A STUDY ON THE APPLICATION OF FORENSIC SCIENCE IN CRIMINAL INVESTIGATIONS IN ZONE 1 OF THE NIGERIA POLICE

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A STUDY ON THE APPLICATION OF FORENSIC SCIENCE IN CRIMINAL INVESTIGATIONS IN ZONE 1 OF THE NIGERIA POLICE

by

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LIST OF ABBREVIATIONS

PPFS-Q	Four Police Perceptions of Forensic Science Questionnaire
6FPQ	Six-factor Personality Questionnaire
AFSinCI	Application of Forensic Science in Criminal Investigation
CIID	Crime Investigation and Intelligence Department
CJA	Criminal Justice Assessment
CJAT	Criminal Justice Assessment Toolkit
CJFA	Criminal Justice Forensics Availability
CoFS-Q	Challenges of Forensic Science Questionnaire
GLOBE	Global Leadership and Organisational Behavior Effectiveness
H2FT	Herzberg Two-factor Theory
IPO	Investigating Police Officer
JG	Jigawa
KN	Kano
KT	Katsina
MS	Motivation Scale
NP	Nigeria Police
OCAQ	Organisational Culture Assessment Questionnaire
SCIID	State Crime Investigation and Intelligence Department
ZCIID	Zonal Crime Investigation and Intelligence Department

KAJIAN MENGENAI APLIKASI SAINS FORENSIK DALAM PENYIASATAN JENAYAH DI ZON 1 PASUKAN POLIS NIGERIA

ABSTRAK

Sungguhpun kadar jenayah menjejaskan perkembangan sosio-ekonomi dan keselamatan individu-individu di Nigeria, Polis Nigeria (NP) dilihat seperti tidak menggunakan teknik-teknik sains forensik sepenuhnya. Masalah persepsi, personel, faktor motivasi dan organisasi serta cabaran yang mempengaruhi fungsi umum PB boleh bertanggungjawab terhadap situasi ini. Namun, kajian-kajian untuk mengenalpasti secara khusus sebab-sebab kesukaran Polis Nigeria dalam mengaplikasikan sains forensik dalam aktiviti-aktiviti mereka, sungguhpun unit-unit dan jabatan forensik wujud dalam organisai, adalah sedikit. Oleh sebab itu, kajian ini mengenalpasti isu-isu berkaitan dengan aplikasi sains forensik dalam penyiasatan jenayah oleh Polis Nigeria. Objektif utama adalah: 1) mendapatkan profil Pegawai Penyiasat Polis (IPO) daripada segi penanda sosio-demografik dan ciri-ciri personaliti, 2) mengenalpasti kemudahan forensik sains yang ada, 3) sebab-sebab kekurangan kemudahan-kemudahan sains forensik, 4) mengenalpasti motivasi dan persepsi IPO, dan 5) budaya organisasi, dan cabaran-cabaran yang dihadapi dalam mengaplikasikan sains forensik oleh NP. Kajian ini merupakan tinjauan sampel keratan rentas yang menggunakan bateri ujian soalselidik swaguna dan temuduga separa berstruktur untuk pengumpulan data. Lokasi kajian adalah Zon 1 Polis Nigeria dan responden adalah IPO. Persampelan sistematik digunakan untuk memilih 401 responden soalselidik, dan persampelan bertujuan digunakan untuk memilih 12 responden temubual. SPSS Versi 24 telah digunakan untuk menganalisa data; statistik deskriptif dan berdasarkan inferens telah dihasilkan menggunakan yang berikut: regresi, ujian Mann Whitney, ujian Kruskall-Wallis, dan kolerasi Pearson; antara lain. Tujuh kumpulan hipotesis

kuantitatif dan empat tema kualitatif telah digubal. Enam hipotesis nul di tolak. Pegawai Penyiasat Polis (IPO) mempunyai persepsi yang baik terhadap sains forensik, dan persepsi tersebut dikaitkan dengan motivasi dan ciri-ciri personaliti. Terdapat bukti bahawa kemudahan forensik tidak mencukupi dan keadaan ini berkait rapat dengan budaya dan motivasi. Hubungkait antara beberapa cabaran telah dikenalpasti: pangkalan data yang tidak boleh dipercayai, kekurangan kerjasama antara agensi, rasuah dan gangguan yang tidak wajar dalam penyiasatan. Daripada tema yang digubal, dapatan kualitatif menunjukkan bahawa terdapat 1) prospek positif dalam penggunaan sains forensik dalam penyiasatan jenayah oleh NP, 2) rational penting dinyatakan berkaitan penggunaan sains forensik yang kurang mencukupi, dan 3) terdapat bukti cabaran-cabaran sebenar yang perlu ditangani. Keputusan kajian ini mengutarakan cadangan keperluan latihan NP, dan pengemaskinian kemahiran dalam usaha untuk menambahbaik kerja-kerja penyiasatan.

A STUDY ON THE APPLICATION OF FORENSIC SCIENCE IN CRIMINAL INVESTIGATIONS IN ZONE 1 OF THE NIGERIA POLICE

ABSTRACT

Despite the rate of crimes that affects socio-economic development as well as the safety of individuals in Nigeria, the Nigeria Police (NP) appears to underutilize forensic science techniques in criminal investigations. Perceptual issues, personnel, motivational and organizational factors as well as the challenges affecting the general functions of the NP could be responsible for this situation. However, studies to specifically understand the reasons for the NP's inability to incorporate forensic science into their activities, even when forensic units and departments exist for years in the organisation, are few. This current study, therefore, explored issues related to the application of forensic science in criminal investigations by the NP. Its main objectives were to 1) profile the Investigating Police Officers (IPOs) in terms of sociodemographic markers and personality traits, 2) determine the availability of forensic science, 3) reasons for the (in)adequacy of forensic facilities, 4) determine the motivation and perception of forensics of the IPOs, and 5) identify the organisational culture and challenges faced in applying forensic science by the NP. The study was cross-sectional, utilizing a self-administered survey battery and semi-structured interviews as instruments for data collection. The location of the study was zone 1 of the NP with IPOs as the respondents. Systematic sampling was used to select the 416 survey respondents, while purposive sampling was used in selecting the 12 interview participants. SPSS version 24 was used to analyze the data; descriptive and inferential statistics were generated using regression analysis, Mann Whitney test, Kruskal-Wallis test, and Pearson's correlation, among others. Seven quantitative group hypotheses and four qualitative themes were formulated. Six null hypotheses

were rejected. The IPOs have an excellent perception of forensic science, and the perception was associated with motivation and personality traits. It was evidenced that there were inadequate forensic facilities that were related to organisational culture and motivation. The relationships among some challenges were identified: unreliable databases, lack of inter-agency cooperation, corruption and undue interference in investigations. From the themes formulated, the qualitative findings revealed that there were 1) positive prospects for the utilization of forensic science in criminal investigations by the NP, 2) essential rationales were expressed with regards to the inadequate utilization of forensic science, and 3) real challenges that should be addressed. The results herein suggest the need for more facilities, NP training, and updating of skills to improve investigation works.

CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter introduces the study. It discusses the background to the study, statement of the problem and study rationale, research questions, objectives of the study, and the hypotheses. It also presents the conceptual and operational definitions of terms and scope of the study.

1.2 Background to the study

This section describes three factors that set background to the exploration of the application of forensic science in criminal investigations by the Nigeria Police (NP). The first factor is the historical antecedent of the NP, then the crime problem in Nigeria. The third factor is the application of forensic science in criminal investigations. A more detailed explanation related to these backgrounds is found in sections 2.2, 2.3, and 2.4.

1.2.1 Historical antecedents of the Nigeria Police

From the Biafran civil war it experienced from 1967 to 1970, which affected the socio-economic development of the country, Nigeria is also being affected by different conflicts that are rooted in political and socio-economic conditions, ethnic and religious relations in the country (Ugorji, 2016). For example, there were violent conflicts in some states as a result of the reintroduction of Sharia, the new agitation for Biafran state and continued bloodshed as a result of *Boko Haram* phenomena.

It is important to note that elements of criminal activities tend to be the common characteristic of all the conflicts Nigeria has experienced or is experiencing. Indeed, there are emerging and recurring criminal activities such as kidnapping,

terrorist activities, cattle rustling, rape, drug abuse and cybercrimes in the country (National Bureau of Statistics, 2017). In addition to the current effort of the law enforcement agencies, the federal government has resolved to commission socio-criminological studies to determine issues surrounding the conflicts and associated criminal activities with the view to addressing them (James, 2015). Be it as it may, whatever effort would be made to tackle the problems, the capability of security and law enforcement agencies, particularly the police, need to be strengthened to effectively play their role.

The NP, formerly known as the Nigeria Police Force (NPF) (Oluwasegun, 2017), is the principal law enforcement agency in Nigeria charged with the responsibility of protection of lives and properties. The agency was first established in 1820, though various accounts have documented its beginning with colonialism in 1861 (Alemika, 2014). In the beginning, the police was formed with the sole purpose of ensuring administrative policy and was concerned with the colonial government which was the relegation of the national interests of the people to the selfish political and economic interest of the state (then the colonialists) (Alemika, 2014). Perhaps, as a result of the power given by their masters, the police were found killing, maiming, torturing, and looting; instead of keeping the peace for the community as expected of typical police, thus exhibiting an example of a kind of military organisation (Aning, 2002).

With Nigeria's independence in 1960, the NP has passed through several phases of development during the military and civilian regimes. The Nigeria's 1999 Constitution, which is the constitution currently governing the Nigerian federation, has recognized and provided for the establishment of the police under Section 214 (2). Under the provision of this section, the functions of the police are thus:

> *The police shall be employed for the prevention and detection of crime, the apprehension of offenders, the preservation of law and order, the protection of life and property and the due enforcement of all laws and regulations with which they are directly charged, and shall perform such military duties within or without Nigeria as may be required of them by or under the authority of this or any other Act (Section 214 (2) Nigeria's Constitution, 1999).*

The constitutional recognition of the NP as a crime-fighting organisation that now has about 377,000 personnel, 36 State commands, which are grouped into 12 zones and nine administrative departments at the headquarters (Owen, 2016) was meant to ensure that they occupy their proper place in the polity through democratic policing. However, Alemika (2014) argued that the police practice in Africa, including Nigeria, centers on two things: regime security and reactive policing. They are more concerned with providing security for a few government officials and respond to a crime only when it has been committed, which is a reactive approach to crime prevention.

Besides, they are not sufficiently reformed in terms of organisation, training, philosophy of policing, relationship with the public (Tankebe, 2008), and lack modern facilities (Alemika, 2014). According to Chukwuma (2000), most reform efforts have been geared towards human rights issues, recruitment, police accountability, and integrity.

NP reform has been linked to insufficient funds; the organisation is underfunded. For instance, according to the Nigeria Police, the agency received N31.6 billion (equivalent to USD 87.8 million) in the 2017 budget as against the N1.13 trillion (equivalent to USD 3.6 billion) it required to perform effectively and efficiently (Punch, 2019). In an attempt to reform the police, the government came up with a white paper containing 79 recommendations, which was sent to the National Assembly

in 2008 (BBC, 2009). It was hoped that the paper would eventually become the Nigeria Police Force Reform Trust Fund Act, a proposed blueprint towards a total overhaul of the organisation. After more than ten years of waiting, the bill was passed by the Nigeria's Senate in the second quarter of 2019 (Punch, 2019).

Nonetheless, it is important to note that even with the police reform bill been passed, there is a need for research to ascertain how best the various reform activities could be executed; this belief is also shared by Alemika (2014). According to the author, the areas that need to be researched have more to do with the conceptual and analytical aspects of policing (Alemika, 2014). However, issues dealing with police operations, especially investigations, need to be explored also as they will show whether the police are performing the role they ought to play, what their challenges are, and how the challenges could be addressed.

To put it more clearly, the police in Nigeria cannot function without proper reform of its operational approach to policing, including the investigation function. Indeed, police brutality and torture in the course of obtaining evidence and or confession from suspects, perhaps as a result of inadequate modern investigative facilities; have continued to raise serious concerns (Human Rights Watch, 2013). Scientific research, therefore, needs to be pursued in areas to do with the conduct of investigations and application of fairer, more valid and reliable means of dealing with suspects and prosecution.

1.2.2 The crime problem in Nigeria

Crime is one of the challenging security problems affecting countries of the world; very few African countries have a low crime rate. In Nigeria, for example, the rate is high and was increasing (National Bureau of Statistics, 2017). Nigeria has

consistently remained among the top three countries that have high rates of crime in Africa. See Table 1.1.

In 2013, the crime index in Nigeria was 60.62. This value increased to 77.86 in the year 2014. However, between 2015 and 2018, the crime index steadily decreased from 76.60 to 63.12. The crime index increased slightly in 2019 with 64.41.

Table 1.1:Crime index of some African countries

Rank	**Country**	**Crime Index**						
		2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**
1	Kenya	74.30	78.90	72.61	69.49	64.96	59.77	54.82
2	South Africa	76.68	78.53	78.44	78.43	75.72	75.71	76.80
3	Nigeria	60.62	77.86	76.60	74.14	70.87	63.12	64.41
4	Angola	52.86	63.05	67.97	-	65.51	-	-
5	Uganda	66.02	62.24	59.41	-	56.87	-	53.27
6	Libya	-	61.42	69.64	57.81	54.47	56.74	59.18
7	Zimbabwe	52.86	60.82	62.18	60.02	53.46	54.56	51.80
8	Tanzania	-	57.11	61.80	60.02	61.39	59.83	59.01
9	Mauritius	51.51	55.72	48.53	53.69	51.13	48.31	46.81
10	Egypt	48.67	52.43	60.14	56.53	52.86	53.72	50.71
11	Algeria	51.82	52.31	51.34	57.58	49.63	50.68	48.33
12	Morocco	34.32	48.39	47.55	50.28	48.89	48.51	50.24
13	Botswana	-	47.03	46.77	-	58.22	-	-
14	Tunisia	45.46	47.03	42.67	38.90	40.94	40.43	42.29
15	Ghana	-	46.38	49.42	49.01	46.99	45.00	51.95
16	Namibia	37.34	45.53	55.59	60.89	63.09	68.22	68.66
17	Eritrea	57.81	39.14	-	-	-	-	-
18	Ethiopia	26.04	36.07	35.07	34.19	49.18	47.67	47.18
19	Sudan	-	34.84	35.68	-	35.05	-	-

Note. Crime Index is an estimation of the overall level of crime in a country. Questions for the surveys are like those of many scientific and government surveys. Entries in the survey are saved as the number in the range [-2, +2], with -2 having a meaning of strongly negative and +2 meaning of strongly positive. Index of responses is calculated, and crime levels categorisation is made based on the indexes. The crime levels categorization is as follows: lower than 20 = very low; between 20 and 40 = low; between 40 and 60 = moderate; between 60 and 80 = high; higher than 80 = very high. **Source:** Numbeo (2018).

It is mentioned here that reliable data for trend analyses on Nigeria's crime problem were not available or obtainable from the official sources. The most reliable source of official crime statistics in Nigeria, apart from the NP itself, is the National Bureau of Statistics. Herein, the data for 2016 and 2017, which are available and sourced from the National Bureau of Statistics are referred to.

According to the 2016 and 2017 crime statistics of the Nigeria's National Bureau of Statistics, there were increases in all three of the four major categorization of offences in the country. For example, offences against persons increased from 45,454 in 2016 to 53,641 in 2017, while offences against property rose from 65,397 to 68,579 respectively. Similarly, offences against lawful authority appreciated from 12,144 in 2016 to 12,678 in 2017 (National Bureau of Statistics, 2017; 2018). The statistics is represented in Figure 1.1.

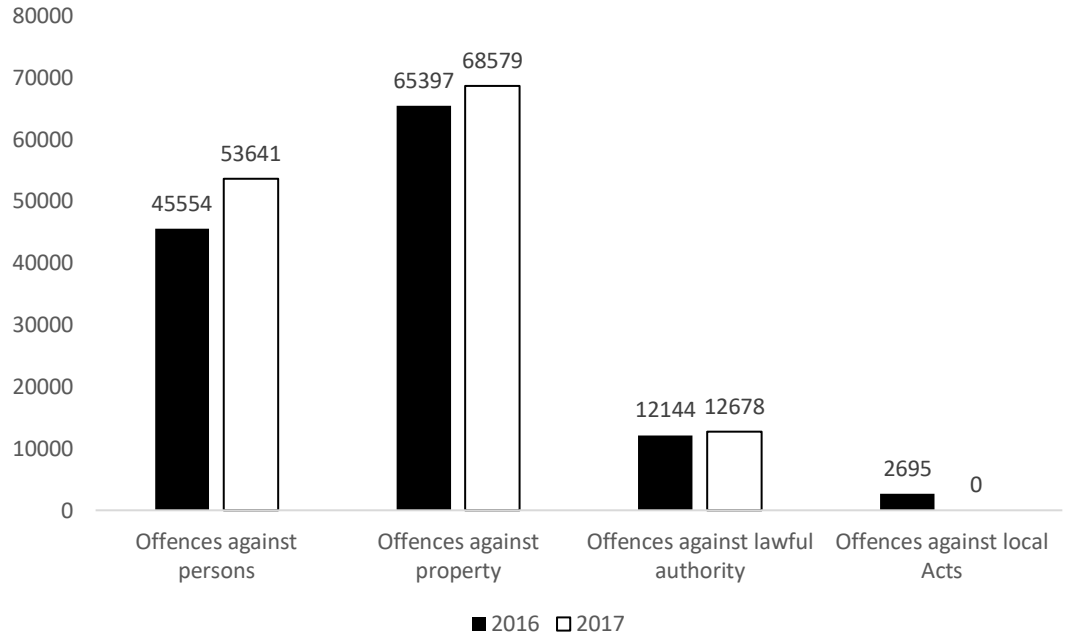

Figure 1.1: Nigeria crime rate comparison between 2016 and 2017 (Source: National Bureau of Statistics, 2017; 2018)

Specifically, financial and economic crimes, cybercrimes, terrorism, rape, murder, assault, drug and substance abuse, theft, kidnapping and highway robbery are the common crimes (National Bureau of Statistics, 2017) that negatively affect the socioeconomic development and general security in Nigeria. For instance, cybercrimes tarnish the image of the country and reduce the competitive edge of organisations (Hassan, Lass, and Makinde, 2012); terrorism and insurgent activities are costing many

innocent lives (Sarki and Lalu, 2017); rape has continued to raise social and reproductive health concerns; while drug and substance abuse render youth socially and economically unproductive (Folayan et al., 2014). Corrupted officials have stolen over USD 150 billion from Nigeria in the last 10 years, in addition to more than USD 400 billion stolen between 1960 and 1999 (Folayan et al., 2014). Consequently, there is an urgent need for both proactive and reactive measures, especially by the police, to curb the menace of crime in Nigeria.

1.2.3 The utilization of forensic science in a criminal investigation

Forensic science refers to a group of scientific disciplines that are applied to the questions of civil and criminal matters. It involves various methods and techniques that are largely laboratory-based, for example, DNA analysis and toxicology, and those that fundamentally require skills and expertise in understanding observed patterns, for example, fingerprints and blood spatter. Despite some challenges of reliability (Bolden, 2011), its tested advantages in solving legal issues (Robertson, Vignaux, and Berger, 2016) have made forensic science to remain one of the important tools that are employed to address problems of crime, both as proactive and reactive strategies.

The application of forensic science has the advantage of limiting the involvement and suffering of innocent individuals who are perceived as suspects or accused persons (Prahlow, 2010; Rudin and Inman, 2000). For example, computer forensic can be used to track, identify and prosecute cybercriminals, while excluding the innocents (Mohammed, Mohammed and Solanke, 2019). Forensic accounting can help solve financial crimes (Ehioghiren and Atu, 2016); while rapists and drug abusers can be identified using DNA (Campbell and Fehler-Cabral, 2018) and drug analyses (Bennett and Holloway, 2009) respectively. Firearms and ballistic sub-disciplines of

forensic science are potent tools to investigate crimes involving guns and explosives (Yaxiong, 2005), for example, insurgents and terrorists' activities.

Forensic science may also save time and resources in addition to many other benefits to the police force, criminal justice system, and society at large (Robertson, Vignaux, and Berger, 2016). Contemporary law enforcement agencies around the world have improved their capacity and ability of crime prevention and control by utilizing forensic science methods and procedures. Compared to the conventional investigation, crimes are now better solved through careful examination of the crime scene and analyses of forensically obtained evidence (White et al., 2011). The utilisation of forensic science methods therefore becomes relevant and important in contemporary policing in Nigeria.

The NP has adopted the use of forensic science in criminal investigations since more than three decades ago, yet serious concerns are being expressed as to the nature of forensic science being utilized by the police (see, for instance, Etin-osa and Etin-osa, 2019; Otu and Elechi, 2018; Aigbokhaevbo and Iyamu-Ojo, 2015; Nte, 2012). The worries came as a result of the fact that the NP was unable to successfully investigate and solve many crimes which people believed could have been dealt with if forensic techniques were used. Forensic science is not yet prioritized by the authorities, added to the concerns on utilization queried by people (Etin-osa and Etin-osa, 2019; Otu and Elechi, 2018). There is therefore the need to empirically explore issues to do with the forensic criminal investigation as used by the NP.

The exploration is particularly important because the concept of evidence-based policing is central to ensuring an effective police service. Evidence-based policing is a popular policing philosophy that police practice should be based on scientific evidence obtained through research about what works best in improving

police ability to discharge their duties (Lum and Koper, 2017). More so, scientific knowledge is seen as a better predictor of crime and the effects of preventative efforts than individuals' personal experiences (Palmer, 2011).

1.3 Statement of the problems and study rationales

Several problems justified the conduct of this study. The first problem discussed is the underutilised forensic facilities in Nigeria and specifically the NP. This first problem subsequently translates to the second problem, that being a lack of reliable data on the types of forensic techniques used by the NP. The third problem is that the NP perception of forensic science needs to be better understood; and fourth, the lack of research on forensic skills of the NP. Sections 2.2 to 2.5 discusses these problems in more detail.

1.3.1 Inadequate forensic facilities in Nigeria

Forensic science has enormous benefits to the activities of the police and the criminal justice system as highlighted in section 1.2.4. Consequently, it is appropriate, if not necessary; for the police and the governments to hold unto it in their efforts to ensure crime prevention and security in society. Yet, little consideration has been given to forensic science in Nigeria.

In the whole of the country with a population of 190,886,311 people (National Population Commission, 2018), a high crime rate and increasing rates of criminal activities (Torruam and Abur, 2014; Adebayo, 2013; Ajaegbu, 2012), there are only two forensic laboratories owned by the NP (Nigerian Police Force, 2016). One laboratory established in 1986 in Lagos, is hardly utilised because of inadequate and outdated facilities (Duru, 2016; Otu and Elechi, 2018)– the laboratory issues the

certificate of character, international driver's licences and provide skeletal service related to fingerprints only (Adebola, 2016). Adebalo (2016:1) added that this laboratory, which is under the direct supervision of the Force Criminal Investigation Department; is in a state of disrepair and has "been virtually abandoned" as well as being treated as "a dumping ground for inactive police officers". The other laboratory called the Digital Resource Center, commissioned in 2016 (i.e. 30 years after the establishment of the first laboratory) is located at the NP headquarters in Abuja (Nigeria Police Force, 2016; Okunola, 2016).

The Digital Resource Center has a wide variety of applications for the positive identification of suspects through their fingerprints, iris and facial recognition functions. The facilities could be used to collect, store, merge and display the identity of the targeted criminal element even at the crime scene. The system in place can convert existing manual record of arrested suspects into a digital and searchable format (Nigeria Police Force, 2016).

Millions of law enforcement research materials such as journals, reports, force orders, annual reports, forensic books and videos, digital maps as well as publications by police researchers and experts around the world are accessible at the center. Also, officers can research any facet of policing through the FCIID robust data portal also connected to the INTERPOL Global Learning Centre, Singapore. The centre would serve as a central unit for training, presentation and strategic meetings for the various sections of the FCIID (Nigeria Police Force, 2016).

Despite the existence of these laboratories, according to Police Reform in Nigeria (2010), the entire forensic manpower capacity of the NP as of 2007 comprised of only one trained forensic pathologist. At that time, there were no ballistics and DNA experts (Police Reform in Nigeria, 2010). Fingerprints and photographs of a crime

scene were rarely taken (Police Reform in Nigeria, 2010). With many of the police forensic specialists being deployed to the general duty section as a result of fewer activities in the forensic units (Adebola, 2016), it could be difficult to have a reliable number of forensic specialists in the Nigeria Police. According to the then Inspector General Police, Solomon Arase, the Nigeria Police has over the years, been grappling with a weak forensic capacity which has been a major factor in the agency's inability to manage complex criminal situations (Nigeria Police Force, 2016).

A review of the forensics and investigation capabilities found a near-total absence of forensic science in a police investigation in Nigeria (Transtec Report, cited in Police Reform in Nigeria, 2010). Currently, the two laboratories in existence could not possibly cater for the demands of the NP agency in terms of carrying out the basic forensic tests required in criminal investigations, looking at the NP's extensive structure; particularly if one compares with South Africa that has a population of 56,717,156 people (United Nations, 2017), a high crime index of 75.72% (Numbeo, 2018). Yet the South Africa Police Service owns four comprehensive forensic laboratories (South African Police Service, 2018). Based on this comparison, the NP is about 14 laboratories short of the South African Police Service.

According to the Global Cybersecurity Index Report (2018), Nigeria was ranked fifth in Africa with Mauritius, Kenya, Rwanda and South Africa rated above it. Among these countries, Nigeria incurred the highest losses resulting from cybercrimes (Kshetri, 2019). However, there is no specific laboratory or related mechanism in place for the police to tackle the problem as the Digital Resource Centre is a repository of knowledge rather than a functioning cyber lab that can run crime analytics. This further supports the assertion of inadequate forensic facilities in Nigeria to address not only the general but specific types of crime.

In comparison, in the Asia-pacific region, Malaysia is ranked second (eighth in the world) with Singapore being the first (Global Cybersecurity Index, 2018). According to CyberSecurity Malaysia (CSM) through its chief executive officer, Datuk Dr. Amirudin Abdul Wahab, the high ranking of Malaysia in the Global Cybersecurity Index was largely due to the advanced nature of the digital forensic laboratory they have and which the Royal Malaysia Police and other agencies are utilizing (The Sun Daily, 2019).

Lack of reliable and underutilised forensic investigative facilities could lead to many unresolved and poorly resolved cases, and negate the essence of the criminal justice system, that is, ensuring peace and fairness through justice and timely due process and valid evidence procedures. For example, the lack of forensic facilities has been linked to several unsolved murder cases in Nigeria (Nte, 2012). Table 1.2 shows some of these cases.

Table 1.2: Unsolved murders of some prominent Nigerians

S/N	Name	Date	Identity
1	Omololu Falobi	Oct 06, 2000	Founding Executive Director of JAAIDS.
2	Lai Balogun	Dec 01, 2000	A politician and Architect
3	Bola Ige	Dec 23, 2000	Former Minister of Justice
4	Dan Kemibagha	Dec 11, 2001	Counsel to Odi Youths in Bayelsa State
5	Monday Tambari	Dec 18, 2001	Leader, Rivers State House of Assembly
6	Odunayo Olagbaju	Dec 21, 2001	Member, Ogun State House of Assembly
7	Ade Awonus	Jan 07, 2002	Secretary to the Chief Justice of Nigeria
8	Janet Olapaole	Aug 13, 2002	PDP Leader in Ondo State.
9	Barnabas Abigwe	Sept 01, 2002	Former Chairman, NBA, Onitsha Branch.
10	John M. Agatutu	Dec 14, 2002	PDP Leader in Delta State
11	Isyaku Mohd	Dec 12, 2002	UNPP Party Captain

12	Joyce M. Fatai	May 03, 2003	Former Commissioner for Women affairs
13	Prof C. Ikoku	Oct 12, 2003	Former VC, University of Nigeria.
14	Lateef Olaniyan	Jun 03, 2005	Associate of Lamido Adedibu.
15	Jesse Anikwu	Jun 30, 2006	ACD Governorship Spirant
16	Godwin Aborokpo	Dec 19, 2006	Editor of This Day Newspaper
17	Segun Ananebi	May 30, 2007	Former CSO to Governor of Ondo State

Source: Nigeria Police Crime File (2018) and Weekly Spectator, cited in Nte (2012)

The cases shown in Table 1.2 are those involving prominent Nigerians only. There could have been many solvable cases, not only murders, that were not solved due to the unavailability of the facilities and subsequently underutilisation of forensic science methods for case investigation and court trial needs (Etin-Osa and Etin-Osa, 2019; Out and Elechi, 2018). In other words, criminal cases were closed, as they could not be tried as thoroughly as they should due to a lack of reliable evidence. Ladapo (2011) had pointed out that for crime investigations to be effective, there is a need to address this challenge of underutilisation of forensic science. More recently, Iorliam (2018) and Etin-Osa and Etin-Osa (2019) were also of the opinion that one of the benefits of using forensic science would be increases in solved criminal cases. Thus, inadequate forensic facilities in the NP and its consequences could, therefore, be very detrimental to the safety and peaceful coexistence of individuals and the larger society, given a) the increasing population and urbanization (Jiboye, 2011) taking place in the country, b) the rate at which certain crimes are also increasing and c) the reoccurrence of large-scale criminal activities – terrorism, insurgency, rape, kidnapping, drugs and substance among others.

Conversely, the availability of forensic science and its application in criminal investigations by the NP could have helped the Nigerian government in its previous and current efforts to curb and prosecute rape, kidnapping, theft, murder and drug abuse as well as financial misappropriation by the government officials and private individuals (Kasum, 2009). These are crimes that have been affecting the socio-

economic development of the country (Dada, Owolabi and Okwu, 2013). Similar arguments on the benefits of forensic science have also been voiced by several authors, including Ahunwan (2002), Okogbule (2006), and Obuah (2010) in their studies.

Indeed, there are potentially multiple applications of forensic science beyond 'conventional' crime investigations. For instance, a comprehensive biometrics database can be used to address illegal political practices like election rigging. It was noted in previous works (for instance, Omotola, 2010; Verjee, Kwaja and Onubogu, 2018) that some politicians manoeuvre themselves into various offices through election rigging in Nigeria. As another example, an up-to-date criminal database could enable criminal activity monitoring of specific crimes, specific people, and specific hotspots (Yu *et al.*, 2011; Wang *et al.*, 2013), thereby serving as a proactive effort of crime prevention.

Consequently, a question is continually raised as to what could have been responsible for not adequately utilizing forensic science by the NP despite its enormous advantages. Attempt to address this important question formed one of the justifications for this study, especially as the outcome may assist the police in overcoming the problem of inadequacy of forensic science. Solving the problem of inadequacy will hopefully translate into improving the hitherto disturbing crime trend in Nigeria.

1.3.2 Lack of reliable data on forensic science techniques used by the Nigeria Police

As could be understood from Section 1.3.1, forensic science application in a criminal investigation is not well established in Nigeria. Subsequently, there is a lack of reliable data on specific forensic science techniques used by the NP. What is

available are the limited published works that focused on issues related to forensic science in the country (Nte, 2012). For example, it is believed that criminal investigation is pivotal to the effective administration of justice (Ladapo, 2011) and that forensic science is a core tool in a criminal investigation (Kasum, 2009) in Nigeria. Unfortunately, neither Kasum (2009) nor Ladapo (2011) identified the available forensic methods used by the police, not to talk of their utilisation.

Motunrayo (2016) and, Aigbokhaevo and Iyamu-Ojo (2015) also emphasised that forensic science is a missing link in a criminal investigation in Nigeria and listed some types of forensic techniques. Other researchers argued for the consideration of human rights in the application of Disaster Victim Identification, an area of concern in forensic science (Motunrayo, 2016) and reformation of requirements for DNA testing in the Nigerian police work (Iyamu-Ojo, 2017). However, these researchers, that is, Aigbokhaevbo and Iyamu-Ojo, 2015; Motunrayo, 2016; Iyamu-Ojo, 2017, did not explore whether these types of forensic methods they talked about are being utilized by the NP. Indeed, out of 41 studies on different forensic science sub-disciplines related to Nigeria published between 2008 and 2017, which the current researcher was able to access (Table 1.3 and Appendix A are referred), none of them reported on what forensic science methods are available and utilized by the NP, the challenges in utilizing them, and how the utilization could be improved.

Table 1.3: Summary of published works on forensic science related to Nigeria

Discipline	**No. of Studies**	**Discipline**	**No. of Studies**	**Discipline**	**No. of Studies**
Forensic accounting	7	DNA	2	Toxicology	3
Ballistic	1	Anthropology	11	Soil chemistry	1
Fingerprints	3	Pathology	6	Psychiatry	1
Computer forensic	2	Odontology	3	Lip forensic	1

Sources: Google Scholar, ResearchGate, Emerald, and Academia accessed 1-13 June 2018

There is a negative implication with the lack of reliable data on the types of forensic science usable by the NP, as it could hinder efforts to strengthen the prominence of forensics and their benefits in Nigeria. For authorities and interested bodies to improve the state of forensic science service in the NP; there is a need to determine what techniques are on the ground, and how usable they are. This research, therefore, intended to determine the types of forensic science used by the police in Nigeria, and thus identify forensic areas that are useful for application in policing, which could serve as a point of reference and standard operation for the police and the government in criminal investigations.

1.3.3 The Nigerian police perception of forensic science needs to be better understood

Several studies have been conducted on different aspects of the police organisation in Nigeria. Examples of the previous studies include those on historical antecedents (Karimu and Osunyikanmi, 2012), nature and operation of the NP (Alemika and Chukwuma, 2003), police-community violence (Alemika and Chukwuma, 2000) as well as community policing (Ikuteyijo and Rotimi, 2012). Other studies have been conducted on state police and its implication in democratic dispensation (Innocent and Ogbochie, 2014), gender relations and discrimination in the NP (Alemika and Agugua, 2001). The problem of corruption and its effect on policing has also been studied (Alemika, 1999; Alemika and Chukwuma, 2004).

Owing to its importance, the issue of perception and police in Nigeria was also studied (Ajayi and Longe, 2015; Ikuteyijo, 2009; Obioha, 2004). However, the studies were largely about the public perception of the police. The perception of the police on the various aspects of their work were rarely studied. Particularly, the question of how

the police perceive the use of forensic science techniques in criminal investigation has not been addressed, even though it is the perception of players in an organisation (for example, police investigators in the NP) that shape organisational climate and make working environment effective (Armstrong-Stassen and Ursel, 2009; Wiesenfeld, Raghuram and Garud, 2001).

The type of perception, whether negative or positive, police investigators have on forensic science can influence how the methods are adopted and utilized during criminal investigations (Perugini and Prestwich, 2007). The lack of studies on this crucial issue is therefore surprising given the acknowledgment of the benefits that forensic science has to offer to police activities and the criminal justice system in general. The importance of police perception regarding forensic science and lack of studies on the subject therefore rationalized the conduct of this study. The study attempted to explore the perception of the Nigerian police officers on forensic science application in a criminal investigation.

1.3.4 Lack of studies on the Nigerian Police officers' forensic science skills

Another problem that justifies the conduct of this research is the lack of studies on the forensic skills of the Investigating Police Officers (IPOs) in Nigeria. Previous studies on the NP's competence and skills were seen in a general perspective (Alemika, 2008); in other words, police forensic skills and knowledge were not specifically researched. For example, studies that determined the frequency of forensic training among IPOs were not available. Most of the past studies were restricted to studying sociodemographic attributes as the basis for assessing police competence (for example, Chinwokwu and Igbo, 2017; Odedokun, 2015; Afolabi and Omole, 2011; Ladapo, 2011).

Looking at the previous studies, for example, Aremu's (2005) work on police credentialing, i.e. process of reviewing, verifying, and evaluating officers' credentials and competence. Aremu (2005) focused on how academic qualification, training, and other professional qualifications were related to the general career commitment of young police officers in Nigeria, but an attempt was not made to answer questions to do with forensic skills of the IPOs. Another example is Adebayo and Ogunsina (2014) who studied personality attributes, and their effect on job commitment of officers and men of the NP. Adebayo and Ogunsina (2014) did not, for example, explore whether the police have the required adaptability attribute which is an important component to having forensic science skills.

Alemika (2008) had earlier recognised the importance of forensic skills to the Nigerian police officers and went on to conclude that the police did not have training in handwriting, ballistic and fingerprinting analyses. However, the author did not support his position with any empirical data. It is not surprising then that Alemika (2008) called for the conduct of Training Need Analysis (TNA) of the police. TNA is a designed assessment of what the police personnel possess and need in terms of skills to perform their duties effectively (Alemika, 2008). Evidently, the few studies on police officers' competence did not address the issue of forensic skills. Hence, there is a need to assess through empirical study whether the IPOs in Nigeria possess the necessary skills to use forensic science; this is what the current study intended to do.

1.4 Research questions

Sequel to the discussions in the problem statement section, the following research questions were intended to be answered:

1. What is the socio-demographic profile of the IPOs in Nigeria?

2. What are the forensic disciplines and techniques utilized in NP criminal investigations?
3. What are the motivations of IPOs and organisational culture in the NP?
4. What adaptability traits do the IPOs in the NP have?
5. What is the perception of the IPOs on the application of forensic science in criminal investigations?
6. What are the challenges associated with forensic science application in criminal investigations by the NP?
7. Are motivation and organisational culture related to the utilization of forensic science in criminal investigations?
8. Are there differences between forensic science training and sociodemographic of the IPOs?
9. Is forensic science training associated with the adaptability trait of the IPOs?
10. Are there relationships between sociodemographic and perception of forensic science, when training is controlled?
11. Is there a relationship between the perception of forensic science and the adaptability traits of the IPOs?
12. Are there relationships between the perception of forensic science, motivation, and organisational culture?
13. Is there a relationship between the challenges of forensic science?
14. Could there be a model to explain the interrelationship among the variables of interest in this study vis-à-vis forensic utilization in the NP?

It should be stated that the first research question, that is, the question on sociodemographic profiles of the respondents, is purposely included in the questions

because sociodemographic variables play an important role in police activities as shown in the literature review section: Section 2.5.1. Thus, in this study, comparisons were made to understand how the variables could affect training and perception of forensic science among the respondents (See research questions 8 and 10).

1.5 Research objectives

The general aim of this study was to explore issues related to the application of forensic science in criminal investigations by the NP. The specific objectives were to:

1. Establish the socio-demographic profiles of the IPOs.
2. Determine the forensic disciplines and techniques used by the NP in criminal investigations.
3. Determine IPOs' motivation and organisational culture levels
4. Determine the adaptability trait scores of the IPOs.
5. Determine IPOs' perception of forensic science scores.
6. Examine the challenges associated with forensic science application in criminal investigations by the NP
7. Generate relationship links between motivation, organisational culture, and utilization of forensic science in criminal investigations.
8. Compare forensic science training among the sociodemographic of the IPOs.
9. Determine the association between forensic science training and adaptability traits of the IPOs.
10. Determine the relationship between sociodemographic and perception of forensic science, when training is controlled.

11. Determine the relationship between perception of forensic science and adaptability traits of the IPOs
12. Generate relationship links between perception of forensic science, motivation, and organisational culture.
13. Determine the relationship between the challenges of forensic science.
14. Create a model for assessing NP application of forensic science in criminal investigations

1.6 Research hypotheses

Corresponding to the objectives outlined above, this study formulated the following seven group hypotheses, which were tested via quantitative means:

$HG_0$1: There is no relationship between the availability of forensic science disciplines in the NP and the motivation of the IPOs and organisational culture in the NP.

$HG_0$2: there is no association between training on forensic science and sociodemographic characteristics of the IPOs.

$HG_0$3: there is no association between forensic training attendance and adaptability traits of the IPOs.

$HG_0$4: there are no perceptual differences of forensic science among the categories of sociodemographic characteristics of the IPOs while controlling the effect of forensic training attended.

$HG_0$5: there is no relationship between perception of forensic science and adaptability traits of the IPOs.

$HG_0$6: there is no relationship between perception of forensic science and motivation of the IPOs and organisational culture in the NP.

$HG_0$7: there is no association among the underlying challenges of forensic science utilization in the NP.

The study also put forward the following four themes that were investigated via qualitative means:

1. Forensic techniques in contemporary criminal investigations.
2. Rationales and opinions for not adequately utilizing forensic knowledge in criminal investigations.
3. Challenges in the application of forensic science in criminal investigations.
4. Prospects in the application of forensic science in criminal investigations.

These qualitative themes were meant to complement the quantitative aspect of the study to achieve data saturation. They were, therefore, developed based on the objectives of the study and guidelines provided by Castillo-Montoya (2016). The themes addressed issues related to the IPOs' awareness and usage of forensic science. Also, knowledge of the challenges, as well as the officers' views on the future of forensic science in the NP agency, were sought through the themes.

1.7 Scope of the research

This study has limited scope. Although the supposed subjects of the research are all IPOs in Nigeria, the actual respondents in the study consisted of sampled IPOs selected from one zone out of the 12 zones of the NP. The data were collected from the said respondents. Consequently, in interpreting the research outcome this fact must be borne in mind. It is nonetheless possible to interpret and perhaps generalise based on the validity of the parameters used in the analytical and statistical activities carried

out with the data. Notably, the NP is a federal institution administered and controlled by a central authority; all its zones likely share similar policing characteristics.

Also, survey responses can either be positive or negative depending on the respondents' state of mind at the time of conducting the survey. As a result, the findings of this study are relative but objective. The relativity is limited to the time of conducting the study but not to the subjects involved in the research, as the NP personnel are generally homogenous across the country.

1.8 Conceptual and operational definitions

This section presents definitions of some concepts that are key in this study. They are operationalised to help in understanding the central arguments and general contents presented in this thesis. The concepts are criminal investigations, forensic science, police reform, the preparedness of the Nigeria Police, perception, personality traits, motivation, and organisational culture.

1.8.1 Criminal investigations

A criminal investigation is a legally recognised process of gathering evidence of a crime that has been or is being committed (Brown, 2001), to establish or ascertain criminals and victims of a particular crime. According to Stelfox (2013) and Bennett and Hess (2000), a criminal investigation is the process of discovering, collecting, preparing, identifying and presenting evidence before a recognised tribunal to determine what happened and who is responsible.

Criminal investigation also involves gathering evidence to protect the occurrence of a crime. All traditional and modern methods of establishing a case or narrowing it down to a few specific suspects are part of criminal investigations. Thus,

forensic science is considered a tool in criminal investigation and that forensic criminal investigation is a process of investigating crime using forensic science knowledge and techniques.

1.8.2 Forensic science

Forensic science or forensics involves a systematic approach in examination, treatment and interpretation of material evidence from a scientific perspective with due consideration being given to legal requirements (Leung, 2006). It is conceptualized here as a group of scientific disciplines that are concerned with the application of their scientific area of expertise to law enforcement, criminal, civil, legal, and judicial matters, as defined by Prahlow (2010). Thus, all branches of forensics like forensic pathology, forensic odontology, forensic anthropology, trace evidence, forensic psychology, and forensic psychiatry; are considered as part of applicable forensic science (Cardinetti and Cammarota, 2005).

1.8.3 Police reform

Police reform refers to any designed effort by the police authority, government or any stakeholder in crime prevention and control to improve the working of the police (Bell, 2016). Hence, all planned attempts to ensure police effectiveness in discharging their duties, in terms of operations, having a fair investigative process and prosecutorial practices, as well as building cordial relationships with the public are part of police reform.