

The Silent Backbone of Justice: The Punjab Forensic Science Agency in Pakistan's Criminal Justice System

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Abstract

Forensic science has become a more prominent part of the administration of criminal justice in all countries of the world, and has become a source of information for the purposes of adjudication that is less reliant on witness testimony. This article looks at the Punjab Forensic Science Agency (PFSA), which was formed in Pakistan in the wake of the Punjab Forensic Science Agency Act, 2007, which was the first legislation to establish a full-service forensic agency which is internationally recognised and belongs to Punjab. The article is based on the Agency's institutional documents and published case reports, secondary literature, and a structured interview with a high-ranking official of the Agency; it chronicles the development of PFSA, how it is organised and how it operates in the fourteen forensic disciplines. It also explores some of the case studies in the country where PFSA's forensic expertise has influenced court decisions, looks at the overall challenges faced by forensic science in Pakistan and provides a comparative analysis with provincial and international standards.

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Introduction

Forensic science is considered to be the use of scientific knowledge and methodology to answer legal questions related to criminal, civil, and administrative events (Shen & Vieira, 2016). Internationally, forensic science is recognised not only as a technical assisting arm of the law enforcement sector but as an essential part of the justice sector. Forensic science, according to the United States Department of Justice (n.d.), can provide objective results that could incriminate or vindicate a person, and the National Institute of Standards and Technology (NIST, n.d.) has pointed out its ability to help solve long-unresolved crimes and provide information to aid in judicial decisions with material consequences for the accused. However, as comparative experience has shown, there is no room for complacency: sustained underinvestment and a lack of high-level leadership has led to a decline in institutional capacity in forensic science, which was once considered a benchmark for the world, but which in England and Wales has fallen to a state where it cannot be taken for granted (House of Lords Science and Technology Select Committee, 2019).

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In this global setting, the status of forensic sciences within the framework of the criminal justice system in Pakistan has always been relatively underdeveloped. Historically, the role of investigation and adjudication has been tied to confessional evidence and eyewitnesses, which has been linked to wrongful convictions on the one hand, and evidentiary insufficiency on the other (Mateen, Tariq & Rasool, 2018). In 2002, approval was given for a federally administered National Forensic Science Agency, but the project did not get to the operational level envisioned. In this context, the creation of the Punjab Forensic Science Agency (PFSA) is a unique and comparatively successful effort to institutionalise forensic science in the context of a Pakistani provincial justice system. This article presents a historical and legal overview of PFSA, followed by a description of its organisation and the scope of the Agency's fourteen forensic disciplines, as well as a discussion of documented cases of the Agency's work influencing judicial outcomes, and a review of challenges the Agency is still facing and its position in relation to provincial and international benchmarks. Data collected for the analysis includes institutional publications, peer-reviewed publications on forensic science in Pakistan, press coverage in English of specific cases, and a structured interview with the Director (admin and finance) of PFSA, the results of which are presented in Section 8.

This inquiry is not only important for this institution, but for all of us. In the international literature, forensic science is often mentioned as one of the factors that can determine the veracity of a criminal justice system in distinguishing the guilt of a perpetrator from a defendant, irrespective of the party's position, resources, or credibility (Krishnan & K J, 2025). Where there is limited institutional resources for forensic analysis, the court correspondingly relies on testimonial forms of evidence, and these have well-known potential for error and coercion. When examining PFSA, it is therefore relevant to consider the ways in which forensic institutions can be constructed in resource-limited environments, and the role they often play in the wider justice system, as well as the constraints that remain even in countries that have had reasonably successful institutional development.

Conceptual Framework

Figure 1 places this study in the broader context of the literature on forensic science and criminal justice, beginning with general theoretical considerations, followed by literature from around the world and across the developing world, the South Asian framework, and Pakistan's policy and legal setting, and culminates with the institutional framework of PFSA and its documented effects on cases and public trust. This trajectory shows the research deficit that the current article deals with: PFSA as an institutional and evidential player, despite its proven value at the level of individual cases.

Figure 1. Conceptual Framework: The Punjab Forensic Science Agency in Pakistan's Criminal Justice System (2007–2025)



Figure 1. Conceptual framework situating PFSA within global, regional, and national forensic science literature.

Background and Establishment of the Institution

In October 2007, the Assembly of the Province of Punjab passed the Punjab Forensic Science Agency Act for the first time, thus giving PFSA the initial legal support (Government of the Punjab, 2007). However, it did not result in operational capacity immediately after the legislation was passed. The Agency was given due importance by Chief Minister Shehbaz Sharif's government after the general elections in 2008, due to the concern of the law and order issue in the province. In 2009, Dr. Muhammad Ashraf Tahir, a Pakistani Forensic Scientist who was the Executive Director of a forensic laboratory system in the United States, was hired to develop the Agency (International Symposium on Human Identification [ISHI] News, 2020).

The introduction of a full-service forensic laboratory in the Pakistani context was a challenge due to the lack of a sufficiently large pool of trained forensic scientists, trained equipment suppliers, standardised evidence-handling protocols, and other related factors. The laboratory infrastructure, manpower training, and quality-assurance systems were significantly strengthened or imported within a relatively short time period, and PFSA, being the first forensic laboratory in Pakistan, was the first to seek ISO/IEC 17025 accreditation for forensic laboratories, which is followed globally (ISHI News, 2020). Punjab is still the only province in Pakistan to have a forensic institution that is this size and accredited.

This was a quick institutional development, which is itself remarkable when compared with the comparative literature on institutional development of forensic capacity building. The development of a forensic science system is not the same as in other sectors such as education and/or healthcare, in that an institutional model can sometimes be adapted from existing domestic ones; in the case of the forensic science system, the creation of that system involves investment in physical infrastructure, human resources, quality assurance protocols, and legal frameworks for the admissibility of scientific evidence. The fact that much of this infrastructure was built in a relatively short time frame, rather than over the course of many years as with comparable institutional projects, suggests a high level of administrative and political commitment which does not necessarily occur in similar initiatives elsewhere (ISHI News, 2020).

Objectives of the Study

This article attempts to achieve three goals. First, it outlines the development of the legal framework and institutional setup of the Punjab Forensic Science Agency (PFSA), and details its organisational setup and scope of fourteen forensic disciplines. Secondly, it reviews historical examples of where PFSA's forensic capability has made a measurable impact on the judicial process, to evaluate the Agency's real-world impact on the criminal justice landscape. Third, it puts PFSA in a comparative context, comparing the Agency with the challenges underway in the forensic provision across Pakistan and other jurisdictions to distil lessons for the broader advancement of forensic institutional capacity.

Significance of the Study

The value of this study is that despite the fact that PFSA makes numerous appearances in the media in regard to individual cases, little scholarly attention has been given to the PFSA as an institution. The article combines institutional publications, peer-reviewed literature, and a primary interview with a senior PFSA official to offer an account of the Agency beyond a case-by-case reporting to one that is institutional and evidentiary. This will be of benefit to not only to students and researchers in the field of criminal justice in Pakistan but also to the policymakers who are thinking about the replication of the model of PFSA in other provinces and to the international literature on forensic capacity building in resource-constrained areas.

Research Methodology

The study is based on secondary and primary sources. The secondary sources include PFSA's institutional publications and documented case reports, peer-reviewed literature on forensic science in Pakistan and comparable countries, and English-language press coverage of specific cases involving PFSA. The information on the establishment, structure and case history of PFSA in this article comes from these sources.

The main source consists of a semi-structured interview with the Director (admin and finance) of PFSA, which was conducted to further the documentary evidence with an institutional perspective not found in the written documentation. The semi-structured approach enabled the main questions to be asked in the same way but provided flexibility to follow up on particular answers. Like any account that is based largely on an institutional interview, the voice of the account should be taken with a pinch of salt, and in conjunction with the independent case reports and secondary literature cited elsewhere in the article.

Institutional Structure and Scope

PFSA is an attached department of the Home Department, Government of the Punjab. The Director General leads it, alongside Additional Directors General overseeing the major functional areas, and department heads, forensic scientists, technicians and administrative staff completing the rest of the hierarchy. According to institutional reports, each year it handles more than one hundred thousand cases, with more than one million pieces of evidence (The News International, 2020). Compared to other countries, where such specialities are typically hosted by distinct labs, PFSA operates as a single administrative body, containing fourteen specialised forensic departments, which is not a typical structure abroad (ISHI News, 2020). These departments and their main functions are summarised in Table 1.

Table 1

Forensic Departments of the Punjab Forensic Science Agency

Department	Principal Function
Crime Scene Investigation	Locates, protects, and collects physical evidence at the scene in a manner that preserves its evidentiary integrity.
Death Scene Investigation	Examines the scene of a death to assist in establishing the cause, time, and manner of death, in coordination with the Pathology department.
Pathology	Examines body and tissue samples in death-related cases to determine the medical cause of death.

Firearms and Toolmarks	Examines firearms, bullets, cartridge cases, and tool marks, and correlates them with a specific weapon or implement.
Latent Fingerprints	Develops and compares latent fingerprints recovered from a crime scene against reference prints of a suspect.
DNA and Serology	Analyses blood, hair, saliva, and other biological material to generate DNA profiles for identification or exclusion.
Trace Chemistry	Examines trace materials such as paint, glass, fibres, soil, and gunshot residue that may associate a suspect with a scene.
Narcotics	Tests suspected controlled substances to confirm their identity and purity.
Toxicology	Analyses blood, urine, and tissue samples for the presence of poisons, alcohol, or drugs.
Polygraph	Administers polygraph examinations to suspects or witnesses, with informed consent, in support of an ongoing investigation.
Questioned Documents	Examines handwriting, signatures, stamps, printing, and paper to detect forgery in financial and legal documents.
Computer Forensics	Recovers and examines data from computers, mobile devices, and other digital media, including deleted material.
Audio Video Analysis	Enhances and authenticates audio and video recordings, including closed-circuit television footage and recorded calls.
Forensic Photography	Produces detailed photographic documentation of crime scenes and physical evidence for use in reports and court proceedings.

In addition to its headquarters in Lahore, PFSA also has regional offices in each division of the province, working all year round to provide support for timely collection and processing of evidence (ISHI News, 2020). PFSA's Divisional Crime Scene Units provide training programs to police and other law enforcement officers on evidence identification, collection and preservation at crime scenes, as well as casework. This training function is important because the value of forensic analysis is based on the integrity of the evidence before it reaches the lab, which is dependent on the integrity of the evidence when it is collected and cannot be restored after collection by the forensic process.

Illustrative Case Studies

Several cases in Pakistan were studied that were covered extensively in the media, demonstrating the practicability of PFSA's forensic capability. DNA profiling and comparing with the PFSA DNA database (Anjum et al., 2021) has solved the case of rape and murder of Zainab Ansari in Kasur, the case which got the entire nation in protest against the

government and the police. A series of child sexual abuse cases in the same district, then matched to one offender using a centralised forensic DNA database in the Agency, shows the potential of a DNA forensic database to link the investigations of unrelated cases together (Anjum et al., 2021).

PFSA's scope of work is not limited to interpersonal violence. In 2017, DNA profiling was employed for identification of remains and facilitating their return to families following the oil tanker explosion near Ahmedpur Sharqia that left many burnt beyond visual recognition (The News International, 2020). In another case, widely reported, a suspect was connected to a sexual assault on the Lahore–Sialkot Motorway via the same DNA database system. These cases, in totality, illustrate the value of a well-maintained, centralised forensic database, which can link evidence across investigations, jurisdictions, and time, something that individual police units are unlikely to be able to do independently (Anjum et al., 2021).

The Role of Institutions in the Criminal Justice Process

The work of PFSA can be considered from two sides: a) the relative lack of public visibility of its work, and b) its structural role in providing support to the evidentiary underpinning of court procedure.

Visibility Asymmetry

Forensic analysis is typically a process that takes place behind the scenes, rather than in the public eye like police work or court proceedings. When a forensic finding, such as a DNA match or a document forgery determination, leads to a case that has a 'result', one seldom gets the specific cases that result from a particular finding publicised, and the people who did the analysis are rarely mentioned beyond the courtroom. This is in line with international observations where forensic evidence, although often pivotal to case outcomes, has not received the same level of public and media interest as other case developments such as testimony or investigations.

The Evidentiary Standardisation and Neutrality

PFSA has created a uniform and standardized system for handling evidence by bringing forensic analysis under a single, recognized system, thereby minimizing reliance on the district or police station from which evidence is gathered to determine the quality of the evidence. In addition, the same DNA, toxicology or document evidence can be used to exclude or implicate a suspect, and the prosecution or defence in a trial can call for and/or oppose the admission of evidence. This is in line with a larger principle in the international forensic science literature, where forensic institutions are generally viewed as scientific bodies that provide evidence, and not as investigators or prosecutors (Krishnan & K J, 2025).

Combined, these dimensions indicate that PFSA is a vital and important element of the criminal justice system in Punjab despite its relative invisibility compared to police and judicial institutions.

Public Confidence and Institutional Trust

Another, more subtle but equally important role of forensic institutions is to enhance the trust of the public in the justice system as a whole. Reliance on judicial results relies not just on how harsh or rapid the consequences are, but on the public belief that they are commensurate with what actually happened, and not with how much influence or resources one party had when compared to the other party. The more forensic evidence is independently verified and is able to withstand judicial scrutiny, the more this contributes to overall institutional credibility, which has been observed in the comparative forensic science literature at large. In the Pakistani context, given the lack of faith in the police and courts, this role of forensic evidence is of special importance.

Challenges and Limitations

PFSA has made significant institutional progress, but still has some operational and systemic challenges.

Funding issues: If the annual caseload climbs above a hundred thousand cases, there are capacity challenges, especially in disciplines like DNA analysis, where there is high demand (The News International, 2020).

Capacity gaps within allied actors: police officers, lawyers, and judicial officials are not necessarily trained in the collection, preservation, and presentation of forensic evidence, or have the necessary skills to utilize it effectively in court (Mateen & Tariq, 2019).

Coordinate crime scenes: the forensic evaluation of scene evidence is highly dependent on the manner in which the evidence is collected and handled by first responders, and inconsistent practices can lead to loss of evidence before analysis in the laboratory (Mateen & Tariq, 2019).

Lack of a population-representative DNA allele-frequency database in Pakistan is an ongoing issue in the development of legal and demographic infrastructure, which has an impact on the statistical weighting of DNA evidence in court (Mateen & Tariq, 2019).

The extent to which these constraints do not lessen PFSA's institutional achievements is a testament to the need for more development in PFSA's laboratories, but also in the entire evidentiary chain between crime scenes, investigators and courts.

Comparative Perspective

In Pakistan, Punjab is the only province that has set up a forensic institution with similar size and accreditation, and the evidence that can be presented to a court can differ significantly from province to province. This inequality has ramifications for the uniform application of forensic standards in the country, and has been proposed as a matter that deserves policy attention (Mateen, Tariq & Rasool, 2018).

Compared to international standards, PFSA's efforts to become ISO/IEC 17025 accredited put it on the same technical level as forensic labs in higher-income jurisdictions, and the way it has integrated fourteen disciplines in one administrative block is more than what many forensic systems in the rest of the world have accomplished (ISHI News, 2020). Meanwhile, the House of Lords Science and Technology Select Committee (2019) report on the future of forensic science provision in England and Wales revealed that institutional capacity of this type is not sustainable in the long term, but requires ongoing political and financial support. On this score, the story of PFSA is an example which goes beyond simple resource availability; a political commitment that was sustained over time, aided by technical skill, was a determining factor in its relative success, and one which could be

relevant to similar country-wide forensic capacity building projects, and to other developing country contexts.

Findings and Analysis

To supplement the documentary record with institutional perspective, a semi-structured interview was conducted with a Director (Admin and Finance) of PFSA. The findings are organised below by theme, with the Agency's responses followed by analysis linking them to the literature and arguments developed earlier in this article.

Institutional Role within the Criminal Justice System

Response: Institutionally, the PFSA occupies a central position in Punjab's criminal justice system owing to its unique identity as an independent forensic organization that supports law enforcement agencies, prosecutors, and the judiciary through scientific examination of evidence. It plays a pivotal role in ensuring evidence-based investigations and fair trials by providing impartial forensic analyses. Besides, PFSA also trains law enforcement and investigating agencies in the proper collection, preservation, and analysis of evidence. Its state-of-the-art infrastructure, advanced equipment, and highly qualified human resources are comparable to other similar international institutions and contribute to the timely and accurate administration of justice, thereby strengthening the criminal justice system.

Analysis: This characterisation aligns with the institutional-neutrality argument presented in Section 5, which posited that PFSA's uniform approach to evidence handling would lessen the impact of the district and/or police station in which evidence was collected. It also resonates with the overall statement from the international literature that forensic institutions are independent scientific institutions "in the service of the entire justice system" (Krishnan & K J, 2025).

Changing Engagement of Police and Courts with Forensic Evidence

Response: Before PFSA, forensic capability was limited, fragmented, and less advanced. The police and courts had to rely largely on the investigative skills of the Investigating Officer (IO), eyewitnesses, and testimonies. However, investigations, after the introduction of PFSA, are scientific and evidence-driven. The police and other LEAs now place more emphasis on proper collection and preservation of evidence for its correct scientific analysis. The courts now rely more and more on forensic reports and expert opinions of the scientists from PFSA (friends of the court), leading to transparency and efficiency in the dispensation of justice.

Analysis: This information supports the historical premise stated in the Introduction, in which the pre-PFSA justice system was portrayed as being reliant upon confessional evidence and eyewitness accounts, both of which carry the risk of false evidence and lack of evidence as claimed by Mateen, Tariq and Rasool (2018). Also, the Director's statement that a move towards evidence-based investigation is consistent with the underlying premise of the article that a justice system relying more on the testimony of eyewitnesses may have a greater risk of error and coercion (Krishnan & K J, 2025) is congruent with the argument made in the broader article.

Public Understanding of PFSA's Forensic Disciplines

Response: In my opinion, Digital Forensics, Polygraph Examination, and Firearms and Toolmarks examination are a few of the fields that are least understood by the public. Generally, the public associates PFSA with DNA analysis, fingerprint identification, and pathology/toxicology. As the work done by PFSA is highly technical and largely conducted behind the scenes, many people are unaware of its role in the criminal justice system.

Analysis: This response emphasizes the visibility asymmetry mentioned in Section 5: forensic activities like those of PFSA are done in the dark and are not so well known to the public, and even disciplines that are central to casework, such as digital forensics and firearms examination, are not well known to the public, something often highlighted in high-profile cases discussed in Section 4.

Operational Constraints Facing PFSA

Analysis: PFSA currently is facing the following challenges: first, a consistent increase in workload due to increased reliance on and growing demand for forensic examination, which puts pressure on human resources, equipment, and laboratories. Second, budget constraints and the need for adequate funding for its continuously expanding scope and capacity while maintaining its standards.

Response: The constraints are very similar to those cited in Section 6, which identified increased demand for forensic examination, notably in DNA analysis, as a constraint on institutional capacity (The News International, 2020). The Director's response is a confirmation, within the institution, of a lack of resources that is identified in the secondary literature in relation to the provision of forensic science as a whole, and not just in relation to the provision of forensic science in the police setting.

Institutional Safeguards and PFSA's Future Trajectory

Response: PFSA ensures its integrity and transparency through strict compliance with protocols, Standard Operating Procedures (SOPs), robust quality assurance mechanisms, and automated procedures. The examination of evidence is based on scientific principles and is subjected to internal quality control mechanisms, including peer independent reviews and supervision.

PFSA is undergoing a major transformation in its organizational structure, infrastructure, and forensic capabilities. In the next decade, areas such as Digital Forensics, Artificial Intelligence, and Cyber Forensics are expected to expand significantly. PFSA is also expected to strengthen evidence collection and management through the establishment of Crime Scene Units in all the districts of Punjab. Moreover, increased collaboration with national and international stakeholders and academia can be expected. In addition, the Training, Research, and Development (TRD) institution will further enhance its role in strengthening the criminal justice system.

Analysis: The focus on standard operating procedures and internal quality control resonates with the argument for evidentiary standardisation and neutrality put forward in Section 5 and with the Agency's drive for ISO/IEC 17025 accreditation mentioned in Section 7, which highlights the importance of following procedures in achieving the credibility of the Agency (Krishnan & K J, 2025; ISHI News, 2020). The ADG's discussion of planned growth in

digital, artificial intelligence (AI) and cyber forensics further demonstrates PFSA's ability to address gaps identified in Section 6, which in part are the result of its own strategic priorities.

The themes identified from the interview are grouped together and are similar to the themes discussed in the literature in the previous section of this article. The comparative literature, alongside the internal evidence from the Director, supports the idea that an institution that is well-equipped and standardised could lessen the dependence of a justice system on testimonial evidence; and that the funding and capacity concerns which the secondary sources ascribe to Pakistani forensic science in general are similarly present within the Agency. Concurrently, this is an institutional account, and should be interpreted as supplementary to, rather than an alternative to, individual case reporting and academic literature cited elsewhere in the article (see the Methodology).

Conclusion

This article has reviewed the Punjab Forensic Science Agency (PFSA) as an institutional case study for building up forensic capacity in the criminal justice system of Pakistan. The establishment of PFSA marks a conscious move away from a longstanding system of criminal investigation that has been largely founded based on witness testimony, helping to ensure that the system is built on two foundations: legislation that provides the necessary authorisation, and a strong and persistent political will and commitment to the system together with its technical development in accordance with international standards. Several cases have been reported where the Agency's forensic expertise and its centralised DNA database have played a significant role in the outcome of trials of public importance. Concurrently, caseload pressures, capacity gaps between actors in the allied justice sector, and gaps in the population-level forensic infrastructure are not resolved. The experience gained by PFSA has indicated that institutional development in forensic science is not only about technical investment but also about political will, technical expertise and cross-institutional training. This experience is significant for the further development of forensic institutional capacity in Pakistan but also for other institutional settings around the world.

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