaried workers, and professionals typically demonstrate higher savings rates than agricultural laborers and casual workers due to income stability.

Rural-Urban Differences : Urban households generally enjoy better access to banking infrastructure, financial services, and investment opportunities. Rural households often depend on traditional forms of savings such as cash holdings, livestock, and gold.

Migration and Remittances : Bihar experiences substantial out-migration. Remittances sent by migrant workers contribute significantly to household savings and consumption expenditures. Migrant income often serves as an important source of financial security for rural families.

Financial Inclusion : The expansion of banking facilities through schemes such as the Pradhan Mantri Jan Dhan Yojana (PMJDY) has enhanced financial access among low-income households. However, account ownership does not always translate into active saving behavior. Financial literacy remains a critical challenge.

Significance of the Study : The study contributes to understanding the economic behavior of households in Bihar and provides insights for policymakers seeking to strengthen savings mobilization. Improved savings can enhance household resilience, reduce vulnerability to economic shocks, and promote sustainable development.

Importance of the Study : The significance of the present study lies in its attempt to examine the socio-economic factors that influence household savings patterns in Bihar, a state characterized by diverse economic conditions, widespread rural population, and varying levels of financial inclusion.

Savings play a crucial role in both individual financial security and overall economic development. Understanding the determinants of savings behavior is therefore essential for policymakers, researchers, financial institutions, and development planners.

Comparative Analysis of Savings Patterns in Bihar

Variable	Rural Households	Urban Households
Income Level	Lower	Higher
Formal Savings	Limited	Extensive
Financial Literacy	Moderate	High
Banking Access	Restricted in some areas	Better Access
Digital Banking Usage	Low	High
Investment Diversification	Limited	Greater
Savings Rate	Moderate	High
Dependence on Informal Savings	High	Low

Major Determinants of Savings

Determinant	Impact on Savings
Income	Very High
Education	High
Occupation	High
Family Size	Moderate
Financial Literacy	High
Banking Access	High
Migration Remittances	Moderate to High
Digital Finance	Increasingly Important

Review Literature-

Ayushi Raichoudhury (2025) Revisiting Financial Inclusion: Does Socio-economic Development Matter? The study found that household income, literacy, awareness of financial schemes, and proximity to banking institutions significantly influence financial inclusion and formal savings behavior. Higher educational attainment was associated with greater participation in formal financial systems[3].

Mukesh Kumar Mishra (2025) Financial Literacy and Retirement Planning Trends: An Empirical Investigation of Financial Planning in Saharsa District in Bihar. The study found that financial literacy positively influences saving and investment decisions among households in Bihar. Behavioral and socio-economic factors significantly affect financial planning[4].

Dr. Manta Dey, Navtej Tiwari, and Rupsha Dey (2024) Catalysing Economic Enfranchisement: An Exploration of Financial Inclusion Dynamics in Bihar. The authors highlighted that financial accessibility, migration patterns, occupational structures, and socio-economic conditions are major determinants of financial inclusion and savings behavior in Bihar[5].

Anirban Hazra and Neelanjan Mitra (2024) Economic Analysis of Household Savings Behaviour: Insights from India. Using NSSO data, the authors identified income as the strongest determinant of household savings. The study also noted the influence of demographic and occupational characteristics on saving behavior[6].

Swati Dutta and Balwant Singh Mehta (2021) Banking the Unbanked: The Performance and Impact of PMJDY Schemes on Poor Households in Bihar. The study found that education and financial literacy significantly affect the active use of bank accounts and savings products. Financial inclusion initiatives improved account ownership but did not necessarily increase savings without awareness and financial education[7].

Taufeeque Ahmad Siddiqui and Kashif Iqbal Siddiqui (2020) Telecommunication, Socioeconomic, and Financial Inclusion: An Empirical Evidence from Bihar. The study demonstrated that socio-economic development and technological access positively influence financial inclusion and saving behavior among rural households[8].

Rajat Deb (2016) Determinants of Savings in Sukanya Samriddhi Account: Evidence from Tripura. The study concluded that education, awareness, income, and accessibility to financial institutions significantly affect savings participation among households[9].

Rajarshi Ghosh and Asis Kumar Pain (2005) What Determines Household Savings in India? The authors identified income, demographic characteristics, employment status, and macroeconomic conditions as major determinants of household savings[10].

Objectives-

1. To analyze the savings pattern of households in Bihar.
2. To examine the socio-economic factors influencing household savings.
3. To compare rural and urban savings behavior.
4. To evaluate the impact of education and financial literacy on savings.
5. To suggest policy measures for enhancing household savings in Bihar.

Hypothesis-

1. Income level has a significant positive impact on household savings in Bihar.
2. Educational attainment positively influences saving behavior.
3. Urban households save more through formal financial institutions than rural households.
4. Financial literacy significantly affects the choice of savings instruments.
5. Access to banking and financial services positively influences household savings.

Discussion : The present study examined the socio-economic factors influencing savings patterns in Bihar through a comparative analysis of different socio-economic groups. The findings indicate that household savings behavior is not determined by a single factor; rather, it is shaped by the interaction of income, education, occupation, family structure, financial literacy, migration, and access to financial institutions. These findings are consistent with both classical and contemporary theories of household savings, which emphasize the role of economic capacity and social characteristics in determining saving behavior.

Income as the Primary Determinant of Savings : The analysis reveals that income level is the most significant determinant of household savings in Bihar. Households with higher and more stable incomes demonstrate a greater capacity to save, while low-income households often struggle to meet basic consumption needs, leaving little scope for savings. This finding supports Keynes's Absolute Income Hypothesis, which argues that savings increase as income rises. In Bihar, where a large proportion of the population is engaged in agriculture and informal-sector employment, income instability remains a major constraint on savings accumulation.

The study further indicates that households receiving remittances from migrant workers exhibit relatively higher savings rates. Migration has emerged as an important economic strategy for many families in Bihar, and remittance income often provides financial resources that can be allocated toward savings, investment, education, and asset creation.

Overall the study confirms that savings behavior in Bihar is shaped by a combination of economic, social, and institutional factors. Income remains the most influential determinant, but education, occupation, financial literacy, and access to financial services also play critical roles. Significant disparities exist between rural and urban households, highlighting the need for targeted interventions. The findings underscore the importance of integrating financial inclusion, educational

advancement, employment generation, and social development policies to create an environment conducive to higher household savings. Such measures will not only improve individual financial security but also contribute to the long-term economic development of Bihar and India as a whole.

Conclusion : The study reveals that savings behavior in Bihar is strongly influenced by socio-economic characteristics. Income remains the most significant determinant of household savings, followed by education, occupation, financial literacy, and access to formal financial institutions. Urban households exhibit greater participation in formal savings mechanisms due to better financial infrastructure and higher awareness levels, whereas rural households continue to rely significantly on informal savings channels.

Financial inclusion initiatives such as PMJDY have increased account ownership among disadvantaged groups; however, the effective utilization of these accounts for savings remains constrained by low financial literacy and limited awareness of financial products. Education plays a transformative role by improving financial decision-making and encouraging long-term saving habits. Migration and remittance income also contribute significantly to household savings in Bihar, particularly in rural regions.

To improve savings mobilization, policymakers should focus on strengthening financial literacy programs, expanding banking infrastructure, promoting digital financial services, enhancing employment opportunities, and developing savings products tailored to the needs of low-income households. Such measures would not only improve household financial security but also contribute to capital formation and sustainable economic development in Bihar.

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Federalism and the Politics of Counter-Insurgency: State Capacity and Left-Wing Extremism in Bihar

Dr. Rajesh Kumar*

Abstract

This article examines Left-Wing Extremism in Bihar through the combined lenses of Indian federalism, state capacity and democratic counter-insurgency. It argues that the decline of Maoist violence in Bihar cannot be understood only as a technical security outcome. It has to be situated within a broader transformation in the relationship between the Union, the State government, district administrations and rural society. Bihar's experience is analytically significant because Naxalite politics in the state historically emerged from agrarian inequality, caste power, land conflicts, social humiliation and the limited reach of formal justice. In such a setting, counter-insurgency is not merely a question of coercive capacity; it is also a test of the State's ability to provide security, development, rights and credible governance. The article shows that India's constitutional architecture places police and public order primarily within the State List, while the Union government plays a major supplementary role through central forces, funding, intelligence, development schemes and policy coordination. This produces a form of negotiated security federalism in which success depends on coordination rather than unilateral authority. Official data show a major contraction of Left-Wing Extremism in Bihar, including the decline of recorded incidents and the reclassification of formerly affected districts. Yet the article cautions that administrative success must not be equated with the complete resolution of the social conditions that once sustained insurgency. Durable peace in Bihar requires a post-conflict governance strategy focused on institutional trust, rights-based development, local justice, social inclusion and the continued strengthening of state capacity.

Keywords: federalism, counter-insurgency, Left-Wing Extremism, Bihar, state capacity, internal security, governance, India.

1. Introduction

Left-Wing Extremism in India has often been described as both a security threat and a crisis of governance. The duality is important: Maoist insurgency uses violence against the State, but its social appeal has historically drawn upon grievances rooted in land, caste, class, dispossession, administrative absence and failures of justice. Bihar illustrates this duality with unusual clarity. The state was one of the major theatres of Naxalite mobilisation, especially in its central and southern districts, where agrarian inequality and caste domination generated intense political conflicts. At the same time, the state has witnessed a marked decline in recorded Left-Wing Extremist violence in recent years, making it an important case for examining the relationship between counter-insurgency and democratic state-building.

The central argument of this article is that the politics of counter-insurgency in Bihar is best understood as a problem of federal state capacity. "Federal" is important because internal security in India is constitutionally divided: police and public order are primarily State subjects, yet the Union government has become indispensable through central armed police forces, intelligence inputs, development grants, road and telecommunication programmes, and national-level policy frameworks. "State capacity" is equally important because the ability to suppress violence is only one part of democratic counter-insurgency. A state must also administer justice, deliver public goods, create employment, protect vulnerable communities and build the legitimacy of lawful institutions.

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The article proceeds from three research questions. First, how did Bihar's socio-political structure shape the nature of Left-Wing Extremism? Second, how does Indian federalism affect the design and implementation of counter-insurgency policy in the state? Third, what does the recent decline of Left-Wing Extremism in Bihar reveal about the strengths and limitations of state capacity? The argument developed here is that Bihar's experience cannot be reduced either to a policing success or to a developmental success. It is an outcome of interactions among security operations, infrastructure expansion, welfare measures, district administration, social change, and federal coordination.

Methodologically, the article uses a qualitative political analysis supported by official data and secondary scholarly literature. It relies on Government of India sources for recent figures on Left-Wing Extremism, district classification and development initiatives, and uses academic studies on central Bihar's Naxalite movement to interpret the social roots of insurgency. The empirical data are not treated as self-explanatory. They are read politically, with attention to what they show, what they obscure, and how they should be interpreted in relation to democratic governance.

2. Conceptual Framework: State Capacity and Democratic Counter-Insurgency

The concept of state capacity is central to the analysis of insurgency. In the narrowest sense, it refers to the ability of the State to enforce decisions, maintain order and monopolise legitimate violence. In a wider sense, it refers to the State's ability to penetrate society, collect information, deliver services, resolve disputes and secure compliance without relying primarily on coercion. Michael Mann's distinction between despotic and infrastructural power is useful here. Despotic power refers to the State's ability to act over society, while infrastructural power refers to its ability to act through society by embedding administrative, legal and communicative networks across territory.[1]

In insurgency-affected regions, the distinction is crucial. A state may possess enough coercive power to conduct raids and deploy forces, but may lack the infrastructural power required to provide schools, roads, banking access, welfare delivery, land records, courts and responsive local administration. Conversely, a state may announce development schemes but fail to protect workers, contractors, teachers and citizens from insurgent coercion. Counter-insurgency therefore demands a layered understanding of capacity. Security capacity is necessary but not sufficient; administrative and developmental capacity must convert territorial control into legitimate governance.

Democratic counter-insurgency differs from authoritarian counter-insurgency in one central respect: it must defeat violence without undermining the constitutional order it claims to defend. The State must use force lawfully, distinguish between armed insurgents and civilian populations, protect rights, and allow democratic dissent. When counter-insurgency becomes indiscriminate, it may weaken insurgent organisation in the short term but damage the legitimacy of the State in the long term. In contrast, rights-respecting security operations can strengthen the State by demonstrating that law is more credible than violence.

State capacity also has a legitimacy dimension. Citizens do not evaluate the State only by its formal authority; they evaluate it through encounters with police stations, revenue offices, schools, ration shops, courts, banks and local elected bodies. Where these institutions are absent, corrupt, discriminatory or inaccessible, insurgent groups can claim to offer alternative justice and representation. Bihar's history of Left-Wing Extremism shows that insurgency is not merely produced by poverty. It is produced by the combination of poverty, domination and the failure of legitimate institutions to provide redress.

3. Bihar's Naxalite Politics: Agrarian Inequality and Caste Power

Bihar's Naxalite movement has to be situated in the social history of agrarian power. In central and southern Bihar, land relations were deeply intertwined with caste hierarchy. Landowning

[1] Michael Mann, "The Autonomous Power of the State: Its Origins, Mechanisms and Results," *European Journal of Sociology* 25, no. 2 (1984): 185-213.

groups exercised not only economic power but also social and political authority, while landless labourers, many of them from Dalit and marginalised communities, experienced low wages, humiliation, insecurity and limited access to justice. In this setting, Naxalite mobilisation found support not because armed revolution was an abstract ideology, but because it articulated everyday grievances in the language of dignity, wages, land and resistance.

Bela Bhatia's study of the Naxalite movement in central Bihar remains important because it challenges purely security-centred explanations. The movement, she shows, was rooted in local struggles over agrarian relations and social oppression.[2] It emerged in a field where the formal State was often unable or unwilling to protect the weakest citizens. When official mechanisms appeared slow, biased or captured by local elites, insurgent organisations could claim to provide immediate justice, however coercive and violent their own methods were.

George Kunnath's work on becoming a Naxalite in rural Bihar adds an ethnographic depth to this interpretation. It shows that participation in the movement was linked to experiences of class struggle, social humiliation and political awakening.[3] Such findings do not legitimise Maoist violence; rather, they make clear why a purely law-and-order explanation is analytically inadequate. People do not enter insurgent politics only because of ideology. They may do so because formal citizenship has failed to protect them from domination.

At the same time, the Naxalite movement in Bihar cannot be romanticised. Its armed strategy produced fear, targeted killings, extortion, coercive justice and hostility toward democratic institutions. It also contributed to cycles of retaliation involving caste-based private armies and localised violence. The result was a violent political field in which ordinary civilians were often trapped between insurgent groups, private militias and an uneven State. This history is important because it shows that the democratic State faced two simultaneous obligations: to dismantle armed insurgent structures and to correct the conditions of injustice that gave them social meaning.

4. Federalism and the Constitutional Architecture of Internal Security

Indian federalism shapes the politics of counter-insurgency in distinctive ways. Under the constitutional distribution of powers, public order and police fall primarily within the jurisdiction of the states. The Union government, however, cannot remain indifferent to prolonged insurgency because it affects national security, inter-state coordination, development priorities and the authority of the constitutional order. The result is a layered model in which the State government remains formally central to policing, while the Union supplements it through resources, forces, intelligence, funding and national policy.[4]

This structure produces both opportunities and tensions. On the positive side, the Union can provide financial and logistical support that poorer states may lack. It can deploy central armed police forces, assist in modernisation, fund roads and telecommunications, and create common policy frameworks. It can also facilitate coordination across state borders, which is essential because Maoist organisations operate through forested and rural corridors that do not respect administrative boundaries.

On the negative side, federal counter-insurgency may create questions of accountability. If central forces operate in a state, who is politically responsible for their conduct? If development funds are provided by the Union but implemented by district administrations, how is responsibility for delay, corruption or exclusion assigned? If the Union announces national success but local social grievances persist, what level of government bears responsibility for post-conflict governance? These

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[2] Bela Bhatia, "The Naxalite Movement in Central Bihar," *Economic and Political Weekly* 40, no. 15 (2005): 1536-1549.

[3] George J. Kunnath, "Becoming a Naxalite in Rural Bihar: Class Struggle and Its Contradictions," *Journal of Peasant Studies* 33, no. 1 (2006): 89-123.

[4] Constitution of India, Seventh Schedule, State List, Entries 1 and 2; Government of India, Press Information Bureau, Ministry of Home Affairs, "Development in Left Wing Extremism Affected Areas of Bihar," 1 April 2026.

questions are not merely administrative; they are political questions about the nature of Indian federalism.

Bihar's experience suggests that the most effective model is not coercive centralisation but cooperative and negotiated security federalism. The State government must retain ownership of local policing, district administration and social policy, while the Union must provide support in areas where scale, finance and inter-state coordination matter. Counter-insurgency succeeds when the two levels of government do not treat one another as competitors for credit, but as co-producers of security and legitimacy.

5. Counter-Insurgency Governance in Bihar

Counter-insurgency governance in Bihar has included security operations, police strengthening, intelligence coordination, road connectivity, communications, banking access, skill development and special development assistance. The key point is that these are not separate policy worlds. Roads improve the mobility of security forces, but they also connect villages to markets, schools and health services. Mobile towers assist intelligence and emergency response, but they also integrate citizens into communication networks. Banking access helps welfare delivery, but it also reduces dependency on informal power structures. Thus, development infrastructure can have security effects, while security stabilisation can enable development.

Official information on Bihar's Left-Wing Extremism-affected areas lists a series of development initiatives, including mobile towers, post offices, bank branches, automated teller machines, banking correspondents, industrial training institutes and special central assistance.[5] Such measures are politically significant because they extend the visible presence of the State into areas where insurgent groups once benefited from administrative distance. A bank branch or mobile tower is not a counter-insurgency instrument in the narrow sense, yet it can weaken insurgent power by expanding the practical reach of lawful institutions.

The Bihar case also shows that district administration is the everyday face of counter-insurgency. National policy may be designed in New Delhi, and security forces may be deployed under joint arrangements, but ordinary citizens encounter the State in the block office, police station, school, bank and panchayat. If these institutions are inaccessible or discriminatory, the credibility created by security success may erode. If they are responsive and fair, the decline of insurgency can become a transition toward democratic consolidation.

The success of counter-insurgency governance therefore depends on a sequence that is not purely military. The State must secure territory, but then it must govern the territory. It must reduce violence, but then it must address grievances. It must weaken insurgent organisation, but then it must prevent a vacuum in which criminal networks, predatory contractors or local elites capture public resources. The most difficult phase is often the post-violence phase, when official attention declines but the need for institution-building remains high.

6. Empirical Shift: From Active Insurgency to Legacy Management

Recent official data indicate a substantial contraction of Left-Wing Extremism in Bihar. According to Bihar-specific figures released by the Ministry of Home Affairs through the Press Information Bureau, the state recorded 20 incidents in 2021, 11 in 2022, 4 in 2023, 2 in 2024, 3 in 2025 and none up to 15 March 2026. Civilian fatalities similarly fell from 7 in 2021 to zero in 2025 and 2026. These figures suggest a significant reduction in the operational capacity of Left-Wing Extremist groups in the state.[6]

The geographical contraction is equally important. In 2013, 126 districts across India were listed as Left-Wing Extremism-affected. By March 2026, only two districts were described as

[5] Government of India, Press Information Bureau, Ministry of Home Affairs, "Development in Left Wing Extremism Affected Areas of Bihar," 1 April 2026.

[6] Government of India, Press Information Bureau, Ministry of Home Affairs, "Development in Left Wing Extremism Affected Areas of Bihar," 1 April 2026, Annexure II.

affected, while 35 were listed as "Legacy and Thrust" districts. In Bihar, Aurangabad, Gaya, Jamui and Lakhisarai were placed in this legacy category, indicating that they were no longer treated as actively affected but still required continued attention to prevent resurgence.[7] A subsequent Ministry of Home Affairs monthly report stated that as of 8 April 2026 there was no district affected by Left-Wing Extremism, while districts under the Security Related Expenditure framework were reclassified into "Legacy and Thrust" and "District of Concern" categories.[8]

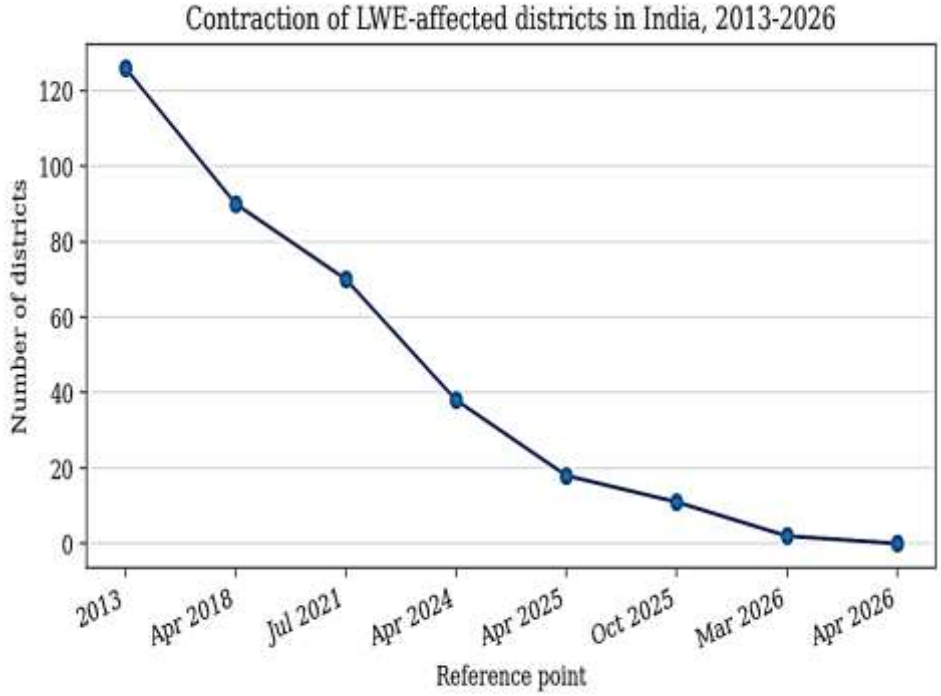

Figure 1: Contraction of LWE-affected districts in India

The figure above captures the symbolic importance of this contraction. Yet the transition from "affected" to "legacy" should be interpreted carefully. Administrative categories are tools of governance, not sociological proof that all underlying grievances have disappeared. A district may no longer have high levels of organised Maoist violence, but it may still have land disputes, unemployment, weak public services, caste tensions or low institutional trust. Legacy management must therefore combine vigilance with development and justice.

National data also show a broader decline in Left-Wing Extremist violence, though yearly patterns are not always linear. The fall in violence demonstrates the weakening of insurgent organisation, but fluctuations in casualties remind us that counter-insurgency success is rarely a smooth process. It involves strategic adaptation by the State, fragmentation or relocation by insurgent groups, local changes in support networks and the political economy of affected regions.

[7] Ibid.
[8] Government of India, Ministry of Home Affairs, "Monthly Major Achievements for April 2026,"June 2026,2-3.

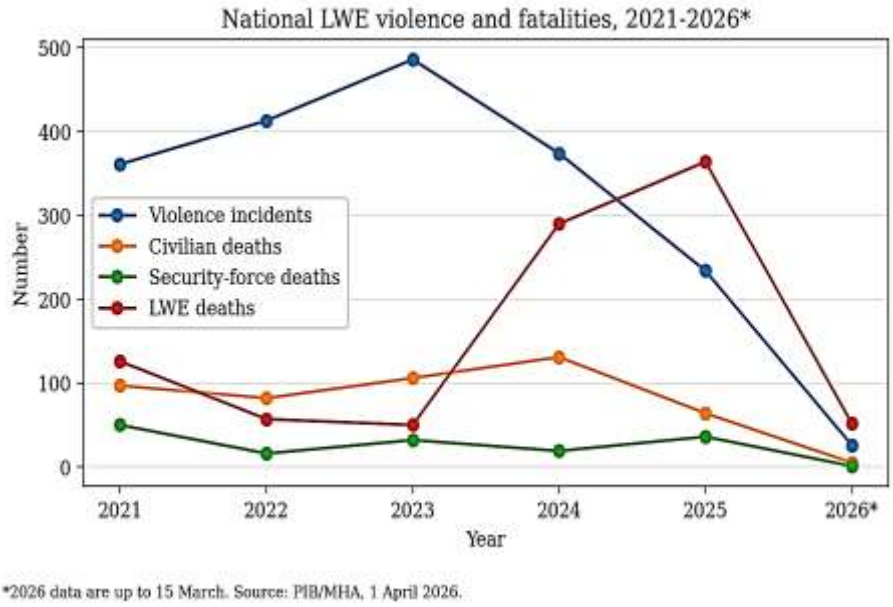

Figure 2: National LWE violence and fatalities, 2021-2026

Bihar's position within the national decline is significant. It suggests that the state has moved from being a major site of Naxalite activity to a space where the central challenge is consolidation. The language of consolidation should be taken seriously. It means that the State must avoid two mistakes: declaring final victory too quickly and withdrawing resources too rapidly. The very logic of the "Legacy and Thrust" category is that the past matters. Insurgency leaves networks, memories, grievances and institutional weaknesses that require patient political management.

7. The Politics of Success

The decline of Left-Wing Extremism in Bihar raises an important analytical question: what counts as success in counter-insurgency? A narrow measure would focus on incidents, fatalities, arrests, surrenders and district classification. These indicators are necessary and valuable. They show whether armed groups retain the capacity to threaten the State and civilians. By these measures, Bihar's recent trajectory is clearly positive.

A wider measure of success, however, must ask whether citizens in formerly affected regions experience the State as legitimate and fair. Do landless labourers and marginalised communities feel safer in approaching the police? Are schools and health centres functional? Are youth able to access skills, employment and mobility? Are welfare benefits delivered without humiliation or extraction? Are local democratic institutions free from intimidation by armed groups or dominant social actors? These questions determine whether counter-insurgency has become democratic state-building.

The politics of success also involves credit-claiming. The Union government may highlight national-level decline, while state governments may emphasise local governance and policing. Security forces may stress operational achievements, while development departments may highlight infrastructure. Academic analysis should not reduce the outcome to one actor. Bihar's decline in Left-Wing Extremism is best seen as a multi-causal process involving security pressure, organisational weakening of Maoist networks, changes in rural politics, increased connectivity, development schemes, welfare delivery, migration, and shifts in public attitudes toward insurgent violence.

A critical point is that insurgency may decline not only because the State becomes stronger, but also because the social basis of insurgency changes. Rural aspirations, migration patterns, media

access, education, mobile connectivity and welfare expectations can alter the political imagination of young people. If the route to dignity increasingly passes through education, employment, electoral politics and welfare citizenship rather than armed struggle, the ideological appeal of Maoist politics weakens. This, too, is part of state capacity, but it is infrastructural and social rather than purely coercive.

8. Federal Coordination and Accountability

Federal coordination is one of the decisive elements of India's counter-insurgency model. The Union provides funding and frameworks; the State implements and adapts; districts translate policy into local practice. But coordination must be matched by accountability. When multiple levels of government share responsibility, there is a risk that failures become diffused. If a road project is delayed, the contractor may blame security; the district may blame funds; the State may blame central approvals; the Union may blame implementation. Citizens, however, experience only the absence of the road.

The constitutional allocation of police and public order to the states means that Bihar's government must be the primary actor in everyday security governance. However, the Union's role is not external. Through central armed police forces, the Security Related Expenditure scheme, special central assistance, road connectivity and communications, the Union shapes the material conditions of state capacity. This is why counter-insurgency in Bihar is a field of shared sovereignty in practice, even if formal constitutional competence is distributed.

The challenge is to ensure that cooperative federalism does not become paternalistic centralism. Central support should strengthen state institutions rather than bypass them. At the same time, state autonomy should not become an excuse for weak implementation or rights violations. Democratic counter-insurgency requires a balance: the Union must assist and coordinate; the State must own and be accountable; districts must implement; citizens must be able to question and participate.

There is also an inter-state dimension. Maoist organisations historically operated across boundaries, and districts in Bihar were linked to wider corridors involving Jharkhand and other states. Security planning therefore cannot remain enclosed within state borders. Intelligence, mobility, road networks and operations require inter-state coordination. Yet social development remains locally specific. A strategy designed for a forested district in central India cannot be mechanically applied to Bihar's agrarian caste landscape. Federalism must therefore combine national coordination with local political sensitivity.

9. Bihar and Developmental Citizenship

One of the central lessons from Bihar is that counter-insurgency must produce developmental citizenship. Developmental citizenship refers to the condition in which people experience the State not only as a coercive authority but as a provider of rights, opportunities and social recognition. For marginalised communities in former Naxalite areas, this is especially important. The decline of armed insurgency will be durable only if citizens believe that constitutional politics can deliver dignity more effectively than insurgent politics.

Developmental citizenship requires more than schemes. It requires access. A banking correspondent must be reachable; a school must teach; a health centre must function; a police station must accept complaints; a panchayat must represent weaker groups; a land record office must reduce conflict rather than deepen it. The official record of mobile towers, post offices, bank branches, automated teller machines, banking correspondents and industrial training institutes in Bihar's affected areas is therefore politically meaningful, but its ultimate value lies in the quality of access created for citizens.[9]

[9] Government of India, Press Information Bureau, Ministry of Home Affairs, "Development in Left Wing Extremism Affected Areas of Bihar," 1 April 2026.

Poverty data reinforce the importance of this agenda. Bihar has achieved a major reduction in multidimensional poverty, but its rate remains higher than the national average. According to the National Multidimensional Poverty Index, Bihar's poverty headcount fell from 51.89 per cent in the NFHS-4 period to 33.76 per cent in the NFHS-5 period, while the national figure fell from 24.85 per cent to 14.96 per cent.[10] This progress is substantial, but it also indicates why development must remain central to post-insurgency governance.

Developmental citizenship also requires social justice. If development benefits are captured by dominant groups, they may reproduce the very inequalities that helped insurgency grow. Land disputes, caste discrimination, violence against Dalits, gender insecurity and labour exploitation cannot be solved only through roads and banks. The State must be able to enforce rights and protect dignity. In this sense, social justice is not an optional moral supplement to counter-insurgency; it is a strategic condition for durable peace.

10. Human Rights, Rule of Law and the Democratic State

Counter-insurgency in a democracy is judged not only by whether it wins, but by how it wins. Human rights and rule of law are not obstacles to security; they are sources of legitimacy. When the State acts within law, investigates abuses, compensates victims, avoids collective suspicion and protects civilians, it distinguishes itself from insurgent violence. When it fails to do so, it risks reproducing the logic of violence it opposes.

The Bihar case is particularly sensitive because the social history of Naxalism involved claims of injustice against marginalised communities. If counter-insurgency is experienced by such communities as arbitrary or biased, it may confirm old grievances. Therefore, police reform, legal aid, speedy trial, witness protection, independent investigation of complaints and community-oriented policing are not peripheral reforms. They are part of the counter-insurgency architecture.

The rule of law also applies to development. Corruption, delayed compensation, unfair land acquisition, exclusion from welfare rolls and contractor-politician networks can weaken legitimacy as much as security excesses. Citizens judge the State by whether it protects them from both insurgent coercion and everyday administrative injustice. A democratic State must therefore combine force restraint with administrative fairness.

This is where state capacity and state legitimacy converge. A capable State is not only one that can deploy force. It is one that can make force accountable, make development inclusive and make law accessible. Bihar's movement from active insurgency to legacy management will remain incomplete unless this broader form of capacity deepens in the districts that were once affected.

11. Policy Implications

The first policy implication is that Bihar should treat the decline of Left-Wing Extremism as a transition, not a closure. The withdrawal of attention after apparent success is a common policy risk. Formerly affected districts require continued investment in policing, justice delivery, roads, education, health, digital access, livelihood and local government. The aim should be to make the return of armed politics socially unnecessary and organisationally impossible.

Second, district-level governance should become the core of the post-insurgency strategy. Each former or legacy district should have a locally sensitive plan that identifies vulnerable communities, land-conflict zones, youth employment needs, police-community relations, public service gaps and infrastructure bottlenecks. Generic development packages are less effective than district-specific governance compacts. These compacts should include measurable targets and social monitoring.

Third, Centre-State coordination should be institutionalised beyond crisis management. Regular coordination among the Ministry of Home Affairs, Bihar's Home Department, development departments, district administrations and neighbouring states is necessary. But coordination should

[10] NITI Aayog and United Nations Development Programme, *National Multidimensional Poverty Index: A Progress Review 2023*.

not be limited to security briefings. It should include the monitoring of welfare delivery, infrastructure completion, rights violations, judicial pendency and local democratic participation.

Fourth, the State must invest in police legitimacy. Training on human rights, caste sensitivity, gender issues, community relations and evidence-based investigation should be treated as core security needs. Police stations in formerly affected areas should be evaluated not only on arrests but also on complaint registration, response time, trust-building and protection of vulnerable citizens. A legitimate police force is one of the most effective long-term counter-insurgency institutions.

Fifth, development must be framed as rights-based citizenship. Skill centres, banking facilities and digital infrastructure should be connected to real employment and service delivery. Youth in former Naxalite areas should see education, migration, entrepreneurship, public employment and local democracy as credible routes to dignity. Without such routes, a security vacuum may be replaced by criminality, frustration or new forms of extremism.

12. Conclusion

Bihar's experience with Left-Wing Extremism demonstrates that counter-insurgency is not simply a battle between the State and an armed organisation. It is a political process through which the State attempts to rebuild authority in areas where its legitimacy, reach and fairness have historically been contested. Federalism shapes this process because the Indian Union and the State government share different but interdependent responsibilities. State capacity shapes it because security, development and governance must converge at the local level.

The decline of recorded Left-Wing Extremist violence in Bihar is a major achievement. It has improved the space for democratic politics, development and normal civic life. Yet the deeper lesson is that the end of violence does not automatically produce the presence of justice. The State must now consolidate peace through social inclusion, rights-based development, police legitimacy and accountable governance. This is the difference between defeating an insurgent organisation and resolving the political conditions that allowed insurgency to emerge.

The article has argued that Bihar should be understood as a case of negotiated security federalism and post-insurgency state-building. The Union's support has mattered, the State's ownership has mattered, district-level governance has mattered, and social change has mattered. The future challenge is to hold these elements together. Durable peace will depend not on a single institution but on the democratic capacity of the State to protect citizens, deliver development, enforce rights and remain accountable to those who were historically most vulnerable.

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Custodial Torture in India: Causes and Prevention

Gazala Firdaus[*]

Abstract

The persistence of custodial torture in India reveals a paradox at the heart of the constitutional order: a state committed by its foundational document to the protection of life and dignity simultaneously operates institutions in which systematic violence against persons deprived of liberty continues with near-total impunity. This paper approaches custodial torture from a rights-centred, gender-sensitive, and socio-legal perspective, examining its causes across three analytical planes—legal-institutional, socio-political, and jurisprudential—and assessing preventive strategies with particular attention to their differential impact on vulnerable populations including women, Dalit communities, and religious minorities. It argues that the structural invisibility of custodial victims—produced by isolation, shame, social marginalisation, and procedural barriers to complaint—is itself a primary cause of impunity that must be addressed through transparency mechanisms, victim-sensitive procedural reforms, and the cultivation of a human rights culture within police institutions. The paper further argues that India's failure to ratify the UN Convention Against Torture and to enact dedicated anti-torture legislation represents not merely a technical omission but a constitutional failure of the first order, and proposes a rights-centred reform framework drawing on comparative models from South Africa, the United Kingdom, and the UN human rights treaty system.

Keywords: Custodial Torture, Human Rights, Impunity, UNCAT, Gender, Police Accountability, Constitutional Remedies, Victim Protection, Fundamental Rights, NHRC, Article 21.

I. Introduction: The Paradox of Constitutional Promise and Custodial Reality

When the Constitution of India was adopted in 1950, it embodied a foundational commitment to human dignity and individual liberty.[1] The Fundamental Rights chapter's guarantee that no person shall be deprived of life or personal liberty except according to fair procedure promised an irreversible departure from the coercive architecture of colonial governance. More than seven decades later, custodial torture persists as a structural feature of India's criminal justice system, suggesting that the constitutional transformation, while normatively profound, remains institutionally incomplete.

India's international standing on this issue is stark. The United Nations Special Rapporteur on Torture has identified India as a country requiring urgent attention;[2] the Committee Against Torture has repeatedly noted India's continued non-ratification of UNCAT and Amnesty International and Human Rights Watch have documented patterns of custodial abuse across virtually every state and union territory. The National Crime Records Bureau data, while underreporting actual incidence, records custodial deaths in double digits annually. What makes custodial torture in India particularly resistant to reform is its intersection with pre-existing structures of social inequality: the victims are overwhelmingly Dalit, Adivasi, Muslim, or from other marginalised communities whose social powerlessness before arrest becomes complete powerlessness after it.[3]

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[1] Constitution of India, 1950, Preamble (securing to all citizens justice, liberty, and dignity of the individual).

[2] UN Special Rapporteur on Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment, Report to the Human Rights Council, UN Doc A/HRC/43/49/Add.1 (2020).

[3] National Crime Records Bureau, Crime in India 2022, Table 16A (NCRB, Ministry of Home Affairs, 2023).

II. The Constitutional and Statutory Framework Against Custodial Torture

A. Constitutional Architecture: Articles 20, 21, and 22

Article 21 has been interpreted since *Maneka Gandhi v. Union of India* to require that any procedure affecting life or personal liberty must be substantively fair, just, and reasonable.[4] The Supreme Court has held that the right to life encompasses the right to live with human dignity—a right that custodial torture extinguishes. In *D.K. Basu v. State of West Bengal*,[5] the Court observed that custodial violence 'is not only an affront to the dignity of the individual and a violation of his constitutional rights, but also an affront to the dignity of the entire nation,' and laid down eleven mandatory guidelines governing arrest, interrogation, and custody. In *Nilabati Behera v. State of Orissa*,[6] the Court held that custodial death raises a strong presumption of state responsibility and that compensation under Articles 32 and 226 is available as a public law remedy independent of criminal prosecution. Article 20(3)'s protection against self-incrimination was further elaborated in *Nandini Satpathy v. P.L. Dani*[7] and definitively extended to modern forensic coercion in *Selvi v. State of Karnataka*.[8]

B. Limitations of the BNS, 2023 and the NHRC

The BNS, 2023, perpetuates the colonial IPC's failure to address torture by public officials as a distinct aggravated offence. Sections 117 and 118 BNS—derived from IPC Sections 330 and 331—criminalise causing hurt or grievous hurt to extort confession, with maximum sentences of seven and ten years respectively, but require proof that hurt was caused specifically for confession extraction, excluding punitive and terroristic violence, and do not address psychological torture or degrading treatment. The BNSS, 2023 introduces procedural safeguards but does not address interrogation procedures or the right to legal representation during interrogation. The NHRC, established under the Protection of Human Rights Act, 1993, cannot investigate complaints more than one year old, cannot itself prosecute offenders, and its recommendations are not legally binding on states, producing a well-documented cycle in which states pay recommended compensation without prosecuting any officer.

III. Causes of Custodial Torture: A Multi-Dimensional Analysis

A. Colonial Legacy and Unreformed Police Culture

The Indian Police Act, 1861[9]—enacted to suppress resistance following the 1857 uprising—created a police force designed for social control, not crime prevention. The National Police Commission observed in 1979 that 'the police in India continue to function as a colonial force and their primary concern continues to be to serve the interests of the rulers.' Despite the Supreme Court's landmark directions in *Prakash Singh v. Union of India* mandating comprehensive structural police reforms,[10] implementation across states has been cosmetic or non-existent. The Bureau of Police Research and Development's annual data reveal that India's police force is severely overburdened, with conviction rates in police-investigated cases remaining low, creating systemic pressure for confession extraction as a short-circuit solution to investigative capacity deficits.

B. Structural Invisibility of Victims

A distinctive and analytically underweighted cause of custodial torture is the structural invisibility of victims within the accountability system. Persons subjected to custodial abuse face compounding barriers to complaint: they may not know their legal rights; their families may be

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[4] Maneka Gandhi v. Union of India, AIR 1978 SC 597; see also A.K. Gopalan v. State of Madras, AIR 1950 SC 27 (overruled).

[5] D.K. Basu v. State of West Bengal, (1997) 1 SCC 416.

[6] Nilabati Behera v. State of Orissa, (1993) 2 SCC 746.

[7] Nandini Satpathy v. P.L. Dani, (1978) 2 SCC 424.

[8] Selvi v. State of Karnataka, (2010) 7 SCC 263.

[9] Indian Police Act, 1861 (Act V of 1861).

[10] Prakash Singh v. Union of India, (2006) 8 SCC 1

threatened; they may lack access to legal aid; and the social stigma of detention in conservative communities may deter disclosure even to family members. The role of legal aid from the point of arrest—not merely after remand—is constitutionally grounded in *Hussainara Khatoon v. Home Secretary, State of Bihar*,[11] which held the right to free legal aid to be an integral component of Article 21. Operationalising this right from the point of arrest creates the single most effective structural deterrent to custodial torture: the presence of counsel during interrogation.

C. Confession-Centric Investigation and Forensic Underdevelopment

Indian investigative practice places a premium on the extracted confession—notwithstanding its inadmissibility under Section 23 of the Bharatiya Sakshya Adhiniyam, 2023[12] when made to a police officer. Confessions serve purposes beyond trial evidence: production of accomplice information, recovery of contraband, and projection of investigative competence to supervisory authorities. India has approximately one forensic science laboratory for every 3,000 police stations, meaning evidence-based investigation is not a viable operational alternative for the vast majority of India's police force, creating a structural dependency on custodial coercion that investment in forensic capacity alone can address.

D. Gender and Intersectional Vulnerability in Custody

Women in custody face a distinct species of custodial abuse characterised by sexual humiliation, strip searches conducted by or in the presence of male officers, sexual assault, and the implicit threat of sexual violence as a coercive tool. The Supreme Court's recognition in *Selvi v. State of Karnataka* of the constitutional inviolability of mental and bodily integrity[13] extends expressly to women in custody. Section 43(5) BNSS, 2023[14] prohibits arrest of a woman after sunset and before sunrise except under judicial authorisation. Section 179 BNSS provides that no male officer shall require a woman to attend a police station. Despite these protections, the National Commission for Women has documented persistent sexual violence against women in custody, with complaint rates severely depressed by fear of social stigma and retaliation. The Criminal Law Amendment Act, 2013[15] introduced procedural protections for sexual assault victims at the complaint recording stage but does not address the initial detention period when sexual violence most frequently occurs.

IV. Comparative Perspectives and International Standards

The UN Convention Against Torture establishes the international normative baseline: states must criminalise all acts of torture without exception; no exceptional circumstances—including war, internal political instability, or public emergency—may be invoked to justify torture; and states must ensure that torture victims obtain prompt and impartial investigation, effective redress, and fair and adequate compensation. The Optional Protocol to UNCAT (OPCAT) establishes a system of regular independent preventive visits to places of detention through National Preventive Mechanisms—independent domestic bodies conducting unannounced visits, private detainee interviews, and public reporting—recognised as the most effective international mechanism for detecting and deterring custodial abuse.

The UN Standard Minimum Rules for the Treatment of Prisoners (Nelson Mandela Rules), revised in 2015,[16] specify minimum standards including: the right of every prisoner to be informed of their rights upon admission (Rule 54); prohibition of instruments of restraint used as punishment (Rule 47); the right to prompt access to a qualified medical practitioner (Rule 24); and the right to

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[11] Hussainara Khatoon v. Home Secretary, State of Bihar, (1980) 1 SCC 81.

[12] Bharatiya Sakshya Adhiniyam, 2023 (Act 47 of 2023), Section 23; re-enacting Indian Evidence Act, 1872, Section 25.

[13] Selvi v. State of Karnataka, (2010) 7 SCC 263, para. 224.

[14] Bharatiya Nagarik Suraksha Sanhita, 2023, Section 43(5).

[15] Criminal Law Amendment Act, 2013 (Act 13 of 2013).

[16] UN General Assembly, United Nations Standard Minimum Rules for the Treatment of Prisoners (Nelson Mandela Rules), GA Res 70/175, UN Doc A/Res/70/175 (17 December 2015).

confidential communication with legal counsel at all times (Rule 61). India's prisons and lock-ups fall significantly below these standards, with occupancy at 131% of capacity nationally. South Africa's Independent Police Investigative Directorate (IPID)[17] provides a compelling comparative model of mandatory investigative jurisdiction, statutory independence from the police hierarchy, and direct parliamentary accountability that India's advisory NHRC cannot replicate. The UK's Independent Office for Police Conduct (IOPC)[18] similarly exercises independent investigative and recommendation powers over all custodial deaths and serious police assault.

V. Preventive Framework: Visibility, Accountability, and Structural Reform

A. Legal Aid from the Point of Arrest and Victim Visibility Mechanisms

Addressing the structural invisibility of custodial victims requires legal representation from the point of arrest—not merely at the magistrate stage. Duty lawyer schemes at police stations, combined with digitally activated legal aid notification systems that alert the nearest Legal Services Authority upon arrest registration, can operationalise this right at scale. An independent custodial monitoring body modelled on the NPM framework under OPCAT—conducting unannounced visits to all places of detention, interviewing detainees privately, and publishing station-level reports—is essential. The existing NHRC State Human Rights Commissions cannot fulfil this function given their limited resources, advisory powers, and lack of operational independence from state governments.[19]

B. Dedicated Anti-Torture Legislation with Victim-Centred and Gender-Sensitive Provisions

The Law Commission of India in its 273rd Report[20] recommended enactment of a Prevention of Torture Act incorporating the UNCAT definition, specific offences for torture by public officials, reversal of the evidential burden where injury is sustained in custody, and a victim compensation scheme independent of the state's duty to prosecute. Such legislation must include gender-specific provisions: mandatory examination of female detainees by a female medical officer within six hours of detention; the right to custody in a women's lock-up supervised exclusively by female officers;[21] prohibition on interrogation of female detainees by male officers alone; and specific aggravated offences for sexual violence in custody with enhanced mandatory minimum sentences.

C. Independent Police Complaints Authorities and Magisterial Oversight

The Supreme Court's directions in *Prakash Singh*[22] mandating independent Police Complaints Authorities have been substantially diluted or ignored.[23] An effective authority requires statutory grounding in central legislation, financial independence through a centrally-allocated budget, investigative staff drawn from outside the police service, power to direct criminal investigations and order suspension of accused officers, and public reporting to the legislature and the High Court.[24] Simultaneously, magistrates authorising remand under Section 187 BNSS[25] must be required to conduct private camera-recorded interviews, document physical complaints in the remand order, and file quarterly High Court reports on custodial conditions—revitalising the constitutional duty recognised in *Sunil Batra v. Delhi Administration*.[26]

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[17] Independent Police Investigative Directorate Act, 2011 (South Africa), Act 1 of 2011.

[18] Policing and Crime Act, 2017 (UK), c. 3; Police Reform and Social Responsibility Act, 2011 (UK), c. 13.

[19] Protection of Human Rights Act, 1993, Sections 21-29 (State Human Rights Commissions).

[20] Law Commission of India, 273rd Report on Wrongful Prosecution (Miscarriage of Justice): Legal Remedies, pp. 48-53 (August 2017).

[21] Bureau of Police Research and Development, Model Prison Manual 2016, Chapter 23 (BPR&D, Ministry of Home Affairs, 2016).

[22] Prakash Singh v. Union of India, (2006) 8 SCC 1.

[23] Commonwealth Human Rights Initiative, Feudal Forces: Reform Delayed (CHRI, New Delhi, 2012).

[24] Independent Police Investigative Directorate Act, 2011 (South Africa), Act 1 of 2011, Section 7.

[25] Bharatiya Nagarik Suraksha Sanhita, 2023, Section 187.

[26] Sunil Batra v. Delhi Administration, (1978) 4 SCC 494.

D. Police Training and Institutional Culture Transformation

Long-term prevention requires transformation of the institutional culture that normalises custodial violence. Human rights education must be integrated into police training at all levels as a pervasive framework—not an isolated module.[27] Promotion criteria must incorporate human rights compliance: officers with recorded complaints of custodial abuse should be ineligible for promotion pending resolution, and those convicted of custodial offences automatically dismissed from service. International experience from post-apartheid South Africa—where the Independent Complaints Directorate was mandated to report on systemic patterns of police conduct—demonstrates that public accountability reporting creates institutional incentives for culture change that internal review processes cannot generate.[28]

VI. Conclusion: Towards a Rights-Centred Custodial Justice System

The persistence of custodial torture in India reflects not a failure of constitutional vision but a failure of institutional translation. The constitutional commitment to dignity, liberty, and the rule of law is fully articulated in Articles 20(3), 21, and 22 and elaborated in a rich body of Supreme Court jurisprudence. What is lacking is the political will and institutional architecture to enforce these commitments in the spaces—the lock-up, the interrogation room, the prison—where state power is most concentrated and constitutional oversight most attenuated.

This paper has argued for a reform strategy centred on four complementary pillars: legislation that specifically criminalises torture by public officials with victim-centred and gender-sensitive remedies; transparency and legal aid mechanisms that give visibility and voice to custodial victims; independent oversight institutions with real investigative and recommendation powers; and a long-term programme of police culture transformation. The victims of custodial torture in India are, overwhelmingly, those least able to advocate for themselves: the Dalit man arrested on suspicion, the tribal woman held without charge, the poor migrant worker unable to afford bail, the religious minority detained on communally inflected grounds. Constitutional democracy's credibility depends not on the protection it affords to the powerful but on the protection it delivers to the most vulnerable. Custodial torture is the most direct test of that credibility—and India's constitutional order requires that this test be passed.

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- Independent Police Investigative Directorate Act, 2011 (South Africa), Act 1 of 2011
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Constitutional Limits on Digital Surveillance in India: Reassessing the Right to Privacy after the Digital Personal Data Protection Act, 2023

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Abstract

The enactment of the Digital Personal Data Protection Act, 2023 (DPDP Act) represents India's most significant legislative engagement with informational privacy since the Supreme Court's landmark recognition of privacy as a fundamental right under Article 21 in Justice K.S. Puttaswamy v. Union of India (2017). Yet the Act has attracted sustained scholarly and civil society critique for the breadth of its government exemptions, the absence of an independent regulatory architecture, and its failure to meaningfully constrain state digital surveillance. This paper undertakes a systematic constitutional assessment of the DPDP Act against the four-part proportionality framework articulated in Puttaswamy—legality, legitimate aim, necessity, and procedural safeguards—examining whether the Act advances or retreats from the constitutional privacy guarantee. Through doctrinal analysis of the Act's central provisions, comparative engagement with the European Union's General Data Protection Regulation, the United Kingdom's Investigatory Powers Act, and Australia's Privacy Act, and a critical survey of India's surveillance infrastructure including the Central Monitoring System, NATGRID, Aadhaar-linked databases, and social media monitoring units, the paper argues that the DPDP Act, as currently enacted, fails to constitute adequate constitutional fulfilment of the Puttaswamy mandate. The study identifies structural deficiencies—overbroad sovereign exemptions, executive-controlled data governance, consent dilution, and absence of judicial oversight over surveillance—and proposes a rights-grounded reform agenda centred on independent oversight, proportionality review, and enforceable digital rights.

Keywords: Right to Privacy, Puttaswamy, DPDP Act 2023, Digital Surveillance, Proportionality, Constitutional Law, Data Protection, State Power, Fundamental Rights, Independent Oversight.

1. Introduction

The right to privacy in India has undergone a profound constitutional transformation. For decades subordinated to a restrictive reading of Part III fundamental rights, privacy was catapulted into constitutional centrality by the nine-judge bench in Justice K.S. Puttaswamy v. Union of India (2017), which held unanimously that privacy is a fundamental right inhering in Article 21 and, derivatively, in Articles 14 and 19. The judgment did not merely recognise an existing entitlement; it articulated a structural framework—grounded in human dignity, personal autonomy, and the right to informational self-determination—that was intended to govern the relationship between the individual and the data-collecting state in perpetuity.

The digital landscape against which Puttaswamy must now be assessed is dramatically more complex than existed in 2017. India's state surveillance infrastructure has expanded substantially: the Central Monitoring System (CMS) enables real-time interception of digital communications without judicial warrant; NATGRID consolidates data across immigration, taxation, banking, and criminal justice records into integrated citizen profiles; the Aadhaar biometric database—now linked to mobile telephony, banking, healthcare, and welfare delivery—constitutes the world's largest civilian biometric identifier. Simultaneously, social media monitoring units operating across state and central governments conduct systematic, algorithmically assisted surveillance of online speech, political expression, and associational activity.

Into this context, Parliament enacted the Digital Personal Data Protection Act, 2023. Described by its proponents as the fulfilment of the Puttaswamy mandate, the Act establishes a

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framework of data principal rights, data fiduciary obligations, and a prospective enforcement mechanism through a Data Protection Board. Its critics, however, identify a set of structural features that systematically privilege state data access over individual privacy: sweeping exemptions permitting government processing without consent in broadly defined circumstances; executive control over the composition and functioning of the Data Protection Board; absence of judicial oversight requirements for surveillance-related data processing; and blanket exemptions for national security and law enforcement data processing that replicate, rather than correct, the constitutional deficiencies identified in Puttaswamy.

This paper examines these tensions through the following architecture: Section 2 reconstructs the Puttaswamy proportionality framework as the operative constitutional standard. Section 3 analyses the DPDP Act's central provisions against this standard. Section 4 examines India's surveillance infrastructure and the Act's failure to constrain it. Section 5 undertakes comparative analysis with mature data protection regimes. Section 6 evaluates the Act's institutional design and oversight architecture. Section 7 addresses the intersection of surveillance and fundamental freedoms beyond privacy. Section 8 advances a reform framework. Section 9 concludes.

2. The Puttaswamy Proportionality Framework: The Constitutional Standard

The proportionality framework articulated in Puttaswamy—drawing on comparative constitutional law, the German Basic Law tradition, and South African constitutional jurisprudence—establishes four cumulative requirements for constitutionally permissible interference with the right to privacy:

- Legality: Any restriction on privacy must be grounded in a valid law. The law must be accessible, sufficiently precise, and contain adequate safeguards against arbitrary application. Vague or overbroad statutory authorisations—particularly for executive action affecting privacy—fail this requirement.
- Legitimate Aim: The interference must pursue a genuinely legitimate state objective. Puttaswamy recognised national security, prevention of crime, and welfare delivery as potentially legitimate aims, while cautioning that the breadth of a claimed aim cannot substitute for precision in its articulation.
- Necessity: The chosen means must be the least restrictive measure capable of achieving the legitimate aim. This requirement directly engages questions of data minimisation, purpose limitation, and proportionate use of surveillance technologies. Measures that collect more data than necessary, retain it beyond required periods, or apply surveillance tools indiscriminately fail the necessity test.
- Procedural Safeguards: Adequate mechanisms must exist to protect against abuse of the interference power. Puttaswamy specifically emphasised independent oversight, judicial review, and redressal mechanisms as constitutional requirements, not merely desirable features.

Subsequent decisions have applied and refined this framework. In the Aadhaar case (2018), the majority held the Aadhaar Act constitutionally valid while striking down certain provisions permitting private use of the database, affirming that proportionality operates as a real constraint. In Anuradha Bhasin v. Union of India (2020), the Court applied proportionality to internet shutdowns, requiring necessity, temporariness, and periodic review. These decisions collectively establish that Puttaswamy's proportionality framework operates as justiciable standard, not merely hortatory guidance.

The critical question for this paper is whether the DPDP Act, 2023—as the primary legislative response to the Puttaswamy mandate—satisfies each component of this framework, particularly in relation to state digital surveillance.

3. Constitutional Assessment of the DPDP Act, 2023

3.1 Overview of the Act's Architecture

The DPDP Act is structured around three conceptual pillars: (a) rights of 'data principals' (individuals whose data is processed); (b) obligations of 'data fiduciaries' (entities that determine the purpose and means of data processing); and (c) enforcement through a Data Protection Board. Data principals are accorded rights to information about processing, correction, erasure, grievance redressal, and nomination. Data fiduciaries are required to process personal data only for specified, lawful purposes, with consent except in specified instances, and to implement reasonable security safeguards.

The Act applies to processing of digital personal data within India and, extra-territorially, to processing outside India if it involves offering goods or services to individuals within India. It creates a tiered obligation structure, with 'significant data fiduciaries'—designated by the Central Government on the basis of volume, sensitivity, or national security implications of data processed—subject to additional obligations including data localisation, algorithmic impact assessment, and appointment of data protection officers.

3.2 Consent Architecture and Its Dilution

The DPDP Act nominally centres consent as the primary basis for data processing: a data fiduciary must obtain 'free, specific, informed, unconditional and unambiguous' consent from the data principal before processing. However, this consent architecture is substantially undermined by an extensive list of 'legitimate uses' permitting processing without consent. These include processing for the performance of state functions, provision of government services, compliance with legal obligations, medical emergencies, employment purposes, and 'any other matter as may be prescribed.' The residual 'any other matter as may be prescribed' clause, conferred upon the Central Government by executive rule-making power, violates the principle of legality by delegating the definition of consent exceptions to the executive without parliamentary specification. This effectively allows the government to expand the grounds for non-consensual data processing by subsidiary legislation, without Article 21 scrutiny.

3.3 Government Exemptions: The Constitutional Flashpoint

The most constitutionally significant provision of the DPDP Act is Section 17, which grants the Central Government power to exempt any government instrumentality from all or any provisions of the Act in the interest of sovereignty, integrity, security, friendly relations with foreign states, public order, or prevention of offences. This exemption is not subject to any necessity, proportionality, or procedural safeguard requirement in the statute itself. Its operation is committed to executive discretion without parliamentary oversight, independent review, or judicial scrutiny at the point of grant.

Measured against the Puttaswamy proportionality framework, Section 17 fails on multiple counts. The grounds for exemption—sovereignty, security, public order—are formulated at a level of generality that does not constitute a 'legitimate aim' with the precision Puttaswamy requires; they can encompass virtually any state activity. The provision contains no necessity requirement: it does not mandate that exemption be limited to the minimum degree necessary to achieve the stated aim. And it provides no procedural safeguards—no judicial warrant requirement, no oversight body, no parliamentary accountability mechanism, no sunset clause requiring periodic renewal of exemptions. The section, in effect, creates a constitutional black hole in which state data processing is entirely unregulated by the Act's privacy framework.

3.4 Data Protection Board: Institutional Independence

The Act establishes a Data Protection Board to adjudicate complaints, impose penalties, and enforce data principal rights. However, the Board's institutional design raises serious concerns about independence. Board members are appointed by the Central Government, their terms and conditions of service are determined by the Central Government, and the Central Government retains power to issue policy directions to the Board. A regulatory authority whose composition, tenure, and

operational guidance are controlled by the entity it is supposed to regulate cannot credibly function as an independent check on government data processing. Comparative data protection institutions—the UK's Information Commissioner's Office, France's Commission Nationale de l'Informatique et des Libertés (CNIL), the German Federal Commissioner for Data Protection—are constitutionally or statutorily insulated from executive control precisely because effective privacy regulation requires oversight of the state by a body not accountable to it.

3.5 Children's Data and Special Category Data

The Act introduces protections for children's data, requiring verifiable parental consent for processing personal data of individuals below eighteen years of age and prohibiting processing that causes detrimental effects on children's wellbeing. However, the Act does not create a category of 'sensitive personal data' or 'special category data'—unlike the GDPR—that would attract heightened protection for health data, biometric data, financial data, or data relating to religious or political beliefs. The absence of a sensitive data category is particularly consequential for Aadhaar-linked health and biometric databases, which currently receive no heightened protection under the DPDP Act framework.

4. India's Digital Surveillance Infrastructure and the Act's Failure to Constrain It

4.1 The Central Monitoring System

The Central Monitoring System (CMS), operational since 2013, enables security agencies to intercept all telecommunications—telephone calls, SMS, emails, and internet traffic—in real time, without judicial warrant, pursuant to executive authorisation under Sections 5(2) of the Telegraph Act, 1885, and Section 69 of the IT Act. The absence of judicial pre-authorisation for CMS interceptions was identified as constitutionally problematic in the light of Puttaswamy, which requires procedural safeguards for privacy interferences. The DPDP Act does not address CMS operations, which fall within the sovereign exemption of Section 17 and continue to operate without independent oversight.

4.2 NATGRID and Integrated Data Profiling

The National Intelligence Grid (NATGRID) integrates data from twenty-one categories of source databases—including immigration records, income tax filings, bank account information, credit card transactions, vehicle registrations, and criminal records—to generate comprehensive profiles of individuals for security agencies. NATGRID operates without a specific legislative basis, without publicly available access protocols, and without any mechanism for individuals to challenge profiling decisions made on the basis of NATGRID data. The DPDP Act's 'state functions' exemption permits this integrated profiling to continue without consent, notice, or purpose limitation. From a proportionality standpoint, the indiscriminate aggregation of data across categories—regardless of any individualised security justification—fails the necessity test.

4.3 Aadhaar-Linked Biometric Surveillance

The Aadhaar biometric database, containing fingerprint and iris data for over 1.3 billion individuals, constitutes the world's most extensive civilian biometric identifier. While the Aadhaar Act was upheld by a majority in the 2018 Puttaswamy sequel, the Court struck down private use of Aadhaar authentication and emphasised the importance of data minimisation and purpose limitation. Subsequent administrative and legislative amendments have progressively expanded Aadhaar linkage requirements across healthcare, banking, and telecommunications. The DPDP Act does not specifically address Aadhaar data processing, and biometric data—the most sensitive category of personal data by virtue of its immutability—receives no heightened protection in the Act's absence of a special category regime.

4.4 Social Media Monitoring and Political Surveillance

Multiple central and state government agencies maintain social media monitoring units that conduct systematic tracking of online speech, political commentary, and associational activity. The Information Technology Rules, 2021, require significant social media intermediaries to enable tracing of the 'first originator' of messages, effectively mandating a backdoor into end-to-end encrypted

communications. The Telecom Bill, 2023, consolidates and expands interception powers. The DPDP Act does not constrain social media monitoring by government agencies, which falls within the sovereign exemption; nor does it address the constitutionality of mass surveillance of political speech, which implicates Article 19(1)(a) and (b) freedoms in addition to Article 21 privacy.

5. Comparative Analysis: Benchmarking Against Mature Data Protection Regimes

5.1 European Union: GDPR and the AI Act

The General Data Protection Regulation (GDPR) establishes a framework substantially more protective of individual privacy than the DPDP Act across several dimensions. The GDPR requires that consent be freely given, specific, informed, and unambiguous, and that its withdrawal be as easy as its grant—a standard that India's consent architecture approximates only in the private sector context. The GDPR's special categories of sensitive data—race, ethnicity, political opinion, religion, biometric and health data—attract heightened protection requirements, including explicit consent, necessity for specific processing, and stronger oversight obligations. Critically, law enforcement and national security data processing under the GDPR and the EU Law Enforcement Directive is subject to independent supervisory authority oversight, Member State parliamentary scrutiny, and judicial remedy before the Court of Justice of the European Union. No equivalent constitutional architecture exists under the DPDP Act.

5.2 United Kingdom: Investigatory Powers Act and ICO

The United Kingdom's surveillance legal framework under the Investigatory Powers Act, 2016, provides instructive contrast. Bulk interception warrants must be approved by a 'Judicial Commissioner'—a serving or former senior judge—and the Investigatory Powers Commissioner's Office provides independent retrospective oversight of surveillance activities, publishing annual transparency reports. The UK Information Commissioner's Office exercises independent regulatory jurisdiction over government data processing, conducts own-initiative investigations, and has issued enforcement notices against government departments. This architecture—combining judicial pre-authorisation for targeted surveillance with independent oversight—provides the procedural safeguards that the Puttaswamy framework requires but the DPDP Act withholds.

5.3 Australia and Canada: Independent Regulators and Sensitive Data

Australia's Privacy Act, 1988, as amended, designates a Privacy Commissioner with independent investigative and enforcement powers, including the power to conduct privacy impact assessments of government programmes and to initiate own-motion investigations without a complaint. Canada's Office of the Privacy Commissioner similarly functions as an independent ombudsman with access to government data systems. Both jurisdictions treat biometric and health data as sensitive personal information attracting heightened protection. The common thread across these mature regimes is institutional independence: regulatory authorities capable of scrutinising state data practices without executive interference. India's DPDP Act departs from this international consensus in vesting data governance oversight in an executive-controlled Board.

6. Institutional Design and the Oversight Architecture

The failure of the DPDP Act's institutional design to produce independent oversight is not merely a technocratic deficiency; it is a constitutional problem. Puttaswamy's fourth proportionality requirement—procedural safeguards—cannot be satisfied by oversight mechanisms that are themselves controlled by the entity whose data processing they are meant to supervise. An independent regulator is a structural constitutional requirement in any data protection regime that aspires to constitutional adequacy under the Puttaswamy framework.

The appropriate model for India is a constitutionally or statutorily entrenched Data Protection Authority with: (a) members appointed through a parliamentary committee process rather than executive discretion; (b) fixed non-renewable terms to insulate against government pressure; (c) financial independence through a parliamentary-appropriated budget rather than government grant; (d) jurisdiction to investigate government data processing activities; and (e) power to issue legally binding orders, including against government instrumentalities, subject only to judicial review.

Beyond the Data Protection Board, meaningful constitutional oversight of surveillance requires judicial pre-authorisation for targeted digital surveillance—as proposed in legislative reform discussions—and independent parliamentary oversight of bulk surveillance programmes. The current architecture, in which the executive authorises its own surveillance activities and the DPDP Act exempts those activities from data protection scrutiny, provides no meaningful check on the constitutional right articulated in Puttaswamy.

7. Surveillance, Privacy, and the Chilling Effect on Fundamental Freedoms

The constitutional stakes of inadequate surveillance regulation extend beyond privacy in isolation. Mass digital surveillance—documented in India's CMS operations, social media monitoring, and NATGRID profiling—produces a well-documented 'chilling effect' on the exercise of other fundamental rights: freedom of speech and expression under Article 19(1)(a), freedom of peaceful assembly under Article 19(1)(b), and freedom of association under Article 19(1)(c). The knowledge of surveillance—even unverified surveillance—induces self-censorship, reduces political participation, and distorts the informational environment in ways antithetical to democratic governance.

The Supreme Court acknowledged the chilling effect doctrine in Shreya Singhal v. Union of India (2015), striking down Section 66A of the IT Act for its overbroad criminalisation of online speech precisely because the provision produced disproportionate chilling effects on constitutionally protected expression. The same analytical framework applies to mass surveillance: any surveillance programme whose scope, duration, and targets are not circumscribed by necessity and proportionality will inevitably chill protected expression, assembly, and association, triggering constitutional infirmity not merely under Article 21 but under Article 19 as well.

The DPDP Act, by exempting state surveillance from its consent and purpose limitation requirements, fails to address the chilling effect dimension of surveillance on fundamental freedoms. A constitutionally adequate data protection regime must engage with the intersection of surveillance and Article 19 freedoms, establishing safeguards—scope limitation, temporal restriction, independent review—that prevent surveillance from producing systemic chilling effects on democratic participation.

8. Reform Framework: Towards Constitutional Compliance

The foregoing analysis yields a structured reform agenda for achieving constitutional compliance with the Puttaswamy mandate:

1. Amend Section 17 of the DPDP Act to replace the blanket sovereign exemption with a narrowly drawn national security carve-out that: (a) specifies permissible grounds with legislative precision; (b) requires necessity and proportionality to be demonstrated by the claiming agency; (c) provides for periodic judicial review of exemption claims; and (d) establishes a sunset mechanism requiring parliamentary renewal of exemption designations every three years.
2. Establish an independent Data Protection Authority by amending the Act to provide for parliamentary appointment of Board members, fixed non-renewable terms, financial autonomy, and express jurisdiction over government data processing including national security functions, subject to in-camera judicial review where disclosure would compromise ongoing operations.
3. Introduce a special categories framework comparable to GDPR Article 9, designating biometric data, health data, financial data, location data, political opinion data, and religious belief data as sensitive personal data attracting heightened processing requirements including explicit consent, mandatory data protection impact assessments, and additional security obligations.
4. Enact a dedicated Surveillance Authorisation Act requiring judicial pre-authorisation for targeted digital surveillance, establishing independent oversight of bulk surveillance

programmes through a Surveillance Commissioner on the UK Judicial Commissioner model, and creating an annual parliamentary transparency reporting obligation.

5. Amend the Telegraph Act, 1885 and IT Act, 2000 to impose judicial warrant requirements for interceptions currently authorised at the executive level, aligning with the procedural safeguard requirements of Puttaswamy and the international human rights standards applicable under Articles 17 and 19 of the International Covenant on Civil and Political Rights, to which India is party.
6. Operationalise the right to erasure and right to correction under the DPDP Act by mandating a specified response timeline, establishing a free complaint mechanism before the Data Protection Board, and providing for statutory compensation—not merely penalties—payable to data principals whose rights have been infringed.
7. Extend data principal rights to government databases including Aadhaar, NATGRID-linked records, and health data repositories, enabling individuals to access, correct, and contest the accuracy of data held about them by state agencies, subject to proportionate national security and law enforcement exceptions reviewed by an independent authority.
8. Mandate privacy impact assessments for all new government surveillance programmes and large-scale data processing initiatives, conducted independently and published publicly before deployment, to institutionalise the proportionality analysis required by Puttaswamy at the programme design stage rather than post-hoc through litigation.

9. Conclusion

Puttaswamy constituted a constitutional watershed: the recognition of informational privacy as a fundamental right grounded in human dignity and personal autonomy imposed a continuing obligation on all branches of government to conduct their data practices in conformity with proportionality. The Digital Personal Data Protection Act, 2023 represents a partial and structurally deficient response to that obligation. While it advances India's data governance framework beyond the pre-2023 vacuum, its central provisions—the sovereign exemption in Section 17, the executive-controlled Data Protection Board, the absence of special category data protection, and the failure to address the surveillance infrastructure that most directly implicates Article 21—collectively fail the constitutional test established by the Supreme Court.

The inadequacy is not merely technical. It reflects a continuing disposition toward state primacy in the data governance relationship, in which individual privacy rights are framed as concessions granted by the state rather than as fundamental constitutional entitlements that constrain it. Constitutionally adequate data protection requires a structural inversion of this hierarchy: the state as data processor must be subordinate to the individual as data principal, and regulatory oversight must be insulated from executive control precisely so that it can enforce that subordination.

The reform agenda proposed in this paper—independent oversight, judicial authorisation of surveillance, sensitive data categories, and mandatory privacy impact assessments—is derived directly from the proportionality framework that India's own Supreme Court has articulated. The constitutional promise of Puttaswamy will remain unrealised until the legislative architecture governing digital surveillance reflects the full demands of that framework: transparent, accountable, proportionate, and subject to meaningful independent review.

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Social Media Usage and Self-Esteem among Adolescents in Araria District, Bihar: A Descriptive-Correlational Empirical Study

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Abstract

The study examined social media usage and self-esteem among adolescents at Araria District of Bihar. With a de-identified sample of 200 adolescents aged 13-19 years, quantitative, cross-sectional, descriptive-correlational design was used. The sample included 100 boys and 100 girls to balance gender; 100 rural respondents and 100 urban respondents to balance location; and 100 respondents from government schools and 100 respondents from private schools to balance school type. The Rosenberg Self-Esteem Scale (RSES) was used to measure self-esteem, with scores ranging from 0–30 based on reverse scoring of negatively worded items. The 6 components of the Social Media Usage Index (SMUI) used in this study (i) daily time (ii) frequency of post (iii) online self-comparison (iv) night-time (v) during study time (vi) restlessness when unable to use the social media application. The statistical analysis undertaken comprised extensive data screening, descriptive statistics, Cronbach's alpha reliability, Pearson and Spearman correlations, Welch t-tests, one-way analysis of variance (ANOVA) with effect sizes, post-hoc comparisons, as well as multiple regression, using HC3 robust standard errors.

The results indicated that 86.5% of respondents use social media for communication which includes WhatsApp, YouTube and Instagram. The RSES mean score was 19.25 (SD = 4.86) and SMUI mean score was 40.02 (SD = 22.14). There was a significant negative correlation between SMUI and self-esteem. The statistical analysis revealed a highly significant difference in self-esteem among various groups with daily usages. The complete regression model accounts for 52.3% of the variance in self-esteem. Following adjustment, elevated SMUI, worry about body image, less sleep and poor academic performance are important predictors. The results show that social media use is not just about how much time one spends on it but rather that comparison-oriented, night-time, and emotionally assentive use is especially relevant to adolescents.

Keywords: Social media usage; self-esteem; adolescents; Araria District; Bihar; Rosenberg Self-Esteem Scale; digital behavior; social comparison; body-image concern; psychological well-being.

Introduction

The level of education and living standards of the youth category shows an upward moving trend in development. It also affects the country's fertility rate too. The World Health Organization states that adolescence is the stage of life from 10-19 years of age. This refers to the time when a person becomes experiences rapid growth and development. At this stage, self-esteem becomes more relevant, as adolescents start to evaluate themselves in terms of school performance, acceptance by peers, expectations of the family, body image, and hopes for the future. A healthy self-image can assist a teen in coping with academic pressures and social uncertainty while poor self-esteem increases sensitivity to feedback, rejection, and social comparison.

Concurrently, the youthhood is now highly tied to digital media. With the rise of smartphones and social media, the ways in which young people communicate, learn, make friends, compare lifestyles, respond and present themselves have changed immensely. Achieving your goals in life and studying is easier in an online world. It can also make youngsters compare with unrealistic standards, face continuous comparison, face with cyberbullying, get engaged at night, get distracted from study, and get anxiety when not connected. Because these experiences happen in private spaces and on personal devices, schools and families usually witness only visible consequences, instead of daily processes that mold self-perception via digital interaction.

Theoretically plausible and empirically complex is the relationship between social media and self-esteem. The theory of Social Comparison points out that we compare ourselves to other people.

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Sociable media enhances the number, the visibility, and the emotional intensity of such comparisons. Teenagers might contrast how they look, how popular they are, what possessions they have, how well they do at school, what friends they have, and the things they do with certain posts made online. Profiles can deceive as they mediate a version of life that is edited, pleasant and achievement-oriented. When things are ordinary, they may be inferior. On the other hand, social media can also offer positive feedback, peer support, and a sense of belonging. This is especially true for adolescents experiencing disconnection offline. This sentence states that the same medium can help some people and harm others depending on its usage.

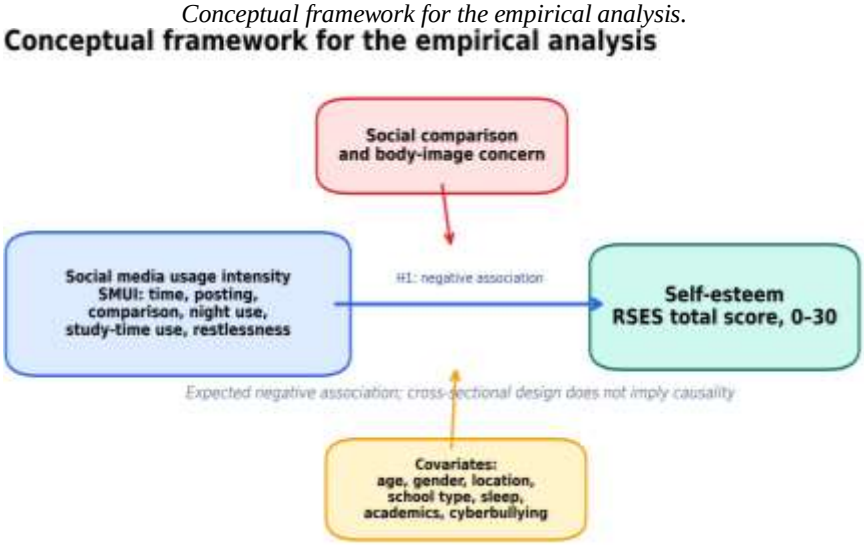
This complexity is reflected in international evidence. There are several studies that show a link between problematic use of social media and social comparison with lower mental health. However, large scale studies show that broad screen time associations with well-being may be small when measuring at a population level (Boer et al., 2021; Keles et al., 2020; Orben & Przybylski, 2019). Research that focuses on the person indicates that the effects of social media can differ considerably from one teen to the next (Beyens et al., 2020; Valkenburg et al., 2021). This suggests that local empirical studies remain of value, especially if they measure a particular kind of usage as opposed to asking, for example, if a student uses social media.

This study takes the sample from Araria District of Bihar. The district profile indicates 28,11,569 people, 53.53% of literate, 751 villages (District Administration Araria, no date). The statistics are important on account of the fact that adolescent digital experiences in Araria district may not be representative of metropolitan samples. Real experience of local youth with digital media. Rural urban divide, parental control, poor education, first generation to go online, peer pressure, multi lingual background, varied level of digital literacy. Research conducted within such environments can enrich debates that are often preoccupied by urban or Western samples with a grounded local perspective.

As a result, the study is an Investigation of use of social media and self-esteem among 200 adolescents of Araria District. Due to the cross-sectional nature of this study, not claiming these social media low self-esteem causes is the main aim. The research looks at whether more comparison-based, emotionally dependent and intense social media engagement may be linked to lower self-esteem after accounting for selected demographic and psychosocial variables. Moreover, the differences will be examined according to gender, place, school type, and daily usage time. Through a combination of standard self-esteem measure with a multi-dimensional index of social media usage, the paper seeks to provide a stronger empirical base for school counselling, parental guidance and further research in the district.

Figure 1

Conceptual framework for the empirical analysis.



Note. The model is correlational. It summarizes the analytic logic and does not assert causal direction.

Literature Review and Theoretical Background

Self-esteem is a global evaluation of one's worth or value. Rosenberg's Classic Formulation Treats Self Esteem As A Broad Positive Or Negative Attitude Towards The Self (Rosenberg, 1965) The Rosenberg Self-Esteem Scale is a widely used measure of global self-worth (self-esteem). It includes 10 items with positive as well as negative wordings, which are helpful in capturing general feelings of self-acceptance and self-respect. According to (Schmitt & Allik, 2005), although the scale has been used across many cultures and languages, its reliability and factor structure can vary by age, language, and context. In adolescents, self-esteem can be affected by school performance, friends' feedback, family support, body changes, and social belonging.

Social media heightens importance of several psychological processes already relevant to adolescence. By allowing adolescents to see the likes, comments, views, messages and follower counts, it changes their social status and visibility of feedback. Nesi et al. (2018) explain how adolescent peer relations are transformed by social media in terms of immediacy, availability, intensity and publicness. For youth, these features makes social belonging feel continuously measured. When a student receives positive feedback rapidly, he or she may feel validated; but a student who receives little feedback or negative feedback will feel rejected more.

One of the most relevant mechanisms is social comparison. Appel et al. provided a review of how the above may interact in 2016. In other words, social media comparison can impair self-esteem when the youth compare their normal lives to ideal ones. Comparisons with lifestyle and appearance might be especially impactful because adolescent develop identity and body image already. The present study adds body-image concern as an additional variable to acknowledge that the social media influence on self-esteem may take place not only through time spent online but also how adolescents examine their own body and socially desirable.

Earlier empirical studies on adolescents suggest that social media may relate to self-esteem and well-being through feedback and peer interaction. In a study on friend networking sites among adolescents, Valkenburg et al. (2006) found that online feedback could exert influence on social self- esteem and well-being. Positive feedback, for instance, was associated with better social self-esteem and well-being as well as opposite pattern for negative feedback. It demonstrates the quality of the online experience is important. The use of hours alone is naive to the meaning of the experience. An adolescent who spends an hour receiving assistive support might differ psychologically from an adolescent who spends an hour comparing appearance or worrying about social exclusion.

New research has warned against one-sided conclusions. According to Orben and Przybylski (2019) using large-scale datasets and specification curve analysis, the overall association between the use of digital technology and adolescent well-being was negative, but small.

It was shown that Social Media effects on well-being may differ between adolescents (Beyens et al., 2020). The findings must not mean social media is unimportant at all. Understanding the use of energy at different periods for various end-uses is important. As a result, it is methodologically better to approach social media use as a range of behaviours, for example using it for comparison, using it at night, using it at study time and being restless, rather than one yes/no variable.

The relationship of mental health with social media use is stronger in the case of problematic use or dependency-like rather than general use intensities. As Boer et al. (2021) pointed out, use problems instead of mere use intensity predicted poorer mental health in adolescents over time. The current study treats a particular case of restlessness when a person can't use social media as one component of the Social Media Usage Index. The detection of this warning sign does not diagnose addiction. Also, including nighttime social media use as it may reduce sleep duration or sleep quality. According to a study by Woods and Scott (2016) adolescents that use social media late at night suffer from impaired sleep and low self-esteem. As a result, "<< sleep >> was included as a covariate in the regression."

Gender differences are not consistent, as the literature also states. Girls might undergo increased pressure to compare their appearances on visual platforms. But for boys, it could be pressures related to gaming or their social status and performance. Local gender attitudes can shape access to mobile phones, ability to use them privately, and family supervision. As a result, gender was included in the current study. However, a directional difference was not included as a certainty. In the Araria District, the rural-urban

location and school type was similarly included because digital access and school culture may vary in these settings.

The research was governed by five hypotheses drawn from the literature as well as the local research purpose. Higher intensity use of social media would be significantly associated with self-esteem. Second, self-esteem would vary between groups with different time time spent on social media on daily basis. Thirdly, there would be gender differences in self-esteem. Rural-urban differences in self-esteem would exist. Fifthly, after controlling for certain factors such as age, gender, type of school, place of residence, supervision by parents, concern for body-image, sleep-time, academic performance, and the experience of cyberbullying, the intensity of social media usage would be a strong predictor of self-esteem. These hypotheses integrate theoretical expectations along with a prudent recognition that adolescent digital effects are probably contextual and multifactorial.

Methodology

The research utilized an empirical quantitative cross-sectional. An appropriate design was used because the purpose was to measure at one point in time the association of social media usage patterns and self-esteem. The study did not have an intervention or a longitudinal follow up. So, the findings are seen as associations, not effects. The analysis was performed on a de-identified dataset and had 200 adolescent respondents from the Araria District of Bihar.

The sample consisted of teenagers aged 13-19 which falls within the WHO specified age definition for adolescents. Average age is 16.06 years SD = 1.70. The dataset was made balanced by the major groups of comparison: 100 boys and 100 girls; 100 rural and 100 urban adolescents; and 100 government school students and 100 private school students. The balanced structure enhances clarity regarding group comparisons, even though it cannot be interpreted as a district-wide random sample. Respondents were school-going adolescents mostly from VIII to XII classes. Every record indicated student assent and parent or guardian consent, as well as permission from the school and assurance of confidentiality.

The Rosenberg Self-Esteem Scale was used to measure self-esteem. The RSES is made up of ten self-report items (five positive and five negative). In this analysis, the positively worded items were scored 0 to 3, with higher scores indicating higher self-esteem. All item scores were moved in the same direction, reverse scoring all negatively worded items. The total score of RSES was obtained by summing the ten item scores. The possible range for RSES total score was 0 to 30. Higher total score indicates stronger global self-esteem. Data screening revealed formula errors in the original RSES total and self-esteem category columns in the file uploaded. As a result, the columns were discarded. The raw responses to the RSES items were rescored, and all analyses used a recalculated RSES total.

The Social Media Usage Index constructed for this study was used as a measure of social media usage. The measure with six indicators, namely time spend on social media on a daily basis, posting photo or video frequently, comparing oneself with others online often, using social media at night, using social media during study time, and getting restless when unable to use social media. Each of the indicators was coded in an ordinal direction where higher values indicated a more intensive use or likely more disruptive use. To enhance the comprehensibility, the six indicators were added up into a raw score before employing the sum, which was converted into a percent score. The SMUI shouldn't be regarded as a diagnostic scale clinically. The use of social media intensity behavior empirically composites' in the dataset which was taken from Liu et al.

The other variables were age, sex, class standard, type of school, rural/urban, type of family, educational status of parents, monthly income of family, supervision by parents of mobile use, performance in last examination, number of best friends, sleep hours, experience of cyber bullying and body image concern due to social media. The platforms employed were coded because there were multiple responses inclusive of WhatsApp, YouTube, Instagram, Facebook, Snapchat, among others. The purposes for which the respondents use the app were similarly coded for study, entertainment, chatting, reels or videos news, gaming, content creation, etc.

Analysis of data followed a layered strategy. To begin with, we examined the quality of data for missing values, consent indicators and broken formula columns. There were no refusal-based exclusions hence all 200 cases were retained. Once more, summary stats were computed for the continuous variables and frequency distribution for the categorical variables. Reliability of measurement method was able to

repeat itself. The fourth linearity test used "Pearson correlation" to test self-esteem associations; Spearman rank correlation association was also reported as several social media indicators were ordinal. The fifth step involved using two-group comparisons with Welch t-tests. Welch's t-test is considered to have more reliability when there are differences in group variances or group sizes. A one-way ANOVA was used to assess the difference in daily time and SMUI category with the effect size computed using eta squared and omega squared. Kruskal-Wallis tests were also reported as non-parametric checks.

Multiple regression was lastly used to test whether social media use predicted self-esteem after adjusting for demographics and psychosocial covariates. The comprehensive regression model comprised of age, gender, school type, location, parental supervision, SMUI, body image, sleep duration, academic performance and cyberbullying experience. HC3 robust standard errors were employed because it is recommended to use heteroskedasticity-consistent estimation when ordinary least squares variance assumptions are uncertain (Hayes & Cai, 2007). Variance inflation factors were used to assess multicollinearity and residual diagnostics with the Shapiro-Wilk test, Breusch-Pagan test, Durbin-Watson statistic, Cook's distance and leverage. Statistical significance was assessed mainly at $p < .05$, whereas effect sizes and confidence intervals were stressed for interpretation.

Table 1: Sample characteristics and social media profile

Characteristic	Description
Age, years	Mean = 16.06; SD = 1.70; range = 13-19
Gender	Boy: 100 (50.0%); Girl: 100 (50.0%)
School type	Government: 100 (50.0%); Private: 100 (50.0%)
Location	Rural: 100 (50.0%); Urban: 100 (50.0%)
Class standard	VIII: 12 (6.0%); IX: 25 (12.5%); X: 24 (12.0%); XI: 54 (27.0%); XII: 85 (42.5%)
Uses social media	Yes: 173 (86.5%); No: 27 (13.5%)
Daily social media time	No use: 27 (13.5%); <1 hour: 23 (11.5%); 1-2 hours: 59 (29.5%); 2-4 hours: 83 (41.5%); >4 hours: 8 (4.0%)
Self-esteem category	Low: 35 (17.5%); Moderate: 150 (75.0%); High: 15 (7.5%)
Cyberbullying experience	Yes: 12 (6.0%); No: 188 (94.0%)

Note. Percentages are based on N = 200 unless otherwise stated. The sample is balanced by gender, location, and school type in the uploaded dataset.

Table 2: Descriptive statistics for major continuous variables

Variable	N	Mean	SD	Median	Range
RSES total score (0-30)	200	19.25	4.86	19.00	4-30
SMUI percent score (0-100)	200	40.02	22.14	43.48	0-82.61
Academic performance (%)	200	66.62	8.97	66.75	43.4-92.4
Sleep duration (hours)	200	6.86	0.72	6.80	5.0-8.9
Body-image concern code (0-3)	200	1.24	0.87	1.00	0-3

Note. RSES = Rosenberg Self-Esteem Scale. SMUI = Social Media Usage Index.

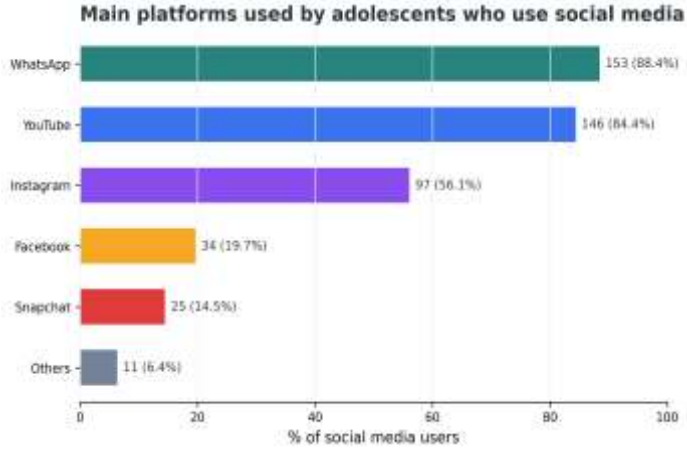
Results

Data screening showed that all 200 records were usable. No consent-based exclusion was required. The key correction was the recalculation of the RSES total score from item-level responses because the original total-score and category columns contained formula errors. After correction, RSES scores ranged from 4 to 30, with a mean of 19.25 (SD = 4.86) and a median of 19. The SMUI percent score ranged from 0 to 82.61, with a mean of 40.02 (SD = 22.14) and a median of 43.48.

The sample was balanced by design. Boys and girls each represented 50.0% of the respondents. Rural and urban respondents each represented 50.0%, and government and private schools each represented 50.0%. Most respondents were in classes XI and XII, which together represented 69.5% of the sample. Social media use was common: 173 adolescents (86.5%) reported using social media, while 27 (13.5%) reported no use. The largest daily-time group was 2-4 hours (41.5%), followed by 1-2 hours (29.5%), no use (13.5%), less than 1 hour (11.5%), and more than 4 hours (4.0%).

Platform use showed the dominance of everyday communication and video platforms. Among social media users, WhatsApp was reported by 88.4%, YouTube by 84.4%, Instagram by 56.1%, Facebook by 19.7%, Snapchat by 14.5%, and other platforms by 6.4%. The most common purposes among social media users were entertainment (80.3%), chatting (79.2%), study (71.1%), reels or videos (65.9%), news (36.4%), gaming (26.0%), and content creation (7.5%). This pattern suggests that social media is not only recreational; it is also embedded in study-related communication and information access.

Figure 2 : *Platform use among adolescents who reported using social media.*



Note. Percentages are calculated among the 173 social media users. Multiple platform selection was allowed.

Self-esteem category scores showed that most adolescents fell in the moderate range. Low self-esteem was observed in 35 respondents (17.5%), moderate self-esteem in 150 respondents (75.0%), and high self-esteem in 15 respondents (7.5%). For SMUI categories, 65 respondents (32.5%) were in the low group, 120 (60.0%) in the moderate group, and 15 (7.5%) in the high group. Parent supervision varied, with 35.5% reporting high supervision, 33.0% moderate supervision, 21.5% low supervision, and 10.0% no supervision. Cyberbullying experience was reported by 12 respondents (6.0%). Body-image concern due to social media was reported at some level by 154 respondents (77.0%), though only 6.0% reported high concern.

Reliability analysis indicated that the RSES had moderate internal consistency in this sample, Cronbach's alpha = .664. This value is lower than some published RSES reliabilities, but it is acceptable for cautious exploratory field interpretation, especially given possible language, local response style, and adolescent comprehension differences. The Social Media Usage Index showed good internal consistency, Cronbach's alpha = .862, supporting its use as a composite indicator of usage intensity and behavior pattern in the present dataset.

Table 3: Internal consistency reliability of the study scales

Scale	Items	Cronbach alpha	Interpretation
RSES self-esteem scale	10	.664	Moderate; retained for exploratory field analysis
Social Media Usage Index	6	.862	Good internal consistency

Note. RSES alpha should be interpreted cautiously because item wording, language, and local response patterns may influence reliability.

The main hypothesis was supported. SMUI was significantly and negatively correlated with RSES self-esteem, r = -.540, 95% CI [-.632, -.434], p < .001. Spearman correlation confirmed the pattern, rho = -.521, p < .001. Several specific indicators were also significantly negative. Online self-comparison showed the strongest bivariate association with self-esteem, r = -.588, p < .001. Daily time code was also negative, r = -.526, p < .001. Night-time social media use was negative, r = -.489, p < .001. Use during

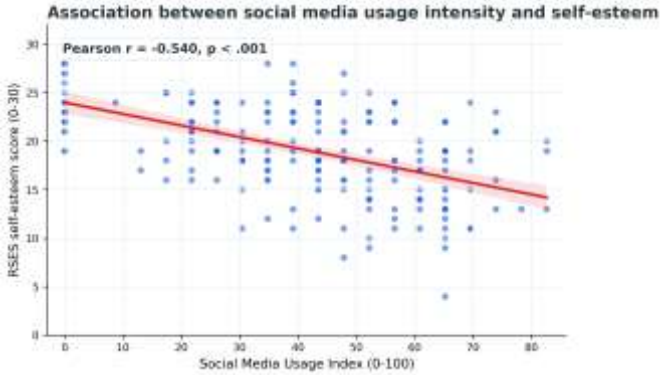
study time and restlessness when unable to use social media were weaker but still significant, r = -.341 and r = -.369 respectively, both p < .001.

Table 4 : Bivariate relationships with self-esteem

Predictor	Pearson r	95% CI	p	Spearman rho	p
SMUI percent score	-.540	-.632 to -.434	< .001	-.521	< .001
Daily time code	-.526	-.619 to -.417	< .001	-.505	< .001
Comparison code	-.588	-.672 to -.489	< .001	-.579	< .001
Night use code	-.489	-.588 to -.376	< .001	-.471	< .001
Study-time use code	-.341	-.458 to -.212	< .001	-.353	< .001
Restlessness code	-.369	-.483 to -.242	< .001	-.356	< .001
Sleep duration	.549	.444 to .639	< .001	.558	< .001
Body-image concern	-.505	-.601 to -.394	< .001	-.518	< .001

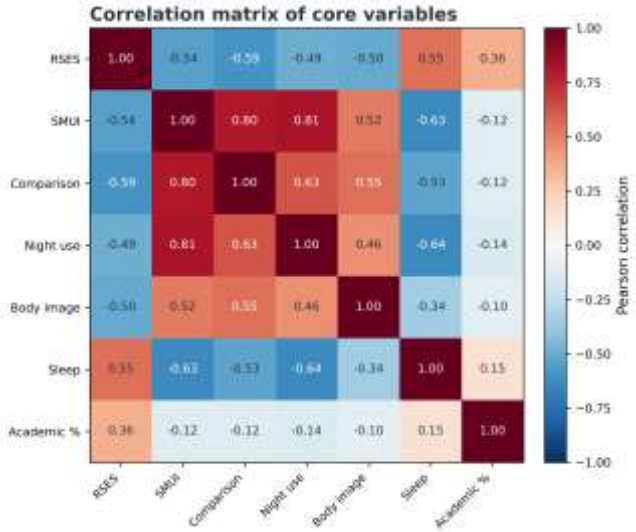
Note. Negative correlations indicate that higher predictor scores are associated with lower RSES self-esteem scores.

Figure 3 : *Association between SMUI and self-esteem.*



Note. The regression line is shown with a 95% confidence band. The association is statistically significant but should not be interpreted as causal.

Figure 4 : *Correlation matrix of core variables.*



Note. The strongest correlations with RSES are visible for SMUI, body-image concern, sleep duration, and online comparison.

Other variables showed meaningful relationships. Sleep duration was positively associated with self-esteem, r = .549, p < .001, indicating that adolescents with longer sleep tended to report higher self-esteem. Academic performance was also positively associated with self-esteem, r = .355, p < .001. Body-image concern due to social media was negatively associated with self-esteem, r = -.505, p < .001. Cyberbullying experience was negatively associated with self-esteem, r = -.173, p = .014, although the effect was smaller and the cyberbullying group was small. Parent supervision was not significantly associated with self-esteem in the bivariate analysis, r = .098, p = .169.

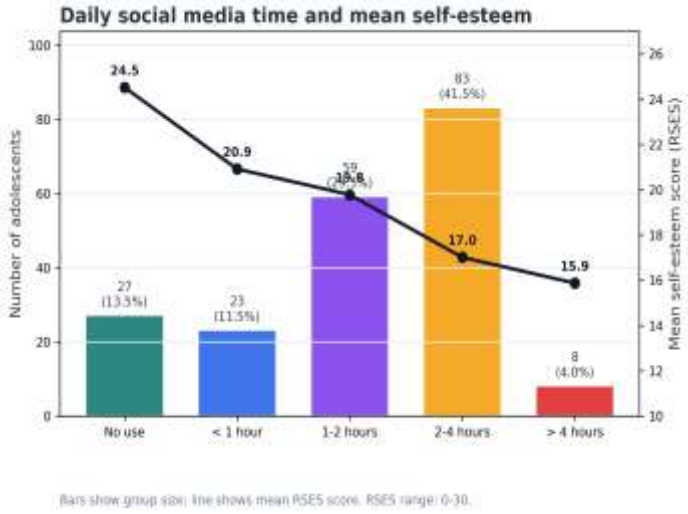
Group comparisons further supported the pattern. Self-esteem differed significantly across daily social media time groups, F(4, 195) = 19.38, p < .001, eta squared = .284, omega squared = .269. The Kruskal-Wallis test confirmed the same conclusion, H = 54.49, p < .001. Mean RSES scores decreased as daily social media time increased: no use, M = 24.52; less than 1 hour, M = 20.91; 1-2 hours, M = 19.78; 2-4 hours, M = 17.01; and more than 4 hours, M = 15.88. Post-hoc Welch comparisons with Holm correction showed that the no-use group differed significantly from all use groups, and the less-than-one-hour group scored significantly higher than the 2-4-hour and more-than-4-hour groups. However, the more-than-four-hour group had only eight respondents, so that specific mean should be interpreted with caution.

Table 5 : Main group comparisons for self-esteem

Comparison	Statistic	p	Effect size	Decision
RSES by daily time groups	F(4, 195) = 19.38	< .001	.284	Supported
RSES by SMUI category	F(2, 197) = 20.41	< .001	.172	Supported
RSES by gender	Welch t(197.22) = -0.77	.442	g = 0.109	Not supported
RSES by rural/urban location	Welch t(195.41) = -1.03	.303	g = 0.146	Not supported
RSES by school type	Welch t(180.16) = -0.71	.477	g = 0.100	Not supported
RSES by social media use status	Welch t(43.54) = 8.51	< .001	g = -1.381	Supported

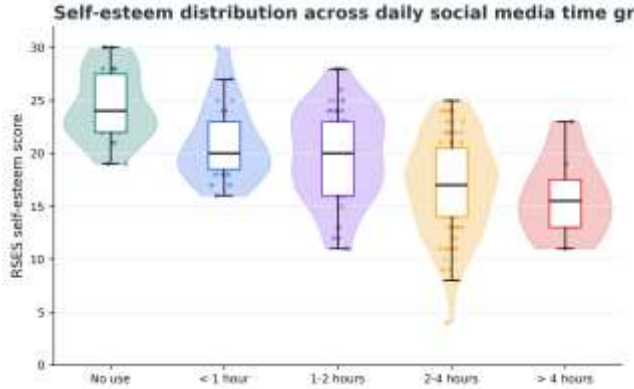
Note. Welch tests were used for two-group comparisons. Eta squared is reported for ANOVA tests; Hedges g is reported for selected two-group comparisons.

Figure 5 : *Daily social media time and mean self-esteem.*



Note. Bars show group sizes and the line shows mean RSES scores. The more-than-four-hour group is small (n = 8).

Figure 6 : *Self-esteem distributions across daily social media time groups.*



Note. Violin shapes show distribution; boxplots show median and interquartile range; points show individual respondents.

Gender differences were not statistically significant. Boys had a mean RSES score of 18.98 (SD = 5.02), while girls had a mean score of 19.51 (SD = 4.71), Welch t(197.22) = -0.77, p = .442. Similarly, SMUI scores did not differ significantly by gender, p = .628. Rural and urban respondents did not differ significantly in self-esteem, p = .303, and government and private school respondents also did not differ significantly, p = .477. Adolescents who reported using social media had lower self-esteem than non-users, Welch t(43.54) = 8.51, p < .001, but this comparison should be interpreted carefully because non-users were fewer in number and may differ in unmeasured ways.

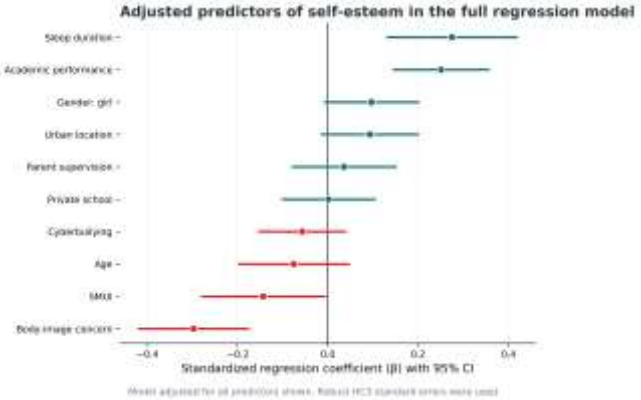
The multiple regression model provided a stronger adjusted test of the research question. The full model explained 52.3% of the variance in self-esteem, R squared = .523, adjusted R squared = .498, F = 20.72, p < .001. After adjusting for covariates, SMUI remained a significant negative predictor of self-esteem, B = -0.031, robust SE = 0.015, p = .039. This means that each one-point increase in the SMUI percent score was associated with a 0.031-point decrease in RSES score, holding other variables constant. A 10-point increase in SMUI would therefore correspond to an estimated 0.31-point lower RSES score. Although this adjusted effect is smaller than the bivariate association, it remains significant after accounting for body-image concern, sleep, academics, and demographics.

Table 6 : Full multiple regression predicting RSES self-esteem

Predictor	B	Robust SE	95% CI	Beta	p
Age	-0.216	0.177	-0.563 to 0.131	-0.076	.222
Gender: girl = 1	0.933	0.512	-0.071 to 1.936	0.096	.069
Private school = 1	0.013	0.504	-0.975 to 1.001	0.001	.980
Urban location = 1	0.901	0.526	-0.130 to 1.931	0.093	.087
Parent supervision	0.177	0.288	-0.386 to 0.741	0.036	.538
SMUI (0-100)	-0.031	0.015	-0.061 to -0.002	-0.143	.039
Body-image concern	-1.658	0.343	-2.331 to -0.985	-0.298	< .001
Sleep duration	1.856	0.494	0.889 to 2.823	0.275	< .001
Academic performance (%)	0.136	0.029	0.079 to 0.193	0.251	< .001
Cyberbullying: yes = 1	-1.168	0.993	-3.114 to 0.778	-0.057	.239

Note. Model R squared = .523; adjusted R squared = .498. Robust HC3 standard errors are reported. Beta = standardized coefficient.

Figure 7 : *Adjusted predictors of self-esteem in the full regression model.*



Note. Standardized coefficients allow approximate comparison of predictor strength across variables. Confidence intervals crossing zero indicate non-significant predictors at $p < .05$.

Body-image concerns, sleep duration and academic performance were the strongest adjusted predictors. Those who reported more concern about their body-image had lower self-esteem. Sleep duration increased, $B = 1.856$, $p < .001$. The academic performance was also significant, $B = 0.136$, $p < .001$. The full adjusted model did notfind statistically significant associations for age, gender, type of school, location, parent supervision and being cyberbullies, although the gender and location were conventionally significant. Diagnostic checks confirmed the model's acceptability. Shapiro-wilk tests on the residuals, $W = .988$, $p = .094$. The Breusch-Pagan tests came in slightly above .05 not strong evidence of heteroskedasticity present but the HC3 robust standard errors will be retained out of conservativeness.

The Durbin-Watson statistic was 2.168, the maximum Cook's distance was 0.052, and all VIFs were less than 2.20, indicating no serious multicollinearity problem in the data.

Discussion

An investigation found that the intensity of social media use and self-esteem have a negative correlation among the adolescents of the Araria District. The resulting data wasn't exclusive to a single analysis. It was seen in the Pearson correlation, Spearman correlation, daily time group comparisons, SMUI category comparisons, and robust multiple regression. Use of more intensive social media especially comparison-oriented use and night-time use was associated with lower self-esteem among adolescents. This is consistent with social comparison theory and studies showing that feedback, comparison, and problematic use have more psychological relevance than purely accessing (Appel et al., 2016; Boer et al., 2021; Valkenburg et al., 2006).

The best bivariate indicator for social media was online self-comparison. This signifies that the psychological meaning of the use of social media is more important than the amount alone, which is important. According to research, spending time online for study or entertainment is not necessarily problematic. Nevertheless, if that comparison turns more frequent and habitual, it can lead the adolescent to evaluate themselves as less attractive, less successful, or less socially valued as their peers, influencers, edited images or idealized lifestyles. High body image concerns have a negative impact on self-esteem in people. When linking social media use with body dissatisfaction, this may threaten self-esteem.

There has been a significant positive link with sleep duration. This result fits with the wider literature associating night-time use of social media with poorer sleep and other psychological outcomes (Woods & Scott, 2016). In the current data, night-time use negatively associated with self-esteem, and sleep duration remained a strong positive predictor after controlling. Late-night hooking-up may reduce sleep, increase tiredness, and weaken emotional regulation. Adolescents with lower self-esteem might go to social media at night to distract themselves or to feel better. The cross sectional design cannot disentangle these pathways, but it does highlight sleep hygiene as a reasonable intervention target.

Self-esteem was positively related to academic performance. According to the researchers, getting good grades helped boost the self-esteem of South African adolescents. In an area where education is closely linked to familial hope and mobilities, academic performance may become a key source of self-

worth. This finding doesn't imply that students with lower marks have personal deficits. It indicates that confidence in your education and self-esteem may strengthen each other. A school may help students with both academic skills and emotional well-being, especially the students who feel academically weak.

It is noteworthy that there was no significant gender difference. It is commonly discussed that girls are at greater risk than boys when it comes to social media harm, due to appearance comparison and the visual nature of social media platforms. In the current sample, girls showed no significantly lower levels of self-esteem than boys, and the gender difference in SMUI was also non-significant. This may show that boys and girls experience social media pressures in different ways. Girls may compare their looks more, whereas boys may compare their social status, performance, gaming or peer-group pressure. Another consideration is that the balanced school-going sample could have scaled down the gender differences which may appear in a larger or more varied district sample.

Differences related to rural-urban and school-type were also not significant. This may spill over to the usage of smartphone-based social media, which may be widely diffused across contexts. It also hints that older divides between rural and urban adolescents may be eroded. Yet, a caution is called for here. Equal group sizes in the sample do not guarantee equal access to digital in the rest of the district. Internet access quality, parental control, digital literacy, privacy and ownership of devices may still differ quite a bit. Additional research should obtain more precise measurements of these dimensions.

Findings of the study shows that the relationship between social media and self-esteem is partially shared with body-image concern and 6 other factors. There is a moderate to strong bivariate correlation between SMUI and self-esteem, but regressive coefficient reduced after adjustment. Find another way to say this could mean that social media might linked to self-esteem through more than one pathway, not just one single pathway. For instance, heavy use may increase comparison and body dissatisfaction, decrease sleep, disrupt study routines, or expose teens to criticism. These processes could then shape self-esteem. A more formal testing of these pathways would require a mediation or longitudinal design.

The results agree with the more tempered course of recent media-effects investigations. Several studies focusing on various populations have argued that the effects of new digital technologies on everyone may be overall small (Orben & Przybylski, 2019). In contrast, research focusing on specific adolescents seems to indicate some adolescents are more vulnerable than others (Beyens et al., 2020; Valkenburg et al., 2021). The current research does not contradict the literature. It indicates that a particular pattern of usage was closely associated with self-esteem in this Araria sample. The meaning seems to be guidance should not be limited to banning or curtailing social media. Prioritize healthier patterns that include less comparison, reduced use at night, less distraction during study time, better sleep and support each other online.

According to the results, self-esteem interventions can be combined with digital well-being education in school counselling. The youth can learn to identify image alterations, comparison traps, unrealistic lifestyles, and attention-seeking designs of the platforms. Counsellors and teachers can prompt students to reflect on how they feel after using social media and not just how long they do. If students are saying that they have body-image concern, poor sleep or restlessness without the phone, then they need help. The supervision of the parent sessions is balanced. Findings do not show a direct effect of parent supervision on self-esteem, this does not mean that the supervision is unimportant. Such a concept of supervision probably means that constructive, communicative and not merely controlling.

At the family level, it should be encouraged to have practical routines like phone-free study time, phone-free bedtime, talking about comparison online and promoting offline peer bonding. Parents shouldn't use only punishment or confiscation, as teens may then conceal their actions online. A more effective strategy might be to explore what they are watching and how it affects them, and how they can manage notifications, privacy and screen routines. In rural and semi-urban settings, schools and community organisations can help families where digital literacy may be uneven.

The research has constraints. First, it is designed cross-sectionally, so the causal direction is unknown. The reduced self-esteem might make one spend more time on social media, spending more time on social media might make one have lesser self-esteem, or a third factor might be affecting both the reduced self-esteem as well as spending more time on social media. Moreover, the data were self-reported, which could lead to memory or social desirability bias. Furthermore, while the sample size is sufficient for

the analyses conducted, it does not have sufficient power for more detailed subgroup modelling by gender, platform, age and location. Furthermore, as there were only eight respondents in the more-than-four-hours use group, comparison with that group should be made with caution. The SMUI was developed in this study, and it displayed good internal reliability but needs validation in independent samples.

Future studies should use longitudinal designs to examine directionality. Experience sampling methods could assess adolescents' subjective feelings right after different social media usage types. Qualitative interviews could be utilized to understand social comparison, parental pressure, academic pressure, and body image in Araria District. More widespread samples may show if platform-specific patterns differ for Instagram, YouTube, WhatsApp and short video content. Future studies could also test whether social comparison, body-image concern, sleep, and academic stress mediate the link between social media and self-esteem.

Implications and Suggestions

Findings generate a fairly useful recommendations. A regular life-skills education theme can be digital well-being. This should include social comparison, online feedback, privacy, cyberbullying, sleep hygiene and study-time distraction. As many young people turn to the internet and social media for study and communication, guidance should not only cast technology in a negative light. Rephrased Text: (14 words)

Students can instead be helped to differentiate the productive, relational, and harmful uses. The use of WhatsApp for information regarding the classes is one thing, however, scrolling through reels late in the night for hours or comparing one's looks with the edited pictures of celebrities is another thing.

Teachers and counselors can screen for risk factors in a non-stigmatizing way. Signs can be consistently comparing yourself to those online, becoming upset after viewing their social media content, experiencing poor sleep patterns, feeling restless without the phone, losing focus on studies, or repeatedly expressing dislike for your body. Small, short-term classroom activities may ask students to track their mood before and after social media use, identify accounts that make them feel less-than, and practice reducing exposure to triggering content. These activities do not require much money and are suitable for the school.

Parents and guardians require advice that is practical and realistic. Most families try to manage mobile usage only through time restrictions. According to present findings, time is important, but the kind of use and timing of use matters too. Compared a teen who communicates with peers on social media for two hours after finishing work to a teen who uses social media for that amount of time at midnight to compare himself to his friends. Families can establish routines such as charging phones outside the sleeping area, defining a study block every day without social media, and discussing online comparison. When adolescents feel respected and included, they're more likely to respond positively to these steps.

The study underlines the need for digital literacy for adolescents for district level youth programmes. Digital literacy should encompass a psychological literacy component, in addition to technical skills. Planner reminders, edited images, peer pressure, cyberbullying, the sleep-emotion nexus and so on. Workshops at the community level should be designed in Hindi and Urdu, the two languages noted on the district website, with locally relevant examples. These programmes would be particularly valuable in areas where first-time smartphone access is growing at a faster rate than formal digital education.

Conclusion

The current research assessed how social media and self-esteem among 200 adolescents in Araria District, Bihar. The results reveal that people who use social media intensively have a low self-esteem. Adolescents with higher SMUI scores, on average, scored lower on the RSES. People who reportedly do not spend any amount of time on social media scored the highest on self-esteem. Users who report spending more than four hours daily scored lowest on self-esteem. The pattern was especially explained by online self-comparison, night-time use, body-image concern, sleep duration and academic performance.

More than half of the variance in self-esteem was explained by the full regression model. After adjustment for demographic variables, and psychosocial variables, SMUI remained a significant negative predictor. The conclusion of this research is correlative in nature. It cannot be proven that social media causes low self-esteem. The most responsible conclusion is that frequent and emotionally charged use of social media is a prominent marker of self-esteem vulnerability in this sample.

In general, The study supports a more balanced approach towards digital well being. Adolescents should not be viewed as a mere victim of technology, and social media should not be treated as harmless. The important issue is how, when, and why adolescents use it. In the Araria District where digital is being accessed by the rural and urban areas alike, school, family, and community organisations can use these findings to lessen harmful comparison, improve online behaviour, protect sleep, strengthen academic confidence and bolster adolescent self-worth.

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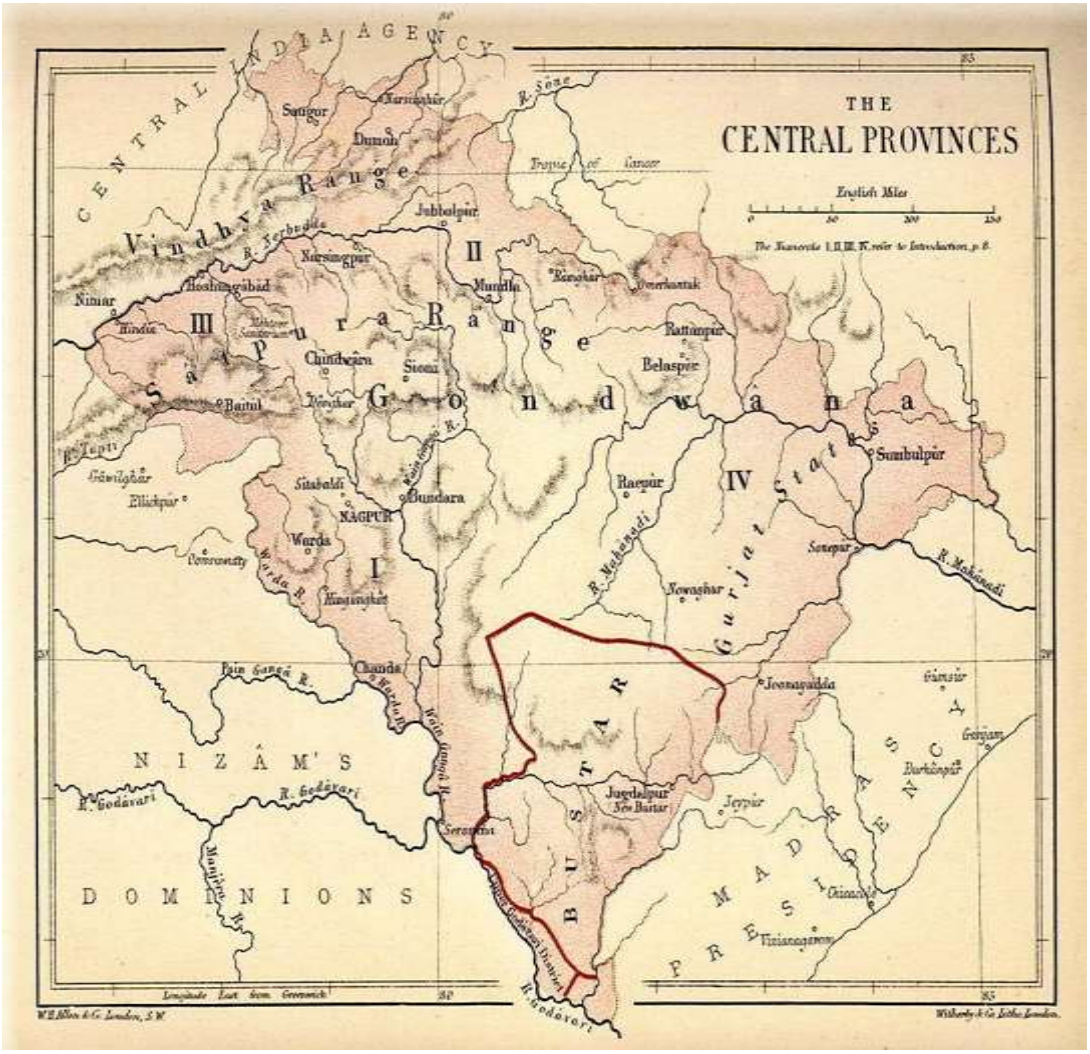
Policy and Practice: English Education and Local Realities in the Central Provinces, 1861-1920

Tarun Singh*

Abstract



https://upload.wikimedia.org/wikipedia/commons/5/54/Pope1880CentralProv2.jpg?_=20101012214321

This paper is an analysis of the divergence of the objectives and implementation of the colonial educational policy in the Central Provinces from 1861 till 1920. During this time period, the British empire aimed at implementing English education as a way to form a skilled labor force and increase administrative effectiveness and loyalty of the population to the colonial regime. However,

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due to the influence of local socio-cultural-economic circumstances, the policies had quite a different impact on the region. The research makes use of the analysis of educational reports, official papers, district materials and the sources of local origin to investigate the nature of acceptance and implementation of English education. Instead of considering the colonial education as a top-down process, the current work shows the active role played by the students, parents and other members of the community in the process. The aspects like caste hierarchy, language preference, lack of access to schooling and local economic situation were some of the factors that affected the English education process. By examining the Central Provinces, a part of India that has not attracted much historical attention regarding colonial education policies, the article shows that the implementation of these policies was far from being consistent and unchallenged. The conditions of local society often changed the colonial plans, resulting in outcomes different from what was planned by officials. Through analysis of the dynamics between policy and practice, this article adds to the knowledge about the role of education as a negotiating ground in colonial India.

Ideological and Political Motivations Behind the Introduction of English Education

The development of English education in the Central Provinces from 1861 to 1920 was part of the general ideological and political agenda of the British colonial rulers in India. The colonial rulers' attitude toward education in India following the educational reforms introduced in the mid-nineteenth century, especially after Wood's Despatch of 1854, was that education could be used as an efficient tool for maintaining colonial domination. According to their understanding, the English education was designed to train a new class of educated Indians as intermediaries between the colonial government and people. As Thomas Babington Macaulay famously argued, the aim was to form "a class of persons, Indian in blood and colour, but English in taste, in opinions, in morals, and in intellect."[1] Through Western science and technology, as well as knowledge of English, the British aimed at cultivating an efficient working class which could help the colonial officials manage the colonial state apparatus. In addition to administrative needs, English education had an important ideological meaning as well. British administrators often used the rhetoric of progress, civilization, and moral improvement to justify the development of education in India. The teaching of English literature, history, and political ideas aimed at acquainting Indians with those values that were needed for modern administration and progress. As Wood's Despatch (1854) itself stated, education was intended "to extend and improve education generally among the people of India," particularly through the promotion of English instruction.[2] However, the application of these policies showed a significant divergence between the official intent and the reality on the ground. Where colonial powers intended education to be a tool for increasing their imperial presence, the locals saw English education as an avenue for other things, such as job prospects, social climbing, and increased social prestige. Thus, English education emerged as an area of contestation where the goals of the colonial rulers clashed with those of the locals. The case of the Central Provinces illustrates how educational policy was not only imposed but continually modified by the reactions of the locals to it.[3]

[1] Thomas Babington Macaulay, *"Minute on Indian Education,"* February 2, 1835.
[2] Government of India, *Wood's Despatch on Education*, 1854.
[3] Krishna Kumar, *Political Agenda of Education: A Study of Colonialist and Nationalist Ideas* (New Delhi: SAGE Publications, 2005), 18–22.

Implementation of Colonial Education Policies: The Role of State and Missionary Institutions

TABLE 5

DISTRICTS AND DIVISIONS OF THE CENTRAL PROVINCES
POPULATION (IN THOUSANDS), AND CULTIVATED
AREA (IN SQUARE MILES)

District and Division	Area	Population		Cultivated		Tribal
		Total	Per square mile	Total	Percent	Percent
Jabalpur Division						
Jabalpur	4,269	620.2	145	1,441	34	22.4
Saugor	4,005	498.6	122	1,083	27	8.1
Damoh	2,457	262.6	107	619	25	12.0
Seoni	3,608	421.7	117	1,008	28	43.6
Mandla	5,638	202.5	36	628	11	61.2
Narbudda Division						
Hoshangabad	3,997	440.4	110	2,351	59	20.0
Narsinghpur	1,916	336.8	176	893	47	17.5
Nimar	2,694	190.6	71	444	16	16.9
Betul	3,863	258.3	67	1,040	27	40.3
Chhindwara	4,032	296.9	74	942	23	40.9
Nagpur Division						
Nagpur	3,734	639.3	171	1,794	48	6.3
Wardha	2,392	343.5	144	1,359	57	11.3
Bhandara	3,922	608.4	155	1,279	33	14.7
Chanda	10,000	537.3	54	1,077	11	24.4
Balaghat	2,608	171.0	66	341	13	28.3
Chhattisgarh Division						
Raipur	8,453	952.8	113	2,973	35	22.5
Bilaspur	7,131	699.5	98	1,894	27	22.0
Sambalpur	5,632	452.3	80	2,520	45	33.4
Central Provinces	80,565	7,919.8	98	23,686	29	23.0

SOURCES: Census 1867, App.--Statistical Tables; IRAP, Famine, December 1888, #15, "Condition of the Lower Classes."

NOTES: All statistics based on 1867 Census, except Tribal percent which is based on the 1888 report.
Districts in the Divisions are listed to indicate the core areas followed by the less populated, less cultivated districts.

https://asianstudies.github.io/area-studies/SouthAsia/Ideas/CP/im/p46.gif

It became necessary to have an organizational mechanism for carrying out the colonial policies in accordance with the ideological and political motives that motivated the introduction of English education. For instance, in the case of the Central Provinces, the spread of English education from 1861-1920 was mostly done through the joint effort of the government and missionaries. While the colonial government formulated the policies, provided finances and regulated the curriculum of the schools, missionaries facilitated the spreading of education through their institutions in places not yet covered by governmental institutions. In order to create a systematic form of education, the colonial government initiated the establishment of government schools, training of teachers, inspection of schools, and standardization of examinations. The policies on education were shaped by considerations of administration efficiency and economy, thus resulting in the gradual spread of schools in the district headquarter towns. The government even used grants-in-aid to involve other private or aided institutions in the process of educational development. However, the extent of the coverage of the schools in rural and tribal areas was quite limited due to lack of infrastructural facilities. However, missionary organizations were able to fill many of these gaps by setting up

schools in distant areas and among communities that did not have access to any formal system of education. While missionary organizations held the same assumption regarding the ability of Western education to change societies as the colonial authorities, their motives often combined teaching and religion as well. As Mahatma Gandhi later observed, "English education has enslaved us; it has created a gulf between the educated and the masses."[4] Similarly, Rabindranath Tagore criticized such systems by stating that "the highest education is that which does not merely give us information but makes our life in harmony with all existence."[5] This made missionary schools a place where English language was taught along with Western subjects. Still, they appealed to students due to more material reasons, such as literacy, employment, and social ascent rather than religious conversion. Despite the efforts of both state and missionary organizations, educational policy was carried out against the background of local specifics. Economic problems, social hierarchies, preference for languages, and attitude towards education defined enrollment rates in schools.[6] In other words, practice of schools was often different from the expectations of policy makers which reflected the complicated relationship between colonial policy and Indigenous local environment.

Uneven Access to English Education: Caste, Tribe, Class, and Gender

TABLE 4

SOCIAL CATEGORIES IN THE CENTRAL PROVINCES AND IN SELECTED DISTRICTS: THE MAIN CASTES AND TRIBES, 1901

Central Provinces		
Caste or tribe	Population in thousands	Percentage of total population
Gonds	2,000	20.0
Korkus	100	1.0
Other tribes	391	3.9
Chamars	740	7.5
Mahars	620	6.3
Telis	593	6.0
Malis and Kacchis	394	4.0
Ahirs	790	8.0
Kunbis	395	4.0
Kurmis	247	2.5
Lodhis	247	2.5
Brahmins	400	4.0
Rajputs	350	3.5
sub-total of above	7,267	73.2
Tribals plus other large castes-- Chamars, Mahars, Telis, Malis, and Ahirs . . .		56.7
Total	9,877	100.0

Hoshangabad District		
Caste or tribe	Population in thousands	Percentage of total population
Gonds	49	11.0
Korkus	23	5.0
Brahmins	34	7.6
Rajputs	28	6.3
Gujars	22	4.9
sub-total of above	156	34.8
Tribals plus Brahmins . . .		23.6
Total	447	100.0

Jabalpur District		
Gonds	79	11.6
Kols	46	6.8
Bharia Bhumias	22	3.2
Brahmins	64	9.4
Lodhis	41	6.0
Kurmis	35	5.1
sub-total of above	287	42.1
Tribals plus Brahmins . . .		31.0
Total	681	100.0

TABLE 4—continued

Nagpur District		
Caste or tribe	Population in thousands	Percentage of total population
Gonds	46	6.1
Kunbis	152	20.2
Mahars	125	16.6
Brahmins	23	3.1
sub-total of above	346	46.0
Tribals plus Kunbis and Mahars . . .		42.9
Total	752	100.0

Balaghat District		
Gonds	73	22.6
Marars	42	12.8
Powars	41	12.6
sub-total of above	156	46.0
Tribals plus Marars	[illegible]	35.4
Total	325	100.0

Raipur District		
	Population in thousands	Percentage of total population
Gonds	216	15
Chamars	245	17
Telis	232	16
Ahirs or Rawats	145	10
sub-total of above	838	58
Tribals plus Chamars . . .		32
Total	1,441	100

SOURCES: Imperial Gazetteer of India (1907), and Balaghat District Gazetteer (1907).

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https://asianstudies.github.io/area-studies/SouthAsia/Ideas/CP/im/p40.gif

[4] Mohandas K. Gandhi, *Hind Swaraj* (Ahmedabad: Navajivan Publishing House, 1909), 37.
[5] Rabindranath Tagore, *Personality* (London: Macmillan, 1917), 102.
[6] Krishna Kumar, *Political Agenda of Education: A Study of Colonialist and Nationalist Ideas* (New Delhi: SAGE Publications, 2005), 18–22.

Even though the expansion of institutions of education made English education more available in the Central Provinces, access to such facilities was still unequal. This was because the spread of education was not only determined by policies and efforts on the part of the colonizer and missionaries, but was also greatly influenced by the prevailing social hierarchy as well as the economic situation. This meant that access to such education was unevenly distributed amongst different castes, tribes, classes, as well as gender. Communities comprising members of the upper caste and the urban middle class were usually the first to benefit from English education. With more financial and social capital, they saw education as a means to accessing government jobs and social mobility. However, for the lower castes and tribals, participation in education posed certain challenges. Poverty, geographic isolation, and social discrimination acted as hurdles for accessing educational opportunities at the schools. While the mission schools tried to ensure the education of those marginalized segments of society, enrolment was quite less owing to poverty which forced children to help in household activities. In addition, language difference and alien curriculum often made it difficult to attract tribal people towards formal education.

The gender issue was also an important divide within the education sector. Little importance was given to the female education in the earlier decades of the colonial rule, and there were also social customs which discouraged girls from attending school. Despite the missionary societies and some local reformers emphasizing female education, enrolment was much lesser in comparison to males. Such disparities highlight that the proliferation of English education was anything but evenhanded. Caste privileges, class differentials, tribals' exclusion, and gender discrimination all played a vital role in determining the results of education. Hence, the case of the Central Provinces reveals how the universal dreams of colonial education policy remained incompatible with social inequities.[7]

Indigenous Responses to Colonial Education: Acceptance, Adaptation, Resistance, and Negotiation

However, this disparity in the availability of education was not followed by a single approach towards colonial education among the indigenous population in the Central Provinces. On the contrary, these groups entered into a complex interaction with English education based on their interests, social, economic, and cultural concerns. While some communities used colonial education to advance in life, others took a more cautious attitude to it, taking what seemed beneficial but avoiding those elements that could jeopardize their culture. In particular, for new middle classes, colonial education became a tool for getting government jobs and careers. The need for clerks and administrators led to the decision to give children education in order to secure the future of the family. In such way, colonial education was seen as an important resource within the colonial economy. In the meantime, acceptance sometimes went hand-in-hand with adaptation. Local societies often adjusted their educational systems in accordance with regional circumstances and expectations. Native people attempted to gain the benefits of English literacy while retaining indigenous languages, religions, and social practices.[8] In other words, education turned out to be a realm where both colonial and local cultures could exist side-by-side. Moreover, resistance to colonial education could become a significant part of indigenous involvement in schooling. Some groups were suspicious of English schools, especially if they seemed to have anything to do with missionary activities or violated existing social traditions. Financial problems, fear of cultural assimilation, and uninterest in certain subjects were among the factors leading to such a situation. From total acceptance to outright opposition was a negotiation process. The communities kept on evaluating the advantages and disadvantages of colonial education, adopting aspects that suited them and opposing aspects that did

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[7] Susan Bayly, *Caste, Society and Politics in India from the Eighteenth Century to the Modern Age* (Cambridge: Cambridge University Press, 1999), 287–292.

[8] Sanjay Seth, *Subject Lessons: The Western Education of Colonial India* (Durham: Duke University Press, 2007), 54–59.

not suit them. This shows that the change in education in the Central Provinces was not just determined by colonial policies but came about through the interaction between the two.

Long-Term Cultural and Social Impacts of Colonial Education

Consequences of the relationship between colonial educational policies and local conditions in the Central Provinces were such that they persisted even after the departure of the British colonizers from the region. Even though the introduction of English education was motivated by the administrative and ideological needs of the colonial rulers, its long-lasting impact helped bring about substantial changes socially and culturally in the region. The spread of education led to the development of an educated middle class whose members were occupying themselves with administrative, legal, teaching, and other occupations. Culturally, English education had brought with it new ideas of intellectuality and knowledge. It had brought about debate on the use of the English language, national identity, and the conservation of native culture. The issue of balancing western educational influence with local culture had been one of the problems of colonial education. Even after the departure of the colonizers, the problem still persisted. The effects of colonial education were not forgotten when post-colonial education was being debated in India. Issues such as the language of instruction in schools, equal opportunities for quality education, and education and social mobility had their beginnings in colonial policies. As evidenced by the historical experience of the Central Provinces, many of the challenges faced by contemporary education systems are deeply rooted in colonial-era educational frameworks.[9]

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A Study of Parental Involvement in Relation with Environmental Behavior among Adolescents

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Abstract

Parental involvement has gained significant attention in environmental psychology, which has revealed a need for an instrument that can measure parental participation with children regarding environmental issues. The present study was undertaken keeping these conditions in mind. Hence, the Parental involvement and environmental behavior and their relations in adolescences were systematically measured. For this, purpose 80 adolescent of Bihar were purposively selected and they were administered Environmentally Responsible Behavior Scale and Parental Participation in Environmental (PPE) Scale. The Pearson correlation was applied to analyze the data. The results as follows: Obtained results show that a significant positive relationship between Parental involvement and environmental behavior of adolescents. The study aims in making the adolescents aware of the environmental behavior and save environment.

Keywords: Parental Involvement Environmental Behavior and Adolescents

Introduction:

Parents are one of the most important components of the social environment because they have the ability to influence the beliefs, values, and behaviours of their offspring (Bandura, 1977; Zigler and Seitz, 1978;). In the last few years, researchers have shown the connection between the pro-environmental behaviours of parents and children and their socialisation (for example, Grønhøj and Thøgersen, 2017; Katz-Gerro et al., 2020; Gong et al., 2021; Jia and Yu, 2021). In general, research have shown that children's perceptions of the human-natural relationship are influenced by the pro-environmental acts of their parents, and that this perspective is a predictor of children's intents to be environmentally conscious. On the other hand, the majority of researches have simply evaluated parental behaviours as a proxy for their direct engagement, and they have believed that the behaviours of parents may be transmitted to their children. There is currently a lack of sufficient research on the impact that parents have in shaping their children's perspectives and attitudes toward environmental concerns. This gap has emerged in part due to the fact that there is presently no instrument available to quantify the participation of parents in environmental concerns. Consequently, the purpose of this research was to verify a parental participation in the environment (PPE) measure that was constructed using a sample of parents who had a variety of demographic characteristics.

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In the field of environmental psychology, it has been recognised how important the pro-ecological behaviour of parents can be in children's behaviour. Purchasing green products, conserving energy and sorting waste are three pro- environmental behaviors related to positive links between parents' and children's behaviors found by Grønhøj and Thøgersen (2009). Grønhøj and Thøgersen (2012) even showed how parents could pass on their values, believes and behaviours to their own kids. But, research in other contexts has shown that the direct intergenerational transfer of ecological behavior is not necessarily the case. One example is Matthies, M., Wust, M., Holgersen, R., Kleiber, F., Skudra, F. and Dekeyrel, B. (2012) – who concluded in their study that parents' pro-environmental behavior (reusing paper) was not transmitted to their children. In the same way, Jia and Yu (2021) reported that there was no relationship between parents and their children's energy conservation behaviors on turning-off energy consuming equipment such as heater, AC and air purifier. Further, these authors suggested that pro-environmental behaviour may be an unstable trait that is transmitted from parents to children. This lack of a connection and consistency in families could be explained by the absence of family norms and direct involvement in environmental issues. Some parents, for instance, might not have explained the advantages of reusing paper to their kids or the importance of switching off large appliances such as their humidifier, heater and air conditioner. In contrast, parents may not be available to children to be observed and act as models. Hence, there may be an unstable relationship between parents' and children's PEBs influencing each other as they are in direct contact (family norms, parent-child discussion, or parent-child involvement). Some of the new research on the topic has been directed towards family socialization in relation to environment topics to address the issue of unsteady transmission across the generations.

Some recent investigations have begun to better understand how a parent's attitudes and practices can be passed on to their child through their socialization process (such as parental values, parenting styles, parent-child relations and parental control). For instance, Grønhøj and Thøgersen (2017) carried out a study indicating that adolescents' perceptions of autonomy support of parents were positively associated with adolescents' environmental behaviors. Normative expectations of the parents were a predictor of adolescents' environmental actions, identified by Collado et al. (2019). Gong et al. (2021) revealed that positive relationship between parents and children was a necessary pathway for the green consumption values of parents to affect children's environmental values. Ando et al., (2015) uncovered that environment-related behaviors between children and parents are mediated by the parents' SER, the parents' norms and parents' PBC.

While previous studies research has indicated that various elements of parental socialization affect children's environmental worldviews, few studies have focused specifically on PPE. One important aspect of parental socialization is the degree of group involvement (e.g., parental participation) according to the so called parental socialization theory (Grusec, 2011; Grusec and Davidov, 2019). While in this process of socialization, parents interact with children, provide role-modeling of learning opportunities and engage in activity organization in order to be able to give their children meaningful opportunities for learning (Grusec, 2011; Grusec & Davidov, 2019). Rogoff et al., (2007) proposed that intentional observation of parents' behaviour will predispose children to being observed as they present similar behaviours for themselves. Through parental involvement (e.g., parent-child interaction in family activities), therefore, children learn social customs and behaviors of society, and internalize the value of society (Rogoff et al., 2007).

Two recent studies investigated the parental involvement in transmitting environmental behaviours intergenerationaly. Katz-Gerro, et al. (2020) looked at how parental socialisation (e.g., reciprocity, guided learning and sense of control) was associated with intergenerational transmission of environmental behaviours, as well as the involvement of parents. Interestingly, they determined that the only domain that could predict parental children's environment behavior (such as being a sustainable lifestyle, saving energy and reducing waste) was the parental participation. Further, socialization by family norms, parent-child discussion, and parent-child engagement were measured by Jia and Yu (2021), and they determined parent-child engagement as the most effective mediator between parents' and children's pro-environmental behaviors. They believed that parents need to directly participate in their kids' kinds of pro-environmental behaviors, and their environmental worldviews, so that they could give their kids direct perception of the values of the behaviors (Jia and Yu, 2021). Hence, parental involvement in relation to their children's environmental issues seems to be essential in assuring the transfer of pro-environmental behaviors from parents to children.

In previous studies on parental participation this measure was not validated however. For instance, four items of the measures of parent-child group participation were adapted from a theoretical article on five dimensions of socialization (Katz-Gerro et al., 2020). Jia and Yu (2021) created eighteen items to assess PCEI, but did not extensively test in a representative sample. It is important to look closely at parental involvement with their children in particular and the environment in general and whether there are environmental topics, activities, or human/natural interaction issues that have not yet been explored. Out of these, some of the gaps are because there was ‘no instrument to assess parental participation' so this study aimed to develop and validate an instrument that could measure them.

This study focused on examining parental involvement and the environmental behavior of parents. It aimed to explore how parents participate in their children’s development and how their attitudes and practices toward the environment influence both their own behavior and that of their children. The study also sought to understand the relationship between the level of parental involvement and the adoption of environmentally responsible practices within the family setting.

Objective: To explore the relationship between parental involvement and environmental behavior among adolescents.

Hypothesis: **There would be relationship between parental involvement and environmental behavior among adolescents.**

Sample:

In the present study, the data were collected on 80 families (including both parents and adolescents) from different rural and urban geographical area of Bihar. The respondents of the research were selected using the snowball sampling method. Individual family contacted having at least one children of age between 12- 18 years of age.

Research Design:

In the current research, a correlational design was used. In this research, analyzing these relationships, we also looked at the relationships between parental involvement and environmental behavior among adolescents.

Tools:

1. **Environmentally Responsible Behavior Scale**: This scale was developed by Iwata (2001) and it contains 25-item to be rated on 5-point scale (never, seldom, occasionally, often, almost always). Participants were asked to read statements carefully and to rate the frequency of the specified behavior.
2. **Parental Participation in Environmental (PPE) Scale:** This scale was developed by Jia, F., & Yu, H. (2021) and it is composed of 9 items that were developed in the preliminary parental interview study. Using a 5-point scale, parents were asked to indicate the frequency (1 = Never to 5 = Always) with which they do specific communication activities with their children (e.g., " Explain organic food and other related knowledge to children when buying food").

Result and Discussion:

Table: Showing correlation among parental involvement and environmental behaviour of parents

		Environmentally Responsible Behavior
Parental involvement	Pearson Correlation	.300**
	Sig. (2-tailed)	.002

To test the stated hypothesis, we computed Pearson correlations between parental involvement and environmental behaviour**.** The results indicated a statistically significant association between parental involvement and environmental behaviour ($r = .300^{**}$, $p < 0.01$) respectively. The results indicated that a higher score on parental involvement corresponded with increase favorable environmental behaviour of family, thereby confirmed our hypothesis concerning the relationship between parental involvement and environmental behavior.

The results of the study revealed a significant positive relationship between parental involvement and environmental behavior within the family. It was observed that higher scores on parental involvement were consistently associated with more favorable environmental practices, such as energy conservation, waste management, and sustainable consumption patterns. These findings support the proposed hypothesis that increased parental engagement plays a crucial role in shaping environmentally responsible behavior among family members.

The results can be interpreted in light of the influential role parents play as primary socializing agents. When parents are actively involved in their children's lives, they are more likely to model positive attitudes and behaviors toward environmental sustainability. This involvement often includes guiding children in everyday practices such as reducing waste, conserving resources, and adopting eco-friendly habits. Consequently, children tend to internalize these values, leading to a more environmentally conscious family environment.

Furthermore, parental involvement enhances communication and awareness regarding environmental issues. Families with higher levels of engagement are more likely to discuss topics related to environmental protection, climate change, and sustainable living. This increased awareness fosters a collective sense of responsibility, encouraging all members of the household to participate in environmentally beneficial activities. The findings are consistent with previous research, which suggests that family environment and parental guidance significantly influence the development of pro-environmental attitudes and behaviors.

Conclusion:

In addition, the study highlights the importance of strengthening parental engagement as a strategy for promoting environmental sustainability at the grassroots level. Policies and educational programs that encourage parents to actively participate in both their children's development and environmental practices can lead to long-term positive outcomes. Overall, the study confirms that parental involvement is a key determinant in fostering favorable environmental behavior, thereby contributing to the broader goal of sustainable development.

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Dark Matter and Dark Energy: Contemporary Theories, Experimental Evidence and Future Directions

Dr. Sunil Kumar*

Abstract

Dark matter and dark energy are empirical names for two failures of the visible-matter description of the Universe. Dark matter is inferred from gravitational phenomena across scales, including galaxy rotation, gravitational lensing, cluster dynamics, the cosmic microwave background, and large-scale structure. Dark energy is inferred from the late-time acceleration of cosmic expansion and from the joint geometry and growth history measured by supernovae, baryon acoustic oscillations, weak lensing, and the microwave background. Together they account for about 95% of the energy density in the standard cosmological model, yet neither has been identified at a fundamental level. This review evaluates contemporary theories, experimental evidence, and future directions. For dark matter, it compares weakly interacting massive particles, axions and axion-like particles, sterile neutrinos, ultralight fields, primordial black holes, self-interacting sectors, and modified-gravity alternatives. It then assesses direct detection, indirect searches, collider constraints, and astrophysical probes, emphasizing the absence of a confirmed nongravitational signal despite tonne-year xenon exposures. For dark energy, it reviews the cosmological constant, quintessence, k-essence, phantom behavior, interacting dark sectors, and modified gravity. Particular attention is given to the 2025 DESI Data Release 2 result: more than 14 million galaxies and quasars yield baryon-acoustic-oscillation constraints that are compatible with flat ΛCDM by themselves, but combined data prefer a time-evolving equation of state at approximately 2.8–4.2 standard deviations depending on the supernova sample. This is intriguing, not decisive. The review argues that progress will depend less on a single "smoking gun" than on internally redundant measurements, background control, cross-survey calibration, and theories that make falsifiable predictions across laboratory, astrophysical, and cosmological scales.

Keywords: dark matter; dark energy; ΛCDM; WIMPs; axions; modified gravity; baryon acoustic oscillations; direct detection; cosmological tensions

I. Introduction

The standard cosmological model is remarkably economical. A spatially nearly flat Universe containing baryons, cold dark matter, photons, neutrinos, and a cosmological constant accounts for the cosmic microwave background (CMB), light-element abundances, large-scale clustering, gravitational lensing, and the observed expansion history with a small set of parameters. Planck measurements place ordinary baryonic matter at only a few percent of the total cosmic energy budget, cold dark matter near one quarter, and dark energy near two thirds.[1] The success is operational rather than explanatory. "Dark matter" specifies how an unobserved component gravitates; "dark energy" specifies the stress-energy required to reproduce accelerated expansion. Neither label identifies a particle, field, or modification of gravity. Historical and conceptual reviews emphasize how long this inferential gap has persisted.[2]

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The distinction between evidence and interpretation is essential. Dark matter is not inferred from one anomalous rotation curve, and dark energy is not inferred from one supernova sample. Each is supported by a network of observations with different systematics. At the same time, the network does not uniquely determine microphysics. A collisionless particle, an ultralight wave, a compact-object population, or modified dynamics may reproduce some dark-matter phenomena. A cosmological constant, a dynamical scalar, an interaction within the dark sector, or a breakdown of general relativity may produce cosmic acceleration.

The history of dark matter illustrates the point. Zwicky used galaxy velocities in the Coma cluster to argue for substantial unseen mass.[3] Decades later, Rubin and Ford's rotation measurements showed that orbital speeds in spiral galaxies remained high beyond the luminous disk, and larger samples established approximately flat outer rotation curves.[4,5] Gravitational lensing and the growth of structure subsequently extended the evidence beyond galactic dynamics. The Bullet Cluster provided a visually compelling separation between X-ray-emitting gas and the dominant lensing mass, placing strong constraints on simple modified-gravity accounts and on large dark-matter self-interactions.[6]

The modern dark-energy problem emerged when two supernova teams found that distant Type Ia supernovae were dimmer than expected in a decelerating Universe.[7,8] CMB and baryon-acoustic-oscillation (BAO) measurements later supplied independent geometric information. In 2025 the Dark Energy Spectroscopic Instrument (DESI) reported three-year BAO measurements from more than 14 million galaxies and quasars. Flat ΛCDM describes the BAO data, but combinations with CMB and supernova observations can prefer an evolving dark-energy equation of state.[9] The result sharpens an old question: is the cosmological constant genuinely constant, or is ΛCDM an effective description of more complicated physics?

This paper reviews the evidence and the principal theoretical families without assigning certainty that the data do not support. It adopts three standards. First, a viable theory must reproduce the multi-scale successes of ΛCDM, not only one anomaly. Second, an experimental claim must survive background modelling, trials factors, calibration uncertainty, and independent replication. Third, extensions should earn their additional parameters by making testable predictions. The aim is not to catalogue every model. It is to identify what is well established, what remains plausible, and which measurements are most likely to change the field.

II. Cosmological Framework

For a homogeneous and isotropic spacetime, the expansion rate is governed by the Friedmann equation,

$$H^2(a) = (8\pi G/3)\rho(a) - kc^2/a^2 \qquad (1)$$

where H is the Hubble parameter, a is the scale factor, ρ is total energy density, and k is spatial curvature. For a component with pressure p and density ρ, the equation-of-state parameter is $w = p/(\rho c^2)$. Nonrelativistic matter has $w \approx 0$, radiation has $w = 1/3$, and a cosmological constant has $w = -1$. Cosmic acceleration requires the total quantity $\rho + 3p/c^2$ to be negative.

The six-parameter ΛCDM model assumes adiabatic nearly scale-invariant initial perturbations, general relativity, cold collisionless dark matter, and a cosmological constant. It fits the acoustic peak pattern in the CMB with exceptional precision.[1] Cold dark matter provides gravitational potential wells in which baryons collapse after recombination, while Λ dominates only at late times and suppresses subsequent growth. The model's success, reviewed in the context of cosmic structure formation,[10] creates a high evidentiary threshold for alternatives: a proposal that explains galaxy rotation but damages the CMB peak ratios is not a complete cosmology.

Dark matter and dark energy are often discussed separately, but cosmological inference couples them. Increasing the matter density changes expansion distances and the growth rate; changing dark-energy dynamics alters both geometry and structure. Neutrino mass, curvature, galaxy bias, intrinsic alignments, baryonic feedback, and calibration can produce partial degeneracies. Consequently, robust conclusions come from probes with different dependencies—CMB, BAO, supernovae, redshift-space distortions, lensing, cluster abundance, and standard sirens.

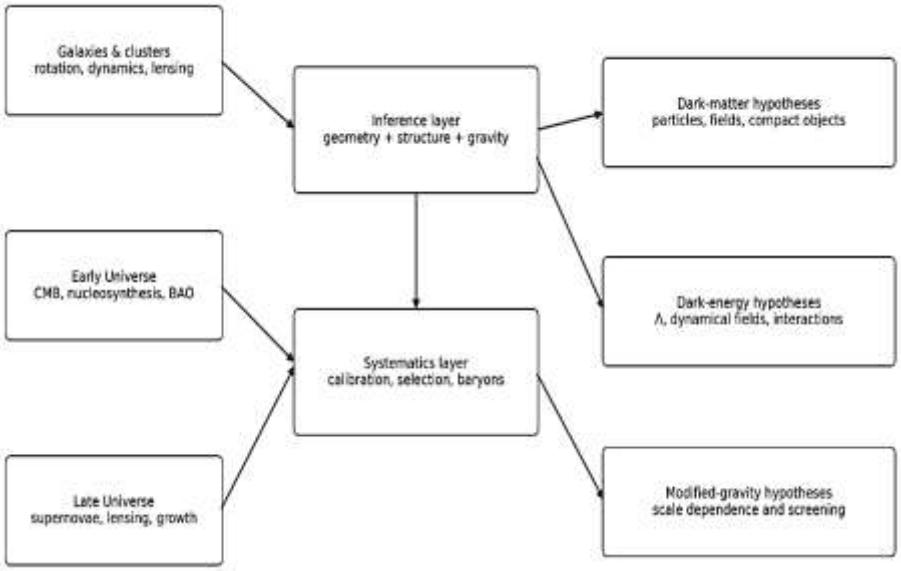

FIG. 1. Schematic relation between observational probes, inference, systematics, and dark-sector hypotheses. A viable explanation must fit geometry and growth across multiple scales while surviving independent calibration tests.

III. Evidence for Dark Matter

A. Galactic dynamics

For a test particle in a circular orbit, Newtonian dynamics gives $v^2(r) = GM(<r)/r$. If most mass followed the starlight, the orbital speed beyond the luminous disk would decline roughly as r^−1/2. Instead, many spiral galaxies exhibit approximately flat rotation curves, implying $M(<r) \propto r$ and an extended mass distribution.[4,5] Gas-rich dwarf galaxies are particularly useful because neutral-hydrogen observations reach far beyond the stellar component, although noncircular motion, inclination, distance, and stellar mass-to-light ratio complicate inference.

Rotation curves are not all identical. Some show central density profiles shallower than the cusps of dark-matter-only simulations, producing the “core–cusp” problem. Others display a tight relation between observed acceleration and that predicted from baryons. These regularities motivate modified dynamics and also challenge galaxy-formation models. Baryonic feedback can transfer energy to dark matter and create cores, but the efficiency depends on star-formation history and halo mass. The data therefore constrain both dark-matter properties and ordinary astrophysics.

Elliptical galaxies, satellite motions, tidal streams, and vertical stellar kinematics provide complementary tests. The Milky Way's local dark-matter density is inferred from stellar motion near the Galactic disk and is crucial for direct-detection rates. Uncertainties in the Galactic potential, disequilibria, and substructure propagate into particle limits. The halo is not a perfectly smooth Maxwellian gas, and precision experiments increasingly treat the velocity distribution as a nuisance function rather than a fixed input.

B. Clusters and gravitational lensing

Galaxy clusters were the first systems in which missing mass was quantified, and they remain powerful because multiple observables can be combined. Galaxy velocities trace the potential dynamically; hot gas temperature traces it hydrostatically; strong and weak lensing trace projected mass without assuming dynamical equilibrium. The baryon fraction in massive relaxed clusters also supplies a cosmological constraint when calibrated by simulations.

Merging clusters are especially informative. In the Bullet Cluster, most baryonic mass resides in collisional X-ray gas that was slowed during the collision, while the lensing peaks remain close to the collisionless galaxies.[6] This spatial separation is naturally produced by a dominant weakly collisional matter component. It is not, by itself, a particle detection, and modified-gravity theories can add unseen fields or neutrinos to improve the fit. Still, any alternative must explain why the gravitational potential tracks the collisionless component rather than the baryonic mass.

Cluster mergers also constrain the dark-matter self-interaction cross section per unit mass. Large interactions would cause drag, evaporation, or offsets between galaxies and dark matter. Inferences vary with merger geometry and simulation assumptions, but they generally disfavor cross sections large enough to make dark matter behave like a conventional fluid in clusters. Smaller velocity-dependent interactions remain viable and may affect dwarf-galaxy cores.

C. The CMB and large-scale structure

The CMB is among the strongest arguments for nonbaryonic dark matter. Baryons and photons were tightly coupled before recombination, undergoing acoustic oscillations. Collisionless dark matter did not share photon pressure and began forming gravitational potentials earlier. The relative heights of the acoustic peaks separately constrain baryon and total matter densities; the two are not equal.[1] Big-bang nucleosynthesis independently limits the baryon density, so the missing component cannot simply be faint ordinary matter.

Large-scale structure supplies a temporal test. The distribution of galaxies, the Lyman-α forest, weak lensing, and cluster abundance are broadly consistent with growth from the primordial fluctuations seen in the CMB under a cold-dark-matter framework. Cold here means nonrelativistic during structure formation, not low thermodynamic temperature today. Free streaming by a hot component erases small-scale power; this is why standard neutrinos cannot constitute most of the dark matter.

The linear matter power spectrum contains a turnover set by matter-radiation equality and oscillatory BAO features inherited from the photon-baryon plasma. N-body simulations with cold dark matter generate a cosmic web resembling observed large-scale structure. On subgalactic scales, baryonic processes and numerical resolution make the comparision harder. This scale dependence is important: ΛCDM is most strongly established on large, linear scales, while many claimed “crises” occur where gas cooling, star formation, feedback, and selection are difficult.

D. What the evidence does not establish

The gravitational evidence establishes an effective source of attraction beyond observed baryons within general relativity, but it does not establish a WIMP, axion, or any other specific candidate. Nor does it prove that gravity is exactly Einsteinian on all scales. The correct inference is layered: nonbaryonic cold dark matter is strongly favored by the combined cosmological data; its microscopic identity is unknown; and small-scale observations remain a testing ground for particle properties and baryonic modelling.

IV. Dark-Matter Theories

A. Weakly interacting massive particles

WIMPs were long the benchmark because a stable particle with weak-scale mass and interactions can thermally freeze out with approximately the observed relic density. In schematic form,

$$\Omega\chi h^2 \simeq 0.12\ [3 \times 10^{-26}\ \mathrm{cm^3\ s^{-1}} / \langle\sigma v\rangle] \qquad (2)$$

where ⟨σv⟩ is the thermally averaged annihilation cross section. The numerical coincidence between the required cross section and weak interactions became known as the "WIMP miracle." Supersymmetry supplied natural stable candidates, but the absence of superpartners at the Large Hadron Collider and increasingly stringent direct-detection limits have reduced the simplest parameter space.[11]

The WIMP framework remains broad. Masses can range from below a GeV to many TeV; interactions can be spin independent, spin dependent, momentum suppressed, inelastic, or mediated by new particles. Thermal production is not required. Experimental exclusions should therefore be stated within an interaction model rather than as a verdict on all WIMPs.

B. Self-interacting and secluded dark sectors

Self-interacting dark matter permits elastic scattering among dark particles while retaining weak coupling to ordinary matter. Cross sections of order 0.1–1 $cm^2\ g^{-1}$ at dwarf-galaxy velocities can thermalize inner halos and produce cores, while smaller effective interactions at cluster velocities satisfy merger constraints.[12,13] Velocity dependence arises naturally from a light mediator.

A secluded dark sector may contain several particles, dark radiation, bound states, and phase transitions. This widens phenomenology to displaced collider signatures, dark photons, altered halo structure, and indirect emission. It also weakens simple one-to-one links between relic abundance and direct detection. The cost is parameter proliferation; without cross-scale predictions, a dark sector can become difficult to falsify.

C. Axions and axion-like particles

The QCD axion was proposed to solve the strong-CP problem and can also be produced nonthermally as cold dark matter. It is a very light pseudoscalar with a mass and coupling related by the Peccei–Quinn scale. Axion-like particles generalize the idea without the strict QCD relation. Coherent galactic axions behave as a classical oscillating field and can convert into photons in a magnetic field, motivating microwave cavities, dielectric haloscopes, lumped-element detectors, and helioscopes.[14,15]

Axion parameter space spans many orders of magnitude. The signal is narrow in frequency but modulated by the Galactic velocity distribution. Experiments must combine high quality factor, low-noise amplification, strong magnetic fields, and extensive frequency scanning. ADMX has reached sensitivity to benchmark QCD axions over selected microelectronvolt ranges, but most plausible masses remain unexplored.[16]

D. Ultralight and wave dark matter

Particles with masses around 10^−22 eV have kiloparsec-scale de Broglie wavelengths and behave as a coherent wave on galactic scales. Wave pressure can suppress small halos and form soliton-like cores, potentially addressing some small-scale issues.[17] The same suppression is constrained by the Lyman-α forest and early galaxy formation. The viable mass depends on thermal history, modelling, and whether the ultralight field constitutes all or only part of dark matter.

More generally, ultralight bosons can be searched for through oscillations in atomic clocks, interferometers, resonant masses, spin-precession experiments, pulsar timing, and black-hole superradiance. Their phenomenology blurs the boundary between particle detection and precision measurement. A signal might appear as a coherent frequency rather than a scattering event.

E. Sterile neutrinos and warm dark matter

A sterile neutrino in the kiloelectronvolt range can act as warm dark matter. Production through mixing with active neutrinos, resonant mechanisms, or decays gives different momentum distributions.[18] Radiative decay can generate an X-ray line, while free streaming suppresses small-scale structure. Claims of an unexplained line near 3.5 keV stimulated intense work, but its interpretation remains disputed because atomic lines, instrumental backgrounds, and target dependence are challenging.

Lyman-α forest measurements place stringent lower bounds on the mass of simple thermal warm-dark-matter particles and constrain nonresonantly produced sterile neutrinos.[19] Warm dark matter can reduce low-mass halo abundance, but it does not automatically solve all galaxy-scale discrepancies. A viable model must satisfy X-ray, structure, phase-space, and production constraints simultaneously.

F. Primordial black holes

Primordial black holes (PBHs) could form from enhanced early-Universe density fluctuations, phase transitions, or collapse mechanisms. They are not made of new particles, but they are nonbaryonic in the nucleosynthetic sense if formed before baryogenesis. Constraints arise from Hawking evaporation, microlensing, CMB accretion, dynamical heating, gravitational waves, and compact-object counts.[20]

No single monochromatic PBH mass can easily provide all dark matter across the full mass range, but windows and extended mass functions remain debated. LIGO–Virgo–KAGRA black-hole mergers renewed interest, though astrophysical stellar channels can explain much of the observed population. PBH models are attractive because they connect dark matter to inflation and gravitational-wave astronomy, yet abundance predictions are highly sensitive to the tail of primordial fluctuations.

G. Modified gravity

Modified Newtonian dynamics (MOND) postulates a departure from Newtonian acceleration below a characteristic scale and reproduces many galaxy scaling relations with striking economy.[21] Relativistic extensions can address lensing and cosmology, but they generally require additional fields and have difficulty matching the full CMB and cluster evidence without some unseen mass.

Modified gravity should not be caricatured as "no dark sector." Scalar, vector, or tensor degrees of freedom can gravitate like an effective dark component. The scientifically useful comparison is predictive: can one framework simultaneously fit rotation curves, lensing, the CMB, structure growth, cluster collisions, and gravitational-wave propagation with fewer arbitrary ingredients? Galaxy regularities keep modified dynamics relevant, while cosmological evidence keeps nonbaryonic dark matter the baseline.

Table I. Principal dark-matter hypotheses and their most discriminating evidence.

Hypothesis	Indicative scale	Characteristic signal	Major constraint or ambiguity
WIMP	sub-GeV to multi-TeV	Nuclear/electron recoil; annihilation; missing momentum	Null direct searches and collider limits are model dependent
QCD axion / ALP	neV to eV and beyond	Photon conversion, oscillating fields, stellar cooling	Large mass-coupling space; scanning speed
Ultralight wave DM	~10^-24 to 10^-18 eV	Coherent oscillations, wave cores, timing effects	Lyman-α forest and early structure
Sterile-neutrino WDM	keV	X-ray decay line and suppressed small-scale power	Production history and atomic/instrumental backgrounds
Primordial black holes	asteroid to stellar masses	Microlensing, mergers, accretion, evaporation	Combined constraints and extended mass functions

Hypothesis	Indicative scale	Characteristic signal	Major constraint or ambiguity
Self-interacting dark sector	model dependent	Velocity-dependent halo cores and offsets	Cluster mergers, halo shapes, parameter freedom
Modified dynamics/gravity	acceleration or length scale	Galaxy scaling relations and gravitational slip	CMB, clusters, lensing, and relativistic completion

V. Experimental Searches for Dark Matter

A. Direct detection

Direct-detection experiments search for energy deposited when halo particles scatter from nuclei or electrons. Dual-phase xenon time-projection chambers reconstruct prompt scintillation and delayed electroluminescence, enabling three-dimensional event localization and discrimination between nuclear and electronic recoils. Cryogenic crystals, liquid argon, bubble chambers, semiconductors, superconductors, and low-threshold gas detectors provide complementary targets and thresholds.

The leading xenon programs reported major exposures in 2025 without a significant WIMP excess. LZ published 4.2 tonne-years, PandaX-4T reported 1.54 tonne-years with a minimum spin-independent limit of $1.6 \times 10^{\wedge}{-}47$ cm² at 40 GeV/c², and XENONnT reported 3.1 tonne-years with a minimum limit of $1.7 \times 10^{\wedge}{-}47$ cm² at 30 GeV/c².[22-24] Differences in analysis threshold and observed fluctuations mean that "best limit" varies across mass. The common conclusion is stronger: the canonical electroweak-scale, spin-independent parameter space is substantially compressed, and no reproducible nuclear-recoil population has emerged.

Background control now defines the frontier. Radioactive noble-gas isotopes, radon daughters, surface events, detector materials, solar neutrinos, and accidental coincidences can mimic signals. Coherent elastic neutrino-nucleus scattering will eventually create a statistical "neutrino fog," not an absolute floor. Directional information, multiple targets, spectral shape, and annual modulation can separate a dark-matter signal from neutrinos.[25]

Low-mass dark matter requires electron recoils, phonons, magnons, molecular excitations, or very low nuclear-recoil thresholds. These searches are vulnerable to poorly understood few-electron and condensed-matter backgrounds. Calibration at the relevant energy—sometimes a few electronvolts—is as important as exposure. The constraints is therefore increasingly detector-physics limited rather than simply target-mass limited.

B. Indirect detection

Indirect searches look for annihilation or decay products: gamma rays, cosmic-ray antimatter, neutrinos, radio emission, or spectral distortions. Dwarf spheroidal galaxies are favored gamma-ray targets because they are dark-matter dominated and have low conventional backgrounds. Fermi-LAT observations yield strong constraints on annihilation into several channels below the TeV scale.[26] Uncertainty in the stellar-kinematic "J factor" remains central.

The Galactic Center has a bright GeV gamma-ray excess whose morphology and spectrum prompted dark-matter interpretations. Unresolved millisecond pulsars, cosmic-ray injection, gas modelling, and instrument response provide alternatives. The debate demonstrates a general rule: a statistically significant residual is not automatically new physics when the foreground model has comparable flexibility.

Antiproton and positron measurements constrain annihilation but depend on cosmic-ray propagation, production cross sections, and solar modulation. Neutrino telescopes search for dark matter captured in the Sun, Galactic halo, and compact objects.[27] Multi-messenger consistency is powerful: a model invoked for one excess must not violate gamma-ray, CMB, or collider bounds.

C. Colliders and fixed-target experiments

At colliders, dark matter appears as missing transverse momentum recoiling against a jet, photon, vector boson, or Higgs boson. The invisible particles leave no direct trace, so interpretation requires a mediator model or effective operator. LHC searches strongly constrain mediators with appreciable quark couplings, while invisible Higgs-decay limits test light candidates coupled through the Higgs portal.[28]

Collider and direct-detection limits are complementary rather than directly interchangeable. Colliders probe production at high momentum transfer without assuming the particle makes up the Galactic halo. Direct detection is sensitive to extremely small low-energy scattering but depends on local density and velocity. Fixed-target, beam-dump, and flavor experiments are particularly competitive for sub-GeV dark sectors with light mediators.

D. Axion and precision searches

Haloscopes such as ADMX search for resonant photon conversion of Galactic axions in a magnetic field.[15,16] Helioscopes search for axions produced in the Sun; light-shining-through-walls experiments test photon coupling without astrophysical assumptions. Nuclear magnetic resonance, atomic sensors, interferometers, and resonant electromagnetic circuits extend sensitivity to ultralight fields.

The experimental landscape has therefore diversified away from a single WIMP target. This is healthy. A null result is informative only for the interaction and mass range actually tested, and the dark-matter abundance itself may be multi-component.

VI. Evidence for Dark Energy

A. Type Ia supernovae

Type Ia supernovae provide relative luminosity distances after empirical standardization of light-curve shape and color. The original discovery samples showed that distant events were dimmer than expected in a matter-dominated decelerating cosmology.[7,8] Modern analyses contain far larger samples and more sophisticated calibration, selection-bias correction, host-galaxy treatment, and covariance modelling. The Dark Energy Survey five-year analysis added roughly 1,500 high-redshift supernovae and obtained cosmological constraints broadly consistent with acceleration.[29]

Supernovae do not measure H(z) directly; they constrain an integral of the expansion history and have a degeneracy with absolute luminosity. Calibration across filters, dust, population drift, peculiar velocities, and photometric classification are major systematics. Different supernova compilations can therefore shift constraints on w0 and wa, a fact that becomes central in interpreting DESI.

B. Baryon acoustic oscillations

BAO provide a standard ruler set by the sound horizon before recombination. Measurements transverse and radial to the line of sight constrain the angular-diameter distance and Hubble expansion relative to that ruler. The completed eBOSS program mapped multiple tracers over a broad redshift range, establishing BAO as a precision geometric probe.[30]

DESI's second data release uses more than 14 million galaxies and quasars from three years of observations.[9] The BAO measurements are consistent with earlier DESI and Sloan results and can be fit by flat ΛCDM. However, the preferred low-redshift distance relation is in mild tension with CMB-inferred ΛCDM parameters. In a w0wa model, DESI plus CMB prefer evolution over Λ at about 3.1σ; including supernovae yields preferences between 2.8σ and 4.2σ depending on the supernova sample. This range is evidence of both interest and fragility.

C. CMB, lensing, and growth

The CMB constrains dark energy indirectly through spatial geometry, the late integrated Sachs–Wolfe effect, and gravitational lensing. Because dark energy is dynamically negligible at recombination in ΛCDM, CMB-only constraints on late-time dynamics are degenerate with curvature and other parameters. BAO and supernovae break those degeneracies.

Weak gravitational lensing measures coherent galaxy-shape distortions caused by foreground matter, probing both geometry and growth. Galaxy clustering and redshift-space distortions add bias-dependent growth information. Dark Energy Survey Year 3 combined lensing and clustering to obtain constraints consistent with Planck within the uncertainties, though the preferred amplitude of late-time structure was somewhat lower.[31] Growth is especially valuable for distinguishing dark energy from modified gravity because two models can share an expansion history but predict different forces and clustering.

D. Acceleration is established; its cause is not

No credible analysis returns the Universe to a simple, decelerating, matter-only model. The acceleration inference survives independent supernova samples and is consistent with CMB-plus-BAO geometry. What remains uncertain is whether w equals −1 exactly, whether it evolves, and whether the underlying cause is a stress-energy component or modified gravity. These questions require percent-level control of correlated systematics across surveys.

VII. Theories of Dark Energy and Modified Gravity

A. The cosmological constant

Einstein's cosmological constant is mathematically equivalent to a uniform component with constant density and $w = -1$. It is the simplest explanation of acceleration and fits most data with no new dynamical degree of freedom. Its theoretical problem is severe: naive quantum-field estimates of vacuum energy differ enormously from the observed value, and the near coincidence between matter and dark-energy densities today appears unexplained.[32]

Anthropic selection in a multiverse is one proposed response; symmetry, sequestering, vacuum adjustment, and modified gravity are others. None has achieved consensus. The practical position is uncomfortable but rational: Λ is observationally successful even though its microscopic interpretation is obscure. Broad dynamical-dark-energy reviews set out the stability and model-building constraints that alternatives must satisfy.[33]

B. Quintessence and scalar fields

Quintessence replaces Λ with a slowly rolling scalar field whose kinetic and potential energies produce $-1 < w < -1/3$. In inverse-power-law or exponential potentials, attractor behavior can reduce sensitivity to initial conditions.[34,35] A dynamical field can evolve and cluster weakly on very large scales, but its mass must be of order the present Hubble scale, making it vulnerable to quantum corrections and fifth-force constraints unless couplings are suppressed.

Scalar-field models are often classified as “freezing” or “thawing.” Freezing fields move toward $w = -1$, while thawing fields begin near -1 and evolve away. The phenomenological Chevallier–Polarski–Linder form,

$$w(a) = w_0 + w_a(1 - a) \qquad (3)$$

captures first-order evolution with scale factor a.[36,37] It is useful for data compression but is not itself a fundamental theory. Some combinations of w0 and wa can correspond to unstable or impossible single-field models.

C. K-essence, phantom behavior, and crossing

K-essence uses noncanonical kinetic terms, allowing the scalar sound speed and equation of state to differ from canonical quintessence.[38] Phantom models have $w < -1$ and increasing dark-energy density, but a simple field with a wrong-sign kinetic term contains ghost instabilities.[39] Effective $w < -1$ can arise without a fundamental ghost through modified gravity, interactions, multiple fields, or nonminimal coupling.

Crossing the “phantom divide” $w = -1$ is particularly relevant to DESI's preferred w0wa region. A stable crossing is difficult for a single minimally coupled canonical scalar. It can be achieved in multi-field, higher-derivative, effective-fluid, or modified-gravity constructions. This makes any persistent crossing signal theoretically discriminating, not just a shift in two fit parameters.

D. Interacting dark energy

Dark matter and dark energy may exchange energy or momentum. Such interactions alter background evolution, structure growth, halo properties, and the CMB. They can change the inferred Hubble constant or matter density and sometimes reduce cosmological tensions. The interaction must be specified covariantly; simple background-level terms can hide perturbative instabilities.

A dark-sector interaction is plausible because both components are unobserved except gravitationally. It is also difficult to constrain uniquely. An apparent interaction can be mimicked by neutrino mass, galaxy bias, or modified gravity. Viable models should predict multiple correlated effects, such as scale-dependent growth or equivalence-principle violation in the dark sector.

E. Modified gravity

General relativity is tested with high precision in the Solar System and binary pulsars, but cosmic acceleration motivates modifications on very large scales. Horndeski theory gives the most general scalar-tensor equations with second-order field equations, and effective-field-theory descriptions parameterize deviations in background and perturbations.[40,41] The near-luminal speed of gravitational waves at low redshift eliminated broad classes of models that predicted a different tensor speed.

In f(R) gravity, the Einstein–Hilbert action is replaced by a function of the Ricci scalar, introducing a scalar degree of freedom. Viable models use screening, such as the chameleon mechanism, to recover general relativity in dense environments. The Hu–Sawicki model is a widely studied example.[42] Dvali–Gabadadze–Porrati braneworld gravity produces self-acceleration through leakage into an extra dimension, but its self-accelerating branch has theoretical and observational difficulties.[43]

Modified gravity can be tested by comparing lensing, which responds to spacetime curvature, with the motion of nonrelativistic matter. Parameterized functions such as an effective Newton constant and gravitational slip describe departures at the linear level.[41] Screening makes nonlinear astrophysical tests important: dwarf galaxies, stellar structure, cluster profiles, and voids may probe environments where deviations are less suppressed.

Table II. Dark-energy and modified-gravity model families.

Model family	**Background behavior**	**Perturbation signature**	**Central theoretical/observational issue**
Cosmological constant Λ	$w = -1$, constant density	Smooth on subhorizon scales	Vacuum-energy magnitude and coincidence
Quintessence	$-1 < w < -1/3$, often evolving	Sound speed near light speed for canonical field	Radiative stability and ultra-light mass
K-essence / effective phantom	Noncanonical or $w < -1$ behavior	Model-dependent sound speed and clustering	Ghost/gradient stability and phantom crossing
Interacting dark sector	Energy or momentum exchange	Modified growth and dark-matter motion	Degeneracy and perturbative consistency
Scalar-tensor / f(R)	Effective acceleration or altered gravity	Scale-dependent growth and gravitational slip	Screening and local tests
Braneworld / extra dimensions	Infrared modification of expansion	Modified potentials and growth	Ghosts, strong coupling, and precision data

VIII. Current Tensions and The Desi DR2 Interpretation

A. The Hubble tension

The local distance ladder, calibrated with Cepheids and Type Ia supernovae, has measured a Hubble constant higher than the value inferred from Planck under ΛCDM.[44] Reviews place the discrepancy in the context of calibration, early-Universe physics, and model dependence.[45] Alternative local calibrators such as the tip of the red-giant branch yield values between some Cepheid and CMB determinations, with continuing debate over zero points and sample construction.[46]

A resolution may be systematic, statistical, or physical. Early dark energy can reduce the sound horizon and raise the CMB-inferred H0, but it must also fit high-ℓ CMB spectra, BAO, and structure. Late-time modifications generally struggle because BAO and supernovae tightly constrain the distance ladder shape. The Hubble tension is not direct evidence for dark energy evolution, though it motivates broader consistency tests.

B. The S8 tension

Weak-lensing surveys have often preferred a lower combination of matter density and fluctuation amplitude, $S8 = \sigma8(\Omega m/0.3)^{1/2}$, than Planck ΛCDM. KiDS-1000 and DES measurements made this tension a prominent topic.[47] Its significance depends on nonlinear modelling, intrinsic alignments, photometric redshifts, baryonic feedback, and data combinations.

Massive neutrinos, dark-sector interactions, or modified gravity can suppress growth, but models that improve S8 may worsen other fits. Cross-correlation among lensing, CMB lensing, galaxy clustering, and clusters is the most promising route because shared sky reduces sample variance and exposes calibration errors.

C. DESI DR2 and evolving dark energy

DESI DR2 is the most consequential recent result because its statistical power turns small distance shifts into model pressure. The collaboration finds that DESI BAO alone is well described by flat ΛCDM, but BAO parameters show a mild 2.3σ tension with CMB-inferred values. Allowing $w(a) = w0 + wa(1 - a)$ improves the joint fit. With CMB alone added, the preference is about 3.1σ; with supernovae, it ranges from 2.8σ to 4.2σ.[9]

The preferred region typically has $w0 > -1$ and $wa < 0$, implying an effective equation of state that crosses −1 in the past. The exact significance changes with Pantheon+, Union3, or DES five-year supernovae. That dependence prevents a discovery claim. The result could reflect dark-energy dynamics, calibration differences, supernova population modelling, CMB assumptions, neutrino physics, or a statistical fluctuation.

A companion DESI analysis examined physically focused models and found that some dynamical classes improve the fit while preserving the broad phenomenology.[48] Yet information criteria and Bayesian evidence can penalize added parameters differently from $\Delta\chi^2$. Parameter-volume effects matter, priors matter, and "sigma" language from nested fits does not answer whether a specific fundamental model is preferred.

Still, the result should not be waved away. Independent BAO measurements are internally consistent, and the direction of the preference appears across several combinations. The proper response is replication with additional DESI data, improved supernova calibration, Euclid and Rubin lensing, CMB lensing, and nonparametric reconstruction. If the pattern persists with controlled systematics, the theoretical implications would be profound because simple Λ would be falsified as a complete late-time description.

IX. Future Directions

A. Next-generation dark-matter searches

Liquid-xenon experiments will continue to accumulate exposure and improve background rejection, while proposed multi-tens-of-tonne detectors approach neutrino-limited sensitivity. Argon targets offer different nuclear response and pulse-shape discrimination. Cryogenic semiconductors and superconducting sensors target sub-GeV masses; directional gas detectors seek the Galactic-wind signature. The strategic goal is not only a lower exclusion curve but a signal with spectral, temporal, directional, and target dependence.

Axion searches will expand frequency coverage using cavities, dielectric stacks, plasma haloscopes, broadband circuits, and quantum-limited amplifiers. Helioscopes such as IAXO can test solar axions, while precision networks search for transient topological defects and coherent fields. Astrophysical observations—stellar cooling, black-hole spin, pulsar timing, lensing anomalies, and streams—will probe parameter space inaccessible to laboratories.

Dark-matter astronomy will become more granular. Stellar streams can reveal subhalos; strong-lens flux ratios and time delays can measure small-scale structure; dwarf-galaxy kinematics can test cores and tides; 21-cm observations may constrain early heating and annihilation. These probes require careful baryonic and selection modelling. A small-scale anomaly is useful only when ordinary astrophysics has been quantified with comparable sophistication.

B. Precision cosmology

Euclid is designed to map billions of galaxies over a large fraction of the extragalactic sky using weak lensing and clustering.[49] The Vera C. Rubin Observatory began releasing first imagery in 2025 and will conduct a decade-long time-domain and weak-lensing survey. Its survey design is described by Ivezić *et al.*[50] DESI will add observing years and reduce BAO uncertainties. Roman will combine high-resolution imaging, supernovae, and spectroscopy, while the Simons Observatory and CMB-S4 aim to improve CMB lensing, neutrino mass, and early-Universe constraints.[51-53]

The power comes from overlap. Euclid or Rubin lensing cross-correlated with DESI galaxies can calibrate bias and redshift distributions. CMB lensing cross-correlated with optical surveys can diagnose multiplicative shear errors. Supernovae, BAO, and standard sirens test the distance-redshift relation through different physics. Internal redundancy will be more valuable than any isolated headline precision.

C. Theory priorities

Theoretical work should move from flexible parameterizations toward falsifiable model classes. For dark matter, this means predicting relic production, direct and indirect signals, self-interactions, and structure simultaneously. For dark energy, it means connecting w(a), sound speed, gravitational slip, screening, and stability. Effective field theory is useful when its validity scale and priors are explicit.

Model comparison must include theoretical consistency. A fit that crosses $w = -1$ may be statistically attractive but physically impossible in a chosen single-field theory. A modified-gravity model that fits background distances but violates gravitational-wave propagation is excluded. A dark-matter model that solves cores but erases observed high-redshift galaxies is not viable.

The field also needs more blind analyses, public likelihoods, end-to-end simulations, and independent pipelines. Cosmological precision is now limited by coupled systematics: photometric calibration, redshift distributions, intrinsic alignments, nonlinear baryons, selection, and covariance. These are not housekeeping details. They determine whether a 3σ deviation grows into discovery or disappears.

X. Conclusion

Dark matter and dark energy are supported by broad, mutually reinforcing evidence, but their fundamental nature remains unknown. The case for nonbaryonic dark matter is strongest when galactic dynamics, lensing, the CMB, and structure formation are considered together. The case for cosmic acceleration is established by supernovae and consistent geometric probes. Neither case uniquely selects a microphysical theory.

WIMPs remain viable in restricted forms, while axions, ultralight fields, sterile neutrinos, primordial black holes, and self-interacting sectors motivate a diversified experimental program. Tonne-year xenon searches have not found a convincing WIMP signal. For dark energy, Λ remains the baseline because of its simplicity and fit, despite the cosmological-constant problem.

DESI DR2 changes the tone but not yet the conclusion. Its combined-data preference for evolving dark energy is statistically substantial and theoretically provocative, yet sensitive to the chosen supernova sample. This is exactly the regime where independent surveys, transparent likelihoods, and cross-probe calibration matter most.

The next decade may identify a particle, reveal modified gravity, establish evolving dark energy, or strengthen ΛCDM through increasingly severe null tests. Any of those outcomes would be scientifically deep. The decisive advance will come from convergence: laboratory signals consistent across targets, astrophysical effects consistent across scales, or cosmological deviations reproduced by instruments with different systematics. Until then, the dark sector is not a blank space. It is a tightly constrained set of unanswered questions.

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Curriculum for Inclusion towards Social Justice and Sustainability – Need, Importance and Challenges

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Abstract

Inclusion into main stream education systems to address marginalisation of vulnerable groups has now become a primary focus of educational practice, policy and research. Inclusive education keeps emphasising the provision of access to education to all. This chapter proposes a social justice framework that relies on three dimensions - distributive, relational, and epistemic – to support the transformation of education in a way that it becomes inclusive and supportive for students coming from all sorts of backgrounds.

Introduction

A curriculum can be called a plan for learning, which contains assumptions about the purpose of education in our society.

Hence any curriculum comprises two major dimensions: a vision and a structure. (Wiles and Bondi-1988). The term curriculum is derived from the Latin word 'Currire' which means 'path'. The Latin meaning of the term 'curriculum' is a racecourse used by chariots. Hence it is any path or course of study to be undertaken by an educational institution to be covered in a specified time frame. The course of events can take place inside the school and also outside it. A curriculum would consist of several events like plan for learning, study periods, sports activities, cultural events etc.

According to Crow and Crow, "curriculum includes all the learners experiences in and outside the school that are included in a programme which has been devised to help to develop mentally, physically, emotionally, spiritually and morally. The modern educational landscape increasingly emphasizes the need for curricula that are inclusive and geared towards social justice and sustainability. This shift reflects a growing recognition that education should not only impart knowledge but also prepares students to engage with and address the complex social, Economic and environmental issues facing the world today. An inclusive curriculum aims to accommodate diverse learners and perspectives, while focussing on social justice and sustainability seeks to ensure that education contributes to a more equitable and sustainable future.

Need for inclusion towards social justice and sustainablility.

1) Addressing Diverse Learner Needs

- Equity in education: Diverse classrooms include students from various cultural, socio economic and ability backgrounds. An inclusive curriculum ensures that all students have equitable access to learning opportunities and resources.
- Personalized Learning: By acknowledging and valuing student's different experiences and perspectives, inclusive curriculum can be tailored to meet individual needs, enhancing engagement and achievement.

2) **Promoting social justice**

- Awareness and Advocacy: Education that incorporates social justice themes helps students to understand critically analyse issues related to inequality, discrimination and human rights.
- Empowerment: teaching about social justice empowers students to challenge, justice and work towards creating more equitable societies. It fosters empathy, ethical reasoning and a sense of responsibility.

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3) Supporting Sustainability.

- Environmental literacy: An emphasis on sustainability in the curriculum helps students understands the impact of human activities on the environment and the importance of sustainable practices. This knowledge is crucial for fostering environmentally responsible behaviours.
- Future preparation. Integrating sustainability into education prepares students to address global challenges such as climate change, resource depletion, and environmental degradation. It equips them with the skill needed to innovative and implement sustainable solution.
- **Importance of inclusive curriculum**
- Cultural Representation: An inclusive curriculum reflects the diverse backgrounds of the students making them feel represented and valued .This can improve their sense of belongingness and increase their engagement in the learning process.
- Reducing Bias: By addressing and challenging stereotypes and biases, an inclusive curriculum helps to create a more respectful and supportive learning environment.
  Enhancing Critical Thinking
- Multiple Perspectives: Exposer to a variety of perspectives encourages students to think critically and develop a more nuanced understanding of complex issues. I promotes open-mindedness and problem_ solving skills.

Real - world Relevance: Linking learning to real world social justice and sustainability issues makes education more relevant and impactful. It prepares students to navigate and address contemporary challenges effectively.

Encourages Civic Engagement:

Active Citizenship Education that emphasizes social justice and sustainability encourages students to become informed and active citizens. It moves them to participate in civic activities and contribute positively to their communities.

Challenges in implementing an inclusive Curriculum.

Institutional inertia: Educational institutions may resist changes to traditional curricula due to established practices, lack of resources, or reluctance to address sensitive topics.

Parental and community Pushback: There can be resistance from parents and community members who may have differing views on social justice and sustainability issues or who may be uncomfortable with changes in the curriculum.

Funding and Support: Implementing an inclusive curriculum often requires additional resources, such as professional development for teachers, updated materials, and diverse instructional tool. Limited funding can be a significant barrier.

Training and Support:

Teacher need training and support to effectively integrate social justice and sustainability themes into their teaching. Without adequate professional development, teachers may struggle to address complex issues.

Curriculum over load: Balancing the inclusion of social justice and sustainability topics with existing curriculum requirements can be challenging.

Individual difference: Addressing the diverse needs and perspectives of all students while maintaining a cohesive curriculum can be complex.

Feedback and Improvement: Gathering feedback from students and stake holders to continuously improve the curriculum can be demanding, but it is essential for ensuring that the curriculum remains responsive and effective.

Strategies for Effective Impiementation

Professional Development : to equip the educators with the skills and knowledge needed to teach social justice and sustainability.

Inclusive Resources: Develop and utilize diverse teaching materials that reflect various perspectives and address different learning needs.

Community Engagement: Involve students, parents and community members in curriculum development and implementation to ensure broad support and relevance.

Curriculum Flexibility: Design a flexible curriculum that allows for the integration of social social justice and sustainability themes while accommodating core academic requirement.

Continuous Evaluation: Implement robust assessment and feedback mechanism to evaluate the impact of the curriculum and make necessary adjustment.

Conclusion

Inclusion and inclusive have becomes a key educational goal in pursuit to equality and justice for students of all back grounds. This chapter proposed a social justice frame work that can aid the development of an environment and a support system that transform education in ways that makes it supportive of the needs of all children, regardless of their back grounds, doesn't expect students to fit system, but the system to adjust to students. Overall, building inclusive education systems and classroom requires a rethinking and reassessment of what education offers to diverse groups in a particular context.

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Imagining the State: Pakistan and the Crisis of Legitimacy

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Abstract

The research article will primarily focus on why Pakistan continues to exist as a post-colonial state. What led to the formation of Pakistan and its society? I will try to answer some of the contradictory arguments of Pakistan being the ideological state and its idea of pan- Islamism. The history of Pakistan after 1947 is marked by an identity crisis and a declining influence in the Middle East, despite its role in geopolitics. The article will critically evaluate the working institution and the idea of democracy in Pakistan and its relation with India so far. What we need to understand through this article is whether Pakistan fail as a nation?

Keywords: Partition, Identity, society, politics, Democracy, existential crisis, Islam, nation-state

Introduction

The existence of Pakistan remains a pertinent question for all of us. Why does it still exist? What makes this state survive? Did this society ever fear that it would collapse? These are the questions that will get into your mind when you start reading about Pakistan and its society. The long journey of Pakistan starts from India, which they now consider their enemy, but I believe they owe India for their existence and their birth, which happened in 1947. The call for Independence, apparently, was seen as independence from the Hindu-dominant nation to the Muslim-majority nation, which they now call Pakistan. The Independence Politics played its role in dividing the nation on ideological bases, but let's not just blame Pakistan for its creation if we look deeper into the politics of our undivided nation, the policy of Nehru and Jinnah made Pakistan a possible Dream. The Lahore Resolution did not mention either Pakistan or Partition, so how did this even become a reality?

Pakistan was imagined without boundaries. If we go by this argument, then Pakistan could have been the UP (Currently Uttar Pradesh) or the Bengal region of India, but they chose the Hind Khush and the North-West Frontier to be their pure land, or should I say, was given. Jinnah's imagination of Pakistan was completely different from what the Indian National Congress and British India were thinking of. Jinnah believed that Pakistan would be born out of religious nationalism, but the boundaries had not been decided. When the plan passed a huge migration started, and that was the time India witnessed the most painful partition of its own region. Without giving much importance to what Pakistan looks like, it just demarcated the line and the creation of the state, the "political abortion" which this state is known in history, started its long journey for survival. It was never believed by the Indian government that Pakistan would survive, and it would soon come back to its original position. But here we misunderstood Pakistan's vision, the vision of its survival, not just based on military support but also the mosque, which wanted Pakistan to survive not for a better state for Muslim but for a radical vision which they had conceived since its formation.

1. Society and Politics

On the eve of independence, the most awaited happiness came to Jinnah, who became the founding father of Pakistan. Looking back to the time when Pakistan was the demand made by the Muslim League, Jinnah was not in favour of creating Pakistan; instead, he asked for a more federal

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structure and equal representation of Muslims in undivided India. But unfortunately, we cannot afford two prime ministers and a foreign minister simultaneously.

The religious ethnic diversity in Pakistan wanted to unite under the umbrella of ISLAM. But Islam came later on to play a role in society. Before that, it was the fear of constant threat from India and the religious colour of the 1948 Kashmir war, which gave the citizens an image to believe that India could threaten the existence of Pakistan. However, we should not ignore the diplomatic strategy which Pakistan adopted while joining hands with the USA and getting military aid and economic help to sustain its existence. It was all played in the name of geostrategic location, which Pakistan enjoy in the South Asian region.

Pakistan's domestic policy mainly deals with the religious autonomy, ethnic rights and political inclusion of the minorities within the majority religious group. After the death of Jinnah, the society lacked legitimacy and plummeted into a military coup. The fear and anguish that the army created in the heart of its illiterate citizens to make them believe that India would one day undo the partition and their Identity could again be merged with the Hindu majority country.

After the military acquired the power, it still lacks legitimacy at the domestic level of politics. Why was this so? The domestic level politics was mainly controlled by the Mosque; the contribution made by Mulla should not be ignored. The Military wanted its legitimate authority over the State and did not want Pakistan to be a democratic nation. ISLAM became the visionary power for Pakistan to gain the trust of its citizens. In March 1949, Pakistan's PM Liaquat Ali Khan presented the objective resolution in the Assembly that Pakistan's future would be based on the Islamic principle. The society was divided ethnically and religiously, and to unite it, they came up with Islam as the guiding principle at the state level of politics.

Before getting the name of the Islamic Republic, the identity of Pakistan was constantly questioned by other Islamic countries. The Middle East did not accept the narration of Islam, which Pakistan used to believe, and for that, it tried to create its own form of Islam and wanted to play a major role in the South Asian region for Muslim identity. Despite all this, the Pakistani society still suffers from poverty and socio-economic inequality, which has been generated because of the unequal treatment of the provinces. They tried to hide the reality that Pakistan is still divided on the ethnic and language principle, which eventually resulted in the class divide in the society and anguish in the heart of Baluchistan, Sindhi and other regions over not getting equal treatment like the Punjabi and Urdu-speaking elite.

The changing regime and the instability caused the military to be the backbone of the nation, but the politics were mainly driven by the religious group. JAMAAT-E-ISLAMI was the one that acknowledged that "Islam is not just a religion but an ideology" They used the slogan *"Islam is in danger"* to misguide their citizen and keep them away from the real politics of Pakistan.

Moreover, they kept all under the control of "*Army and Allah*". The Islamization of Pakistan gave rise to militancy and terrorism as the newly born child of Pakistan out of Islam. Pakistan supported and sometimes funded the terrorist activity in Afghanistan during the 1979 war, and "LASHKAR-E-TAIBA" also became Pakistan's second-best army for Pakistan.

2. Bhutto and Democracy

The political era changed when Zulfikar Ali Bhutto became the first elected Prime Minister of Pakistan. He was the one, who wanted Pakistan to sustain its economy for domestic growth and foreign aid, but it all started with Liaquat Ali Khan visiting Washington, and then his sudden dismissal led Pakistan to again come under a military coup under the leadership of General Ayyub Khan. But after the long coup, in 1973, the election was held, and Bhutto came to power. The People's Party of Pakistan (PPP) gained support, and the personality of Bhutto helped him to gain Western interest in Pakistan. He appointed ZIA- UL-HAQ as the military general to keep an eye on military development and check on militant activity. Bhutto did not eventually want a democratic Pakistan; all he wanted was to be the sole leader of Pakistan, and for that, he even tried to overpower military and militant activity. But this is just the half-truth about Bhutto, its party does support

militant activity and funds them over the Kashmir issue. The major setback came to the Bhutto regime when the India-Pakistan war of 1971 happened, which resulted in the creation of Bangladesh. It was seen as the territory lost to the Indian Army, and even with help from the USA, it did not manage to sustain East Pakistan. The Shimla Accord, where India and Pakistan decided to mutually agree over the creation of Bangladesh, was largely seen as a failure for India and a success for Pakistan. India always wanted a stable neighbour so that democracy would play a major role in Pakistan. To sustain that much democracy, it decided to let go of the failure of the Shimla Agreement. The power of negotiation, which Pakistani leaders used to have, should be considered a blessing. Bhutto believes that Islam is important, but he also believes that Western education could pave the way for Pakistan's future. But this was not acceptable to the radical Islamic scholar. He tried to change the society more in a Western outlook, English- speaking elite and high-class society.

The fate was decided, he was arrested, and Zia-Ul-Haq made it very clear that he was going to hang him. Bhutto had immense support from the AWAM, but on April 4, when he was hanged, there was no social outrage. It was strange to believe, but it happened for real, and now Zia-ul-Haq again brought Pakistan under military rule. His daughter, Benazir Bhutto, gained the support and became the first female Prime Minister of a Muslim nation. After Zia died in a sudden plane crash, the Bhutto regime again tried to suppress the military and wanted to make Parliament more responsible. It was also the time when her party was dismissed, and Pakistan was close to forming the PRESIDENTIAL POLITY. She survived more than one expected, and her party's influence extended not just to India but also to other foreign nations.

Despite that, the military expenditure remains high, and the domestic economy suffers. The 9/11 attacks and the Taliban coming to power led Pakistan to suffer a major setback, but it still managed to keep close ties with the USA. Talking about the *"WAR ON TERROR"* and Pakistan's pro-Taliban approach remains its major power politics strategy to play both sides. Pakistan, as a weak nation, cannot afford a direct war with any country, so it uses its second army (a funded militant group) to fight on its behalf. Pakistan has many times denied the fact that it supported Militant activity and terror groups, but Osama was found near the Pakistani Army headquarters. Cities like Rawalpindi and Islamabad remain the epicentre of military and militant ties. Despite having all this, the USA still shakes hands with Pakistan. The influence which they have managed to create and the kind of diplomacy they played were incredible.

3. Existential Crisis

If we go back to the time when Jinnah used to speak about Pakistan, *"If we want to make this great state of Pakistan happy and prosperous, we should wholly and solely concentrate on the well-being of the people and especially of the masses".* Talking about the masses, who actually demanded Pakistan? The poor Muslims did not care about the nation; they didn't know which nation would serve them in the name of religion. Jinnah's Pakistan was different from what we see today. But that's what we say about Marxist theory: Karl Marx's idea of Communism was different from what was practised by Lenin. But Marx failed, and so did Pakistan.

It will become a whole new debate. Pakistan was inevitable, but nobody thought about how to govern a state where half of the resources are still in India. Pakistan was great in the industrial sector, but hardly any raw materials were left for that. So, it was all that was needed to start from scratch. To make them aware that we became a new nation, something has to be there in history, but Pakistan did not even have their own history, so it created one. The military starts controlling everything from schools to business; everything comes under military rule.

Pakistan was now more of a military than a nation. The Idea of pan- Islamism was ingrained in their Foreign policy so that they could join the Islamic group and create their identity. Islam as a religion has a different interpretation. However, this does not help Pakistan to create its regional Identities. Unfortunately, it didn't serve the purpose for which it was created. Poverty still exists, not every student is getting the same level of education and not every Pakistani stays in Pakistan. For its survival, it supported terrorist activity and militant groups to secure its border. The militant activity

even became a curse for that nation when, in 2007, the Lal Masjid incident happened. It witnessed the clash between militants and the Pakistani army. Now the state faces a threat from its own child.

Conclusion

The crisis of legitimacy was evident from the start when Pakistan came into existence. The society lacks solidarity, and every ethnic group wants more federal structure and equal representation. After 1971, Pakistan became more centralised; it could not afford to lose another territory, so it decided to listen to the unequal demands of its region and benefit those who would ensure its survival. Pakistan did play a great role in their foreign policy; it joined hands with the USA in 1953 and then established cordial relations with China after the 1962 war. Pakistan always believed that its geostrategic location gave it the power to influence the West and led Pakistan to survive on foreign aid. Its economy crashes multiple times, and it suffers from poverty and human rights violations. But the state still lacks a strong reason for its survival. It was not accepted as the result of partition, nor seen as the necessary evil, so why is it still there? One should be aware that international politics deals with sovereignty, and one could alter what happened in the past. Pakistan is the result of history, and it will remain a delusion for us till it survives.

Nonetheless, it played a great role in the South Asian region. India and Pakistan both suffer from a trust deficit. The kind of relation after partition they gradually developed created uncertainty within the nation. India became a democratic nation, and Pakistan fell into military rule, but India always wanted a stable neighbour; surely, it was not accepted by the religious fundamentalists. The Islam which they preach, in its best form, could be seen in India, but both nations suffer from fundamentalist threats. The regional group, which was created by India, SAARC, did not work out, and after the 2016 URI attack, India closed all its ties with Pakistan. Unfortunately, Pakistan does not need India, and that could be a serious issue because then it will invite other players to contribute to its survival in the South Asian region. The asymmetry between India and Pakistan led to a survival threat to Pakistan. The South Asian region, mostly Indian-centric, wants China to be out of that region.

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