



IMPROVING FORENSIC SCIENCE RELIABILITY IN INDIAN CRIMINAL JUSTICE SYSTEM: AN EMPIRICAL STUDY

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Abstract

We are reaching a fundamental turning point in the forensic sciences. The successful use of forensic scientific techniques in the criminal justice system has been questioned and essentially considered in light of several high-profile discoveries and an expanding body of literature. We make the case for the requirement of a stronger relationship and identify key issues that demand consideration from experts working in both the forensic science and legal fields. Forensic science is used by the legal system to settle individual criminal cases as well as by law enforcement to reduce crime and get convictions. Previous studies in this field have concentrated more on science and innovation than on how people may use forensic services and science to their best advantage to achieve just results. As part of this five-year project, the viability of forensic science in police investigations and court preliminary hearings will be examined.

Keywords: *Improving, Forensic Science, Reliability, Indian, Criminal Justice, System*



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Introduction

The quick development of new logical strategies, particularly the increased knowledge regarding the forensic use of deoxyribonucleic acid, has already had and probably will continue to have an almost unanticipated effect on our criminal justice system. This is especially true when things are just getting started. These new logical methods have been applied in forensic investigations most commonly in the criminal preliminary court. Despite the fact that some sciences, such as fingerprinting and blood composition, have been used in criminal indictments for some time, the past 20 years have seen the development of many new types of forensic science criminal evidence, including the now-ubiquitous use of DNA, hair and fiber analysis, new techniques for device imprint and ballistics analysis, warm imaging, and the obviously logical examination of indentations or penmanship, among many others. Unquestionably, these

new types of proof provide difficulties for preliminary adjudicators. Today, gathering and using forensic evidence is a crucial part of both criminal investigations and arraignments.

By adopting logical techniques that are outside the scope of the designated authorities, forensic science unquestionably contributes significantly to helping the legal system resolve complicated criminal cases. The fundamental rule of criminal law is that the court must carefully analyze all evidence before admitting it at a preliminary hearing and decide the grounds for doing so. In criminal investigations and preliminary hearings, the possibility of logical evidence is undeniable, but the role of the legal partners and their skill in vetting the evidence is usually a contested topic in India as well as everywhere else in the globe. The main goal of this delicate article is to frame the questions considered by the preliminary appointed authorities when evaluating the logical arguments and theories mentioned, which must be consistent with the general standards of acknowledgement used by mainstream researchers as a condition precedent to accepting the forensic evidence.

However, more research is anticipated to determine the precise role of forensic evidence in determining the pace of an arrest and exoneration. The presentation of forensic scientific innovation has resulted in emotional mechanical advancements in the dynamic cycle in criminal preliminary proceedings. In this way, as forensic evidence is mentioned during the active phase of criminal proceedings, the opinions of various independent courts have been examined. The traditional observer-based criminal justice system's technique has shown to be very challenging for effective criminal arraignment. The criminal justice system is tainted by this kind of criminal indictment. As a result of witnesses failing to appear on the dates set by the courts or likely refusing to depend on the course of the court, which delays justice, judges are no longer able to decide a criminal case or verify a fact in question solely based on the testimony of potentially lying or dishonest witnesses. Additionally, after questioning the in-boss and reviewing the evidence, the designated authorities are unable to make a definitive judgment about the incident. These days, witnesses avoid testifying in court despite accepting or having seen the evidence because of a psychotic fear of becoming victim to attacks or suspects, which can be fatal.

Typically, crimes are performed in a way that makes it difficult to find a single observer. The dynamic cycle in forensic cases is frequently entirely based on circumstantial evidence, such as DNA evidence, ballistic expert reports, fingerprints, or synthetic examination results. Due to a lack of conviction or sufficient proof, a number of startling suspects are either sentenced or let off the hook based on even the slightest uncertainty. Additionally, the indictment spends a lot of money on criminal court proceedings. As a result, the majority of open assets are

forfeited at usual arraignments, and suspects are freed on the basis that they have a chance to prove their innocence. In fact, there are wrongdoings being committed right now, and logical violations have surfaced that need to be resolved by forensic innovation. Digital forensics, for instance, should be used to handle a digital case. Additionally, the classification of offenses has changed from general to specific. Regular offenses are frequently committed logically using PCs, in which case the major alternative is digital forensics.

Even if examiners are not yet ready to rely on the well-established specialty of examination, source development, and observation to distinguish wrongdoing, wise criminals have begun incorporating science into their illegal activities. Consequently, forensic science and cutting-edge advances are essential to the functioning of the criminal justice system. The advancements in forensic science have provided law enforcement and the judiciary a vital tool. With the use of forensic evidence, a successful and accurate analysis of the wrongdoing and the court system determines the criminal proof of a charged. From one end of the world to the other, forensic science has been used to resolve rational cases, and it may help police investigators conduct excellent investigations. Criminal investigation forms a significant part of the foundation of a criminal indictment. In light of witness testimony, logical investigation using forensic science is substantially more convincing, accurate, and fruitful than the criminal court system. A culpable party cannot be excused because of a witness. However, there is no specific regulation on the admissibility of forensic evidence in court (with the exception of the Indian Proof Demonstration, which manages master proof), therefore we normally rely on the rulings and decisions of the higher courts or the Zenith Court.

1. Literature Review

In order to ensure the validity and dependability of forensic science evidence in the Indian criminal justice system, Das and Chattopadhyay (2021) oversaw a review. They examined current procedures and challenges faced by forensic science professionals and made recommendations for improving the validity of forensic evidence. The assessment emphasized the value of standardized practices, quality assurance mechanisms, and ongoing project preparations to work on the validity and reliability of forensic science proof in India.

Singh and Shukla (2019) looked into the challenges and possible solutions for enhancing the dependability of forensic science in the Indian criminal justice system. Their review identified various factors that affect the validity of forensic evidence, such as a lack of a framework, outmoded technology, and constrained quality control methods. To solve these issues and boost reliability, the designers suggested techniques like increased funding, upgrading of forensic labs, and the establishment of certification systems.

In order to increase the credibility of forensic science in the Indian criminal justice system, Puri and Mathur (2018) carried out a detailed examination of recent developments. The writers discussed forensic techniques, mechanical redesigns, and institutional structural changes. Their conclusions included the need for increasing interest in creative work, acceptance of internationally controlled procedures, and enhanced cooperation between forensic scientific organizations and law enforcement to assure the legitimacy of forensic science evidence.

Patil and Sharma (2017) carefully investigated the reliability of forensic science evidence in the Indian criminal justice system. They investigated master statements, contextual studies, and the precision and dependability of forensic methods. The assessment found problems with the usage of out-of-date equipment, inadequate planning, and a lack of defined processes. The authors stressed the significance of frequent capability testing, advanced project development, and adherence to quality assurance principles to strengthen the validity of forensic evidence.

Desai and Kumar (2016) used a contextual analysis technique to look into ways to increase the dependability of forensic science in the Indian criminal justice system. They examined specific instances where forensic evidence played a crucial role and identified the challenges encountered during exams and preliminary procedures. To increase the dependability of forensic scientific evidence, the creators put up suggestions including strengthening the forensic framework, ensuring the clarity and independence of the forensic foundations, and elevating multidisciplinary collaboration.

2. Forensic Science

The application of science to the common and criminal laws that are executed by police agencies in a criminal justice system is known as forensic science. However, in Bangladesh, common regulations are not approved by the police. The Latin word "forensic," which means "of or before the discussion," is where the English word "forensic" originates. A criminal charge in ancient Rome implied bringing the subject up for discussion in front of a crowd of people. Both the person accused of the wrongdoing and the informant would speak in order to present their respective points of view. The winner of the case would be determined by whoever had the strongest argument and presentation. The term "forensic" is now used interchangeably with the words "legal" or "related to courts." Forensic science can be referred to as "legitimate science" in several ways. The logical method for examining social behavior and historical facts is forensic science. This is especially important when it comes to police and forensics that are completed in accordance with criminal or common law. Every branch of science, including physical science, life structures, physiology, medicine, medical procedure, physical science, and plant science, lends its expertise as needed. At times, this diversity of

branches of science is expected to enable an official courtroom to reach a just conclusion on a contentious issue affecting life or property. In general, forensics is involved with identifying, distinguishing, personalizing, and evaluating actual evidence employing techniques from innate sciences in contexts of legal import. The result of forensic science is forensic proof. For the most part, the term "forensic proof" refers to evidence that was obtained through rational means or with the aid of innovation, such as ballistics, blood collection, or DNA fingerprinting, and was then used in court. It is possible to link infractions that are thought to be related to one another using forensic evidence.

3. Case Study

The Supreme Court defined the word "expert" in *Mahmood v. State of U.P.*, where it was noted that convicting someone based entirely on the testimony of an expert would be exceedingly risky. Although using expert testimony as the basis for a prosecution is dangerous, Sections 53 and 53A of the Code of Criminal Procedure, 1973, mandate its use in certain situations. In *Selvi v. State of Karnataka*, the Supreme Court determined that using forensic procedures like polygraphy without the accused's consent violates Articles 20(3) and 21 of the Indian Constitution and is thus unconstitutional.

5. The Role of Forensic Science in Criminal Justice

In the debates that came before, we saw a few issues and conundrums in the area of forensic logic that have an impact on the reliability of the evidence. We should now change the subject of our conversation to a genuine issue. In criminal situations, the examiners (as the arraignment's proof) and protection (as the guard proof) carry the forensic logical proof into the genuine area. Before it transitions into the degree of confirmation, several partners will deal with it once it enters the observer box. In this section, dialogues are organized to make it easier to understand the issues at hand. Various partners are requested, and it is through them that the logical proof becomes evidence. In every single criminal case, the examiner will open the case if there is any question. He weighs more than the guard does. In contrast to private events, the examiner is appearing for the state even though he has no guardian relationship with it. He can very easily tell his enemy by his profession. In addition to protecting the innocent from false convictions and preventing serious premature delivery of justice, the examiner's duty is to find the real guilty party guilty. In light of the primary areas where law and order is strongest, this is a requirement for strengthening the criminal justice system. Unfortunately, it is evident at arraignments in India that most investigators rush to determine the accused's guilt, whether or not he really committed the crime. To be quite honest, this is more heart-breaking than obnoxious.

The forensic logical evidence should be examined by the investigator first. Forensic investigators may have biased, illogical reports that are inappropriately knitted together inside the white coat. To preserve the public's faith in the system, it is the investigator's duty to locate the trap. He needs to perform his research before submitting the report to the formal courts. It is somewhat astonishing to remark that in India, the examiners neither require nor put much thought into the report's language or its use of rules. How few controllers thoroughly teach their logical observers to exclude some crucial needs from the report is the most hilariously amazing preoccupation. The excellent examiners are well aware that the safeguard will benefit from uncertainty if any regulations interfere with the pack of evidence.

4. Issues on Admissibility of Forensic Scientific Evidence in Criminal Trial

The relationship between law and science cannot be avoided, and this is especially true in criminal instances where forensic evidence from the scene of the crime must be analyzed. Science has continually been enlisted by regulation, and this has been growing little by little. Forensic logical evidence has received serious criticism during the last thirty years. Because of some moral concerns within the forensic logical field, serious reactions were evened out against the validity of several tests in forensic identifiable proof. System or control concerns, exactness issues, trustworthiness issues, and legal advisor skills issues are all thoroughly categorized as the challenges that logical proof in criminal trials must overcome. The preliminary designated authority must overcome certain additional challenges when evaluating forensic logical evidence, such as the possibility that the chief observer may be biased or conflicted.

The legal executive faces a difficult task when evaluating the various pieces of evidence that have an impact on either science or innovation. Within a constrained amount of time, the logical master declaration overflowed into the criminal preliminary system. In actuality, the appointed authorities lack knowledge of the standards that must be upheld for the proper evaluation of the logical evidence that comes before the formal courts. Practically all advances in science and innovation directly impact the preliminary step of the criminal case's reality vetting procedure. Who will evaluate the extremely advanced logical proof—the adjudicator or established researchers—has been a real problem for legal researchers for more than thirty years. If the position were exclusively reserved for seasoned researchers, it would directly affect the adjudicators' traditional task of locating the truth. The appointed authorities are not expected to act as inexperienced researchers at the same time. While evaluating logical master

proof to accept something similar during preliminary, there should be consistency among the selected authorities. The preliminary adjudicators are responsible for not only determining the relevance of the evidence put forth by an expert but also for determining its credibility by taking on the role of true "guardians" in light of the acceptability requirements. It is pitiful to observe that, unlike other purviews, there is no set criteria in India for evaluating logical evidence in criminal trials that has been established by regulation or High Court guidelines.

6. Indian Forensic Scientific Evidence: Factors Affecting Reliability

Despite the fact that forensic science is recognized as a trustworthy area in India, there are additional important criteria in addition to those already covered that affect the validity of the procedure's application in a given instance. The synopsis contains

1. a lack of empirical evidence
2. a dearth of research;
3. a neglect of the field of forensic science
4. Lack of a clearly established code of conduct
5. Lack of technical staff certification
6. Absence of a national identifying evidence database
7. The absence of statistics on the mistake rate for all techniques, etc.

The lack of logical certainty in forensic science is a problem that is prevalent not only in India but also around the world. There isn't quite as much logical proof or conviction in forensic science as there is in other logical areas. The important reason is a direct outcome of its close connection to law because, in legitimate truth, which is seen as not quite the same as logical, law doesn't anticipate any certainty but rather the verification based on probability. Public wrongdoing research facilities are not safe havens for scientists, as Craig rightly put it. The general public cannot rely as much on these labs as it may on other exploration labs because in research labs, researchers use outdated, degraded, fragmented, mutilated, obfuscated, and defiled instances to conduct their investigations. Essentially, all forensic ID tests rely on the analyst's emotional evaluation, which is based on the subject's most recent understanding by an independent person, in the context of test matching. Due to human intervention, there is a chance that the two examples' matching of certain properties will be incorrect.

The lack of investigation, as well as the absence of companion reviewed articles and approved studies, are severe problems that have an impact on trustworthiness. In addition, rather than being used as a result of a valid logical analysis, the majority of forensic processes are used in official courtrooms where they have been successfully applied for years. The best model is the

unique mark approach, which lacks a sound logical foundation but is regarded as reliable by legal authorities because to its long history.

The Public Exploration Gathering of the Public Foundations, US, published a report titled "Reinforcing Forensic Science in the US: A Way Ahead" that contains precise, noteworthy recommendations for enhancing the accuracy, dependability, and legitimacy of the forensic scientific disciplines. The suggestions are:

The following peer-reviewed research fields should get considerable funding from the Public Institution of Forensic Science:

a. studies that present the justifications for the reliability of forensic methods.

b. Real-world, practical case studies that were identified in the course of a delegate test of forensic sciences and research facilities should be reflected in the construction and foundation of quantitative percentages of the dependability and correctness of forensic procedures. Considering the various forensic proof states, concentrates should also describe the limitations of accuracy and precision that scientific procedures may be anticipated to attain. A reputable logical journal should publish the analysis used to calculate dependability and exactness ratios once it has undergone peer review.

c. A rise in the quantitative susceptibility proportions in forensic investigation findings.

d. Robotized methods that can advance forensic research.

In addition to the aforementioned issues, when compared to other logical subjects, forensic science is usually considered as an overlooked field. Since its beginnings, the great majority of countries have neglected it as a part of their systems for enforcing laws and providing justice. This was used as a justification by the government for not providing study funds.

Specialist tendency, compensation, and partisanship are rising as a result of the lack of a particular set of principles and their correct implementation. Professionals who offer services for the protection should be subject to limitations set by the state. Strict convention should be applied to all forensic procedures in order to overcome tendency. India must develop a set of governing rules and a legal framework for enforcing them, much like other nations. A public code of behavior for all forensic science training has been suggested by the Public Foundation of Forensic Science (NIFS) in the United States, and different social orders have been asked to include this public code as a part of their professional set of principles. It also highlights the requirement for a legal instrument to enforce the code for individuals who commit serious moral offenses.

The other exam worth mentioning is the quality assurance in forensic aid. The kind of evidence is influenced by a variety of variables, such as the approval of a plan, instrument quality control,

participant count, accepted procedure, the license of the investigative laboratory, and researcher confirmation. The quality and, hence, the validity of experimental results will be impacted if there is a sizable difference in any of these parameters. Additionally, the overall quality may be tested using capability tests. The capability tests are helpful for determining a person's intellectual capacity and investigative skills.

5. Conclusion

Few would contest the significance of and future relevance of forensic science to the criminal justice system. In any case, it is beneficial for everyone involved in the criminal justice system to be more excited about the conditions and justifications for which forensic sciences become a significant part of the system. I sincerely hope the readers have enjoyed learning about the many issues and hazards related to the use of forensic science sufficiently to merit a full investigation of its application to the body of general laws in India. I want my readers to understand that there are dishonest individuals around. As a result, the major responsibility of the legal executive should be to constantly audit the system in order to hold individuals involved in it accountable and so enhance the quality of the administrations. It is also past time for India to pass a specific law, akin to the Forensic Methodology, to deal with all matters pertaining to forensic science. The preliminary appointed authorities have several difficulties when processing forensic logical evidence in criminal cases, starting with assessing the admissibility of such evidence and determining the legal relevance of the equivalent to the in-question reality. The court date courts in India are reluctant to rely on the equivalent freely without strong validation, as seen by the legal decisions they have made. India's preliminary courts seek validation for confirming logical proof as a matter of training.

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