



Article title: Assessing the state of forensic support to criminal investigations in Ghana: A case study in the Greater Accra Region

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Keywords: criminal investigations, criminal justice system, forensics science, forensic support, fundamental human rights, Ghana, Justice delivery

**ASSESSING THE STATE OF FORENSIC SUPPORT TO CRIMINAL
INVESTIGATIONS IN GHANA: A CASE STUDY IN THE GREATER ACCRA
REGION OF GHANA**

ABSTRACT

Forensic science applications in criminal investigation are very profound to crime resolution. However, there is a wide gap between the application of specialist skills and public knowledge and awareness of forensic science in criminal investigations and it has generated complex practical problems in justice delivery in Ghana. The study attempts to assess the state of forensic support to criminal investigations by accessing public knowledge and perception of forensic science in Ghana. To this account, an elaborate and tortuous survey was conducted using 200 consented respondents in selected neighborhoods in Accra based on homogeneity, population density, economic or industrial activities, and the nature of crime and police activities. The survey included face to face interviews, questionnaire responding, and random phone calls. The final data which was subjected to a simple linear regression model were analyzed with STATA 13. The study revealed that indeed, forensic science in Ghana has "gone dark" as 165(82.5%) who had a formal education of various levels had very limited knowledge about forensic science and procedures. The majority of the respondents 179(89.5%) had no idea about forensics and for that matter lacked awareness of forensics in Ghana before the research while the state of forensics in Ghana was rated on the scale of good (10.5%), bad (81.5%) and very bad (8%) out of the 200 respondents with the respondent level of education, perception, knowledge, and awareness of forensic science and support significantly impacting the wellbeing of the research. The findings of this study call for government and respective stakeholders and policymakers of various institutions, and the adversarial system of Ghana to prioritize the need for forensic science. This is to support criminal investigations to assure the Ghanaian citizens of their safety, security, and fundamental Human rights to justice.

Keywords: *criminal investigations, criminal justice system, forensics science, forensic support, fundamental human rights, Ghana, Justice delivery*

INTRODUCTION

Forensic science is a branch of science (1) that uses scientific principles to investigate crime and solve matters at the court of law (2). The use of forensics to solve crimes has demonstrated magnificent success worldwide and has caused a great revolution to justice systems worldwide (1). The world presents a very great population of advocates of the use of forensics in solving crimes (3). Criminal activities are inevitable situations in our societies which can be explained based on different perspectives. Previously in Ghana, there had been different ways of solving crimes which were mainly orthodox. However, the year 1921 saw the creation of The Criminal Investigations Department (CID) of the Ghana Police Service (GPS) to grant technical support and improve crime solving through scientific approaches (4,5).

The CID of Ghana operates a crime (forensic) laboratory (6,7) and in addition to that, the department has a fingerprint unit located at the CID Headquarters which has been fully operational since 1922 (7). The Forensic Science Laboratory (FSL) is located at "Kawo Kudi" in Accra and it is the only forensic laboratory serving all the 651 police stations (5) across the 16 regions of Ghana. The CID laboratory is an ultramodern forensic laboratory, with five different units making it the first of its kind in West Africa (8).

Major findings from the Ghana police service and available literature informs us about the rate at which crimes have increased in Ghana. It, however, appears that the usual method of investigation by the GPS is seen by most citizens to be interrogating and interviewing victims, suspects, or witnesses at the crime scene and apprehending and incarcerating suspects without forensic procedures being applied (9). It is well noted that in rape case situations, there is some form of forensics however it is mostly depending on the status of victims and suspects for the case to be given adequate attention. In 2018, the exoneration of a convicted suspect, Mr. Emmanuel Asante

through a further forensic analysis at the FSL after he served 12 out of 15 years of his sentence for wrongfully being accused of raping and impregnating a student in Tamale (8) in 2006 informed the public about the importance of forensic investigation to justice delivery in Ghana.

Notwithstanding, there is limited scholarly research on forensic science to ascertain the state of forensic support to criminal investigations in Ghana hence the objective of the study was to assess public knowledge and perception of forensic science. It also sorts to ascertain from respondents their view of the state of forensic support to criminal investigations in Ghana. The study goes further to ask questions about the factors that influence people's knowledge and perception of forensic science in Ghana while discussing the emphasis of formal education on people's knowledge about forensic science.

METHODOLOGY

Study area

The research selected the Greater Accra region as the study area and specifically targeted Accra, Ashaiman, Tema, and Kpone Katamanso due to diversity, homogeneity, economic and industrial activities, and the nature of crime and police activities in these areas.

Study design, population size, and data collection

The study started after semi-structured interviews were conducted with personnel at the Forensic Science Laboratory (FSL) to acquire accurate information. The study considered 200 randomly selected respondents for an interview through a random survey with a questionnaire and random phone calls for five months. The Slovin's formula mathematically states that $n = \frac{n}{1 + ne^2}$. The sample size is represented by (n), the target population is also represented by (n), and (e) shows

the degree of freedom with a margin error of 0.05 indicating a confidence level of 95% (11), hence it was used to calculate the size of the study population.

Ethical consideration

Ethical consideration was granted by the CID Headquarters of Ghana to elicit accurate information from personnel at the FSL and the general public.

Data processing and analysis

The qualitative data was analyzed and transcribed while quantitative data was coded and analyzed and presented in graphs and tables with Microsoft office 16 software. A simple linear regression analysis was performed to understand the relationship between factors that influenced knowledge and perception about forensic science with (STATA (13)) computer statistical software package.

RESULTS

Socio-demographic characteristics and its influence on respondents

The sociodemographic characteristics of respondents had a great impact on the data gathered throughout the survey. Throughout the interview process, it was realized that respondents from the selected neighborhoods had different mindsets based on their present location at the time of study which influenced their perspectives towards the GPS. Respondents who participated in the study fell within ages ranging from 11-60 years with a male majority of 123(61.50%) and the remaining being females. The study made strides to avoid ethnicity or tribal biases by collecting responses from different ethnicities across Ghana including transborder tribes such as Hausa, Yoruba, Kotokoli, Gao, and Zabarma. Devoid of stereotype and discrimination based on previous

experiences or criminal records or history, respondents from every religion were taken into consideration and it was recorded that majority of respondents were Christians 136(68%) followed by 44(22%) Muslims while 20(10%) were considered as those from other religions.

The level of exposure was measured by how far respondents have reached in terms of education or their career experience and as expected the responses came from respondents across all levels and forms of education as 165(82%) were found to have attained formal education either at the basic level or higher-level education while 35(17.50) had been either engaged in informal education i.e. (apprenticeship) or other occupations. The extent of neighborhood disorder was measured considering what respondents perceived about their neighborhood. Items used to identify neighborhood disorder included rates of vandalism, state of abandoned houses, and state of delinquent gangs, state of drug dealing and drug abuse, and nature of the neighborhood (presence or absence of street lights, slums, and well-demarcated streets) as a whole. A few 12(6%) respondents who lived in more secured locations gave good accounts about the GPS and this was based on their sense of security, past or personal experiences with personnel in GPS, and their place of residence. Aside from the positive remarks about the GPS, only 11(5.5%) respondents reported having ever contacted the police for forensic support. The remaining 189(94.5%) respondents did not hesitate to regard criminal investigations conducted by GPS as deficient of forensic procedures in their neighborhoods as shown in (Table 3).

Public knowledge and perception of forensic science in Ghana

The data (Table 2) shows that forensic science is very unpopular in the country because about 179(89.5%) of the respondents were not aware or had no knowledge about forensic science and procedures until the researcher's brief introduction before the interview. This category of the

research population was not even aware that forensic procedures included assessing fingerprint through their biometric ID cards for forensic analysis in crime labs. For those who had an idea or knowledge about forensics, most of them had their source of knowledge mainly from Television series and documentaries with only a few acquiring the knowledge from academic papers and classroom or formal education. It was however realized that, across the data, respondent's area of interest in terms of education had a great influence on their understanding of the subject of research previously or just before the interview. Upon carefully analyzing this category of the population, 34(17%) respondents were identified as either practicing or interested in law programs. The results of the study showed that 3 respondents had a fair knowledge about forensics while the remaining 31 had limited or no idea. On the other hand, 77(38.5%) respondents were either involved or interested in science-related programs and the majority of these respondents were identified as undergraduates or doing postgraduate studies or research. It was revealed that 38 out of the 77 respondents had a fair knowledge about forensic science and its importance in crime-solving either from movies, documentaries, or from scholarly literature while 39 had either limited or no knowledge from similar sources.

Specific questions were used to ascertain the respondent's perceptions about the GPS. Without hesitation, all the 200(100%) respondents answered positively to the question "*Are you aware that GPS is responsible for law enforcement in Ghana?*". Even though all respondents were aware of the great responsibility shouldered by the GPS, 188(94%) had a bad perception about GPS and most of the responses were allegedly attributed to prejudice, ineffectiveness caused by bribery and corruption, poor level of education in the police department, poor police training and other issues regarding institutional trust. Out of the total sampled population, 141(70.5%) respondent's answers were greatly influenced by the bad perception they had about GPS at the time of the study. The

remaining 59(29.5%) respondents were made up of the 47 with negative perception about GPS alongside 12 of those with positive perception about the GPS. This group were however optimistic about the fact that things will change for the better in one way or the other with time hence they had no reason to respond based on their negative perception about GPS.

Even though most respondents 123(61.5%) had little or no knowledge about forensic, in the course of the study they were able to tell and distinguish normal police investigative procedures from forensic procedures and make judgments to create a distinction based on their experiences and encounters with criminal investigations conducted by GPS as shown (Table 1). Respondents upon realizing the need for prioritizing forensic science in the country, most of them were generally impressed about forensics science and linked it with the crime-solving situation in Ghana. All respondents agreed that forensic science is a crime-solving tool and forensic evidence can help prevent delay in justice delivery and justice miscarriage. However, the study identified 26(13%) of the selected population agreeing that forensic science does not or will not always provide positive results as they kept emphasizing professionalism, privacy, and ethical issues relating to the handling of evidence samples and manipulation of results. Most of the respondents linked their responses to the fact that there are numerous unsolved crimes in Ghana which will continue to remain the same simply because of some “untouchables” (12–14) in society. Based on respondent's own experiences, perspectives, and education acquired during the study, respondents made their general impressions about the state of forensic support to criminal investigations in Ghana. Their ratings were based on a liked scale as follows; good 21(10%), bad 163(82%), and very bad 16(8%) (Figure 1).

Table 1: Respondents perception about forensics science

Bad Perception	Frequency	Percentage %	Cumm.
Yes	141	70.50	70.50
No	59	29.50	100.00
Total	200	100.00	

Table 2: Respondents knowledge and awareness of forensics before the interview

Forensic awareness	Frequency	Percentage %	Cumm.
Yes	21	10.50	10.50
No	179	89.50	100.00
Total	200	100.00	

Table 3: Respondents view on criminal investigative procedures

Forensic procedures	Frequency	Percentage %	Cumm.
Yes	11	11.50	11.50
No	189	94.50	100.00
Total	200	100.00	

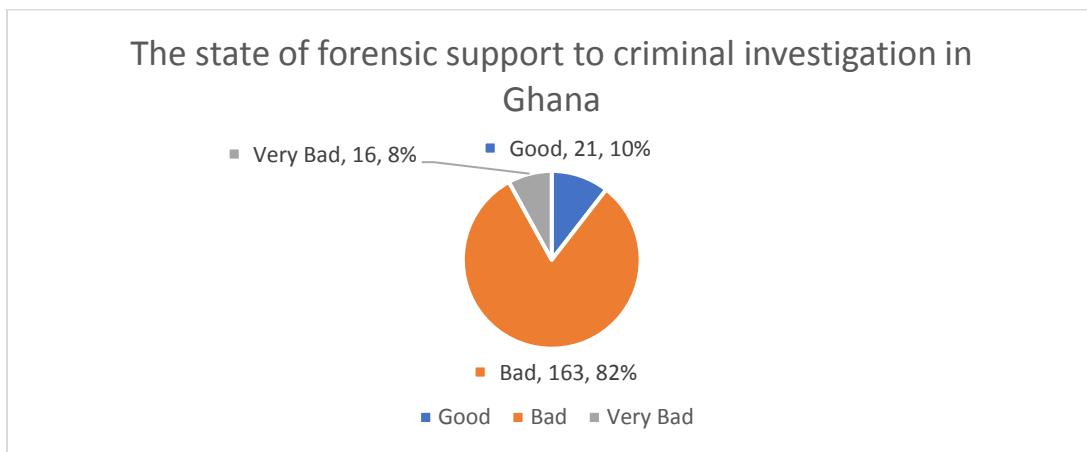


Figure 1: Respondents general rating on the state of forensic support to criminal investigations in Ghana

Source: Field survey, January 2019

Simple linear regression analysis

Factors affecting knowledge and perception of forensic science and support in Ghana

The data gathered across the selected neighbourhoods was used to understand the social reality by subjecting the qualitative data to a simple linear regression analysis as shown (Tables. 4, 5) based

on the model represented with the formula; $y = \beta_0 + \beta_1 X + \varepsilon$ where; y is the predicted value of the dependent variable (y) for any given independent value. B0 is the intercept which represents the predicted value of y when x is 0. B1 is the regression coefficient which explains how much we expect y to change as x increases. X is the independent variable that is expected to be influencing y while ε is the error or measure of the variation of the estimate.

Responses were coded as variables that influenced each other and were explained based on how strong the relationship between the dependant variables and the independent variables were. The analysis conducted gave estimates of how the perception and knowledge of forensic science (dependent variables) change as the independent variables change with time and how it influenced the state of forensic science in Ghana. The analysis was measured based on a good explanatory power of; (Prob > F = 0.000) with R-squared of 83.65% and (Prob > F = 0.000) with R-squared of 23.13% for public perception and their knowledge about forensic science respectively.

Table 4: Public perceptions about forensic science

Variable	Coefficient	Std. Err	P> t
Forensic support	0.4964937	0.1051249	0.000***
Education	0.0139064	0.0188191	0.016**
Perception about GPS	0.2119617	0.1078402	0.051**
Forensic knowledge	0.2326804	0.0802048	0.004***
Age	-0.0025261	0.0028408	0.375
Constants	-0.1725395	0.0866967	0.000

Number of observations = 200; Prob > F = 0.000; R-squared = 0.2313

Table 5: Public knowledge of forensic science in Ghana

Variable	Coefficients	Std. Err	P> t
Level of education	0.069713	0.0152084	0.000***
Gender	-0.0833836	0.0314951	0.009
Religion	-0.0408629	0.072541	0.574
Ethnicity	-0.0110485	0.0134383	0.412
Perception (forensics)	0.0560321	0.0222873	0.013**
Forensic support	0.845126	0.0513649	0.000***
Source of knowledge	0.1204083	0.0077182	0.000***
Perception (GPS)	0.1223348	0.0161785	0.000***
Constant	0.0757172	0.0962525	0.432

Number of observations = 200; Prob > F = 0.000; R-squared = 0.8365

Note: *, ** and * implies significance at 1%, 5%, and 10%, respectively.**

Prob > F – The F-value is the Mean Square Model (2385.93019) divided by the Mean Square Residual (51.0963039), yielding F=46.69. The p-value associated with this F value and how small it is tending to answer the question “Do the independent variables reliably predict the dependent variable?” while R-Squared measures the overall strength of association.

Source: Field survey, 2019

DISCUSSION

To develop and maintain progressiveness in terms of solving crime, the study attempted a bigger problem by breaking it into smaller pieces with intentions to scale up in the future. The study based on prior knowledge acquired based on surveys and interactions with key stakeholders to select the use of forensic science to solve crimes and in Ghana as an imminent solution to administer justice. Responses collected across the total target population explained respondents understanding about the reality surrounding them indicating that they are the right people to solicit information from (15). The study's null hypothesis assumed that there was no significant relationship between respondent's general perception or knowledge of forensic science and other independent variables. However, based on the analysis in (Table 4,5) the null hypothesis can be ignored based on the levels of significance recorded at 1% and 5% with key independent variables.

Upon analyzing the data in (Table 4) the perception of respondents tends to be increased positively as all the independent variables increase positively with time. All independent variables were found to significantly influence the perception people had about forensic science (Table 4) at the time of study except the age of respondents which explains that younger respondents tend to have positive perceptions about forensic science which is as a result of the correlation between age and their level of education which significantly affected their knowledge about forensic science (Table 5) at the time of the study. Perception about forensic science is a very important aspect of understanding the concept of forensic science (16) as in some cases forensics science has done a great deal of serving social justice (17) while denying others in one way or the other (8) elsewhere.

According to the Encyclopedia of Criminology and Criminal justice, people may derive their conclusive perceptions whether negative or positive based on the outcomes of forensic procedures

and what they might have heard about forensic science (18). Other people have their perceptions about forensic science which in most cases tends to be positive based on what they normally see on TV and documentaries commonly known as the Crime Scene Investigation (CSI) effect (19), which yields unrealistic expectations. Forensic science has brought tremendous effect to the area of crime-solving but, what most people do not know is that some issues or situations go beyond forensic science. It is no doubt that elsewhere people's perceptions about forensic science are based on unsupported assumptions and exaggerated claims which do not exist anywhere in forensic science.

In Ghana, issues of institutional trust concerning the GPS and the general public has been addressed by (10) and it is considered as very sensitive issue which needs redress. The extent of this sensitivity was felt as respondents were informed about the GPS operating the state's forensic unit. Apparently, the negative sentiments about the GPS is a reality and the issue with poor and under resourced criminal investigations in Ghana has gone beyond institutional trust. The Managing Editor of the Insight Newspaper Kwesi Pratt Jnr proclaims after his office was burgled *"With all the unsolved crimes in Ghana what would mine do? I don't want to waste my time...It's not a question of trust, it's a question about track records with investigations if you want I can give you the long list of unsolved crimes..."* (20). These situations are not so new in the system as De'lemont mentioned in his work in 2014 that forensic science and crime solving procedures are influenced by many actors which includes physical, intermediate and criminal environments and it is likely that social actors will be involved in the final decision making. It is obvious in (Table 4) that positive perceptions about forensic science can be achieved if the public is positive about the GPS and their operations but the reality on grounds is that others feel that the FSL is going to reflect ineffective services as the GPS is presumed to offer based on respondents point of view.

All four neighborhoods had respondents who had bad perception about the GPS which significantly affected the negative response they all gave regarding forensics in Ghana.

Forensic knowledge and awareness and perception are significantly influenced by respondents level of education (Table 4,5) and it is very clear and explainable that education tends to expand the faculties (22,23) of individuals. As it stands there is presumably a higher chance of individual respondents coming across information regarding forensic science in their educational journey or as they climb higher the ladder of education because it is no doubt that people's perceptions about a phenomenon can be measured based on their level of education (23).

Another influential factor is that in Ghana, students at the tertiary level are allowed to use mobile phones and laptops to facilitate learning. Based on the fact about the data collected a good number of those who had an idea about forensic science were tertiary students and most of them had their knowledge of forensics science from movies and documentaries. The findings further assert that an improvement in watching crime-related movies and documentary will expose more people to forensic science and forensic procedures. Nonetheless the effectiveness of forensic procedures as informed by (21) is not actually what popular trends on movie series and documentaries present to us but is rather found in literature, crime laboratories and the court of law where the cycle of criminal justice ends.

The respondent's level of education, the state of forensic support, perception about forensics in Ghana, the general perception about GPS, and where respondents obtained their knowledge about forensic were found to have significantly impacted respondent's knowledge, perception, and awareness of forensic support to criminal investigations (Table 4,5). The study described forensic support to criminal investigations as a force that will contribute to the massive reduction of

numerous blanketed crimes, wrongful convictions and exonerations (25), and emerging and existing crimes such as kidnapping (26), rocketed rate of cybercrime (27), misled court decisions regarding sexual assault (28), the list of unsolved murders (29), and many other crimes in Ghana. Forensic support to criminal investigations significantly influences respondents knowledge about forensics as it is clear from the data (Table 5) but it was more surprising to find respondents who were very much aware of the rate of cybercrime in the country (27) but were clueless about measures of apprehending cyberfraudsters (30) until they were educated about the importance of forensic science in cybercrime and security.

While interviewing respondents, they were probed further for their views on how they see crime solving and the impact of forensic science based on their perspectives. The views came from different angles with religious, cultural, and contemporary perspectives. Comments recorded from respondents include *"I would willingly give out my biological sample if I know the purpose"*. A respondent who was a renowned Islamic scholar at the time of the study also said *"our sacred scriptures teach us about serving justice even if it is against ourselves, I do not want to be a part of justice miscarriage because justice denied is an offence. Any authorized personnel from the Ghana Police Service will be allowed to collect my biological data for DNA extraction, analyze it to solve a crime situation, and grant justice"*. Some respondents were very keen on how cultural beliefs influenced the shaping and direction of their views on crime. A specific comment passed by a respondent was *"there should be no compelling reason for me to take such an action because in the first place I will not involve myself in any crime"*. Others had doubts about the success of forensic operations and claim the professionalism and credibility of practitioners have been greatly affected by political influence in Ghana so how different is forensic science? (31) assert that for

the general populace to get a better understanding of forensics science, then the elementary actions of investigation and processing of evidence as well as judicial processes must be improved.

Forensic science as an effective tool to achieve sustainable development goal

Sustainable development goal (SDG) 16 promotes democratic governance for peace, security and rule of law, protection of fundamental human rights and inclusive societies and it has a link with all SDGs and it is a vital precursor for economic development (32). The findings of the study show that there are millions of vulnerable people in Ghana who have been denied their fundamental human rights simply because of wrongful convictions and investigations and lack of resources for the investigation of sophisticated crimes (33).

Over the years there have been a very poor relationship between delivering justice and solving crimes such as burglary, cybercrime corruption, document fraud, murder, sexual and physical assault, familial and litigious issues even though Ghana's adversarial system has adopted forensic science in their mode of operation. Real perpetrators of crime mostly are allowed to walk on the streets of Ghana freely because of inadequate resources or substantial evidence to put them to justice (12–14) and that tends to put the next innocent victims at risk. The daunting effect of this poor system is seen in the underdevelopment occurring in various sectors of the state's economic growth and progress even though strides and prudent measures are being implemented continuously.

The recent spike in crime rate is more likely to be attributed to the poor criminal justice system in the future if profound measures are not adopted to curb crimes in Ghana. As Ghana intends to achieve SDG 16, it is imperative to enforce forensic science which is globally known as an

effective tool for justice delivery (34). The burden of social justice should not be forgotten hence people involved in criminal activities should be brought to justice.

CONCLUSION

In conclusion, the cost of security might be overwhelming outrageous in a developing country like Ghana and it might not seem so easy shifting from the old methods of doing things, however, it is worth spending more Ghana cedis on improving forensic science if we still believe in the fundamentals of freedom and justice. Based on the findings of this study, the state of forensics in Ghana is deplorable and that may present peculiar difficulties in the future looking at the unpredictable increase of crime rate in the country. Crime in Ghana nowadays are being committed through sophisticated ways and the study makes it obvious that if perpetrators of such crimes are not identified and brought to justice through sophisticated technology such as forensic science then they are being rewarded because they will always get away with crimes easily.

The study identified the lack of awareness of forensic science amongst the Ghanaian population including the elite and non-elite of the society and more fascinatingly, some security personnel notably private security guards and Motto Traffic & Transport Department (MTTD) of the GPS. The study mentions that education is a vital precursor of knowledge acquisition and it must be leveraged to tackle the issue of advocacy and awareness about forensics in the country.

The study makes it clear that as part of maintaining law and order, forensic science must be used to curb impunity in Ghana so that criminals will know that they cannot commit a crime and go free. Practically, the findings of this study can serve as springboards for the Government of Ghana and respective stakeholders to make improvements in forensics, general policing practices and

strategies to protect the lives of people and ensure that justice is served because the opportunity cost of not investing in forensics is real and significant.

POLICY RECOMMENDATION

It is paramount that the Government of Ghana, GPS, and all respective stakeholders should consider their involvement in ensuring national security is key hence the study recommends firstly that law and order must be heavily enforced in Ghana. Similar comparative and relative studies must be conducted in different regions of the country to update the general populace about the status quo of forensic support to criminal investigations. The recidivism effect is very real hence, the creation of specific forensic databases will be a great step to identify and apprehend perpetrators of specific crimes with hopes of a national database in the future. Funding of forensic research, offering scholarships and academic grants to students interested in forensic careers, the establishment of forensic education and outreach programs, instituting a government recognized forensic society of Ghana, and media advocacy are excellent suggestions for a progressive change in the area of forensic science in Ghana.

The inclusion of aspects of forensic science in the educational curriculum from basic school to the higher-level education of Ghana will enhance the awareness and knowledge about forensic science. Hospitals and research laboratories that are of a good standard must be refurbished and equipped with resources that will aid in forensic analysis to serve as a means to fast-track forensic operations and minimize case backlog due to the overreliance on only one forensic laboratory. Ghana needs a local forensic science and criminology institution to groom people interested in crime-solving careers with both local and exotic crime-solving techniques to help solve crime in our Ghanaian setting and beyond. Furthermore, the establishment of forensics programs in more

of Ghana's tertiary institutions will not only be a cutting-edge innovation but as a problem-solving initiative by increasing the number of forensic expertise nationwide. The Ministry of Interior should make efforts to maximize the autonomy within the GPS and FSL with the call for an independent forensic science department in Ghana being considered as a major priority. Forensic science should be considered as a priority because a nation without peace and justice institutions, human rights, and effective governance through the rule of law cannot boast of proper security, sustainability, and prosperity.

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