

DEVELOPING FORENSIC SCIENCE CAPABILITIES IN NIGERIA: CHALLENGES AND PROSPECTS

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Abstract

The need to integrate investigation actions with forensic capabilities is increasingly becoming inevitable in the developing world so as to overcome challenges posed by security crisis on development. Efforts aimed at improving forensic science capabilities in Nigeria seek to address the growing needs of criminal investigations to achieve durable solutions to various security issues in the country on a long-term basis. For a contextual understanding of the challenges hampering criminal investigations and the prospects abound for Nigeria's forensic capabilities, this paper examined gaps in the investigative actions used in addressing security issues like insurgency, murder, theft, rape, etc. Such actions deploy the use of stale methods and tools based on older technologies rendering many either as victims or survivors of unresolved crimes. The first Nigeria's DNA forensic center was established in 2017; earlier DNA analysis requirements were performed abroad. Therefore, the area of forensics is still plagued by inadequate devices and manpower for effective analysis. This article used secondary qualitative reviews and opportunity theory to explain the role of forensics in crime prevention and control and the promotion of national security. Thus, examining the implications of the gaps in forensics in hampering effective investigations is paramount. More efforts especially by government on the adoption of forensic services by respective relevant agencies would impact on saving life, liberty and property immeasurably.

Keywords: criminal investigation, development, DNA, forensic science, murder.

Introduction

The history of forensic science dates back to thousands of years. In ancient Rome, there was a public place regarded as a forum, where important governmental debates were held; sometimes a town square or even a market place. Gradually, the forum also became a sort of public 'courthouse,' where various trials of importance to the citizenry were held (Kennedy,

2006). In other words, the history of forensic science originates from Roman times, when criminal charges were made public and the case be brought to the group of people in the forum. Both the person accused of the crime and the accuser would give speeches based on their sides of the story. The case would be decided in favor of the individual with the best argument and delivery. Thus the modern usage of forensic is denoting both a form of legal evidence and a category of public presentation (forum).

Fingerprinting was one of first forensics applications used as a quasi-scientific approach. The ancient Chinese used fingerprints to identify business documents. In 1784, in England, John Toms was tried and convicted for murdering Edward Culshaw with a pistol. When the dead body of Culshaw was examined, a pistil wad (crushed paper used to secure powder and balls in the muzzle) found in his head wound matched perfectly with a torn newspaper found in Tom's pocket. In Warwick, England in 1816, a farm labourer was tried and convicted of the murder of a young maid servant. She had been drowned in a shallow pool and bore the marks of violent assault. The police found foot prints and an impression from corduroy cloth with a sewn patch in the damp earth near the pool. There were also scattered grains of wheat and chaff. The breeches of the farm labourer who had been threshing wheat nearby were examined and corresponded exactly to the impression in the earth near the pool (NOUN, 2012).

In 1892, a eugenicist (an adherent of the often prejudiced system of scientific classification) named Sir Francis Galton established the first system for classifying fingerprints. Sir Edward Henry, commissioner of the Metropolitan Police of London, developed his own system in 1896 based on the direction, flow, pattern and other characteristics in fingerprints (Watson, 2018). The Henry Classification System became the standard for criminal fingerprinting techniques worldwide. In 1835, Scotland Yard's Henry Goddard became the first person to use physical analysis to connect a bullet to the murder weapon. Bullet examination became more precise in the 1920s, when American physician Calvin Goddard created the comparison microscope to help determine which bullets came from which shell casings. And in the 1970s, a team of scientists at the Aerospace Corporation in California developed a method for detecting gunshot residue using scanning electron microscopes (Watson, 2018). Later in the 20th century, there were several British pathologists, Bernard Spitsbury, Francis camps, Sydney Smith and Keith Simpson (NOUN, 2012).

This is how the science of forensics continued to grow in relevance by combining a number of scientific techniques, such as the earliest fingerprint mentioned earlier, to the more complex toxicology, ballistics, anthropometry, and the most sophisticated one called the Deoxyribonucleic Acid (DNA) test. The use of forensics and all types of expertise (DNA, polygraph, hypnosis) and intelligence were found to be very helpful in easy crime detection and identification of criminal offenders and exoneration of innocent suspects. Things considered as evidence in the forensic sciences include bite marks, blood and body fluids, bones, broken fingernails (striations), drugs, explosives, fiber, fingerprints, firearm powder residues, firearms and tool marks, glass, hair, ink, paint, petroleum products, questioned documents, shoeprints and tire tracks, soil and minerals, teeth, and toxicology (Appel, Hannaford, Hogue & Lemery, 2014: 6). In line with the above, Forst (2011) observes that forensics is the determining factor that shapes the outcome of a case, with the exception of the polygraph, which essentially serves to eliminate potential suspects. This brought up the fact

that forensics is very important in crime investigation and detection. However, beyond this critical criminal justice role, forensics is essential for enhanced national security, especially the physical aspect of security.

The provision of security of lives and property is the primary responsibility of all governments through designated authorities, i.e. security agencies, like the Nigeria Police Force and the Department of State Security (DSS) who deal with numerous security issues through forensics. These issues range from protecting areas where access should be restricted, pre-mortem and post-mortem tests, and DNA tests. In fact, forensics is crucial in crime prevention because the use of fingerprinting and personal identification number (PIN) can serve as special measures for access control in some restricted places. That is why INTERPOL (2014) makes the following recommendations in its Disaster Victim Identification Guide:

[Forensics is important for] protecting sensitive and confidential information. As far as physical security arrangements are concerned, adequate protections should be implemented to secure sites such as disaster scenes and mortuaries, so that unauthorised access is prevented. Apart from the concerns about scene contamination and disruption, there are health issues associated with permitting entry to such areas. They include unsafe environments that may present hazards to individuals. It is also not appropriate for onlookers to be present, especially in cases where the victims of mass casualties may still be present (INTERPOL, 2014: 23).

This implies that security agencies are confronted with the need for modernising the methods of promoting security of all kinds – physical, personal, information, environmental and national security in general. Nigeria's security apparatus consists, most importantly, of the Nigeria Police Force, the State Security Service (SSS – the intelligence services) and the military, all of which are federal institutions. These agencies play important roles in the maintenance of public order, safety and internal security especially as they ensure the protection of lives and property of the entire populace in addition to other functions that will enhance tranquility and harmony in the society (Nte, 2012; Persson, 2014).

In view of this background, this article examines the relevance of developing forensic science capabilities for the goal of the attainment of national security. The paper is divided into seven sections – section one serves as an introduction; section two conceptualizes key terms; section three provides a theoretical framework; section four discusses the aspect of forensic science capabilities as a driving force for security and development; section five identified some challenges and prospects of developing forensic science capabilities; section six presents policy implications and recommendations; and section seven serves as the conclusion of the article.

Definition of Concepts

Etymologically, the word forensic may be traced to the Latin *forensis*, for 'public,' and to *forensus*, meaning 'of the forum' (Kennedy, 2006). Thus, in some centers of higher learning, forensic studies are referring to the arts or studies of argumentative discourse, while in others the legal and judicial aspects of forensics were emphasized. In modern times, the term forensic

has been applied to a body of knowledge useful to the courts in the resolution of conflicts within a legal context (Kennedy, 2006). According to Watson (2018), forensic science is a discipline that applies scientific analysis to the justice system, in order to help prove the events of a crime. Forensic scientists analyze and interpret evidence found at the crime scene. That evidence can include blood, saliva, fibers, tire tracks, drugs, alcohol, paint chips and firearm residue. Forensic science, according to Cole (2014) is broadly conceived as a term encompassing a variety of different techniques for using physical evidence in the investigation of crime including:

Document examination, toxicology, pathology, drug analysis, print analysis, impression evidence, hair, fibers, paint, glass, soil, entomology, arson and explosives, gunshot residue, materials analysis, "jigsaw" physical fit matching, ballistics, blood spatter, crime scene reconstruction, computer forensics, serology, and DNA profiling (Cole, 2014: 1763).

It is worth noting that forensics cuts across wide spectrum of disciplines. This is why there are many branches of forensic science, such as computer forensics, forensic environmental evidence, forensic anthropology, forensic facial evidence, forensic linguistics, forensic palynology, forensic accounting, forensic document examination, forensic economics, and forensic engineering among others (NOUN, 2012; Delemont, Lock, & Ribaux, 2014). Despite its multidisciplinary nature, the purpose of forensic investigation is to collect facts that can serve as evidence before a court of law; through which the associative part of an accused in the commission of a crime can be proved, with the purpose to resolve the crime (Lambrechts, as cited in Nte, 2012).

Thus, in its broadest sense, forensic science is the application of science to law. Kennedy (2006) maintained that a forensic scientist is essentially a person who relies on a systematically collected body of knowledge in order to provide relevant information to courts of law tasked with resolving legal issues. Although one might speak of science in service to the law, certain conflicts are inevitable in that the classic goal of science is the production of truth, while the goal of the law is to achieve justice. Forensic scientists must recognize that they are, but guests of the court, invited for the court's purposes. It is not unexpected that, from time to time, 'scientific truth' will be subordinated to 'legal truth.' Such is the reality of the adversary system, and one which every forensic scientist must be prepared to accept if he or she is to engage in the modern forum.

Theoretical Framework

If treated as an independent discipline, forensic science has no developed theories; but if considered as a branch of criminology, then ample theoretical frame of reference are there to explain the problem under study. For the purpose of this examination, Felson's (1994) and Felson & Clarke's (1998) crime opportunity theory is adopted in explaining the relevance of forensics in criminal profiling, crime prevention, investigation and for dealing with offenders with the ultimate goal of attaining security and development in Nigeria. The crime opportunity theory is eclectic, combining aspects of the rational choice, routine activity and crime pattern theories.

The crime opportunity theory changed the focus of criminological theory from explaining criminal motivation to explaining the occurrence of criminal events. The proponents argue that criminal motivation alone is not sufficient to cause crime. In addition to motivation, the offender requires the opportunity to pursue his or her inclinations (NOUN, 2012). According to the theorists, the physical and social environments of the offender and the victim (or targets) encourage or limit criminal opportunity. They sought to identify environmental factors that provided the opportunity to commit crime. According to opportunity theory, the danger of a particular environment relates to four factors (1) the accessibility of the victim or target, (2) the perceived attractiveness of the target, (3) the proximity to numerous potential offenders, and (4) the absence of capable guardians (NOUN, 2012: 75). Drawing from above, Felson (1994) therefore specifically mentioned three elements that make crime possible in his routine activity theory – a motivated offender, suitable target and absence of a capable guardian or intimate handler. In other words, the chance of a crime occurring is greatest in environments where accessibility, attractiveness, and proximity are high and where guardianship is low. Hence, security can be ensured and crime would be prevented by keeping potential offenders and potential victims apart (Mukhtar, John & Isyaku, 2017).

The opportunity theory is relevant to the issue at hand because the propositions fit in addressing the security gaps and needs of the forensics identified within the context of this paper. Using forensic science capabilities as means of crime prevention, implies that protective measures associated with access control in computer forensics, physical security, environmental forensics, fingerprinting and psychological profiling can play significant roles in ensuring that an environment and people are free from potential security threats. This can be executed through the use of forensic science efforts in the deflection of suspicious plans, activities, individuals and events. As a tool for reactive security, forensic science is the most reliable means of criminal investigation and producing evidence in a court of law because it is a method of obtaining criminal evidence for the purpose of using it in the court of law. If the goal of crime prevention is prioritized; or if any environmental threat is prevented; or if offenders are traced through forensic science efforts and sanctioned accordingly by the criminal justice, security challenges would be tackled and developmental process will be advanced in Nigeria.

Forensic Science Capabilities for Security and Development in Nigeria

Nigeria is facing several security challenges, as observed by Persson (2014), the country is challenged by widespread violence, criminality and insurgency in the North-East and the Niger Delta and some parts of the South South region. Also, there is substantial spread of illegal small and light weapons coming into the country through porous borders. Border control, especially along the borders with Niger, Chad and Cameroon, is severely lacking and makes smuggling of weapons and other goods relatively easy. There are widespread cases of murder and, according to (Nte, 2012) experts have linked the many cases of unsolved murders that dot Nigeria criminal justice system to absence of forensic evidence in Nigeria over the years. This forensic gap has rendered justice quite ineffective. Nigeria had lost many prominent citizens, ministers, politicians and numerous citizens who were murdered, but the sources of the murder cannot be traced yet.

Every time someone is murdered, Nigerians are told that the authority, notably the President and Commander – in – Chief of the Armed Forces has ordered the Inspector – General of Police to fish out the killers. But to the long suffering of citizens, such a statement leads to nothing because such investigations usually end up being abortive (Nte, 2012). This indicates the need for systematic analysis and evidence-based investigation from by the law enforcement alongside scientific experts to make optimum use of forensics in crime prevention, investigation and control in Nigeria.

It is therefore imperative that Nigeria develops its forensic investigative capabilities. One interesting case, among others, that can substantiate the importance of forensics in tracing murder cases, which took place in June 2018. The ordeal of Laurean Onye and Yusuf Yahaya Abubakar and the effort of the Nigeria Police in identifying and arresting the murder is narrated by the Vanguard (June 16, 2018) newspaper below:

When news broke out of the gruesome murder of a 22-year-old former student of Federal Government College Owerri, Lauren Onye, who was found dead in the home of her boyfriend, Navy Lieutenant, Yusuf Yahaya Abubakar, on Friday May 4, 2018, at the Nigeria Navy Barracks in Borokiri area of Port-Harcourt, Rivers State, many suspected her boyfriend was behind the murder, but they had no inkling he was equally a victim. Two days after she was killed, some Naval Officers forced their way into her boyfriend's apartment after they received information from one of Onye's friends, known as Joy, that she had been killed by her boyfriend and that her corpse was lying in his apartment.

Joy was said to have alerted the naval authorities in Rivers State that she received a text message from Onye's boyfriend, Abubakar, who also asked her not to call him back, revealing that he killed Onye during an argument over their relationship. She added that Abubakar also said Onye demanded to be paid N3million if he knew he wasn't going to marry her but he offered N500,000 which she rejected. Onye then reportedly became very angry, picked up a knife and stabbed him on his head while Abubakar also picked up another knife and stabbed her on the chest and she died on the spot. According to the text message sent to Joy purportedly by Abubakar, he said he fled from the barracks and was on his way out of the country.

Vanguard gathered that the IGP, promptly approved the petition and assigned his operatives at the Special Intelligence Response Team, IRT, led by Deputy Commissioner of Police, Abba Kyari, to commence investigation into the matter. Vanguard gathered further that a team of IRT operatives were deployed to Borokiri in Port Harcourt, Rivers State; they visited the scene, conducted interviews around Abubakar's neighbourhood. The operatives also visited his bank where they discovered that in spite of Joy's story that Abubakar was leaving the country and his phone lines switched off, someone was still withdrawing money from his account. It was further discovered that some of the withdrawals took place in Lagos while a larger part of it, took place in Benin, Edo State. The operatives also found out that Abubakar wasn't the

person making the withdrawals, rather the photograph of the person caught by the cameras at the ATM machines in Lagos and Benin, had striking resemblance with Abubakar's former houseboy, Thaddaeus Jaja, who was seen by neighbours around Abubakar's apartment few days before the murder was discovered.

Three weeks later, one of our informants spotted him in Borokiri and we got him arrested. During interrogations, he confessed killing Abubakar and his girlfriend because he was angry with him for not paying him the money Abubakar owed him. He also burnt Abubakar's corpse in a bush to prevent anyone from linking him to the crime. He told us that he was the person who wrote and sent the text message to Joy while he went to Lagos to withdraw the money from Abubakar's account because he wanted to create an impression that Abubakar was on the run. He further told us that he sold Abubakar's car for N1.9 million and he equally took us to the spot where he burnt Abubakar's corpse and we recovered his bones.

The above scenario shows the need for determination by the security agencies in crime scene investigation and tracing murder cases. Despite less application of sophisticated forensic tools, the police make efforts in carrying out their responsibilities. However, Nte (2012) laments that every time someone is murdered; Nigerians are told that the authority, notably the President and Commander – in – Chief of the Armed Forces has ordered the Inspector – General of Police to fish out the killers. But to the hopes of citizens, such statements lead to a lot of waiting and expectation among victims and relations. This calls for the need for systematic analysis and evidence-based investigation from by the law enforcement institutions alongside scientific experts to make optimum use of forensic science efforts in crime prevention, investigation and control in Nigeria.

The Challenges for Developing Forensic Science Capabilities and Prospects in Nigeria

Developing forensic science capabilities is very difficult and is associated with a lot of challenges even in the developed countries, like the United States of America and the United Kingdom. Some of the numerous challenges are associated with the cost of achieving universal forensic certification, employing the specialized forensic service providers, forensic equipments and lack of expertise. The total cost of achieving universal certification of forensic science service practitioners is very difficult to estimate given the large uncertainties described above, including the number of practitioners that would be captured by any such requirement; the number of certification programs that might need to be developed for disciplines that do not currently have such programs in place (NSTC, 2014). For example, U.S. forensic science service providers and forensic units employ an estimated 35,000 to 50,000 individuals today, predominately in law enforcement agencies, with most of these individuals are providing limited forensic science services the wide array of other stakeholders, including private entities and government agencies at the local, state, and federal level.

The implementation of a universal requirement for certification of forensic science practitioners is an exceedingly complex issue because of the large number of individuals performing such a broad array of duties who would be covered by such a provision. In view

of this, the development of certification programmes need not wait for legislation and could be encouraged by administrative actions aimed at incentivizing progress towards this goal, including the provision of grant/funding for the development of curricula, training, and testing (NSTC, 2014). In the case of forensic services, security restrictions in some countries may act as barriers to foreign companies seeking to enter their domestic market; some in the UK would argue that genuine security concerns make such restrictions not just legitimate but desirable (House of Commons Science and Technology Committee, 2005).

Furthermore, there are challenges related to the limitations of the power of the police and legal agents to intrude into the privacy of suspects. For example, Mijares & Jamieson (2011) gave example with the use of thermal imagery, complete with its legal and operational discourse. There are cases which represent issues that arose from same set of facts whereby narcotics investigators used thermal imagery to detect the heat anomalies associated with indoor cultivation of marijuana in private residences. The defense argued that investigators possessed neither probable cause nor warrant to conduct an electronic search of premises. The most recent interpretations of the legality of thermal-imagery technology state that its use is limited to corroborating evidence gathered from other sources such as a confidential informant. Therefore, irrespective of the type of alleged illegal activity being investigated, the technology cannot be used in a “fishing expedition” to uncover criminal activity.

The *Katz*, *Cusumano*, and *Porco* cases differed in terms of the areas being searched, the evidence being sought, and the technology being used. However, in each case the issue was the expectation of privacy and how it is to be observed by law enforcement personnel (Mijares & Jamieson, 2011). As remarked by INTERPOL (2014), DNA comparison is ideal in theory, but remains a complex task. It is easy to obtain samples from relatives, but collecting PM samples depends on the condition of the body (decomposition, carbonization). And infectious samples taken from bodies contaminated by biological agents must be processed in complete safety by P3 laboratories. Samples cannot be processed locally; they must be sent to specialized laboratories, in accordance with strict transport procedures. Turnaround times are long, and the cost of analyses is high. DNA analysis is the only way to match all body parts belonging to a given cadaver.

Policy Implications

For the purpose of policy making, recommendations are key; noting that different kinds of problems call for different tools and interventions. This is because forensics is a multidimensional enterprise and in the context of this paper, the policy recommendations would sound too ambitious in the sense that forensics ought not to be restricted to investigating physical evidence after crime has taken place. It should be used to serve as both a proactive and a reactive security measure. For example, solutions to the varieties of security challenges bedeviling the country such as terrorism, kidnapping, human trafficking, arms trafficking are as good as fighting cases of theft, robbery, murder, rape, and even pedophilia. Forensics should be developed with the aim of fighting these security challenges in tandem.

For the fact that the cost of developing forensic capabilities is monumental, the Nigerian government should adequately fund it as an important area of criminal justice and security development. As stated earlier in the challenges of developing forensic capabilities, the costs

are related to achieving universal forensic certification, employing the specialized forensic service providers and forensic equipment. Consequently, Kennedy (2006) recommends that creative funding practices and reliance on research from other fields (e.g., military and industry) are needed to keep pace with strides in technology made by the criminal elements of society. In addition, there is the need for coordinated first-responder systems, the protection of critical infrastructure, and public/private responses to terrorism, to allow the local police a rather natural leadership role in secondary responses to terrorism.

Much like the police response to crime, secondary responses are important for saving lives, minimizing damage, and investigating terrorism events (Green, 2011). It is however important for the police and other security agencies to be given special training to meet the tedious challenge associated with forensic security services in Nigeria. Good working relationship between the police and other security agencies as well as with the community is vital to the success of any aspect of law enforcement. The partnerships that the security agencies developed through community policing and intelligence-led policing form the important foundation for planning and implementing, emergency responses to many security challenges.

Early warning system is instrumental to reducing the cost or damage of any criminal tendencies. The legal profession should not be contented that the adversarial system in the offers adequate opportunities for the testing of expert evidence. The law enforcement, including the Police Force, National Security and Civil Defence Corpse and National Drug Law Enforcement, can actively involve the community in ways that dispel the idea of police spying, while responsibly engaging the community in the general observation of community conditions warranting police attention (Green, 2011).

In line with the objective of forming a good working relationship, NSTC (2014) reported the relevance of Interagency Working Group (IWG), which is a lesson for Nigeria to learn in its quest for developing forensic capabilities. The IWG is an integral aspect of forensic security service of the developed nations, US in particular and its process includes receiving information from a multitude of stakeholders including state and local advisory members, national associations and organizations representing the forensic science and medico-legal death investigation communities, the academia, private industry, and other entities. Thus, IWC involves the following:

- i. Accreditation, Certification Interagency Working Group (AC IWG);
- ii. Standards, Practices, and Protocols Interagency Working Group (SPP IWG);
- iii. Education, Ethics, and Terminology Interagency Working Group (EET IWG);
- iv. Research, Development, Testing, and Evaluation Interagency Working Group (RDT&E IWG); and
- v. Outreach and Communication Interagency Working Group (OC IWG) (NSTC, 2014).

This is instrumental because larger police departments should maintain specialized units that help them effectively carryout their specialized roles. The same applies for having specialized units that can help protect citizens from criminal activity. The police can advise citizens on effective home security techniques or conduct Project ID campaigns, engraving valuables with

an identifying number so that they can be returned if recovered after a burglary; police can also work in schools to teach kids on how to avoid delinquent behaviours and develop victimization prevention. In fact, police and other security agencies should maintain and have access to forensic laboratories that enable them to identify substances to be used as evidence and to classify fingerprints. As Siegel & Senna (2007) put it, planning and research functions include designing programs to increase police efficiency and strategies to test program effectiveness. Police planners monitor recent technological developments and institute programs to adapt them to police services.

Conclusion

This article amplifies the relevance of developing forensic science capabilities for achieving the overall goal of security and development in Nigeria. As such, the development of forensics is essential as it promotes security, which is a catalyst for national development. Unfortunately, security challenges in various ramifications are confronting Nigeria, such as insurgency, smuggling of illegal small and light weapons and other contraband goods; widespread cases of murder, burglary, theft and rape. Therefore, government should bridge the forensic gap in order to address these security challenges in the country. Because development in social, economic and political aspects of the Nigerian society is strongly tied to security, the country cannot aspire to achieve these aspects of national development until it overcomes the security issues. On the measures for enhancing national security in the modern globalised and technologically advanced world, there is the need to re-engage and re-position the existing security agencies, including the Nigeria Army, the Nigeria Police Force, the DSS, NSCDC, NDLEA, the Nigeria Customs Service, etc. with the ability to integrate forensic science investigative aspects with intelligence in proficient approaches for the agencies to live up to their callings.

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