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NEED FOR A NATIONAL FORENSIC SCIENCE POLICY IN INDIA

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I. ABSTRACT

The use of forensic science has become increasingly important in criminal investigations because it helps investigators rely on scientific findings rather than depending entirely on witness statements or confessions. As crime has become more complex with the growth of technology, cyber offences, organised criminal activities, and sophisticated methods of committing offences, the need for scientific investigation has grown significantly. Forensic evidence today plays an important role in identifying offenders, establishing facts, supporting prosecutions, and ensuring that innocent people are not wrongly implicated. In recent years, India has taken several steps to strengthen the use of forensic science within the criminal justice system. However, despite these developments, the forensic framework in the country continues to face a number of practical and institutional challenges. Many forensic laboratories experience heavy workloads, delays in issuing reports, shortage of trained personnel, and lack of modern infrastructure. Differences in facilities and standards across States have also created uneven levels of forensic support in criminal investigations. Although various laws, institutions, and investigative agencies make use of forensic science, there is still no comprehensive national policy that provides a clear and uniform direction for the development and regulation of forensic services throughout the country. This article examines the need for a National Forensic Science Policy in India and argues that such a policy has become necessary for strengthening scientific investigation and improving the effectiveness of criminal justice administration. The study analyses the present forensic science framework, identifies the major issues affecting forensic services, and discusses the consequences of these shortcomings for criminal investigations and court proceedings. It further explores how national policy can help establish uniform standards, improve infrastructure, promote professional training, encourage technological advancement, and strengthen coordination among different institutions involved

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in the criminal justice process. The article concludes that a comprehensive National Forensic Science Policy can play an important role in improving the reliability, efficiency, and credibility of scientific investigation in India.

II. KEYWORDS

Forensic Science, National Forensic Science Policy, Criminal Justice, Forensic Laboratories, and Forensic Evidence.

III. INTRODUCTION

The primary purpose of any criminal investigation is to discover the truth and ensure that justice is delivered fairly. To achieve this objective, investigating agencies must collect reliable evidence and present an accurate account of the events before the court. In the past, criminal investigations largely depended on eyewitness accounts, confessions, and circumstantial evidence. However, these forms of evidence are not always free from error. Witnesses may forget important facts, statements may be influenced by external factors, and false accusations can sometimes occur. As a result, modern criminal justice systems have increasingly turned towards scientific methods of investigation to improve accuracy and reliability.[2]

Forensic science has emerged as one of the most important tools in this process. It applies scientific knowledge and techniques to the investigation of crime and helps investigators analyse evidence collected from crime scenes. Scientific methods such as DNA profiling, fingerprint examination, forensic pathology, ballistics, toxicology, and digital forensic analysis assist in identifying offenders and connecting them to criminal activities. Unlike assumptions or personal opinions, forensic evidence is based on scientific examination, which often makes it more reliable in criminal proceedings.[3]

The importance of forensic science has increased significantly because crime itself has changed over time. Today, law enforcement agencies are required to deal with cybercrimes, financial frauds, organised criminal networks, terrorism-related

[2] Paul C. Giannelli & Edward J. Imwinkelried, *Scientific Evidence* § 1-1 (6th ed. 2016).
[3] Max M. Houck & Jay A. Siegel, *Fundamentals of Forensic Science* 3–12 (4th ed. 2015).

offences, and technology-based crimes. These offences are often complex and cannot always be solved through traditional methods alone. Scientific investigation has therefore become an essential part of modern policing and criminal justice administration. It not only helps in detecting crime but also supports fair investigation by reducing the possibility of wrongful accusations and investigative mistakes.[4]

In India, forensic science has gradually become an integral part of the criminal justice system. Central and State Forensic Science Laboratories play an important role in assisting police authorities and courts. The increasing use of scientific evidence in criminal trials reflects the growing confidence placed on forensic methods. Recent legislative developments have also recognised the importance of scientific investigation. The Bharatiya Nagarik Suraksha Sanhita, 2023 has introduced provisions that encourage greater use of forensic examination in the investigation of serious offences, demonstrating the increasing role of science in criminal justice.[5] Despite these developments, the forensic science system in India continues to face several practical difficulties. Many laboratories are burdened with a large number of pending cases, which often results in delays in forensic reports. In some regions, there is a shortage of trained forensic professionals and modern equipment. The quality of forensic facilities and resources also differs from one State to another. These issues can affect the efficiency of investigations and sometimes delay the progress of criminal trials.[6]

Another important concern is the absence of a comprehensive National Forensic Science Policy. Although forensic institutions function across the country, there is no single policy that provides a common vision for the development of forensic science in India. Issues relating to infrastructure, training, accreditation, quality standards, research, technological advancement, and institutional coordination are often addressed through separate measures rather than a unified national framework. This

[4] Brandon L. Garrett, *Convicting the Innocent: Where Criminal Prosecutions Go Wrong* 5–14 (2011).
[5] Bharatiya Nagarik Suraksha Sanhita, No. 46 of 2023, § 176 (India).
[6] B.R. Sharma, *Forensic Science in Criminal Investigation and Trials* 21–29 (5th ed. 2016).

can lead to inconsistencies and may limit the full potential of forensic science in supporting criminal investigations.[7]

As the demand for scientific investigation continues to increase, the need for a clear and comprehensive national policy has become more evident. Such a policy can help establish uniform standards, strengthen laboratory facilities, improve professional training, encourage research and innovation, and ensure better coordination among all agencies involved in the criminal justice process. More importantly, it can contribute towards making forensic evidence more reliable, accessible, and effective in assisting courts and investigating authorities.[8]

Against this background, this article examines the need for a National Forensic Science Policy in India. It discusses the present forensic science framework, identifies the major challenges affecting forensic services, and analyses how the absence of a comprehensive policy impacts criminal investigations and justice delivery. The article also explores the key elements that can form part of a future national policy and highlights its potential role in strengthening scientific investigation and improving the overall criminal justice system.

A. Research Objectives

The present study seeks to examine the need for a comprehensive National Forensic Science Policy in India. The specific objectives of the study are:

1. To analyse the evolution and existing framework of forensic science in India;
2. To identify the major institutional, infrastructural, and operational challenges affecting forensic services;
3. To examine the impact of the absence of a comprehensive national forensic policy on criminal investigations and justice delivery; and

[7] National Human Rights Commission, Quality Assurance in Forensic Science Laboratories: Issues and Challenges 8–15 (2019).
[8] United Nations Office on Drugs and Crime, Crime Scene and Physical Evidence Awareness for Non-Forensic Personnel 1–7 (2009)

4. To evaluate the key components that should form part of a future National Forensic Science Policy for strengthening scientific investigation and criminal justice administration.

B. Research Questions

The study is guided by the following research questions:

1. What is the present legal and institutional framework governing forensic science in India?
2. What are the principal challenges affecting the effective functioning of forensic science services in India?
3. How does the absence of a comprehensive National Forensic Science Policy impact criminal investigations and criminal justice administration?
4. What policy measures can be adopted to strengthen forensic science infrastructure, standardisation, quality assurance, and institutional coordination in India?

C. Research Methodology

This study adopts a doctrinal and desk-based research methodology. The research is primarily based on the analysis of statutory provisions, judicial decisions, government reports, committee reports, policy documents, and scholarly literature relating to forensic science and criminal justice administration. Secondary sources including books, journal articles, institutional publications, and reports issued by national and international organisations have also been examined. The study employs analytical and descriptive methods to evaluate the existing forensic science framework in India and to assess the necessity of a comprehensive National Forensic Science Policy.

IV. FORENSIC SCIENCE IN INDIA: EVOLUTION, PRESENT FRAMEWORK AND INSTITUTIONAL LANDSCAPE

A. Evolution of Forensic Science in India

The development of forensic science in India has taken place over a long period and has gradually become an important part of criminal investigation. During the early years of policing, investigations mainly depended on witness statements, confessions,

and physical observations. As scientific knowledge developed, efforts were made to use science for identifying offenders and examining evidence collected from crime scenes. One of the earliest and most significant contributions came from the development of fingerprint identification during the colonial period. Research conducted in British India helped establish fingerprints as a reliable method of personal identification and later influenced forensic practices across the world.[9]

After independence, the need for scientific investigation became more evident as crimes became increasingly complex. Investigating agencies began relying on scientific techniques to support criminal inquiries and verify evidence. Over the years, forensic science expanded beyond fingerprints and document examinations to include disciplines such as forensic biology, toxicology, ballistics, DNA analysis, cyber forensics, and digital evidence examination.[10] This gradual expansion transformed forensic science from a supporting tool into an essential component of criminal justice administration. Today, forensic science plays a significant role in criminal investigations involving serious offences such as murder, sexual offences, cybercrime, organised crime, terrorism, and financial fraud. The increasing dependence on scientific evidence reflects a broader shift towards objective and evidence-based investigation methods.

B. Development of Forensic Laboratories and Scientific Investigation Mechanisms

The growth of forensic science in India led to the establishment of specialised institutions for scientific examination of evidence. To strengthen criminal investigations, the Government of

India established Central Forensic Science Laboratories (CFSLs) at different locations across the country. These laboratories provide scientific assistance in complex criminal

[9] Chandak Sengoopta, *Imprint of the Raj: How Fingerprinting Was Born in Colonial India* 35–58 (Macmillan 2003).
[10] B.R. Sharma, *Forensic Science in Criminal Investigation and Trials* 3–14 (5th ed. Universal Law Publishing 2016).

cases and offer expert opinions on various categories of forensic evidence.[11] State Governments also established State Forensic Science Laboratories (FSLs) to support local police agencies and criminal courts. These laboratories examine biological samples, fingerprints, firearms, questioned documents, narcotic substances, toxicological materials, and digital evidence. The creation of these institutions has significantly improved the ability of investigating agencies to collect and analyse scientific evidence during criminal investigations.[12]

Apart from laboratories, India has also developed several mechanisms to support scientific investigation. Mobile forensic units, crime investigation teams, cyber forensic divisions, DNA testing facilities, and specialised training centres now form part of the forensic framework. These mechanisms help investigators preserve evidence properly and ensure that scientific examination begins at the earliest stage of the investigation process.

C. Existing Legal Framework Governing Forensic Evidence

The use of forensic evidence in India is supported by various legal provisions that recognise the importance of scientific expertise in criminal proceedings. The Bharatiya Sakshya Adhiniyam, 2023 permits courts to consider expert opinions in matters relating to science, medicine, fingerprints, handwriting, and other specialised subjects[13]. Such expert opinions often assist courts in understanding technical issues that fall outside ordinary judicial knowledge. Similarly, the Bharatiya Nagarik Suraksha Sanhita, 2023 contains several provisions relating to investigation, medical examination, collection of evidence, and forensic procedures. These provisions highlight the growing importance of scientific investigation within the criminal justice process.[14]

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[11] Directorate of Forensic Science Services, *Ministry of Home Affairs, Government of India, Annual Report* 2022– 23.
[12] Bureau of Police Research & Development, *Model Forensic Science Laboratory Manual* 1–5 (2020).
[13] Bharatiya Sakshya Adhiniyam, No. 47 of 2023, § 39 (India).
[14] Bharatiya Nagarik Suraksha Sanhita, No. 46 of 2023, §§ 176, 184 (India).

An important recent development in the regulation of forensic and biometric data is the enactment of the Criminal Procedure (Identification) Act, 2022.[15] The Act authorises the collection of a wide range of identification measurements from certain categories of convicted persons, arrested individuals, and other persons directed by competent authorities. These measurements include fingerprints, palm-print impressions, footprints, photographs, iris and retina scans, physical and biological samples, and their analysis. The legislation also provides for the preservation of such records for a period extending up to seventy-five years and authorises the National Crime Records Bureau to collect, store, process, share, and destroy such data in accordance with the statutory framework. The Act was enacted with the objective of strengthening criminal investigation through improved identification and record management mechanisms. However, it has also generated debate regarding privacy, proportionality, data protection, and the scope of State powers relating to the collection and retention of personal data.

These concerns demonstrate that forensic governance involves not only scientific and investigative considerations but also important constitutional and privacy-related issues. The existence of the Act indicates that India has already begun developing a legal framework for forensic and biometric data management, although broader questions relating to standardisation, institutional coordination, accreditation, infrastructure, and forensic governance continue to remain outside the scope of a comprehensive national forensic policy.

Judicial decisions have also contributed significantly to the acceptance and regulation of forensic evidence in India. Indian courts have repeatedly recognised that scientific evidence can provide valuable assistance in determining facts and ensuring fair adjudication. At the same time, courts have emphasised that the use of forensic techniques must remain consistent with constitutional protections. In Selvi v. State of Karnataka,[16] the Supreme Court held that the involuntary administration of narco-analysis, polygraph examinations, and Brain Electrical Activation Profile (BEAP) tests

[15] Criminal Procedure (Identification) Act, No. 11 of 2022 (India).
[16] Selvi v. State of Karnataka, (2010) 7 SCC 263 (India).

violate the protection against self-incrimination under Article 20(3) and the right to personal liberty under Article 21 of the Constitution. The decision highlights that while scientific investigation is important, forensic procedures must operate within constitutional limits. Conversely, forensic evidence has also demonstrated its value in securing convictions in serious criminal cases. In Mukesh v. State (NCT of Delhi),[17] arising from the widely known Nirbhaya case, DNA profiling, fingerprint examination, and other forensic evidence played a significant role in corroborating the prosecution case and establishing the guilt of the accused. These decisions illustrate both the evidentiary importance of forensic science and the legal safeguards governing its use within the criminal justice system.[18]

D. Role of Forensic Science Laboratories, CFSLs and State FSLs

Forensic Science Laboratories occupy a central position in the criminal justice system because they provide scientific examinations of evidence collected during investigations. Their reports assist in investigating officers, prosecutors, and courts in understanding technical aspects of a case that cannot be determined through ordinary observation alone.[19] The Central Forensic Science Laboratories generally handle specialised examinations and cases requiring advanced scientific expertise. State Forensic Science Laboratories deal with a large volume of evidence generated from criminal investigations within their respective States.

Together, these institutions provide scientific support for the investigation and prosecution of criminal offences throughout the country. In addition to examining evidence, forensic laboratories contribute to research, professional training, development of scientific methods, and capacity building within law enforcement agencies. Their work helps improve the quality of criminal investigations and strengthens the reliability of evidence presented before courts.

[17] Mukesh v. State (NCT of Delhi), (2017) 6 SCC 1 (India).
[18] State of H.P. v. Jai Lal, (1999) 7 SCC 280 (India).
[19] Paul C. Giannelli & Edward J. Imwinkelried, *Scientific Evidence* § 1-1 (6th ed. LexisNexis 2016). [16] Bharatiya Nagarik Suraksha Sanhita, No. 46 of 2023, § 176 (India).

E. Recent Criminal Law Reforms and Present Status of Forensic Infrastructure in India

Recent criminal law reforms have further increased the importance of forensic science in India. The Bharatiya Nagarik Suraksha Sanhita, 2023 has introduced provisions that encourage greater use of forensic investigation, particularly in cases involving serious offences. The requirement relating to forensic examination in certain categories of offences reflects a significant policy shift towards scientific investigation and evidence-based criminal justice.[16] These reforms demonstrate the growing recognition that scientific evidence can improve the quality of investigations and reduce dependence on less reliable forms of proof. However, the effectiveness of such reforms depends largely on the strength of the existing forensic infrastructure.

At present, India possesses an extensive network of Central and State forensic laboratories. In recent years, the Government of India has undertaken significant measures to strengthen forensic infrastructure and capacity. A major development was the approval of the National Forensic Infrastructure Enhancement Scheme (NFIES) in June 2024 with a financial outlay of ₹2,254.43 crore for the period 2024–2029. The Scheme provides for the establishment of nine new campuses of the National Forensic Sciences University (NFSU), seven new Central Forensic Science Laboratories (CFSLs), and enhancement of existing forensic infrastructure. These initiatives reflect a growing recognition of the importance of scientific investigation within the criminal justice system.

Nevertheless, despite these investments, several challenges continue to affect the functioning of forensic institutions, including laboratory backlogs, shortages of trained personnel, uneven distribution of facilities, and growing demands arising from mandatory forensic examination requirements under recent criminal law reforms.[20] One of the most frequently discussed issues is the large backlog of cases awaiting forensic examinations. The increasing demand for forensic services has placed considerable pressure on available laboratories and personnel. Delays in

[20] Ministry of Home Affairs, Government of India, *National Forensic Infrastructure Enhancement Scheme (NFIES)*, Cabinet Approval dated 19 June 2024.

forensic reports often affect the progress of investigations and criminal trials.[21] Another challenge relates to shortages of trained experts, modern equipment, and specialised facilities in several regions. The availability of forensic resources is not uniform throughout the country, and differences in infrastructure often affect the quality and speed of forensic services. Concerns have also been raised regarding accreditation standards, quality assurance mechanisms, and the need for continuous professional training.[22]

Recent governmental measures further demonstrate the increasing emphasis placed on forensic capacity-building. Parliamentary and governmental records indicate continued financial support for strengthening forensic institutions, including substantial allocations for forensic science infrastructure, laboratory modernisation, cyber-forensic capabilities, and DNA analysis facilities.[23] In addition, the Ministry of Home Affairs has directed States and Union Territories to strengthen forensic science laboratories, fill vacancies, and address pending forensic backlogs within specified timelines.[24] These measures indicate that significant efforts are underway to improve forensic capabilities across the country. However, the persistence of backlog-related concerns and disparities among States suggests that long-term institutional planning remains necessary.

The present situation shows that while India has made substantial progress in developing forensic capabilities, significant gaps still remain. The increasing reliance on scientific investigation, coupled with recent criminal law reforms, has created a greater need for standardisation, capacity building, and long-term institutional planning. These developments make it necessary to examine whether the existing framework is sufficient to meet future demands or whether a comprehensive National

[21] Bureau of Police Research & Development, Model Forensic Science Laboratory Manual 24–28 (2020).
[22] National Human Rights Commission, *Quality Assurance in Forensic Science Laboratories: Issues and Challenges* 12–18 (2019).
[23] Ministry of Home Affairs, Government of India, Parliamentary Reply on Strengthening Forensic Infrastructure, March 2026.
[24] Ministry of Home Affairs Directive to States on Strengthening Forensic Science Laboratories and Clearing Backlogs, 2026.

Forensic Science Policy is required to address these challenges. This issue forms the focus of the next chapter.

V. WHY INDIA NEEDS A NATIONAL FORENSIC SCIENCE POLICY

A. Lack of Uniform Standards and National Coordination

The previous chapter showed that forensic science in India has developed through the establishment of various Central and State institutions. Although these institutions contribute significantly to criminal investigations, the forensic system continues to operate without a comprehensive national policy. As a result, forensic practices often vary across different States and institutions. The availability of resources, quality of infrastructure, training standards, and laboratory procedures are not always uniform throughout the country.[25]

This lack of uniformity can create practical difficulties in criminal investigations. Scientific evidence must be collected, preserved, examined, and reported according to recognised standards. When different institutions follow different practices, inconsistencies may arise in the handling of evidence. Such variations may affect the reliability and comparability of forensic findings. The problem becomes more significant in cases involving multiple jurisdictions, where coordination among different agencies is essential.[26]

A National Forensic Science Policy can help address these concerns by establishing common standards and procedures for forensic services across the country. It can also promote greater coordination among laboratories, investigating agencies, prosecutors, and courts. Such a framework would contribute to consistency and improve confidence in forensic evidence.

[25] BUREAU OF POLICE RSCH. & DEV., MODEL FORENSIC SCIENCE LABORATORY MANUAL 1–8
(2020).
[26] NAT'L HUMAN RIGHTS COMM'N, QUALITY ASSURANCE IN FORENSIC SCIENCE LABORATORIES: ISSUES AND CHALLENGES 12–18 (2019).

B. Shortage of Forensic Experts and Capacity Constraints

The effectiveness of forensic science depends largely on the availability of trained professionals. However, India continues to face a shortage of qualified forensic experts in several specialised fields. The growing use of forensic evidence in criminal investigations has increased the demand for professionals trained in DNA analysis, cyber forensics, toxicology, ballistics, digital evidence examination, and related disciplines.[27]

The shortage of skilled personnel places additional pressure on existing laboratories. Experts are often required to handle a large number of cases within limited timeframes. This situation can affect efficiency and increase delays in the examination process. It also highlights the need for continuous professional training and specialised education.

Although institutions such as the National Forensic Sciences University have expanded educational opportunities in this field, a broader and long-term strategy is required to meet future demands.[28] A National Forensic Science Policy can provide such a strategy by focusing on recruitment, training, research, and professional development. Strengthening human resources is essential if forensic science is expected to play a larger role in criminal investigations.

C. Delays in Forensic Examination and Laboratory Backlogs

One of the most frequently discussed problems within the forensic system is the delay in examination and reporting. As the number of cases requiring forensic analysis continues to increase, laboratories are often burdened with heavy workloads. The demand for scientific examination has grown considerably due to rising awareness of forensic evidence and greater reliance on scientific investigation by law enforcement agencies.[29]

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[27] B.R. SHARMA, FORENSIC SCIENCE IN CRIMINAL INVESTIGATION AND TRIALS 41–49 (5th ed.,
Universal Law Publ'g Co. 2016).
[28] National Forensic Sciences University Act, No. 32 of 2020 (India).
[29] DIRECTORATE OF FORENSIC SCI. SERVS., MINISTRY OF HOME AFFS., GOV'T OF INDIA, ANNUAL REPORT 2022–23.

Delays in forensic reports can affect the entire criminal justice process. Investigating officers may be unable to proceed further until scientific findings become available. Prosecutors may face difficulties in preparing cases, and courts may be required to adjourn proceedings while awaiting expert reports. Consequently, delays in forensic examination contribute to delays in investigation and trial.

Recent criminal law reforms have placed greater emphasis on forensic investigation, particularly in serious offences.[30] While this development is welcome, it also increases the need for adequate laboratory capacity and manpower. Without corresponding improvements in infrastructure and staffing, the burden on forensic institutions is likely to increase further. Recognising these challenges, the Government of India has initiated large-scale infrastructure expansion through the National Forensic Infrastructure Enhancement Scheme, which envisages new NFSU campuses, additional CFSLs, and upgraded forensic facilities across the country. The Ministry of Home Affairs has also directed States and Union Territories to strengthen laboratory capacity, fill vacancies, and reduce forensic backlogs.

These initiatives demonstrate that efforts are being made to address capacity constraints; however, their long-term effectiveness will depend upon successful implementation, sustained funding, and coordination among Central and State authorities.[31] A National Forensic Science Policy can provide a roadmap for reducing backlogs through better resource allocation, expansion of facilities, and improved institutional planning.

D. Inadequate Infrastructure, Technology and Research Support

Modern forensic investigation requires advanced scientific equipment, specialised laboratories, digital technologies, and continuous research. Although India has made considerable progress in developing forensic facilities, significant disparities still exist

[30] Bharatiya Nagarik Suraksha Sanhita, No. 46 of 2023, § 176 (India).
[31] National Forensic Infrastructure Enhancement Scheme (NFIES), Ministry of Home Affairs, 2024.

in terms of infrastructure and technological capacity. Some laboratories possess modern equipment and specialised divisions, while others continue to operate with limited resources.[32]

The rapid growth of cybercrime, digital fraud, artificial intelligence-based offences, and transnational criminal activities have created new investigative challenges. Addressing such crimes requires constant technological upgradation and investment in research. Forensic institutions must be equipped not only to respond to present challenges but also to adapt to emerging forms of criminal activity.

A National Forensic Science Policy can help ensure long-term planning for technological development and research. It can encourage investment in advanced forensic facilities, support innovation, and promote collaboration between academic institutions and forensic laboratories.

Such measures are essential for keeping pace with evolving investigative needs.

E. Quality Assurance, Accreditation and Reliability of Forensic Evidence

The credibility of forensic evidence depends upon the quality of scientific examination. Courts, investigating agencies, and the public must be confident that forensic reports are prepared according to recognised scientific standards. This makes quality assurance and accreditation important components of any effective forensic system.[33]

At present, concerns have occasionally been raised regarding differences in laboratory standards, quality control mechanisms, and accreditation practices. Since forensic findings often influence important judicial decisions, even minor errors can have serious consequences.

Maintaining reliability therefore requires regular monitoring, professional training, standard operating procedures, and independent quality assessment.

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[32] BUREAU OF POLICE RSCH. & DEV., MODEL FORENSIC SCIENCE LABORATORY MANUAL 24–28
(2020).

[33] NAT'L HUMAN RIGHTS COMM'N, QUALITY ASSURANCE IN FORENSIC SCIENCE LABORATORIES: ISSUES AND CHALLENGES 20–27 (2019).

A National Forensic Science Policy can establish uniform quality standards and encourage accreditation of forensic laboratories throughout the country. Such measures can strengthen the reliability of forensic evidence and improve public confidence in scientific investigation.

F. Impact of Existing Deficiencies on Criminal Justice Administration

The challenges discussed above are not isolated institutional problems. They directly affect the functioning of the criminal justice system. Delays in forensic examination, shortages of experts, inadequate infrastructure, and lack of uniform standards can influence the quality of investigations and the speed of criminal trials. In some situations, these deficiencies may weaken the evidentiary value of scientific findings or delay the resolution of criminal cases.[34]

Scientific evidence has become increasingly important in ensuring fair investigations and accurate judicial outcomes. Consequently, weaknesses within the forensic system have broader implications for justice delivery. Strengthening forensic science is therefore not merely an administrative requirement but an important component of effective criminal justice reform.

The growing reliance on scientific investigation, coupled with the challenges currently faced by forensic institutions, demonstrates the need for a comprehensive National Forensic Science Policy. Such a policy can provide a structured framework for strengthening forensic capabilities and ensuring that scientific evidence contributes more effectively to the administration of justice in India.

VI. CONSEQUENCES OF THE ABSENCE OF A NATIONAL FORENSIC SCIENCE POLICY

A. Impact on Criminal Investigations and Fair Trial Rights

The absence of a comprehensive National Forensic Science Policy affects the quality of criminal investigations in several ways. Scientific evidence has become an important part of modern criminal justice because it helps investigators verify facts

[34] PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, SCIENTIFIC EVIDENCE § 1-1 (6th ed., LexisNexis 2016).

through objective methods. However, when forensic services are not supported by uniform standards, adequate infrastructure, and trained personnel, the effectiveness of scientific investigation is reduced. Weaknesses in the forensic system may result in incomplete examination of evidence, delays in obtaining reports, and inconsistencies in scientific findings.[35]

These issues do not merely affect investigating agencies. They also have a direct impact on the rights of individuals who become part of the criminal justice process. Fair investigation is an important component of a fair trial. When scientific evidence is not examined properly or when forensic reports are delayed for long periods, both the accused and the victim may suffer the consequences. In some situations, important evidence may lose its value due to delay or improper handling. In others, innocent individuals may continue to face suspicion because scientific findings are unavailable at the required stage of the investigation.[36]

Another concern is that unequal forensic capabilities across different regions can create differences in the quality of investigations. Individuals involved in criminal proceedings should receive equal access to scientific investigation regardless of the State in which thek offence occurs. The absence of a coordinated national framework makes it difficult to ensure such consistency. As forensic evidence continues to play a larger role in criminal trials, strengthening forensic services becomes essential for protecting fairness and maintaining public confidence in the justice system.[37]

B. Delays, Case Backlogs and Judicial Burden

One of the most visible consequences of existing weaknesses in the forensic system is delay.

Criminal investigations often depend upon forensic reports before further action can be taken. When laboratories are burdened with a large number of pending cases, the

[35] PAUL C. GIANNELLI & EDWARD J. IMWINKELRIED, SCIENTIFIC EVIDENCE § 1-1 (6th ed., LexisNexis 2016).
[36] Brandon L. Garrett, Convicting the Innocent: Where Criminal Prosecutions Go Wrong 5–14 (Harvard Univ. Press 2011).
[37] NAT'L HUMAN RIGHTS COMM'N, QUALITY ASSURANCE IN FORENSIC SCIENCE LABORATORIES: ISSUES AND CHALLENGES 12–20 (2019).

process of examination takes longer than expected. This delay affects not only investigators but also prosecutors, defence lawyers, victims, and courts.[38]

The problem becomes more serious when forensic evidence forms a central part of the prosecution case. Courts may be required to postpone hearings while waiting for scientific reports. Investigating officers may be unable to complete investigations within a reasonable period. Victims may experience frustration due to slow progress, while accused people may remain under prolonged uncertainty. Such delays ultimately add to the already existing burden on the criminal justice system.

The recent emphasis on scientific investigation under the Bharatiya Nagarik Suraksha Sanhita, 2023 reflects the growing importance of forensic evidence. However, increased reliance on forensic examinations without corresponding improvements in infrastructure may further increase pressure on laboratories.[39] This highlights the importance of long-term planning and institutional strengthening. The National Forensic Science Policy can help reduce delays by improving laboratory capacity, increasing human resources, and ensuring better distribution of forensic facilities across the country.

C. Emerging Challenges in the Era of Cybercrime and Digital Evidence

The need for national policy has become even more urgent because the nature of crime is changing rapidly. Criminal activities are increasingly linked to digital technologies, electronic communication, financial networks, and online platforms. Cybercrime, identity theft, online fraud, ransomware attacks, cryptocurrency-related offences, and digital harassment have become common challenges for law enforcement agencies.[40]

These offences generate forms of evidence that are significantly different from traditional physical evidence. Digital evidence is often fragile, easily altered, and technically complex. Effective examination requires specialised knowledge, advanced

[38] BUREAU OF POLICE RSCH. & DEV., MODEL FORENSIC SCIENCE LABORATORY MANUAL 24–28
(2020).
[39] Bharatiya Nagarik Suraksha Sanhita, No. 46 of 2023, § 176 (India).
[40] UNITED NATIONS OFF. ON DRUGS & CRIME, COMPREHENSIVE STUDY ON CYBERCRIME 43–57
(2013).

software tools, and modern forensic facilities. The growing dependence on digital evidence therefore places new demands on forensic institutions.

What makes the situation more challenging is the speed at which technology evolves. New forms of criminal activity emerge faster than traditional investigative systems can adapt. Without continuous investment in research, training, and technological development, forensic institutions may struggle to keep pace with these changes. A fragmented approach is unlikely to be sufficient in the long run.

A National Forensic Science Policy can provide a long-term strategy for addressing these emerging challenges. It can encourage investment in digital forensic infrastructure, promote specialised training, support research and innovation, and establish national standards for handling electronic evidence. Such measures are necessary to ensure that forensic science remains capable of responding to future criminal justice needs. The discussion in this chapter therefore reinforces the argument that a comprehensive national policy is no longer merely desirable but has become an essential requirement for strengthening scientific investigation in India.

VII. BUILDING A NATIONAL FORENSIC SCIENCE POLICY FOR INDIA

A. Establishing a Uniform National Forensic Framework

The discussion in the previous chapters has shown that forensic science in India has developed considerably over the years. However, the growth of forensic institutions has not always been accompanied by a common national framework. Different States often operate with varying levels of infrastructure, expertise, and resources. This situation highlights the need for a policy that can provide a clear direction for the future development of forensic science across the country.

A National Forensic Science Policy should begin by establishing uniform standards for forensic practices. Scientific evidence must be collected, preserved, examined, and reported according to consistent procedures. Uniform standards would help reduce variations between institutions and improve confidence in forensic findings. Such a

framework can also make cooperation easier when investigations involve more than one State or agency.[41]

Another important aspect of a national framework is institutional coordination. Forensic laboratories, police authorities, prosecutors, and courts all play important roles in the criminal justice process. Their work is closely connected, and weaknesses at one stage can affect the entire investigation. A comprehensive policy can promote better communication and coordination among these institutions and help create a more organised forensic system.

While the need for a National Forensic Science Policy is evident, its implementation must also take into account India's constitutional distribution of powers. Matters relating to police administration and public order primarily fall within the legislative competence of the States under the Seventh Schedule to the Constitution.[42] Since forensic laboratories frequently function as part of State policing and criminal investigation systems, a national policy cannot rely exclusively on central direction. Consequently, any effort to establish uniform forensic standards must operate through constitutionally permissible mechanisms. These may include centrally sponsored schemes, model legislation for adoption by States, inter-governmental coordination through the Ministry of Home Affairs, conditional funding linked to compliance with national standards, and where appropriate, legislation enacted pursuant to Article 252 of the Constitution upon resolutions passed by State Legislatures.[43] Such cooperative federal mechanisms can help achieve national uniformity while preserving the constitutional autonomy of the States. A successful National Forensic Science Policy must therefore be designed as a framework for cooperative governance rather than as a purely centralised regulatory model.[44]

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[41] BUREAU OF POLICE RSCH. & DEV., MODEL FORENSIC SCIENCE LABORATORY MANUAL 6–12
(2020).
[42] Constitution of India, Seventh Schedule, List II, Entries 1 and 2.
[43] Constitution of India, art. 252.
[44] M.P. Jain, Indian Constitutional Law (latest edition), discussion on legislative relations between the Union and States.

B. Strengthening Infrastructure and Human Resource Capacity

A strong forensic system requires more than legal recognition. It also requires adequate laboratories, modern equipment, trained professionals, and continuous institutional support. While India has expanded its forensic infrastructure over the years, the growing demand for scientific investigation has placed significant pressure on existing facilities.[45] One of the major objectives of a National Forensic Science Policy should therefore be to strengthen forensic infrastructure throughout the country. This includes improving laboratory facilities, increasing access to modern scientific equipment, and expanding specialised units dealing with DNA analysis, cyber forensics, toxicology, ballistics, and digital evidence examination. Equal attention should be given to regions where forensic facilities remain limited.

Human resources are equally important. The effectiveness of forensic science ultimately depends upon the knowledge and competence of forensic professionals. A shortage of trained experts can affect the quality and speed of forensic examinations. For this reason, the policy should focus on professional training, specialised education, skill development, and continuing research opportunities.[46] The policy should also encourage closer cooperation between forensic institutions and academic centres. Universities and specialised institutions can play an important role in producing skilled professionals and supporting future research. Investment in human resource development is likely to produce long-term benefits for both forensic science and the criminal justice system as a whole.

C. Quality Assurance, Accreditation and Technological Development

The value of forensic evidence depends largely upon its reliability. Courts rely on forensic findings because they are expected to be based on scientific principles and professional examination. If the quality of forensic analysis is questioned, public confidence in scientific investigation may also be affected. Consequently, quality

[45] DIRECTORATE OF FORENSIC SCI. SERVS., MINISTRY OF HOME AFFS., GOV'T OF INDIA, ANNUAL REPORT 2022–23.
[46] National Forensic Sciences University Act, No. 32 of 2020 (India).

assurance should form an essential part of any National Forensic Science Policy.[47] The policy should encourage forensic laboratories to follow recognised scientific standards and maintain effective quality control mechanisms. Accreditation of laboratories can further strengthen confidence in forensic findings by ensuring that institutions operate according to accepted professional requirements. Regular assessment, proficiency testing, and monitoring mechanisms can help maintain consistency and reliability in forensic examination.

At the same time, technological development must remain a continuous priority. Criminal methods are constantly evolving, particularly in areas such as cybercrime, financial fraud, digital offences, and electronic communication. Forensic institutions must therefore be capable of responding to new forms of criminal activity. Investment in modern technology, specialised software, and advanced scientific techniques is essential for maintaining the effectiveness of forensic investigations.[48] A future-oriented policy should recognise that forensic science is a dynamic field that requires constant adaptation. Strengthening quality standards while encouraging technological development can help ensure that forensic institutions remain capable of meeting emerging challenges.

D. Promoting Research, Innovation and Future Readiness

Scientific investigation cannot remain effective without research and innovation. New technologies, changing crime patterns, and emerging forms of digital evidence require forensic institutions to continuously update their methods and capabilities. A National Forensic Science Policy should therefore promote research as one of its core objectives.

Research can contribute to the development of new investigative techniques, improvement of existing forensic methods, and better understanding of emerging forms of criminal activity. It can also assist in addressing practical challenges faced by

[47] NAT'L HUMAN RIGHTS COMM'N, QUALITY ASSURANCE IN FORENSIC SCIENCE LABORATORIES: ISSUES AND CHALLENGES 20–29 (2019).
[48] UNITED NATIONS OFF. ON DRUGS & CRIME, CRIME SCENE AND PHYSICAL EVIDENCE AWARENESS FOR NON-FORENSIC PERSONNEL 17–24 (2009).

forensic laboratories and law enforcement agencies. Encouraging collaboration between universities, research institutions, forensic laboratories, and government agencies can create an environment that supports innovation and knowledge sharing.[49]

Future readiness is equally important. The growing use of artificial intelligence, cloud computing, cryptocurrency, digital platforms, and advanced communication technologies is likely to create new investigative challenges in the coming years. Forensic institutions must be prepared to respond to these developments through continuous learning and technological adaptation.

A National Forensic Science Policy that places emphasis on research, innovation, and future preparedness will not only address present challenges but also strengthen the ability of forensic institutions to respond to future needs. Such an approach can help ensure that scientific investigation remains an effective and reliable component of the criminal justice system in India.

VIII. RECOMMENDATIONS AND CONCLUSION

A. Recommendations

The first and most important recommendation arising from this study is the formulation of a comprehensive National Forensic Science Policy for India. Although forensic science has become an integral part of criminal investigations, its development has largely occurred through individual institutional initiatives rather than through a coordinated national framework. This has resulted in differences in standards, infrastructure, and operational practices across various States and institutions. A dedicated policy should clearly define national objectives, establish uniform standards for forensic practices, identify institutional responsibilities, and create a long-term roadmap for the development of forensic science. Such a policy would provide consistency in forensic operations and ensure that scientific

[49] MALIMATH COMM., COMM. ON REFORMS OF THE CRIMINAL JUSTICE SYS., REPORT OF THE COMMITTEE ON REFORMS OF THE CRIMINAL JUSTICE SYSTEM 171–76 (2003).

investigation receives the attention necessary for effective criminal justice administration.

The second recommendation is the strengthening of forensic infrastructure and laboratory capacity throughout the country. The increasing reliance on forensic evidence has significantly increased the workload of forensic institutions. However, many laboratories continue to face challenges relating to limited resources, shortage of equipment, and growing case backlogs. In several regions, access to advanced forensic facilities remains inadequate when compared to the increasing demands of criminal investigation. Greater investment should therefore be directed towards establishing modern laboratories, upgrading existing facilities, expanding DNA and digital forensic units, and improving access to specialised scientific equipment. Strengthening infrastructure is essential not only for improving efficiency but also for reducing delays that affect investigations and criminal trials.

The third recommendation relates to the development of human resources within the forensic science sector. Scientific investigation depends largely upon the expertise and competence of forensic professionals. Despite the increasing demand for forensic services, India continues to face shortages of trained personnel in several specialised areas. This issue cannot be addressed solely through infrastructure development. Equal emphasis must be placed on education, specialised training, professional development, and research opportunities. Universities, forensic institutions, and government agencies should work together to create stronger academic and professional pathways for future forensic experts. Continuous training programmes should also be encouraged so that existing professionals remain updated with emerging scientific techniques and technological developments.

Another important recommendation is the establishment of a robust quality assurance and accreditation framework for forensic laboratories. Since forensic findings frequently influence judicial decisions, maintaining scientific reliability is essential for protecting the integrity of the criminal justice system. Uniform accreditation standards, periodic audits, proficiency testing, and effective quality control mechanisms can contribute significantly towards improving confidence in forensic

evidence. A national policy should ensure that all forensic institutions operate according to recognised scientific standards and follow transparent procedures that promote accuracy, accountability, and professional integrity.

The final recommendation is the promotion of research, innovation, and technological advancement within forensic science. The nature of crime is changing rapidly due to technological developments, digital communication, artificial intelligence, and cyber-based activities. As a result, forensic institutions must continuously adapt to new challenges. Greater support should be provided for research initiatives, interdisciplinary collaboration, and technological innovation in emerging fields such as cyber forensics, digital evidence analysis, artificial intelligence-assisted investigations, and cryptocurrency-related crime detection. Encouraging collaboration between forensic laboratories, universities, research centres, and law enforcement agencies can help create a more dynamic and future-oriented forensic system capable of responding effectively to evolving criminal activities.

B. Conclusion

Forensic science has emerged as one of the most important pillars of modern criminal investigation. The increasing dependence on scientific evidence reflects a broader shift towards objective and evidence-based methods of crime detection and prosecution. India has made considerable progress in developing forensic institutions and expanding the use of scientific techniques in criminal investigations. However, the existing forensic framework continues to face challenges relating to infrastructure, manpower, standardisation, technological development, quality assurance, and institutional coordination.

The study has shown that many of these challenges arise from the absence of a comprehensive national framework governing forensic services. While various institutions perform important forensic functions, their efforts are often fragmented and lack the support of a unified long-term policy. As forensic evidence assumes greater importance within the criminal justice process, these shortcomings become increasingly difficult to ignore.

The adoption of a National Forensic Science Policy can provide a clear direction for future development by promoting uniform standards, strengthening infrastructure, improving professional capacity, encouraging research and innovation, and ensuring greater institutional coordination. Such a policy would not only improve the quality of scientific investigation but also contribute to fairer, faster, and more reliable criminal justice outcomes.

In the coming years, the growth of cybercrime, digital evidence, and technology-driven offences will place even greater demands on forensic institutions. A comprehensive National Forensic Science Policy is therefore no longer merely a desirable reform but an essential requirement for ensuring that the criminal justice system remains capable of responding to contemporary and future challenges.

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