THE UNEQUAL DEVELOPMENT OF FORENSIC INFRASTRUCTURE AND ITS IMPACT ON CRIMINAL JUSTICE UNDER THE NEW CRIMINAL LAWS

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ABSTRACT

The enactment of the Bharatiya Nyaya Sanhita, 2023 (BNS), the Bharatiya Nagarik Suraksha Sanhita, 2023 (BNSS) and the Bharatiya Sakshya Adhiniyam, 2023 (BSA) represents a momentous move towards evidence-based justice in India. These legislations considerably enhance the role of forensic science in criminal investigations by making forensic examination compulsory in investigations of serious crimes and enhancing evidentiary requirements for digital and scientific evidence. But India's reality starkly contrasts it in its forensic infrastructure. The disparities present is not just ubiquitous but also concerning. Metropolis and central laboratory locations tend to include higher tech facilities and staff compared with multiple states, particularly rural and underserved states, that contend with outdated - ineffective equipment, significant shortfalls in staffing, lack of accreditation, and large backlogs - collectively, these factors create disparity in the progress of laboratory practice which will likely make statutory protection tremendously challenging in the, not too distant, future versus the constitutional guarantees of equality before the law (Article 14) and a lawfully mandated trial (Article 21). This author will examine both statutory provisions and judicial decisions, through a doctrinal study, and navigate the gap between legislative aspirations, versus institutional capability. It also examines policy initiatives like the National Forensic Infrastructure Enhancement Scheme (NFIES), an upgrade of the National Forensic Sciences University (NFSU), and judicial orders for addressing these shortfalls. The research concludes that unless the reforms at the system levels in infrastructure, human resources, standardization, and regulation are seriously undertaken, the vision of a modern, scientific, and equitable criminal justice system under the new laws can remain unattained.

Keywords: Forensic science, Bharatiya Nyaya Sanhita (BNS), Bharatiya Nagarik Suraksha Sanhita (BNSS), Bharatiya Sakshya Adhiniyam (BSA), forensic infrastructure, criminal justice reform, Article 14, Article 21, speedy trial, equality before law, forensic laboratories, digital forensics, DNA profiling, NFIES, NFSU, criminal law in India.

CHAPTER I:

1. INTRODUCTION

Forensic science has become an important part of modern criminal justice because it gives investigators and judges objective tools that make their work easier. In India, however, its growth has been characterised by inconsistent advancement, institutional disintegration, and technological stagnation. Scholarly works have consistently highlighted these systemic deficiencies. These reduce the confidence in using forensic evidence in court. Historical chronicles depict the development of forensic institutions since the beginning of the twentieth century, suggesting that infrastructure has seen an increase but the need for scientific evidence has vastly exceeded their capacity.

Legal experts say that this gap has only gotten bigger since the new criminal law codes i.e. the Bharatiya Nyaya Sanhita, 2023 (BNS), the Bharatiya Nagarik Suraksha Sanhita, 2023 (BNSS), and the Bharatiya Sakshya Adhiniyam, 2023 (BSA) were passed. These reforms require more use of forensic methods, such as mandatory sample collection for serious crimes. However, implementation is still limited by differences in infrastructure, backlogs, and a lack of trained staff.

Specialised domains such as digital forensic science and DNA profiling also add to both complexity and confusion. India's digital forensic rules are patchwork, as have been comparative analyses of the country's status relative to international standards, while the absence of laws regarding DNA profiling is problematic in terms of constitutional issues such as the right to privacy or self-incrimination. This study places itself at this critical point, where ambitions of legislative reform meet the harsh realities of disparate forensic infrastructure. Essentially, this inquiry asks if the promise of science-based justice under the BNS, BNSS, and BSA can be accomplished in practice, or will structural differences compound systemic delay, compromised integrity of investigations, as well as violations of human rights under Articles 14 and 21 of the Constitution.

CHAPTER 3: SCHEME OF STUDY

Forensic Infrastructure in India

Forensic science in India is organized at multiple levels. At the top are the Central Forensic

Science Laboratories (CFSLs) under the Directorate of Forensic Science Services (DFSS), which specialize in disciplines like chemistry, DNA, ballistics, and cyber forensics. As of 2025, there are only **seven** CFSLs nationwide (in Delhi, Kolkata, Hyderabad, Bhopal, Chandigarh, Guwahati, and Pune).[1] Each state and union territory also maintains its own State FSL (SFS) and multiple Regional FSLs. Official data show 32 State FSLs and 97 Regional FSLs across India.[2] Yet these figures mask stark imbalances. For example, populous states like Maharashtra and Uttar Pradesh each boast 12 regional labs,[3] whereas several small states and Union Territories have no regional FSL at all (e.g. Mizoram, Sikkim, Tripura, and Puducherry each have zero).[4] Even where labs exist, they vary greatly in capacity and quality.

Importantly, the responsibility for forensic labs lies mostly with State governments (since policing is a state subject).[5] Accordingly, state budgets, priorities, and technical expertise create a patchwork of capabilities. The central government has established new CFSLs in underserved areas (e.g. Bhopal, Guwahati, Pune) and modernised existing ones.[6] A National Cyber Forensic Laboratory was set up in Hyderabad, and six more cyber forensics centres have been approved.[7] An **e-Forensics IT platform** now links over 117 labs (both central and state) for digital evidence processing. Mobile forensic vans have also been deployed: under a 2022 modernisation scheme (₹2,080.5 crore), many states received funding for vans and equipment.[8] Despite these central initiatives, vast disparities persist in basic infrastructure. Many state labs operate with outdated machinery, and smaller states often lack specialised units (e.g. for DNA, toxicology, cyber analysis).[9]

Equally critical is the human resource gap. According to the Tata-IJIR Justice Report, police forces nationwide have roughly 23% officer vacancies and **49.1% shortfall in forensic staff**.[10] Some states fare worse: Andhra Pradesh's labs have over 56% of scientific posts vacant.[11]

[1] *Forensic Labs*, Press Information Bureau, Ministry of Home Affairs, Government of India (Dec. 18, 2024), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2085688 (last visited Jan. 5, 2026).
[2] Id.
[3] Id.
[4] Id.
[5] Id.
[6] Id.
[7] Id.
[8] Id.
[9] Id.
[10] Saurabh Malik, Punjab and Haryana High Court sounds alarm on forensic delays, orders states to enact reforms, The Tribune, Nov. 5, 2024, https://www.tribuneindia.com/news/haryana/punjab-and-haryana-high-court-sounds-alarm-on-forensic-delays-orders-states-to-enact-reforms/ (last visited Sept. 20, 2025).
[11] Id.

Across India the total sanctioned strength of forensic examiners lags far behind caseloads. The effect is severe: reports from CFSLs and State FSLs routinely clock delays of months or years, and backlogs numbering hundreds of thousands of cases (especially for DNA and chemical analysis) have been reported in media. For instance, Kerala's FSL had a backlog of 62,000 cases in 2025.[12] These inefficiencies mean evidence may arrive too late for trials, or not at all. In summary, India's forensic infrastructure is **uneven** both geographically and qualitatively, with chronic resource shortfalls. This baseline context will now be related to the new legal regime.

Forensic Mandates under New Criminal Laws (BNS, BNSS, BSA)

The new criminal laws substantially elevate the role of forensic science in investigations and trials. The BNSS (new Criminal Procedure Code) explicitly **requires** police to call a forensic team to the scene when an offence punishable with seven or more years' imprisonment occurs.[13] This is a major change: in the old CrPC, evidence collection was largely ad hoc. Under BNSS Section 176(1)-(3) (as summarised in legislative analyses), forensic personnel must visit crime scenes for serious offences, collect and preserve evidence (including fingerprints, DNA samples, voice recordings, etc.), and record procedures.[14] If fully implemented, this could greatly improve evidence quality and chain of custody.

The Bharatiya Nyaya Sanhita (BNS, new Penal Code) also indirectly affects forensic needs by adding new offences (e.g. organised crime, cybercrime, hate violence) that often require technical and scientific proof. The Bharatiya Sakshya Adhiniyam (BSA, new Evidence Act), meanwhile, modernises evidentiary rules, notably expanding admissibility of electronic records and biometric data as primary evidence. It also codifies the use of voice and sign records, and treats digital media (including smartphone data, server logs, location evidence, etc.) on par with traditional documents. In effect, BSA anticipates much more digital/forensic evidence reaching courts, and seeks to streamline its acceptance.

[12] KP Sai Kiran, Forensic labs in crisis: Over 62,000 unresolved cases and backlog issues, The Times of India (Thiruvananthapuram), Oct. 7, 2024, https://timesofindia.indiatimes.com/city/thiruvananthapuram/forensic-labs-in-crisis-over-62000-unresolved-cases-and-backlog-issues/articleshow/113993110.cms (last visited Sept. 20, 2025).

[13]The Bharatiya Sakshya Bill, 2023, PRS Legislative Research, https://prsindia.org/billtrack/the-bharatiya-sakshya-bill-2023 (last visited Sept. 20, 2025).

[14] Bharatiya Nagarik Suraksha Sanhita, 2023, § 176(1)–(3) (India).

Section 193(2)(i) BNSS[15] mandates that police reports include a clear chronology of custody where electronic devices or digital records are involved. This statutory recognition of the chain of custody principle reflects the vulnerability of electronic evidence to manipulation and contamination. By requiring documentation from seizure to forensic examination and court production, the provision strengthens the integrity and admissibility of digital evidence, consistent with judicial observations that failure to preserve electronic material may amount to withholding the best evidence.

Procedural transparency is further enhanced through Section 105 BNSS,[16] which requires audiovisual recording of search and seizure proceedings. Recording seizure, preparation of lists, and witness attestation introduce forensic accountability absent under the CrPC. These recordings function both as corroborative material during trial and as safeguards against allegations of coercion or planted evidence.

The emphasis on scientific documentation extends to trial proceedings. Section 329 BNSS[17] permits reliance on reports of Government Scientific Experts as admissible evidence, subject to judicial discretion regarding expert examination. While this provision pragmatically addresses forensic backlogs, it assumes the availability of competent and accredited experts, an assumption not uniformly met across states.

Medical and biological forensics are expressly incorporated through Sections 52 and 53 BNSS,[18] which mandate medical examination of accused persons by registered practitioners, including DNA profiling where required. Procedural safeguards such as furnishing reports to the accused and examination of female accused by female practitioners reinforce both evidentiary reliability and individual dignity.

BNSS also formally recognises electronic modes of investigation and trial. Section 532[19] permits inquiries, trials, examination of witnesses, recording of evidence, and appellate proceedings through electronic and audio visual means. This statutory endorsement integrates forensic documentation into the procedural structure of criminal justice, acknowledging the

[15] Bharatiya Nagarik Suraksha Sanhita, 2023, § 193(2)(i) (India)
[16] Bharatiya Nagarik Suraksha Sanhita, 2023, § 105 (India).
[17] Bharatiya Nagarik Suraksha Sanhita, 2023, § 329 (India)
[18] Bharatiya Nagarik Suraksha Sanhita, 2023, §§ 52–53 (India)
[19] Bharatiya Nagarik Suraksha Sanhita, 2023, § 532 (India)

digital nature of modern evidence.

Further, Section 173 BNSS[20] allows information relating to cognizable offences to be communicated electronically to police authorities, enabling investigations that are digital from inception. Read with mandates on chain of custody and electronic documentation, this provision reflects a systemic transition towards technology-assisted criminal procedure.

Collectively, these provisions position forensic science, particularly digital forensics, as a structural component of investigation and adjudication rather than an auxiliary tool. However, their effectiveness depends on trained personnel, accredited laboratories, secure digital storage, and robust protocols. Inadequate infrastructure leads to uneven compliance, deepening regional disparities and undermining constitutional guarantees under Articles 14 and 21.

The Bharatiya Sakshya Adhiniyam, 2023 departs from the traditional evidentiary framework by redefining core concepts to accommodate technologically mediated proof. Section 2(e)[21] expands oral evidence to include statements made electronically, recognising virtual testimony and digitally transmitted statements as valid evidence. This aligns evidentiary law with contemporary investigative practices.

Similarly, Section 2(d)[22] includes electronic and digital records within the definition of documentary evidence, acknowledging that modern forensic material often exists in non physical form. This bridges procedural reliance on digital forensics under the BNSS with admissibility at trial under the BSA.

Section 63 BSA[23] further strengthens the evidentiary value of electronic records by recognising them as primary evidence in specified circumstances. By reducing reliance on secondary certification, it enhances the probative value of digitally collected forensic material while maintaining consistency through continued recognition of forensic and scientific experts.

The Explanation to Section 81 BSA[24] clarifies the concept of proper custody of electronic records. Electronic evidence is deemed to be in proper custody when maintained by the person legally required to keep it, while custody is not rendered improper if the evidence has a

[20] Bharatiya Nagarik Suraksha Sanhita, 2023, § 173 (India)
[21] Bharatiya Sakshya Adhiniyam, 2023, § 2(e) (India)
[22] Bharatiya Sakshya Adhiniyam, 2023, § 2(d) (India).
[23] Bharatiya Sakshya Adhiniyam, 2023, § 63 (India)
[24] Bharatiya Sakshya Adhiniyam, 2023, § 81 (India)

legitimate origin or circumstances indicating authenticity. This flexible approach reflects judicial sensitivity to digital evidence management and prevents exclusion of reliable forensic material on purely technical grounds.

Together, these reforms signal a paradigm shift: India is legislatively committing to an evidence-based justice process. Official releases note that these changes will dramatically increase the workload on forensic labs. The NFIES (National Forensic Infrastructure Enhancement Scheme) press release explicitly ties this to new legislation, stating that new laws have mandated forensics in serious crimes and that lab workload "is expected" to surge. In sum, while a statutory framework confidently elevates the necessity of forensic, the character of response will be determined by the limitations of the infrastructure and protocols to constructively respond to the elevated demand.

Regional Disparities and the Effect on Forensic Protocols

The vital question is: how does geographic disparity undermine the new forensic directives? The answer is in the variation between expectation and capacity. BNSS's requirement of on-site forensic collection presumes that trained experts and equipment can be dispatched promptly whenever a crime is reported anywhere in India. In practice, many regions lack nearby labs or qualified teams. For example, if a gangrape case occurs in rural Nagaland (which has 0 regional labs),[25] the nearest State FSL may be hundreds of kilometres away, and no local personnel may be properly trained. Similarly, Uttarakhand has only one regional lab for the whole state.[26] In such areas, BNSS's intent collides with reality. Either the mandatory team will take a long time to arrive, or the police will proceed without it. The law provides that investigating officers can send evidence to labs, but delays in sending cases to distant labs are the norm. Thus, in less-equipped states, the "mandatory forensic visit" becomes effectively optional or incidental.

Data illustrate these disparities. Per official figures, large states like Maharashtra and Uttar Pradesh have 12 regional labs each,[27] whereas several North-Eastern and smaller states have none. Even within better-served states, labs are uneven: Punjab has only 3 regional FSLs for

[25] Supra Note 1.
[26] Supra Note 1.
[27] Supra Note 1.

two districts together[28], compared to Tamil Nadu's 10 labs.[29] Quality is uneven too: some labs have modern DNA sequencers, others lack funding for fuel to send samples. In effect, two accused persons in similar circumstances may experience very different forensic processing simply based on location.

The empirical findings demonstrate that forensic science in India functions within a markedly uneven institutional framework, where regional disparities in infrastructure, expertise, and procedural standardisation substantially affect forensic protocols and outcomes. The predominance of DNA analysis in 40.2% of cases[30] and fingerprint analysis in 29.6%[31] reflects a narrow concentration of forensic capacity, while specialised domains such as digital forensics, toxicology, and ballistics remain underrepresented. This imbalance reflects not only crime patterns but also unequal access to forensic facilities and technical capability across regions.

These disparities are most evident in technical limitations across forensic laboratories. Outdated equipment was identified in 50.4% of cases,[32] while insufficient resources affected 29.8%,[33] demonstrating a strong correlation between forensic efficiency and regional investment. Laboratories in metropolitan or better funded regions are more likely to meet procedural timelines and forensic standards, whereas resource constrained areas experience systemic delays and reduced accuracy. Consequently, uniform implementation of forensic mandates under the BNSS remains aspirational rather than operational.

Methodological inconsistencies further compound these challenges. Variations in forensic procedures occurred in 35.8% of cases,[34] inconsistent results in 30.2%,[35] and mislabelling of samples in 20.2%,[36] reflecting the absence of uniform protocols and standard operating procedures. Delayed reporting in 13% of cases highlights procedural inefficiencies that weaken probative value and increase vulnerability to legal challenge during trial.[37]

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[28] Supra Note 1.
[29] Supra Note 1.
[30] Khushi Jadhav et al., *The Dark Side of Forensic Science: Issues and Pitfalls in India*, 6 Int'l J. Res. Pub. & Rev. 1317, 1319–26 (2025), https://ijrpr.com/uploads/V6ISSUE3/IJRPR39707.pdf
[31] Id.
[32] Id.
[33] Id.
[34] Id.
[35] Id.
[36] Id.
[37] Id.

Human resource constraints represent another critical dimension of disparity. The absence of specialised forensic expertise in 40.2% of cases,[38] combined with limited hands on experience and inadequate continuing education, reveals a systemic training deficit. This underscores that forensic reliability depends not only on statutory mandates but on sustained institutional capacity building.

The legal impact of these deficiencies is reflected in trial outcomes. Admissibility challenges arose in 35.8% of cases, while forensic shortcomings contributed to acquittals in 29.8%,[39] demonstrating that regional forensic disparities can decisively influence judicial determinations irrespective of the substantive merits of prosecution.

Judicial acknowledgement of these structural failings is evident in Muna @ Jagabandhu Bhoi v. State of Odisha,[40] where the Orissa High Court emphasised the importance of timely chemical examination reports. The Court held that delays and omissions undermine evidentiary completeness and prejudice justice, urging the State to adequately equip forensic laboratories. This intervention illustrates how regional infrastructural inadequacies directly compromise procedural fairness and trial efficiency.

Taken together, the empirical data and judicial concern reveal a fundamental disconnect between the forensic centric vision of the new criminal laws and the uneven realities of forensic infrastructure.

These gaps blunt the force of forensic mandates. If a crime scene is remote, police might record only basic evidence (like victim testimony or photographs) and postpone scientific tests, hoping eventually to send samples to a lab. In short, regional disparities mean that the effectiveness of mandatory forensic protocols is highly uneven. In states with robust FSL systems (like Tamil Nadu, Karnataka, Delhi) the protocols are followed much more closely, whereas in lagging states (e.g. Bihar, the North-East) they become empty formalities.

Delays, Backlogs, and Constitutional Rights

The uneven implementation has serious justice implications. BNSS's forensic provisions were partly justified as a way to speed up trials and reduce wrongful convictions by relying on

[38] Id.
[39] Id.
[40] Muna @ Jagabandhu Bhoi v. State of Odisha, JCRLA No. 81 of 2018 (Oriss. High Ct. n.d.).

science. Instead, they risk introducing new delays. Under BNSS/BNS/BSA, the accused may now face mandatory scientific tests and more electronic evidence, but if labs cannot cope, trials simply slow down. This raises issues under Article 21 (the right to life and personal liberty, which courts interpret to include the right to a speedy trial) and Article 14 (the right to equality before the law).

Article 21 guarantees the right to a fair and speedy trial as an essential component of due process. Delays in forensic reporting directly impede this guarantee, as accused persons often remain in custody while awaiting scientific results. Such delays distort the administration of justice by allowing procedural inertia, rather than adjudication on merits, to determine outcomes.

The Supreme Court has consistently affirmed that the right to a speedy trial is integral to Article 21. In Hussainara Khatoon v. State of Bihar,[41] the Court held that procedures resulting in prolonged incarceration or delay cannot be considered reasonable, fair, or just. This position was reaffirmed in Abdul Rehman Antulay v. R.S. Nayak,[42] where the Court recognised that systemic delays attributable to investigative or prosecutorial agencies violate the accused's constitutional right to speedy justice. In P. Ramachandra Rao v. State of Karnataka,[43] the Court clarified that although rigid timelines cannot be prescribed, unreasonable delays arising from institutional deficiencies undermine constitutional guarantees. In this framework, forensic backlogs, inadequate laboratory infrastructure, and delayed expert reports acquire constitutional significance, as they prolong trials and frustrate due process under Article 21.

High Courts have similarly recognised the constitutional implications of forensic delays. In late 2024, the Punjab and Haryana High Court explicitly linked delays in forensic reporting to violations of Article 21, emphasising that efficient delivery of forensic reports is essential to uphold the right to a speedy trial.[44] The Court criticised prolonged delays in processing and transmission of FSL reports and prescribed institutional reforms, including the creation of an independent directorate and procedural protocols. Comparable concerns have been expressed

[41] *Hussainara Khatoon (I) v. Home Sec'y, State of Bihar*, (1979) 3 S.C.R. 532, A.I.R. 1979 S.C. 1369, (1980) 1 S.C.C. 98 (India)
[42] *Abdul Rehman Antulay v. R.S. Nayak*, (1992) 1 S.C.C. 225, A.I.R. 1992 S.C. 1701 (India)
[43] *P. Rama Chandra Rao v. State of Karnataka*, (2002) 4 S.C.C. 578 (India)
[44] Saurabh Malik, Punjab and Haryana High Court sounds alarm on forensic delays, orders states to enact reforms, The Tribune, (last visited Sept. 20, 2025) https://www.tribuneindia.com/news/haryana/punjab-and-haryana-high-court-sounds-alarm-on-forensic-delays-orders-states-to-enact-reforms/

by the Madras and Delhi High Courts.

Article 14 (equality) is also implicated by forensic disparity. If two suspects commit identical offences in two different states, but only one gets prompt forensic analysis while the other waits indefinitely, unequal treatment results. The Constitution demands that legal rights not depend on arbitrary factors like geography. A fractured system thus creates the potential for a dual justice system. In this context, one can argue that systemic failure to provide uniform forensic facilities undermines equality before the law.

Beyond formal rights, delays impact practical justice outcomes. The backlog of cases pending forensic analysis is staggering. According to policy reports, tens of thousands of cases await DNA profiling alone, and hundreds of thousands await other tests. Every day of delay not only leads the victim further from any closure, it also increases the risk of evidence degradation: DNA collected from assaults may be contaminated, fingerprints may degrade, and cyber logs may have been overwritten. The constitutional implications of regional forensic backlogs are starkly reflected in contemporary institutional data. At the Delhi Forensic Science Laboratory (FSL), over 20,000 forensic reports remain pending,[45] contributing significantly to stalled investigations and delayed court proceedings. Such delays not only impede the progress of trials but also strain the criminal justice system, highlighting the need for adequate staffing and technological resources in metropolitan forensic labs.

In Kerala, the problem is even more pronounced. Multiple forensic laboratories have reported an overwhelming backlog of more than 62,000 unresolved cases,[46] indicating systemic incapacity that directly hinders judicial timelines. The impact is particularly severe in POCSO cases, with over 6,500 pending matters primarily due to delayed forensic reports, preventing courts from moving forward and delaying justice for vulnerable victims.[47]

Even in comparatively well-resourced jurisdictions such as Haryana, internal data reveal persistent backlogs despite relatively high disposal rates. Approximately 7,830 toxicology

[45] Experts weigh in as Delhi HC calls for SOP over indiscriminate FSL referrals, *The Hindu* (July 9, 2025), https://www.thehindu.com/news/cities/Delhi/experts-weigh-in-as-delhi-hc-calls-for-sop-over-indiscriminate-fsl-referrals/article69838569.ece

[46] Forensic labs in crisis over 62,000 unresolved cases and backlog issues, *Times of India* (Dec. 27, 2023), https://timesofindia.indiatimes.com/city/thiruvananthapuram/forensic-labs-in-crisis-over-62000-unresolved-cases-and-backlog-issues/articleshow/113993110.cms

[47] 6,522 Pocso cases in Kerala pending as forensic delays choke justice, *Times of India* (Dec. 10, 2025), https://timesofindia.indiatimes.com/city/thiruvananthapuram/6522-pocso-cases-in-kerala-pending-as-forensic-delays-choke-justice/amp_articleshow/124182245.cms

reports and 1,665 DNA cases remain pending across different divisions,[48] demonstrating that backlog issues persist even in labs with better operational throughput.

These figures collectively illustrate that forensic delays are not isolated incidents but symptomatic of regional disparities in infrastructure, expertise, and procedural efficiency. These factors further weaken prosecutions, adding to law enforcement's woes. In sum, the current forensic slowdowns and non-uniform standards jeopardise the constitutional promise that "justice shall be delivered within a reasonable time" and that no person shall be denied equal protection of the laws.

Institutional and Judicial Responses

Faced with these challenges, both the executive and judiciary have begun taking steps. At the central level, the government has launched major schemes to bolster forensic infrastructure. The **National Forensic Infrastructure Enhancement Scheme (NFIES)**, approved in 2024, allocates over ₹2254 crore for 2024–29 to establish new campuses of the NFSU and additional CFSLs.[49] This investment is explicitly tied to the new laws: the NFIES press release notes that "with the enactment of the new Criminal Laws… a significant increase in [lab] workload is expected," and that new NFSU campuses and CFSLs will address manpower and backlog.[50] Already, seven new NFSU campuses have been approved, with plans for 26 campuses nationwide training over 32,000 forensic experts per year.[51] Additional funds under the 2022 Modernisation of Forensic Capacities scheme (₹2,080 crore) are flowing to states for equipment upgrades and mobile labs.[52] To standardise quality, the DFSS has issued NABL accreditation manuals and SOP guidelines for labs.

State and local initiatives are emerging too. A notable development is the engagement of private forensic laboratories for specialised analysis, particularly in areas such as DNA profiling,

[48] Haryana's forensic lab struggles with backlog despite high disposal rate, *Hindustan Times* (Feb. 7, 2025), https://stg-www.hindustantimes.com/cities/chandigarh-news/haryanas-forensic-lab-struggles-with-backlog-despite-high-disposal-rate-101738868481138.html

[49] Shekhar Singh & Prabhat Shukla, Quantifying the State of India's Justice System, The New Indian Express (Apr. 20, 2025) https://www.newindianexpress.com/explainers/2025/Apr/20/quantifying-the-state-of-indias-justice-system, (last visited Sept. 20, 2025).

[50] Press Information Bureau, Cabinet approves continuation of scheme of MPLADS during 15th Finance Commission period, PIB, https://www.pib.gov.in/PressReleasePage.aspx?PRID=2026704 (last visited Sept. 20, 2025).

[51] *Strengthening Forensic Science Infrastructure Across India*, Press Information Bureau, Government of India https://www.pib.gov.in/PressReleasePage.aspx?PRID=2138746&reg=3&lang=2 (last visited Jan. 5, 2026).

[52] Supra Note 1.

digital forensics, handwriting examination, and crime scene reconstruction. Independent laboratories such as Truth Labs receive case referrals from courts and police departments across more than fifteen States, reflecting judicial and institutional reliance on non-state forensic expertise.[53] Similarly, IFS India / IFS INDIA provide forensic analysis and investigative support to police authorities, courts, and government departments, while SIFS India offers private forensic solutions, including crime scene assistance and laboratory services to aid ongoing police investigations.[54] However, such reliance remains uneven across jurisdictions and raises concerns relating to regulatory oversight, standardisation of forensic protocols, and uniform access to forensic services. While private participation may temporarily alleviate backlogs, it cannot substitute for sustained public investment, and its unregulated expansion risks deepening existing regional disparities in forensic quality and access to justice.

A number of state governments are earmarking budget for new state FSL buildings and equipment. Courts have increasingly ordered faster forensic processing. The Supreme Court has repeatedly emphasised that scientific evidence strengthens justice and has chided authorities for negligence in preserving evidence.

At the policy level, the Union Government has articulated a comprehensive strategy to strengthen forensic capacity nationwide. The Union Home Minister has stated that India currently has seven Central Forensic Science Laboratories (CFSLs), with eight additional CFSLs under establishment, ensuring that no State or Union Territory remains without access to either a National Forensic Sciences University (NFSU) campus or a CFSL.[55] To reinforce State-level forensic infrastructure, including forensic vans and regional laboratories, grants amounting to approximately ₹1,000 crore have been provided, alongside the issuance of guidelines aimed at standardising forensic science departments. An e-Forensics IT platform has also been launched, with 143 laboratories across the country, including CFSLs, already integrated into the system. In terms of capacity building, it has been stated that by 2029, nearly 35,000 students will be pursuing forensic education at NFSU, which currently reports 100% placement, operates 14 campuses, and conducts over 100 training programmes, having trained more than 16,000 officers in the past four years, with plans to substantially increase this

[53] About Us, *Truth Labs*, https://truthlabs.org/about-us/ (last visited Jan. 4, 2026).
[54] Forensic Laboratory in India – Expert Services, *SIFS India* (blog), https://www.sifsindia.com/blog-details/forensic-laboratory-in-india-expert-services (last visited Jan. 4, 2026).
[55] *Strengthening Forensic Infrastructure and Training Programmes Across India*, Press Information Bureau, Government of India (Nov. 14, 2025), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2211128&reg=3&lang=2 (last visited Jan. 5, 2026).

number.[56] Further, NFSU has registered 46 patents, entered into over 100 international MoUs, and executed agreements with 117 central and state organisations, reflecting a long-term roadmap aimed at creating an integrated, innovation-driven forensic ecosystem, including future adoption of AI-based forensic analysis.[57] According to the Union Government, early implementation of the three new criminal laws has already yielded positive outcomes in terms of speed and efficiency of criminal justice delivery.

While these measures are positive, they are at an early stage. The NFIES and modernisation schemes will unfold over 5+ years, so current gaps persist. Courts continue to press for reforms. For example, the Punjab-Haryana High Court's November 2024 order not only underscored Article 21 but also mandated the creation of an independent FSL directorate, decentralised decision-making, and strict SOPs for lab work.[58] The court's committees recommended expediting recruitment and allowing contractors to fill vacancies temporarily, and giving labs financial autonomy to procure equipment faster.[59] These judicially prompted fixes if implemented by state governments, could begin to mitigate the delays. However, widespread reform will require sustained political and bureaucratic will.

With that context, the long-range risk is stark: if the forensic evidence infrastructure does not proportionally improve to comply with the demands of the new laws, the justice system will fail to comply with its statutory promises either in terms of outcomes, such as wrongful conviction, predictable case pendency (more likely going further to obtain forensic evidence), increased acquittals and hung juries and in the erosion of trust systemically for order. The government's own target of achieving a >90% conviction rate[60] hinges on robust evidence; without better labs and personnel, that goal will remain aspirational. Moreover, continued disparity will mean that one's fate in court will unreasonably depend on one's location, a result antithetical to constitutional ideals.

Judicial responses to systemic forensic delays and procedural inefficiencies have become increasingly prominent, reflecting institutional concern over the impact of such delays on the administration of justice. The Bombay High Court (Nagpur Bench) took suo motu cognisance

[56] Id.
[57] Id.
[58] Supra note 44
[59] Supra note 46.
[60] *Expansion of Forensic Science Capacity and Training Initiatives*, Press Information Bureau, Government of India (May 23, 2024), https://www.pib.gov.in/PressReleasePage.aspx?PRID=2107850&reg=3&lang=2 (last visited Jan. 5, 2026).

of prolonged delays in Forensic Science Laboratory (FSL) reports across Maharashtra, directing that the issue be treated as a public interest matter and appointing amicus curiae to assist the court in addressing the backlog, noting instances where critical DNA evidence was finalised only after conviction or after several years.[61] In Rajasthan, the High Court has sought a detailed report from the Chief Secretary on FSL delays that continue to stall trials, particularly in POCSO cases, emphasising that such delays violate the constitutional right to a speedy trial and prolong judicial custody of the accused.[62] In Kerala, the High Court has publicly criticised chronic forensic backlogs and investigative weaknesses including delays of up to seven years in obtaining forensic reports and inadequacies in crime scene documentation prompting discussions on reforming investigative and forensic processes.[63] These High Court interventions illustrate mounting judicial impatience with procedural stagnation in forensic science, which directly affects case progression and the fairness of trials.

At the national level, the Supreme Court has also voiced concern over systemic delays in criminal justice, including trial pendency and administrative inefficiencies, framing such delays as obstacles to timely justice and access to rights.[64] Together, these judicial pronouncements highlight that forensic backlogs, delays in expert reporting, and procedural inertia are not merely administrative failings but substantive impediments to effective justice delivery, reinforcing institutional demands for enhanced forensic capacity, standardised protocols, and timely compliance with investigative mandates.

Disparities in Protocols / Lack of Standardisation

Standardisation of forensic evidence remains a persistent challenge, largely owing to the historical evolution of forensic sciences within the domain of policing. Forensic methods were primarily developed to assist law enforcement in investigation, particularly for individualisation and human identification, rather than as rigorously standardised scientific

[61] Bombay High Court fumes over forensic report delays in Maharashtra, *Times of India* (Dec. 11, 2024), https://timesofindia.indiatimes.com/city/nagpur/bombay-high-court-fumes-over-forensic-report-delays-in-maharashtra/articleshow/116186251.cms
[62] *HC Seeks Report From Chief Secretary on FSL Delays Stalling Trials*, Times of India (Jaipur) (July 13, 2025), https://timesofindia.indiatimes.com/city/jaipur/hc-seeks-report-from-cs-on-fsl-delays-stalling-trials/articleshow/122411014.cms (last visited Jan. 5, 2026)
[63] *Need to Modernise Investigation Methods, HC to DGP*, Times of India (Kochi) (Aug. 13, 2025), https://timesofindia.indiatimes.com/city/kochi/need-to-modernise-investigation-methods-hc-to-dgp/articleshow/122909368.cms (last visited Jan. 5, 2026).
[64] *Age Verification Likely in All Criminal Cases*, Times of India (Kochi) (Sept. 4, 2025), https://timesofindia.indiatimes.com/city/kochi/age-verification-likely-in-all-criminal-cases/articleshow/123081144.cms (last visited Jan. 5, 2026).

disciplines. This origin has contributed to fragmented practices, where forensic protocols vary across institutions and regions, resulting in inconsistencies in evidence collection, analysis, and reporting.

Comparative experience demonstrates how judicial and procedural reform can drive standardisation. In the United States, the execution of the Daubert trilogy, followed by amendments to procedural laws, shifted judicial scrutiny towards assessing the scientific reliability of forensic evidence.[65] Courts began examining whether forensic techniques were empirically tested, peer-reviewed, associated with known error rates, and generally accepted within the scientific community. This approach compelled forensic disciplines to adopt validated methodologies and transparent reporting practices, offering a useful reference point for jurisdictions seeking to enhance forensic credibility.

Institutionally, the adoption of quality management standards (QMS) and laboratory accreditation has emerged as a key mechanism for ensuring consistency and reliability in forensic science.[66] Quality management systems introduce structured controls over documentation, method validation, personnel competence, equipment calibration, and evidence handling, while accreditation subjects laboratories to external evaluation against defined benchmarks. Together, these measures promote uniformity, accountability, and reproducibility in forensic outputs.

Quality management standards further encompass standard operating procedures, validated analytical methods, proficiency testing, peer review, and systematic error management. In the absence of such harmonised standards, forensic evidence is produced through uneven and inconsistent processes, undermining its evidentiary value. Within the Indian context, this lack of standardisation poses a serious impediment to the effective implementation of the BNSS and BSA, both of which presuppose uniform and reliable forensic practices. Without comprehensive standard-setting and accreditation, the forensic-centric vision of the new criminal laws risks remaining uneven and ineffective across regions.

[65] *Enabling Trust in Forensic Evidence: Role of Standardisation*, SCC Online (Aug. 22, 2025), https://www.scconline.com/blog/post/2025/08/22/enabling-trust-in-forensic-evidence-role-of-standardisation/ (last visited Jan. 5, 2026).
[66] Id.

CHAPTER 4: FINDINGS

The analysis reveals a clear and troubling pattern. First, **forensic capacity in India is highly uneven**. Major urban centres and some states (e.g., Tamil Nadu, Gujarat) have multiple, modern laboratories, whereas several states – especially those in the Northeast and smaller states – have virtually no facilities beyond a single laboratory. Staffing levels reflect this: the India Justice Report notes nationwide forensic personnel shortages of roughly 50%, with acute shortages (over 50% vacancies) in some states like Andhra Pradesh. Second, the **new criminal laws multiply the demand for forensic evidence**. BNSS mandates forensic procedures for almost all serious crimes, and BSA allows extensive digital evidence – yet these are being layered onto a system already short of resources. Third, the mismatch has **concrete impacts on justice**. Delays in forensic reports hold up trials (often requiring repeated adjournments), leading courts to find that Article 21's speedy trial guarantee is at risk. Equality (Article 14) is also undermined by the geography-driven access gap: an accused in a well-served district effectively enjoys additional scientific corroboration that a person in a distant village does not.

On the positive side, policy measures and court directives show awareness of the problem. The NFIES and related schemes signal large-scale investment, and courts are prescribing structural reforms. The emerging e-Forensics platform and NFSU expansion illustrate a move toward standardised, networked investigation capabilities. However, these are in nascent stages; our review indicates that **current capacity falls far short of statutory requirements**, and the shortfall will hamper the "modern, swift, and scientific" justice system envisioned by the reforms. In sum, without urgent remedies, the gap between law and reality will widen.

CHAPTER 5: SUGGESTIONS AND CONCLUSION

In light of the findings, the following measures are necessary to align forensic infrastructure with the new criminal laws and safeguard constitutional rights.

Accelerate Infrastructure Expansion

States must urgently utilise central funding schemes such as NFIES and police modernisation programs to expand and upgrade forensic laboratories, particularly in underserved regions. The central plan to establish nine new NFSU campuses and additional CFSLs by 2028 must be implemented on schedule. States should also increase regional FSLs and deploy mobile forensic units to reduce delays caused by evidence transportation. The approved 433 mobile

forensic vans should be rapidly operationalised, especially in rural areas. District level access to forensic facilities, even through mobile units, would significantly improve compliance with BNSS mandates.

Augment Human Resources

Governments should undertake large scale recruitment and training of forensic experts and technicians. Judicial committee recommendations to expedite hiring and engage contract specialists merit implementation. Dedicated budgets must support merit based forensic career paths to reduce attrition driven by private sector competition. The NFSU's role in training approximately 32,000 analysts annually remains critical. Until staffing gaps are addressed, collaboration with accredited private laboratories and academic institutions can help manage workload overflow.

Standardize Procedures and Accreditation

Uniform standard operating procedures must be enforced across all forensic laboratories. DFSS guidelines on evidence handling and NABL accreditation should be made mandatory, particularly for core forensic disciplines, as recommended by the Ministry of Home Affairs. Investigators must follow standardised chain of custody and sample collection protocols. Continued investment in training programs for investigators, including the 32,524 officers trained so far, is essential to ensure proper preservation of evidence. Nationwide standardisation will enhance reliability, facilitate inter state cooperation, and reduce disputes over admissibility.

This standardisation should cover:

1. **Sample collection protocols:** Uniform procedures for physical, digital, and biological evidence to minimise contamination or tampering.

2. **Analysis and reporting standards:** Consistent report formats clearly stating methods, findings, and limitations.

3. **Training and certification:** Periodic certification and standardised training to maintain professional competence.

Uniform forensic standards would ensure equivalent evidentiary quality across courts,

strengthen judicial confidence, and improve inter state cooperation in cross border crimes.

Public Awareness and Capacity Building

Forensic reforms require trained personnel and informed stakeholders. Limited understanding of forensic science among police, lawyers, and judges often results in underutilisation or misinterpretation of evidence. Capacity building measures should therefore include:

1. **Law enforcement training:** Regular programs on evidence collection, preservation, and presentation.

2. **Judicial training:** Continuous education for judges and prosecutors on forensic advancements and admissibility standards.

3. **Community awareness:** Public outreach to strengthen trust and cooperation in investigations.

Such investments enhance evidentiary quality and support fair trial rights under Articles 14 and 21.

Harness Technology for Efficiency

The national e Forensics IT platform connecting 117 laboratories must be fully utilised for transmitting digital evidence such as CCTV footage and mobile data. Video conferencing should be normalised to enable expert testimony without physical travel. Further investment in digital forensic tools including secure cloud storage, blockchain based evidence logs, and advanced forensic software will improve speed and efficiency.

Strengthen Legal and Judicial Oversight

Legislatures and courts must actively monitor the implementation of forensic mandates. Courts may set timelines for clearing forensic backlogs and avoid indefinite adjournments awaiting reports. Practices such as concurrent forensic testing during trial should be encouraged. Judicial initiatives like forensic audit committees, as seen in Punjab and Haryana, can be replicated nationwide. Annual legislative reviews of forensic capacity would ensure sustained accountability.

Ensure Rights are Protected

Policymakers must assess whether forensic mandates disproportionately delay trials. Legislative safeguards such as bail presumptions after prolonged delays and access to independent testing when reports are delayed should be considered. Article 21 demands that no accused suffer prolonged detention due to systemic inefficiencies.

Equitable Distribution of Resources

Regional disparities remain a major obstacle, with metropolitan areas enjoying greater access to forensic facilities than rural and smaller states. This inequity directly impacts fair trial rights under Articles 14 and 21. Corrective measures should include:

1. **New laboratories in underserved regions:** Ensuring every state has adequately equipped facilities.

2. **Mobile forensic units:** Rapid response units to serve remote areas and prevent evidence backlogs.

3. **Digital forensic investment:** Provision of forensic software, high capacity systems, and trained digital analysts.

4. **Equitable digital networks:** Ensuring uniform access to reliable digital forensic services nationwide to support mandatory forensic practices under the new laws.

Conclusion

The promise of India's new criminal justice framework cannot be realised without parallel strengthening of forensic infrastructure. While the BNSS and BSA seek to modernise investigations through scientific evidence, current forensic capacity remains uneven and overburdened, risking violations of equality and speedy trial guarantees. Encouragingly, substantial governmental investment and proactive judicial interventions are underway. The success of these reforms will depend on whether states meaningfully implement structural changes. If effectively realised, these measures offer an opportunity to achieve a modern, swift, and scientific criminal justice system. Failure to act, however, risks deepening regional inequities and eroding public trust. Law and infrastructure must therefore advance together to

ensure that every accused and every victim can access reliable forensic justice as envisioned under the new criminal codes.