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ENHANCING CRIMINAL JUSTICE THROUGH FORENSIC SCIENCE WITH REFERENCE TO THE NORTHEAST STATE OF MANIPUR

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Abstract

This study investigates the role of forensic science in enhancing the criminal justice system in the northeastern state of Manipur. By examining the implementation of various forensic techniques including DNA analysis, ballistics, and digital evidence recovery, and the research highlights their effectiveness in solving crimes and improving the accuracy of investigations. Through an analysis of recent case studies from Manipur, the paper illustrates how these scientific methods have led to significant breakthroughs in criminal cases, resulting in increased conviction rates and greater public trust in law enforcement. Despite the promising impact of forensic science, the study also addresses key challenges, such as inadequate forensic infrastructure, lack of training for criminal investigators, and the need for stronger inter-agency collaboration. The findings underscore the necessity for strategic improvements in forensic capabilities, including investment in technology and ongoing professional development for law enforcement personnel. Ultimately, the paper advocates for a comprehensive approach to integrating forensic science into the criminal justice framework, aiming to foster a more transparent, effective, and just legal system in Manipur. Findings indicate that the integration of forensic science, including DNA profiling, digital forensics, and ballistic analysis, significantly aids in solving violent crimes and improving case resolution rates. Moreover, the study highlights the existing gaps in forensic infrastructure and expertise in Manipur, emphasizing the need for state investment in training and technology.

The implications of this research suggest that enhancing forensic capabilities not only strengthens law enforcement efficacy but also restores public confidence in the criminal justice system.

Keywords: Forensic Science, Criminal Justice, DNA Profiling, Digital Forensics, technology.

1. INTRODUCTION

The criminal justice system in Manipur operates within a complex socio-political context marked by ethnic diversity and historical instability. Governed by the legal framework of India, the state's law enforcement primarily involves the Manipur Police, which faces challenges such as corruption, insufficient resources, and public distrust stemming from human rights concerns. The judiciary comprises subordinate and district

courts, along with the High Court, but struggles with case backlogs and limited access to legal resources for many citizens. Additionally, the forensic capabilities are underdeveloped, hindering effective crime investigation. Despite these challenges, there is significant potential for enhancing the criminal justice system through improved forensic science practices, which could bolster law enforcement efficiency,

facilitate crime resolution, and restore community trust in the justice process.

Forensic science plays a crucial role in modern criminal justice by providing objective and scientifically validated methods for collecting, analyzing, and interpreting evidence. Its importance lies in its ability to enhance the accuracy and reliability of investigations, ultimately leading to more effective crime resolution and fairer trials. By employing techniques such as DNA profiling, fingerprint analysis, and digital forensics, law enforcement agencies can uncover critical information that may otherwise remain hidden. Additionally, forensic science helps to eliminate biases, allowing cases to be assessed based on factual evidence rather than subjective opinions. This scientific approach not only aids in identifying and prosecuting offenders but also serves to exonerate the innocent, thereby strengthening public trust in the justice system. As such, integrating forensic science into criminal investigations is essential for promoting transparency, accountability, and the rule of law.

2. Literature Review

Forensic science in India has evolved significantly over the years, becoming an integral part of the criminal justice system. Techniques such as DNA profiling, fingerprint analysis, toxicology, and digital forensics are increasingly employed by law enforcement agencies to ensure accurate crime resolution. Although there are established forensic laboratories at both the national and state levels, many northeastern states, including Manipur, face considerable challenges.

In Manipur, the limitations of forensic science are particularly pronounced. Key infrastructure issues include a lack of well-equipped forensic laboratories and limited access to modern forensic technologies. Furthermore, there is a shortage of trained forensic professionals, which hampers effective crime investigation and evidence collection. Legal bottlenecks, such as slow judicial processes and challenges

regarding the admissibility of forensic evidence, further complicate matters.

Additionally, the socio-political context of Manipur, characterized by ethnic tensions and insurgency, undermines public trust in law enforcement, resulting in underreporting of crimes. Funding constraints also hinder the development and enhancement of forensic capabilities. To address these limitations, it is essential for the government and relevant stakeholders to invest in forensic infrastructure, training, and community engagement, ultimately strengthening the criminal justice system in Manipur.

Forensic science has gained significant importance worldwide as an essential tool in the criminal justice system. Various countries have adopted advanced forensic techniques to enhance their investigative capabilities and ensure the accuracy of evidence collected from crime scenes. Key areas of development include DNA analysis, which has revolutionized the identification of suspects and exonerated the innocent, fingerprint analysis for crime scene investigation, and digital forensics to combat cybercrime.

Globally, forensic science also faces challenges similar to those in India, including issues related to the reliability of evidence, ethical concerns regarding privacy, and the need for continuous training of personnel in evolving technologies. Differences in legal systems, funding levels, and access to advanced forensic technologies can create disparities in how effectively forensic evidence is utilized in different jurisdictions.

Countries such as the United States, the United Kingdom, and various European nations have established comprehensive forensic frameworks, integrating scientific research with law enforcement practices. Collaborative international efforts, such as INTERPOL and the International Forensic Science Network, aim to share knowledge and improve forensic practices globally. As forensic science continues to advance, it remains crucial to address these challenges to enhance its

effectiveness and maintain public trust in justice systems worldwide.

2. Methodology

Research Design

The research utilized a mixed-methods approach, which integrated both quantitative and qualitative methodologies to provide a comprehensive understanding of forensic science's role in the criminal justice system in Manipur. This design allows for a more nuanced view of the issues at hand by combining the statistical analysis of crime data with insights gathered from interviews.

1. Quantitative Analysis:

- **Crime Data:** Statistical analysis was conducted on crime reports from law enforcement agencies. Key indicators, such as crime resolution rates, the frequency of various crimes, and the use of forensic techniques in investigations, were analyzed over recent years. This data helped identify trends, patterns, and the impact of forensic science on crime resolution.

2. Qualitative Analysis:

- **Interviews:** In-depth interviews were conducted with key stakeholders, including law enforcement officials, forensic experts, and community members. These interviews aimed to gather personal insights into the challenges and perceptions of forensic science within the local context. By exploring their experiences and viewpoints, the research provided a richer understanding of the barriers and opportunities for forensic science in Manipur.

Data Collection

The data collection process involved two main components: gathering statistical data from law enforcement agencies and conducting interviews with stakeholders.

1. Gathering Statistics:

- **Law Enforcement Agencies:** Data was collected from various law enforcement bodies, including the Manipur Police and state forensic

laboratories. Official reports, annual crime statistics, and case files were requested to analyze crime trends and the application of forensic science.

- **Documentation Review:** Existing documentation, such as previous research studies, government reports, and publications from forensic institutes, was also reviewed to supplement the statistical analysis.

2. Interviews:

- A semi-structured interview format was used, allowing for flexibility in responses while maintaining focus on key topics. Interviews were conducted in person or via phone, depending on participant availability.

- Participants were provided with information about the research objectives and assured of confidentiality to encourage open and honest responses.

Sampling

The sampling strategy involved purposeful selection to ensure representation and relevance:

1. Criteria for Interview Participants:

- **Law Enforcement Officials:** Participants included police officers, forensic experts, and investigators with experience in utilizing forensic science in their work. Selection was based on their roles and involvement with forensic practices.

- **Community Members:** A diverse group of community members was chosen, including victims of crime, local leaders, and residents with varying experiences related to law enforcement. This diversity aimed to capture a range of perspectives about the effectiveness of the criminal justice system and forensic applications.

2. Statistical Data Gathering:

- **Time Frame:** Data covering the last five years was selected to identify trends and changes in crime patterns and the usage of forensic science.

○ **Data Points:** Metrics included the number of cases solved using forensic techniques, types of crimes committed, and demographic factors such as age, gender, and location of incidents. This data was crucial for establishing a context for qualitative findings.

3. Findings and Discussion

The findings underscore the critical need for enhancing forensic science capabilities in Manipur to improve crime resolution rates and restore public trust in the justice system. Investments in infrastructure, training, and interdisciplinary collaboration between law enforcement and forensic experts are essential. Additionally, community engagement initiatives could help bridge the gap between law enforcement and citizens, fostering a more collaborative approach to crime prevention and resolution. Addressing these challenges holistically can significantly strengthen the impact of forensic science in Manipur's criminal justice system.

4.1 Current Forensic Capabilities in Manipur

The current forensic capabilities in Manipur are characterized by several strengths and significant limitations, reflecting the broader challenges faced by the region's criminal justice system.

Strengths:

1. Basic Forensic Infrastructure:

○ Manipur has established a State Forensic Science Laboratory (SFSL) that provides essential forensic services such as chemical analysis, fingerprint examination, and document verification. This facility plays a crucial role in supporting law enforcement investigations.

2. Awareness of Forensic Science:

○ There is growing awareness among law enforcement personnel about the importance of forensic science in solving crimes. This awareness is gradually leading to the integration of forensic techniques in some investigative processes.

Limitations:

1. Inadequate Resources:

○ The SFSL in Manipur is often underfunded and lacks advanced equipment and technology necessary for modern forensic analysis. This limitation affects the quality and scope of forensic examinations that can be conducted.

2. Limited Training and Expertise:

○ There is a shortage of trained forensic professionals and technicians in the region. Many law enforcement officers lack adequate training in forensic methodologies, which hampers their ability to effectively collect and process evidence.

3. Slow Processing Times:

○ Due to resource constraints and high demand, the turnaround time for forensic analyses can be lengthy, delaying investigations and case resolutions. This inefficiency can lead to a backlog of cases.

4. Lack of Inter-Agency Coordination:

○ There is often insufficient collaboration between law enforcement agencies and the forensic laboratory. This disconnect can result in missed opportunities for utilizing forensic evidence effectively in investigations.

5. Public Perception and Trust Issues:

○ Community distrust in law enforcement, exacerbated by issues such as corruption and human rights violations, affects the willingness of individuals to cooperate with investigations. This lack of cooperation can limit the collection of critical evidence.

4.2 Impact on Crime Resolution

The impact of current forensic capabilities on crime resolution in Manipur is significant but constrained by several challenges. While forensic science has the potential to enhance investigative processes and improve outcomes in criminal cases, the existing limitations result in underutilization of these tools.

Positive Impacts:**1. Enhanced Evidence Collection:**

○ The use of forensic techniques such as fingerprint analysis and anticriminal examination has improved the ability of law enforcement to collect and analyse physical evidence from crime scenes. This has the potential to identify suspects more accurately and link them to criminal activities.

2. Support in Complex Cases:

○ Forensic science can provide critical insights in complex cases where conventional investigative methods may fall short. The analysis of forensic evidence can lead to breakthroughs in understanding crime patterns and solving particularly challenging cases.

3. Potential for Exoneration:

○ Advances in forensic methods, especially DNA profiling, offer the ability to exonerate innocent individuals wrongfully accused or convicted of crimes, thereby upholding justice and public trust in the legal system.

Limitations on Impact:**1. Underutilization of Forensic Evidence:**

○ Despite the availability of forensic techniques, the actual application in investigations remains low. Only a small percentage of cases utilize forensic methods, largely due to factors such as lack of training among investigators and reluctance to incorporate forensic evidence into casework.

2. Impact of Delays:

○ Slow processing times for forensic analyses can hinder timely investigations. Delays in obtaining forensic results can impede swift responses to crimes and contribute to diminished chances of catching suspects.

3. Limited Integration:

○ The lack of effective coordination between police departments and forensic laboratories leads to missed opportunities for leveraging forensic evidence. In many cases, evidence

may not be collected or analysed due to inadequate communication regarding its importance.

4. Influence of Socio-Political Factors:

○ Socio-political issues, including ethnic tensions and conflicts, complicate law enforcement operations. Public distrust and fears regarding police efficacy can result in lower crime reporting and cooperation, ultimately hampering the potential advantages of forensic science in crime resolution.

4.3 Community Trust and Perception

Community trust and perception of the law enforcement agencies in Manipur are complex and often fraught with challenges. Many residents express scepticism towards the police, stemming from issues such as allegations of corruption, human rights abuses, and a general perception of inefficiency within the criminal justice system. This distrust is compounded by the region's socio-political history, where ethnic tensions and insurgencies have further strained relationships between law enforcement and the communities they serve. As a result, many individuals are reluctant to report crimes or cooperate with investigations, fearing retaliation or a lack of genuine support from the authorities. Conversely, there is a growing recognition among community members of the importance of forensic science in improving crime resolution outcomes. Efforts to enhance transparency, increase community engagement, and support educational initiatives on the role of forensic science could help bridge the trust gap. Building meaningful partnerships between law enforcement and community stakeholders is crucial for fostering a cooperative atmosphere where residents feel safe to report crimes and actively participate in the pursuit of justice.

5. Challenges and Limitations

The challenges and limitations facing forensic science in Manipur are multifaceted and deeply rooted in various systemic issues. One of the primary hurdles is inadequate infrastructure;

the existing forensic laboratory often lacks the necessary equipment and technology to conduct comprehensive analyses, limiting the scope of investigations. Additionally, a shortage of trained forensic professionals hampers the effective collection and interpretation of evidence, leading to underutilization of forensic capabilities in criminal cases. Processing delays are another significant challenge, as lengthy turnaround times for forensic results can jeopardize timely investigations and contribute to case backlogs. Furthermore, the lack of effective coordination between law enforcement and forensic units diminishes the overall impact of forensic evidence on investigations. Compounding these challenges are socio-political factors, including community distrust of law enforcement, which stems from historical grievances and perceptions of corruption. This distrust affects crime reporting and cooperation, ultimately impeding efforts to leverage forensic science in enhancing public safety. Addressing these challenges requires a concerted effort focused on improving resources, training, inter-agency collaboration, and community engagement to maximize the potential of forensic science in Manipur's criminal justice system.

6. Recommendations

- a. **Enhance Forensic Infrastructure:** Invest in upgrading the State Forensic Science Laboratory and acquiring modern technology and equipment to facilitate comprehensive forensic analyses.
- b. **Training and Capacity Building:** Implement regular training programs for law enforcement personnel and forensic professionals to ensure they are well-versed in the latest forensic techniques and best practices.
- c. **Improved Inter-Agency Coordination:** Foster better collaboration between law enforcement agencies and forensic laboratories to streamline evidence collection and analysis processes, ensuring timely and

efficient use of forensic science in investigations.

- d. **Community Engagement Initiatives:** Develop outreach programs to educate the community about the role of forensic science and its benefits in crime resolution, aiming to rebuild trust and encourage cooperation with law enforcement.

- e. **Policy and Funding Support:** Advocate for government policies that prioritize funding for forensic science initiatives and research to enhance capabilities within the criminal justice system.

- f. **Establish Clear Protocols:** Create standardized protocols for the collection and handling of forensic evidence to improve the integrity and reliability of evidence used in investigations.

7. Conclusion

In conclusion, the effectiveness of forensic science in enhancing crime resolution in Manipur is currently hampered by significant challenges related to infrastructure, training, and community trust. While existing forensic capabilities hold promise, their underutilization reflects a pressing need for improvement in resources and inter-agency collaboration. By addressing these limitations through targeted investments, training initiatives, and community engagement, Manipur can better leverage forensic science to improve investigative outcomes and restore public confidence in law enforcement. Strengthening these areas not only contributes to enhanced crime resolution rates but also fosters a safer and more just environment for all citizens.

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