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USE OF FORENSIC TECHNIQUES IN POLICE INVESTIGATION IN INDIA: CHALLENGES & SOLUTIONS ABSTRACT

AUTHORED BY - DEVANG BHATI

The use of forensic techniques in police investigation have a crucial role in ensuring justice and maintaining law and order in India. This paper explores the challenges faced by the police during the investigation while using forensic techniques and proposes possible solutions to overcome these obstacles. However, this area of study encompasses various forensic techniques through which the effectiveness of investigation by the police is in direct correlation. Forensic techniques include a collection of different evidence demanded by the various scientific disciplines, handwriting analysis, and others. Aforesaid mentioned forensic techniques under various scientific disciplines used by police officer for the collection of evidence while investigation faces challenges as the IO or SHO has to call a mobile van to the scene to collect the evidences and send for the testing which is not the best way to collect the evidences. The first responders to a crime scene must be either IO or SHO which do generally not know as to what evidence must be collected and also they have lack of required tools to collect the proof for the forensic team. The enforcement personnel lack comprehensive forensic training and there is an absence of clear guidelines for the collection and preservation of forensic evidence, most forensic infrastructure and laboratories are outdated which ultimately leads to the effect in the police investigation. Police in the process of investigating being overburdened by cases forget to collect the important evidence which ultimately hampers ensuring justice and maintaining law and order in India. The solution to address these challenges includes increased investment to ensure access to modern technologies and tools, a training program for the police personnel, coordination and collaboration between forensic and law enforcement, and setting uniform standards and protocols to ensure consistency and reliability which can ultimately help in solving crimes and better investigation by the police.

Keywords: Forensic, evidence, investigation, techniques, training, collection, Analysis.

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INTRODUCTION

Forensic Science is a multidisciplinary sector that uses scientific ways for investigating and solving crimes. This field has in the recent years become increasingly popular and pivotal in the criminal justice system as it assists in solving the crimes. It collects, analyses, and interprets the evidence collected, which helps in to establish facts, identify suspects and thereby catching criminals and providing justice to all. Forensic Science has made its way into the Indian Criminal Justice System as well.

While there is no denying that forensic science is a key component of our criminal justice system that relies on resolving cases and achieving justice, the applicability of the science is not free from challenges. Some challenges include- lack of infrastructure, improper training, lack of standardisation in admitting the forensic evidence. Furthermore, with the technological advancement globally even the crimes have become more innovative and technologically oriented making it challenging for the forensic scientists to keep up with. Furthermore, forensic scientists aren't trained, don't have proper resources, there aren't standardized methods for practice and the infrastructure is also limited which affects the overall quality of the utilising forensic science leading to improper investigations and wrongful convictions.

Thus, in this background, it is imperative that the current framework is studied and critically analysed to study the role of the science in the Indian criminal justice system (herein after CJS) to identify challenges and possible solutions that could counter the challenges. Furthermore, this paper shall identify the loopholes in the system and show ways to develop the applicability of the science in the system such that the system is fairer and more reliable which shall help in propagating the principles of justice.

1. MEANING AND SCOPE OF FORENSIC SCIENCE

Forensic is derived from the Latin word forensic which means "suitable or pertaining to court".[1] Forensic techniques essentially mean that using science based methods on evidence that were obtained from the scene that can be used in the court with certain conclusions drawn from the study of the physical evidence collected. For example, collection of fingerprints or blood splatter at a crime scene is used to determine who were possibly at the crime scene or who were guilty. Such evidence plays a crucial role in determining the accused, their arrest and their

[1] 'The Importance of Forensic Science in Criminal Investigations and Justice' (IFF Lab26 December 2017) <https://ifflab.org/the-importance-of-forensic-science-in-criminal-investigations-and-justice/>

prosecution.

Some common forms of forensic techniques used are DNA analysis, ballistics, handwriting analysis, fingerprinting, toxicology, analysis of synthetic and natural materials. Basis such techniques, the examiner and experts prepare reports that provides information regarding key points of information regarding the crime such as- crime nature, as in which manner crime was committed, the demographic nature of the offender, the time of the crime, instruments used and the identity of the offender. Such information helps the investigators in expediting the investigation and prove with more surety the conviction. This essentially allows the investigators to retrace the steps of the offender by corroborating and reconstructing the incidents that occurred at the crime scene. Information such as the nature of the stain at the crime scene, the tools involved such as the kind of bullet used etc excludes and dissociates people and objects not involved in the scene.[2]

2. ROLE OF FORENSIC SCIENCE IN INVESTIGATIONS

Forensic Science is a key tool in the CJS that studies and analyses the scientific and physical clues that are available at the crime scene. By studying the same, it attempts to explain who possibly committed the crime due to the distinctiveness of the clue obtained from the scene, the evidence or clue collected shall specify the nature of the crime committed and based on the same even the time and method of committing the crime can be ascertained. Basis clues collected and studying those, the who, what, when, where, when and how of the crime can be answered. Once such questions are answered, the motive behind the crime becomes clearer thereby leading to conclusion of investigations.[3]

In the entire procedure of the criminal investigation, evidences collected from the crime scene or an eye-witness account is narrated. Based on the evidence collected, the examiner or the expert studies the same in the laboratory whose results and reports are then presented before court. Every crime committed make different scene of crime which is in itself unique and every offender leaves a trace behind as no crime is committed perfectly. Forensic science is essentially using such imperfect commissions of crime to the advantage of the investigator who

[2] 'Development of Forensic Science and Criminal Prosecution-India.' (*Ijsrp.org*2023) <https://www.ijsrp.org/research-paper-1214.php?rp=P363493> accessed 5 January 2024

[3] Gaur M, 'Examining the Role of Forensic Science for the Investigative -Solution of Crime' (2018) 5 <https://www.jetir.org/papers/JETIREP06090.pdf>

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uses such information, studies it scientifically and analyses the same for identifying the culprit and subsequently convicting him. Such evidence may include fingerprints, blood drops, bullet holes. In the modern days, the DNA technology has emerged that gives even more information about the scene to the investigator that uses the biological traces of every human to study the crime that links the scene to the offenders.

3. Statutory Framework of use of Forensic Science in CJS of India

The CJS of India in its legislative framework has incorporated several provisions that regulate the admission of evidence that are backed by forensic techniques. Such provisions make sure that the evidence thus used are collected, preserved and analysed scientifically in a fair and reliable manner. Some key provisions that ensure the same are as follows:

A. Indian Evidence Act, 1872

This Act incorporates the entire framework that governs the admissibility of forensic evidence in courts of law basis its relevancy, reliability, and weight it is given in the court proceedings. This also extends to the forensic evidence. Section 45 of the Act states that an opinion of an expert can be referred to including forensic experts for evidence to be admissible in court. Such experts may provide opinion on various technical issues such as DNA analysis, handwriting analysis, profiling etc.[4] Similarly, Section 47 deals with opinion of the expert in case of electronic evidence wherein the evidence such as computer generated documents, emails, hard disks, electronic records and other electronic devices are examined, analysed by such experts who determine the admissibility and reliability of such electronic evidence in the court. Section 73 of the Act pertains two the handwriting

analysis such as signatures, handwriting, finger impressions wherein such impression are compared to determine the authenticity of the same.[5]

B. Code of Criminal Procedure, 1973

[4] The Indian Evidence Act, 1872, No. 1, Acts of Parliament, 1872 (India)

[5] 'Evidentiary Value of Expert Evidence under Indian Evidence Act, 1872' (*World's Largest Collection of Essays! Published by Experts*3 June 2013) <https://www.shareyouressays.com/knowledge/evidentiary-value-of-expert- evidence-under-indian-evidence-act-1872/119180> accessed 5 January 2024

 ISSN: 2582-6433

CrPC is a law that lays down procedural law for investigation, prosecution and trial of crimes wherein the forensic evidence is pivotal. CrPC ensures that the forensic evidence is collected analyses and presented properly and legally in the cases in accordance with procedural rules.[6] Section 46 of the Code states that the police while making arrest has to follow proper procedures such as the fingerprinting, profiling, DNA analysis to ensure that the identity of the individual is established during the arrest of. Section 53 delas with the examination of individuals by medical practitioners such that biological samples can be collected for forensic analysis to establish the identity of the individual and to determine the guilty of the individual. Similarly, Section 207 deals with the supplying the relevant documents and statements to the accused such that the forensic reports, laboratory findings can be studied by the accused such that they can rebut the same if required.

C. Indian Penal Code, 1860

IPC is a complete act that lays down all offenses and their consequent punishments in India.[7] Certain provisions in the IPC form the legal framework in using forensic evidence in criminal cases in determining guilt and serving justice. Section 328 of the Code penalises the act of causing harm to any person by use of poison or any substances. Forensic science uses its techniques to determine the substance used for causing harm or injury. Similarly, Section 272 to 278 penalises offenses relating to adulteration of food, drugs, drinks and other substances to spread infection. The forensic science is used to analyse the presence of harmful substances. Section 195 and 463 of the Code penalises offenses relating to forgery and document tampering wherein forensic science and techniques are used for examining handwriting, signatures and other documents. Section 304B and Section 498A deal with offenses related to cruelty during marriage and dowry deaths which require the assistance of forensic science and techniques to determine the causes of death and violence.

D. **Information Technology Act, 2000**

This piece of legislation regulates information technology, digital evidence and cybersecurity issues.[8] This act is the legal framework for collection of digital evidence, preservation and prosecution, safeguarding data protection and digital pricavy. The most key provision in this act

[6] The Code of Criminal Procedure, 1973, No. 2, Acts of Parliament, 1974 (India)
[7] The Indian Penal Code, 1860, No. 45, Acts of Parliament, 1860 (India)
[8] The Information Technology (Amendment) Act, 2008, No. 21, Acts of Parliament, 2000 (India).

 ISSN: 2582-6433

is Section 65B which pertains to the admissibility of electronic record as evidence. It lays down condition in which the electronic record can be used as an evidence in court. It tells that the electronic record to be considered as evidence in the court requires that the person must certify the same and the person certifying must be at crucial official position. Such experts thereby determine the admissibility and reliability of electronic records and provide and expert testimony.

E. Narcotics Drugs and Psychotropic Substances Act, 1985

NDPS is a piece of legislation that pertains to the offenses committed in relation to narcotics and drugs.[9] Forensic science thus plays important part while investigating of such offenses. Section 50 of the Act provides that the authorised officer may search without a warrant and seize as well. The science ensures that the procedure of search and seizure is done with due process and in line with forensic techniques such as proper dug identification and collection, proper weighing of the substances which shall establish the nature of the drug and also the quantity seized. Section 67 of the Act provides for the penalising those activities that promote the consumption of dugs and such substances. Forensic science plays a important role in determining the examination of the media that promotes the same.

F. DNA Technology (Use and Application) Regulation Bill, 2019[10]

The DNA Bill, 2019 is currently pending in the parliament but it aims to govern the use of DNA technology and creating a DNA database for forensic analysis. This bill lays down the guidelines for collecting, analysing, and preserving DNA data and thereby using the same for profiling, identifying and matching the criminals.

4. Landmark cases that shaped the applicability of forensic science in Criminal Justice system in India

The Indian Judiciary has played a very important role in establishing of forensic science and its application in the CJS by shaping the procedure in which the forensic evidence is admitted as evidence in court.

[9] The Narcotic Drugs and Psychotropic Substances (Amendment) Act, 1985, No. 61, Acts of Parliament, 1985 (India)
[10] The DNA Technology (Use and Application) Regulation Bill, 2019, 128 of 2019

In the case of ***Selvi vs State of Karnataka***[11] the SC set down guidelines that determine the admission of polygraph tests commonly known as lie detector tests, brain mapping and narcoanalysis as evidence in court. The Court held that such tests are against the constitutional right under Article 20(3), the right against self-incrimination and such tests cannot be conducted on an individual without obtaining their consent.

In yet another case before the SC, ***Tomaso Bruno and Anr. v. State of Uttar Pradesh***[12] it was observed that the investigation process should seamlessly adapt the inevitable field of information technology and advancement as electronic evidence is an "invaluable ally" of law enforcement agencies and the court as it shall assist in establishing facts that cannot be refuted. In this case, the court upheld the electronic evidence as valid evidence in the court and also laid down guidelines to ensure that admissibility and reliability of the same.

In yet another case of ***Sandeep vs State of Uttar Pradesh***[13] the victim was pregnant and murdered as she refused to go through an abortion by the accused. Upon DNA analysis it was found that the victim was in fact pregnant with the accused's child and was ultimately murdered due to the same. The Court acknowledged that the DNA proof plays a pivotal role in determining and concluding the case thereby bringing justice to the victim.

In the famous case of ***Surendra Koli vs State of Uttar Pradesh***[14] also known as the Nithari case, the applicability of forensic science was meticulously studied. The accused was subject to several forensic techniques such as analysis of narco and brain mapping test. Through such analysis, the tendencies of the accused was proved such as necrophilia, paedophile and paraphilia.

5. Challenges faced in applying of forensic science in CJS in India

There is not an iota of doubt that the use of forensic science has revolutionized the solving and investigation of crimes in the criminal justice system of India and delivering justice to all involved. Form using tools such as fingerprint analysis to DNA profiling, forensic science now plays a pivotal role in identification of offenders, their arrest and subsequent conviction by

[11] Selvi vs State of Karnataka, , (2010) 7 S.C.C. 263

[12] Tomaso Bruno and Anr. v. State of Uttar Pradesh, (2015) 7 S.C.C. 178(India)

[13] Sandeep v. State of Uttar Pradesh (2012) 6 S.C.C. 107 (India)

[14] Surendra Koli vs State of U.P., (2011) 4 S.C.C. 80 (India)

linking them to a crime scene by using scientific evidence whose reliability cannot be challenged or questioned in the court. While the methods used in the investigation are quite scientifically backed and based on extensive research and study, the field of forensic science still faces challenges in the criminal justice system.

Some challenges it faces include:

A. **Lack of standardisation**: In India, the forensic tools, procedure, protocols are not standardised nationally. There is no uniformity in the way evidence is collected, analysed, preserved, which leads to inconsistencies and errors. Such errors question the reliability of the forensic evidence in the court. [15]
B. **Limited Infrastructure and resources**: Forensic laboratories in India face the problems of lack of funding, lack of training, outdated instruments and equipment which compromises the quality of research and also the reliability of the evidence. This can furthermore create a problem for accurate analysis which could lead to delayed investigations and court matters. [16]
C. **Quality Control and Accreditation**: Due to the limited infrastructure and resources available to the laboratories in India, the quality and reliability of the forensic evidence is compromised which is the most crucial for the criminal justice system.
D. **Backlog of cases**: There is a limited number of forensic laboratories and experts for examination and analysis of forensic evidence thus leading to a backlog of cases. Furthermore, the number of cases are always increasing which leads to an increasingly high number of cases that are yet to be analysed delaying the investigation and trials.[17]
E. **Lack of awareness and education**: There is limited knowledge about the importance and significance of forensic science amongst the law enforcement bodies, investigators and even the general public. Such a lack of awareness and training can hinder the investigation process as the evidence collected could be handled improperly thereby again questioning the reliability of the same and ineffective use of forensic techniques in investigating and trials.

[15] Prachi Kathane and others, 'The Development, Status and Future of Forensics in India' (2021) 3 Forensic Science International: Reports 100215 <https://www.sciencedirect.com/science/article/pii/S2665910721000463?via%3Dihub> accessed 5 January 2024

[16] Daily Pioneer, 'INADEQUATE FORENSIC LABS DELAY JUSTICE' (*The Pioneer*27 August 2022)

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6. Solutions and way forward for continuing applications of criminal justice system in India

While there are various challenges in the applicability of the forensic science in the criminal justice system, the importance of it cannot be ignored, the following recommendations from several experts from the field can be incorporated to strengthen the field. Adoption of these recommendations shall integrate the use of this science in the investigation such that the system

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[16] <https://www.dailypioneer.com/2022/columnists/inadequate-forensic-labs-delay-justice.html> accessed 5 January 2024

[17] Bhumika Indulia, 'Integrating Forensic Techniques in Indian Criminal Justice System | SCC Blog' (*SCC Blog*10 December 2022) <https://www.scconline.com/blog/post/2022/12/10/integrating-forensic-techniques-in-indian-criminal-justice-system/> accessed 5 January 2024

becomes more efficient, accurate and reliable in delivering justice and preservation of the rights of the accused as well as the victim.[18]

Some recommendations that can be incorporated are as follows:

A. **Promoting research and innovation**: Forensic Science as a field of study, research and development can be encouraged at universities and courses at professional levels that can drive curiosity leading to development of technology, better methodology and ensuring best practice at all levels. Research projects can be funded by the government, research collaboration opportunities can be provided, and incentives can be proposed for those who contribute in cutting edge forensic practices, techniques and methods which in turn shall improve the investigation mechanism, prosecution of more criminals and better adjudication by the courts. [19]

B. **Enhanced Forensic infrastructure and resources:** The government or well-intended organisations can fund in better infrastructure, laboratories, forensic facilities which can encourage study, research, and development of forensic science. Advanced instruments and equipment, and upgraded laboratory can boost the forensic science research thereby allowing the experts to work more effectively.

C. **Forensic Science training and certification courses**: Comprehensive forensic science training and courses can be introduced that can encourage and improve the skills of the forensic experts, enhance their knowledge. Specialised training could be provided in various forensic disciplines, contributing to continuous improvement learning and increased capabilities of experts in handling complex forensic science issues. [20]

D. **Strengthening the current legal framework**: The current legislative framework can be continuously updated to keep up with the developing forensic science techniques which are updating itself with the technological advancements. The legislative framework can be continuously amended to ensure that it remains the relevant and admissible and reliable in the court. Clearer directives, standards and reforms that match the internationally accepted practices shall ensure that the forensic science is relevant and applicable in the Indian criminal justice system. [21]

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[18] 'Data, Engineering and Applications' [2019] SpringerLink <https://link.springer.com/book/10.1007/978-981- 13-6351-1> accessed 5 January 2024

[19] Gaur M, 'Examining the Role of Forensic Science for the Investigative -Solution of Crime' (2018) 5 https://www.jetir.org/papers/JETIREP06090.pdf accessed 5 January 2024

[20] Parveen N, 'Role of Forensic Science in a Criminal Investigation - Indian Law Portal' (*Indian Law Portal*29 August 2020) <https://indianlawportal.co.in/role-of-forensic-science-in-a-criminal-investigation/> accessed 5
January 2024

[21] Chawla MrDS, 'The Role of Forensic Evidence in Criminal Investigations in India' (2023) 11 IJRASET 760
<https://www.ijraset.com/best-journal/the-role-of-forensic-evidence-in-criminal-investigations-in-india> accessed 5 January 2024

E. **Promote interdisciplinary and international collaborations:** Forensic experts can collaborate with law enforcement agencies, investigators, and academicians which can allow a collective advancement and also strengthen the forensic science and its applicability in the CJS. A platform can be created that shall foster regular exchanges and knowledge sharing across the several agencies which in turn shall boost the quality and reliability of the forensic evidence and science.

F. **Develop specialised forensic units:** Forensic Science is a multidisciplinary field and setting up varying units within the law enforcement agency and judiciary itself can assist in speedy investigation and immediate assistance. This shall also ensure that the forensic science is adequately incorporated in all investigation procedures such as DNA analysis, fingerprinting analysis, digital forensics, etc can ensure that the field is specialised and properly handled.

7. Conclusion

Forensic Science with the technological development has become an indispensable tool for investigation and solving crimes in the Indian CJS. While Indian is moving towards a more robust criminal investigation framework, the role of forensic science cannot be ignored rather efforts must be made to ensure development which shall lead to justice for victims and also enhancing the principles of rule of law. Forensic science is an exciting area with a plethora of opportunities which if explored can counter the challenges that CJS currently faces. The Indian CJS has become increasingly reliant on forensic technology to support investigations and move towards a more reliable framework. Forensic science plays an important role by taking a careful approach to evidence gathering and processing. Crime scene investigators methodically collect tangible evidence such as fingerprints, blood splatter, and other materials. This rigorous technique allows detectives to link suspects to the scene, clear the innocent, and more accurately re-create the crime's timeframe.

Moreover, forensic science covers a wide range of specific topics. These specialisations, which range from analysing blood and tissue samples to identify drugs or poisons (forensic toxicology) to scrutinising documents for validity (forensic document examination), provide a comprehensive strategy to uncovering the complexity of crime. This scientific backing strengthens the prosecution's case by providing evident proof. In addition, forensic science has the ability to infuse fresh energy into unresolved cases by opening up new areas of inquiry through procedures such as DNA testing, which can identify previously unknown suspects. In

ISSN: 2582-6433

conclusion, forensic science is a valuable instrument for improving the accuracy and efficiency of criminal investigations in the Indian CJS.

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