



# Prospective Role of Advanced Technologies in Forensic Science in Averting Harassment of Accused in India

Navin Kumar Sehrawat

**Abstract:** *The present work addresses the impact of modern scientific techniques of investigations on the rights of accused. The dramatic scientific breakthroughs in forensic science like new scientific instrumentation, DNA typing and physical evidence databases have contributed to evidence in criminal proceedings over the years. A systematic change in investigations can be brought by applying the 7 basic principles of forensic science capable of giving impartial results. Increasing the reliance on objective forms of evidence, result oriented investigation based on scientific methods will prevent futile harassment of accused.*

**Keywords:** *Advanced technologies, Criminal investigation, Forensic Science, Scientific methods.*

## I. INTRODUCTION

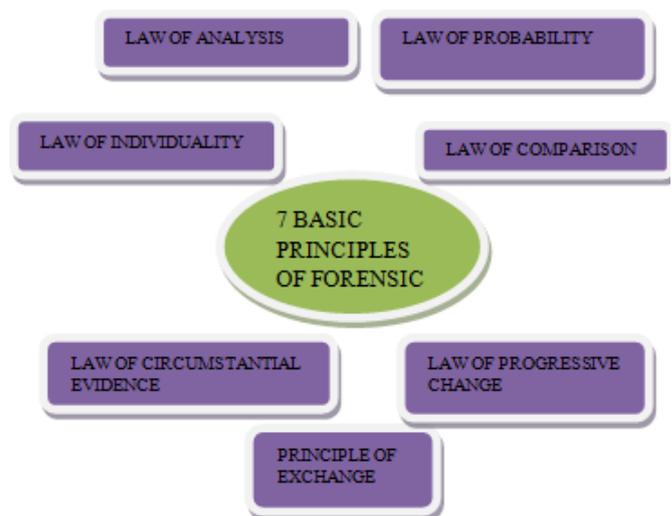
Forensic Science is application of scientific methodology and techniques in criminal investigations. Knowledge of various fields such as engineering, chemistry, biology, geology, physics etc is applied in collection, examination and analysis of evidence. Forensics expedites conviction of guilty by exposing the crime with scientific proof. Earlier the absence of forensic practices in investigations facilitated criminals to escape punishment and gave way to harassment of suspects or accused. The procedures and standards applied in scientific examination are much more reliable as evidence and vindicate the accused whose rights are compromised due to lack of evidence by traditional ways of investigation. Science offers a chance of accurate fact finding. Technology infusion in detection of crime will help in efficient functioning of the system. New techniques and methods are changing the scope of approach of Forensics.

## II. RESEARCH QUESTION

The object of this paper is to understand that whether the denial of use of advanced technologies in forensic science in criminal investigation itself amounts to violation of rights of accused. This paper will explain the broad scope of forensic science and the use of modern technologies in its distinct disciplines.

## III. FORENSIC SCIENCE ROLE IN CRIMINAL INVESTIGATION

The need for forensic science in criminal investigation is urgent. The conventional techniques of investigation leaves many loopholes and the third degree methods used for confessions are against the basic human rights of people and violate the rights of accused. Many trials end in acquittal for lack of evidence, which not only shakes the confidence of society, hearten criminals but large amount of public money is also wasted in prosecution. A sizeable number of criminal offences have no witnesses and comparison shows statistically higher rates of charging and conviction in cases with forensic evidence which ascertains facts beyond reasonable doubt. Forensic science clutches the braches of science for the purpose of law. Criminal Investigation without science and technology is deficient in the rapidly changing world. The technical access to almost every person in the large population, new modes of transport, sophisticated weapons and new manners of crime are hard to track without scientific methods. With specific branches for collecting and studying evidence, forensics establishes the identity of culprits, also proving the innocence of accused if falsely prosecuted. With both theoretical and practical scientific training of the police force the disappointment caused for ignorance of the value of evidence can be avoided. The scientific examination strengthens the investigations by adjoining the missing links, helping the courts to make judgments based on impartial evidence.



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#### IV. EVIDENTARY VALUE OF FORENSIC EVIDENCE

The Criminal Procedure code 1973 and The Indian Evidence Act 1872 are the two major procedural laws based on which trials are conducted in the Indian Courts and they provide for Expert Testimony of not only medical practitioners but other experts too. The general rule that evidence can be given of facts within the knowledge of witness has exceptions as relevance is given to the opinion of the third person under section 45 to section 51 of Indian Evidence Act.

Sections 45 and 46 are particularly concerned with Expert opinion. As per Section 45, In matters concerned with Science, art, foreign law, identity of handwriting or finger impressions, In forming opinion upon a point, Court gives relevance to the opinion of persons specially skilled in these fields, and these persons are called experts. Also the facts which are otherwise not relevant becomes relevant in the eyes of law if they are supported by opinions of experts or inconsistent with them, if such opinions are relevant according to section 46, I.E.A.

Section 53 provides for examination of the accused at the request of a police officer by a medical practitioner, an arrested person can make such request for such examination under Section 54 of Cr.P.C. 1973. With no specific legislation for DNA profiling tests Section 53A explanation and section 54 covers examination of samples by use of modern scientific techniques which includes DNA profiling. Section 27 of POTA, 2002 also provides power to direct for samples for investigation which are scientifically examined. In technically complicated matters which require special knowledge or skill, Expert opinion based on scientific conclusions is admissible only when the Expert is examined as witness in court. The reports under section 293, Cr.P.C. are exception to the above mentioned provision and are admissible as evidence without examination. They are made by the following Government scientific experts:

- Chemical Examiner or Assistant Chemical Examiner to Government
- Chief Controller of Explosives
- Director of the Finger Print Bureau
- Director, Haffkine Institute, Bombay
- Director, Deputy Director or Assistant Director of a Central Forensic Science Laboratory or a State Forensic Science Laboratory
- Serologist to the Government
- Any other Government scientific expert specified, by notification, by the Central Government for this purpose.

#### V. DISTINCT DISCIPLINES IN FORENSIC SCIENCE

With new techniques and inventions, science is changing at very fast pace. Forensic science has very broad scope. In order to organize the specialties in forensic science, the American Academy of Forensic Sciences (AAFS) has recognized many different forensic science disciplines.

##### A. Digital and Multimedia Sciences- (Thumb Drives to Massive Networks)

The nature of crime has changed with time and also the mode of doing it. With technological changes the forensic science will evolve. The professionals in this field examine digital data (i.e text, audio, video and images etc.), software

or hardware tools and find the relevant evidence hidden in terabytes of data and help if crimes related to stalking, identity theft and fraud.

##### B. Anthropology- (Reconstructing a Life)

It is sum up of many sub-disciplines which are cultural anthropology, linguistics, archaeology, and biological anthropology. It is an attempt in reconstruction of a person's life and death.

##### C. Engineering and Applied Sciences- (Natural and Manmade Disasters)

This branch covers experts from physics, chemistry or engineering background. They investigate explosions, collisions of automobiles, building collapses, Environmental contamination and product failures.

##### D. Criminalistics – (Understanding the Evidence)

Evidence is collected from crime scene and the criminalistics play role in understanding the evidence collected and identify the object or person involved. Criminalistics specializes in DNA study, toolmarks, forensic ballistics (firearms), fire and explosive debris, trace and wildlife evidence.

##### E. Odontology

Forensic dentistry or Odontology is the branch that gives aid in identifying human remains from crime scene or natural disaster, finding answers from tooth. A dental expert compares dental remains, evaluates bite marks, aging and oral injuries, contributing in many ways in investigations.

##### F. Pathology/Biology Scientists

Pathology performs an autopsy examining tissues, organs and fluids to determine circumstances or cause of death.

Forensic biology experts aid in death investigation by studying:

- Entomology (insects), helping to ascertain when they have taken over the human remains.
- Botany (plants), scientist identifies the stomach contents and finds hidden graves.
- Genetics, A geneticist helps in confirming the identity of organisms.

##### G. Toxicology

Toxicologist studies adverse effects of chemicals like alcohol and drugs on humans. Forensic toxicologist interprets results by analyzing biological specimens which includes hair, tissues, urine, fluids (from eye, brain, or liver).

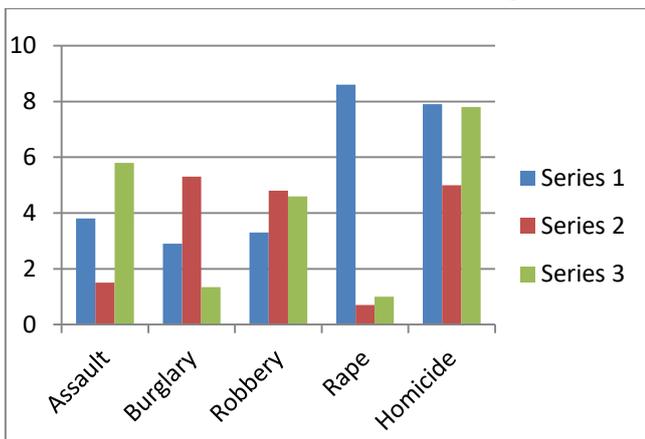
Along with these the technologies like forensic dactyloscopy for fingerprints study, questioned document examination, Phenom Desktop SEM, facial reconstruction from skeleton remains, alternate light photography to detect damage under skin, link analysis software to examine connection between networks, 3D Scanners, Ballistic photography and LA-ICP-MS are powerful analytical technologies used to identifying the guilty in a scientific manner that never existed and avoid unnecessary harassment of others.

**VI. SCIENTIFIC INVESTIGATION PREVENTS FUTILE HARASSMENT**

Novelty in Forensic Science field with experimental technologies give advanced information. The “cutting-edge” technologies positively affect reliability in successful convictions, correct identifications and case closure rates. The Right to life and personal liberty are enshrined in Constitution of India which protects against unlawful arrest and detention. Asian Human Rights Commission (AHRC) held a consultation in 2005 at Hong kong with forensic, legal professionals and discussed interplay between forensic science and human rights. Participants examined that improved institutions and procedures for forensic investigations are essential for rule of law and to effectively redress victims of human rights violations. It was agreed that extent of use of forensic science in criminal investigation has direct bearing on human rights violations and particularly on torture. Torture is the most common method of criminal investigation even in the nations that have ratified the U.N. Convention against Torture (CAT) and Other Cruel Inhuman or degrading treatment or punishment and the international covenant on civil and political rights (ICCPR).

The countries such as Hong kong and South Korea where forensic science plays a key role in investigation, torture is rarely used, usually detected and effectively punished. The denial of scientific investigation in criminal matters itself amounts to human rights violation as it promotes the imperfect, violent methods of policing and gross abuses. Without systematic changes for expanding the role of forensic experts and limiting the power of police in investigations the situation is unlikely to change.

**The data of National Criminal Justice Reference shows percentage of cleared cases with the types of evidence mentioned in Series1, 2 and 3 in the following chart**



Series 1-DNA  
Series 2- Fingerprints  
Series 3- Other evidence

**VII. RESULTS**

The following results are revealed from this research:

1. The data indicates that the percentage of convictions is more with the use of scientific methods of investigation.
2. It is proved that conventional methods of investigations are root cause of violation of accused rights.
3. By making forensic science an integral part of criminal investigation, if ample financial resources for Mobile Forensic units, mini FSLs at district levels equipped with well trained experts in adequate numbers are utilized the unnecessary harassment of accused can be avoided.

**VIII. CONCLUSION**

Obstacles in the use of forensic science must be seen as obstacles to protection of rights. From the commencement of investigations, modern technologies and forensic science must be used. For the preservation of crime scene a cadre of crime scene officers should be created to collect physical evidence. Optimal forensic cover to investigating officers can be provided by strengthening the network of CFSs and FSLs in our country. Forensic science can play a crucial role in protecting rights of accused. The forensic scientists can play a crucial role to influence public opinion towards change. The government can harness the knowledge of forensic experts by suitable regulatory methods and legal provisions and achieve the two fold aim of protecting the innocent and punishing the guilty.

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