Population density and armed robbery in Nigeria: an analysis of variation across states

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Abstract

The occurrence and rate of crime in a society are often associated with factors such as unemployment, urbanization and the strength of law enforcement. In Nigeria, very little is known about the association between population density as an independent variable and the frequency and rate of crime. This study sought to address this puzzle. Data on reported cases of armed robbery and populations across the states of Nigeria in the year 2006 were analyzed using Pearson's correlation and multiple regression analysis. The study shows statistically significant variation in the occurrence of crime across the states with Southern states recording more crimes and higher rates than Northern states. Population density was found to be a predictor of the volume of crime, but not the rate. The spatial analysis further shows that proximity to major cosmopolitan states may be a factor that contributes to the rate of crime in the country. The paper recommends the creation of a national database in order to address the problem of anonymity and put crime under control in the country.

Key words: Crime rate; anonymity; heterogeneity; inter-state variation; cosmopolitan state.

Introduction

Crime, described here as the breaking of prohibitory laws, to which legitimate punishments are attached (Scott & Marshall, 2005) is a major social problem from which no known society is immune. In one of the earliest works with focus on the relationship between population density and the incidence of crime, Simmel (1905) theorized that the intensification of nervous stimulation that results from high population density in cities results in different forms of behaviors that negate the norms guiding behavior. Put differently, high population density contributes to delinquency and crime in society. The primary concern in this study is to explore the relationship between population density, which is a key indicator of the level

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of urbanization in a particular area, and the incidence and rate of crime in such an area.

Researchers, the world over, have explored different dimensions of crime, including types, trends, patterns, processes, causes, consequences and correctional approaches. Few of the most recent of these studies were reviewed to show what is known about the relationship between population density and crime across the globe in general and in Nigeria in particular. A study shows that property crime rate and population size are related but population size has no correlation with violent crime rates (Nolan, 2004). Harries (2006) on the other hand found violent and property crimes to be correlated with population density. Another study by Baltagi (2006) shows that although crime rates tend to increase with population density, the correlation is not significant. Yet another study suggests that violent and property crime rates are positively associated with percentage of commercially zoned areas, percentage of one-person household and unemployment rate (Kepple & Freisthler (2012).

Other studies have revealed findings of different shades on the subject matter including one by Chamlin & Cochran (2004) which concludes that population size (not density) is a strong predictor of violent and property crime counts; and another by Christens & Speer (2005) which argues that population density is among the most significant negative predictors of violent crime per capita (Christens & Speer, 2005). Studies have also attributed crime to other factors such as unemployment (Edmark, 2005; Andresen, 2006; Omotor, 2009; Hassan *et al*, 2012); absence/presence of tree canopy (Troy *et al*, 2012); presence of young populations (Andresen, 2006); combination of industrial/commercial land use with household dwellings (Shopeju, 2006); urbanization, weak criminal justice system and negative role models (Hassan *et al*, 2012).

One study has demonstrated that there is regional variation in rates of personal crime in Nigeria with the North-East having the highest rate and the South-West having the lowest rate. In addition, the study shows that the urban areas have higher rates of crime than the rural areas (Ikoh, 2011).This study seeks to solve the puzzle on state and regional variation in armed robbery cases in Nigeria. In a recent study in Nigeria, Omotor (2010) argued that population density is positively correlated to all forms of crime. The current study also seeks to interrogate this assertion by exploring the association between one form of crime, armed robbery and population density in a given year in which census was conducted in Nigeria. This takes away the need for projections which come with errors.

Theoretical background

Emile Durkheim's (1893/1984) ideas provide a theoretical background to this study. Durkheim argued that the inevitability of crime is connected to the

heterogeneity of population in modern societies. Using the concept of anomie – a state in which the social norms, values and customs have broken down, and there exists norm and role confusion – he explained how social forces create an environment where crime is bound to occur. Durkheim attributed anomie to the shift from rural society to an urban one. He described the type of social solidarity that characterizes a rural society as mechanical solidarity. Within the rural social setting, there is homogeneity of norms, values, beliefs, traditions, and there exists a collective conscience. In the modern urban setting on the other hand, there is an organic solidarity in which the people are different and interaction is characterized by division of labor. Since people are different, they go about meeting their needs using different methods and some of them perceive crimes as options available to them to meet these needs. Based on this explanation, it can be argued that the disorganized urban areas are the breeding grounds of crime because the people lack legitimate opportunities to achieve socially approved goals through socially approved means.

If there is gap between the people's desired goals and what the economic and political realities allow them to achieve, the result is a state of normlessness or anomie. In the context of this study, I argue that the urban setting in Nigeria brings into close proximity affluence and poverty. Many of the people who live their daily work lives in urban centers live their night lives in working class satellite or suburban slum neighborhoods within those states or in neighboring states due to the high cost of accommodation in the middle-class residential urban areas. For instance, many poor people who work in Abuja live in neighboring Nasarawa state while many people who work in Lagos live in neighboring Ogun state. Many of the cities in Nigeria are home to very affluent people and their show of affluence may influence the taste of the poor around them. The implication is a population of poor people who are exposed to the taste of the rich without having the resources of the rich. If these poor people are not able to become affluent legitimately, they may resort to robbery to acquire money and/or other forms of wealth. By implication, this leads to a high crime rate in states that are urban and those proximate to major cities where a measure of organic solidarity is evolving. This study hypotheses that in states with a high level of urbanization as measured by population density and those that are close to them, a high rate of crime may be observed than in other less urban states.

Methods

Data

This study made use of data retrieved from the 2006 population and housing census and the crime statistics made available by the Nigeria Police Force to the Nigerian Bureau of Statistics (NBS). Data on population, crime statistics and land area were sourced from NBS's Annual Abstract of Statistics, 2009. The indicator of incidence of crime employed is armed robbery and the year in focus is 2006. Data are available for all the states of the federation on robbery for that year and actual population figures are also available. Thus, projections were not needed. The data were processed using SPSS. The statistical test employed at the bivariate level

is the Pearson's correlation while the multivariate test employed was the multiple linear regression analysis. To determine the fit of the regression model, the ANOVA statistic was employed.

Measurements

Population density was computed as number of persons per square kilometer using the formula: $\frac{Total\ population}{Land\ area\ in\ square\ km}$.

Crime rate was measured as number of robbery cases reported per 100,000 persons in the population. To compute this, the formula stated below was employed. $CR = \frac{Cases\ of\ armed\ robbery}{Population} \times 100{,}000$.

Results

In Table 1, the land area of Nigeria, the 2006 population, reported cases of armed robbery, and the computed population density and crime rate per 100,000 persons are presented for the 36 states of the federation and the Federal Capital Territory (Abuja).

Table 1: 2006 Indicators of population density and armed robbery in Nigeria

State	[a]Land area (km^2)	[b]2006 Population	[c]Population density	[a]Reported cases of robbery	Crime rate (per 100,000 persons)
Abia	1914.06	2845380	581	97	3
Adamawa	15117.19	3178950	82	106	3
Akwa Ibom	2695.31	3902051	566	51	1
Anambra	1900.39	4177828	859	125	3
Bauchi	19187.11	4653066	95	51	1
Bayelsa	3538.67	1704515	188	51	3
Benue	12031.25	4253641	138	32	1
Borno	28362.89	4171104	57	61	1
Cross River	8510.55	2892988	133	134	5
Delta	6682.81	4112445	240	121	3
Ebonyi	2500.00	2176947	340	62	3
Edo	7494.92	3233366	169	163	5
Ekiti	2123.05	2398957	441	36	2
Enugu	2942.97	3267837	434	44	1
Gombe	6679.69	2365040	138	22	1
Imo	2065.63	3927563	743	172	4
Jigawa	9096.48	4361002	187	23	1

Kaduna	16594.14	6113503	144	55	1
Kano	7921.88	9401288	464	56	1
Katsina	9203.52	5801584	246	55	1
Kebbi	14447.27	3256541	88	30	1
Kogi	10838.67	3314043	119	57	2
Kwara	13947.27	2365353	66	20	1
Lagos	1433.98	9113605	2483	300	3
Nassarawa	11224.61	1869377	65	131	7
Niger	26923.83	3954772	57	43	1
Ogun	6406.25	3751140	229	166	4
Ondo	6179.69	3460877	219	70	2
Osun	3525.78	3416959	379	31	1
Oyo	10351.56	5580894	211	194	3
Plateau	10604.30	3206531	118	43	1
Rivers	4130.86	5198716	492	138	3
Sokoto	10869.14	3702676	133	21	1
Taraba	21985.16	2294800	41	38	2
Yobe	18206.64	2321339	50	24	1
Zamfara	14816.80	3278873	86	39	1
FCT(Abuja)	2971.48	1406239	185	48	3

Sources: a – National Bureau of Statistics, 2009;
b – National Population Commission, 2009;
c – Computed

Population density ranged from about 41 persons per square km to 2,483 persons per square km in the country. All but one of the states in the South-Eastern part of the country had 400 persons per square km. In the zone, Anambra had the highest density (859 persons per square km). Next in density to Anambra was Imo state with about 743 persons per square km. The only state with a relatively low density of 340 persons per square km in the South-East region was Ebonyi state. In the South-South region, Akwa-Ibom had the highest density (566 persons per square km. Rivers state also had a high population density of about 492 persons per square km. All other states within the region had densities of between 100 and 399 persons per square km. The state in the region with the least density was Cross River with a population density of 133 persons per square km.

In the South-West, Only Lagos and Ekiti states had densities of 400 or more persons per square km, with Lagos recording the highest density (2483 persons per square km) in the whole country. In the North-West zone, and in the whole of the north, Kano recorded the highest density (with 464 persons per square km). The North-East zone had the states with the least densities with only one state (Gombe) having a density of more than 100 persons per square km (138 persons per square km). In the region and in the whole of the country, Taraba recorded the least population density (with 41 persons per square km). In the North-Central

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zone, only Plateau state recorded a density of more than 100 persons per square km.

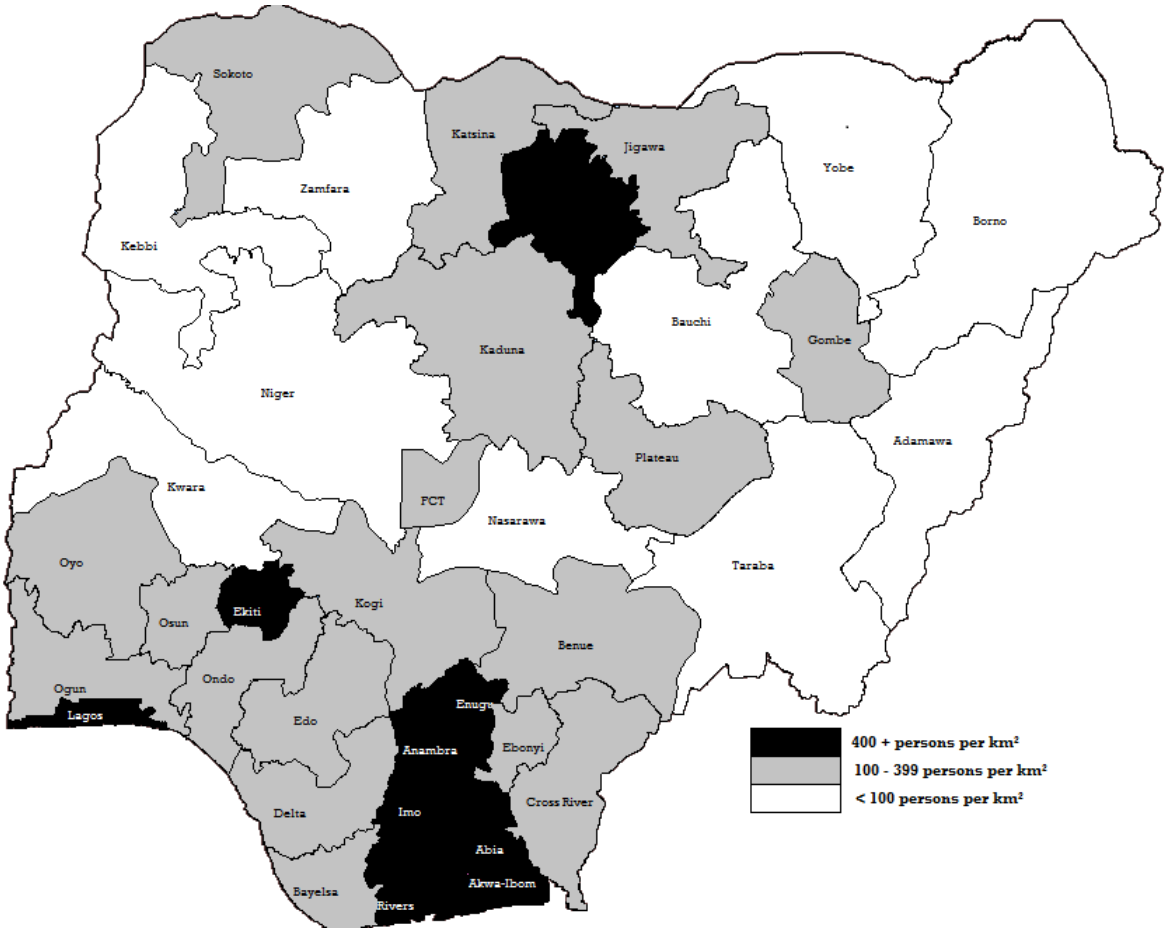

Table 1 shows that Lagos state had the highest number of reported cases of robbery (306) in the year. Other states with high cases of robbery include Oyo (194), Imo (172), Ogun (166), Edo (163), Rivers (138), Anambra (125) and Adamawa (106). Kwara state had the least (20) number of reported cases of robbery in the same year. When rates of robbery (that is number of cases of robbery per 100,000 persons) were considered, the state with the highest rate was Nasarawa, with about 7 cases of robbery per 100,000 persons. This is followed by Cross River and Edo with the rate of 5 cases of robbery per 100,000 persons each; and Imo and Ogun states with the rate of 4 cases of robbery per 100,000 persons each.

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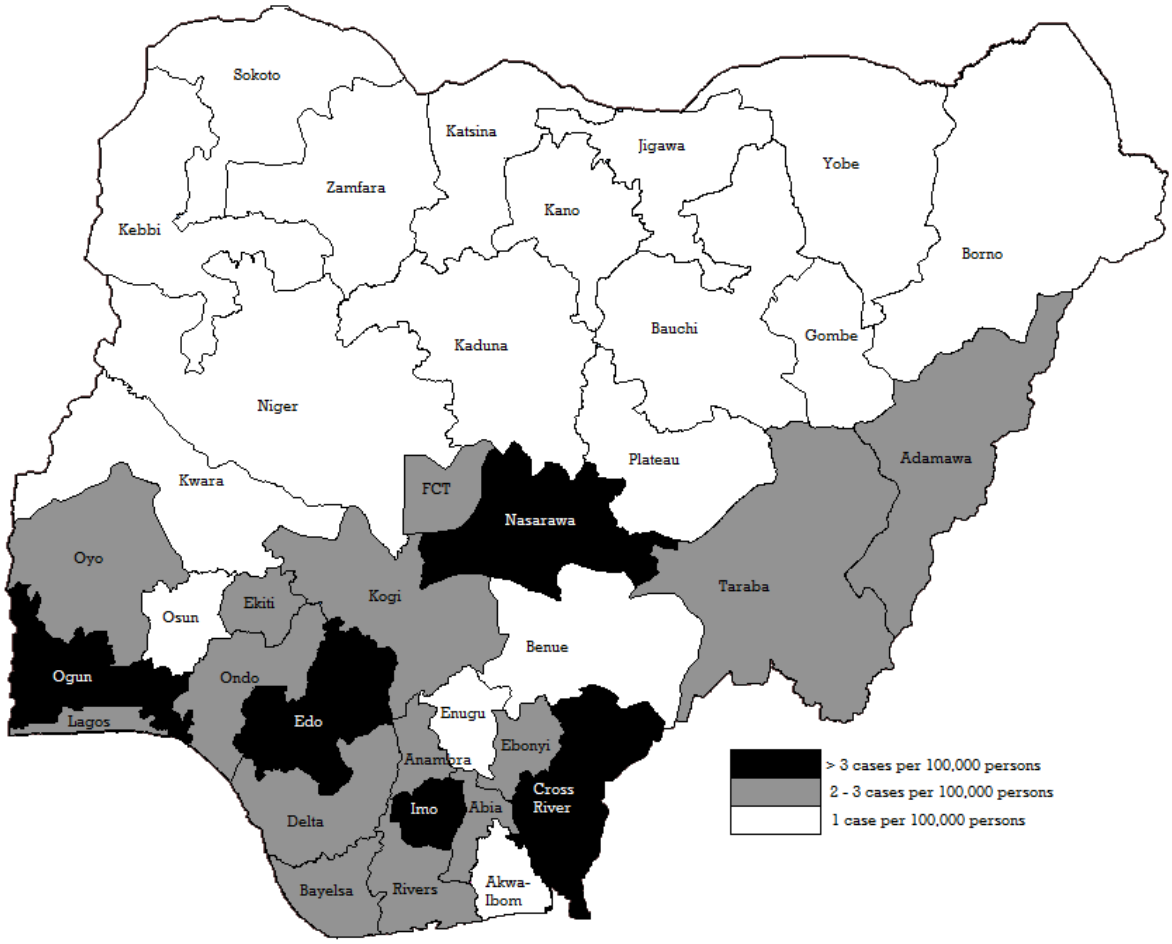

A spatial analysis of crime rates in the country suggests that high crime rates were somewhat localized within the Southern regions of the state, the only exception being Nasarawa which in fact has the highest rate of crime of 7 cases of robbery per 100,000 persons in the country. The data show that among the states with very high crime rates of more than 4 cases of robbery per 100,000 persons, only Imo had a high density of more than 400 persons per square km. The other dark spots (that is Cross River, Edo, Imo and Ogun) recorded moderate densities of between 100 and 399 persons per square km. It should be noted however, that the state with the highest rate of crime (Nasarawa) also had a very low population density. Statistical tests show that there is no significant correlation between population density and crime rate.

Bivariate correlation tests suggest that population density and population size are correlates of reported cases of armed robbery (p-value < 0.01 in both cases) as shown in Table 2. Further tests were conducted at the multivariate level using the regression analysis. As shown in Table 3, population density remained a significant predictor of cases of robbery (p-value < 0.001). The Regression model accounts for 44.5 percent of change in cases of robbery in the country as shown by the R Square value of .445 in Table 3. The ANOVA statistics summarized in Table 3 also show

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that the model is acceptable for the prediction of cases of robbery with an F statistic of 13.603 (p-value = 0.000).

Table 2: Summary of Pearson's correlation tests

	Independent correlates	
Dependent variable: Reported cases of armed robbery	Population density	Population
Pearson's Correlation	.664**	.421**
P-value	.000	.009
N	37	37

Table 3: Multiple Linear regression model for number of crimes reported in a state

	Unstandardized Coefficients		Standardized Coefficients		95.0% Confidence Interval for B	
	B	Std. Error	Beta	Sig.	Lower Bound	Upper Bound
Independent variables						
Constant	40.306	19.852		.050	-.038	80.650
Population size	.000002723	.000	.075	.628	.000	.000
Population density	.093	.023	.622	.000	.046	.139

ANOVA F = 13.603 (p-value = 0.000); R = 0.667; R^2 = 0.445

Discussion

Population density is associated with the incidence of crime, but not with the rate of crime. According to Shopeju (2006), increased interactions and anonymity contribute to crime by making detection difficult. With population density comes less in-depth knowledge of the people we see and interact with as we have in many urban areas today. One recent study suggests that crime is a major problem in urban areas (Hove & Ngwerume, 2013). Contacts with people in this environment are largely impersonal, superficial, transitory and segmental (Wirth, 1938). The result is increased anonymity. A large proportion of people in high density settings are not known to those around them because everyone becomes engrossed in the daily battle for survival and very little time is left for in-depth interaction and

getting to know one another. The problem of anonymity is further heightened in a country like Nigeria by the absence of a database that has information on citizens. The country does not have a comprehensive database on its citizens. Many births and deaths remain unrecorded and movements across the borders of the federation are difficult to monitor. Movement across state boundaries within the federation is virtually not documented.

All these contribute to a situation where people do not know their 'neighbours' and the next door neighbour may just be a criminal. Since the high level of anonymity in the country reduces a criminal's chances of being apprehended, there is sufficient motivation to be involved in crime. Another major factor that contributes to the creation of a society that is prone to crime is heterogeneity as Durkheim has suggested. While Shopeju (2006) focuses on environmental heterogeneity which is the mixed use of space by different sectors such as the commercial, industrial and residential sectors, cultural heterogeneity also contributes to the creation of a crime prone society. As Wirth (1938) argues, a cultural melting pot is a favourable breeding ground for cultural hybrids which challenge traditional norms. The implications of the cultural hybrids for deviant behaviour are easily seen in the lack of consensus on matters of appropriate dressing and propriety of certain sexual activities. A common example is the absence of consensus on the propriety of sexual relations with 'minors' in Nigeria. Arguments continue to arise on the appropriate age of consent based on varying cultural standards.

Yet, there is another way in which cultural heterogeneity may contribute to the creation of a crime prone environment in Nigeria. Cultural hybrids challenge conservative norms and values including the traditional value of 'modesty' even in situations of financial abundance. Thus, many people living in cosmopolitan areas are 'liberated' from the tradition of keeping a low profile. An adage among some peoples of Nigeria says that when one's yam tubers are very big, you cover them with your hands. In many cosmopolitan parts of the country today, this way of living has been challenged and many will flaunt their wealth. This way of living has the consequence of inviting potential criminals or encouraging them to also get wealth at all cost. Personal crimes such as rape and physical assault may also be connected with this display of freedom to dress in particular ways, an excuse potential assailants are looking for to justify their criminal activities.

Cultural heterogeneity which characterises many high density areas also leads to the collapse of traditional crime control mechanisms. Potential criminals are aware of loopholes in the criminal justice system and will exploit such to their advantage. Since the burden of proof is on the prosecutor even where perpetrators of crimes are arrested, criminals may take advantage of the prosecutor's weaknesses in proving a case and/or limited access to information.

A major observation in this study is that nearness to a highly cosmopolitan state/area can be responsible for a high rate of crime. This is particularly true for the highly cosmopolitan states of Lagos, Rivers and the FCT. While the FCT had a medium range rate of crime, the neighboring state of Nasarawa has a high rate of

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crime. Similary, Lagos and River states recorded medium range rates of crime, their neighbors, Ogun and Imo states recorded high rates of crime as shown in Figure 2. These three areas are of great importance in the country, Lagos, being the commercial hub of the federation, Abuja, being the Capital city and Rivers, which is home to major oil and gas companies (and expatriates) operating in Nigeria. In each of these cities, there is a class of affluent people with access to huge resources. This also creates an underclass of people who witness the display of wealth on a daily basis. This may contribute to the use of illegitimate means of acquiring wealth in the neighboring states where many of the people who come in contact with the urban rich live.

Conclusion

This study concludes that there is a significant variation in incidence and rates of crime across the states of the federation in Nigeria, with Southern states being more likely to record higher incidence and rates of crime than core Northern states. While population density is a significant predictor of incidence of crime, it is not a significant predictor of crime rate. Nearness to a major cosmopolitan state can result in a high rate of crime which may in fact be higher than the rates recorded in the cosmopolitan states themselves. This is as a result of exposure to high living standards by residents of states in close proximity with cosmopolitan states, without commensurate opportunities/access to resources in those less cosmopolitan states.

There is sufficient scientific cause to argue that there is a high level of other forms of crime in areas with high levels of armed robbery. Usman *et al* (2013) found through a study that there is correlation between crimes against persons and crimes against properties. This study concludes therefore, that states with high levels of population density have the tendency to record high incidence of armed robbery and other forms of crime. More than the states with high density and other urban features themselves, states that are proximate to high density states run the risk of recording a high level of the incidence and rate of crime. The problem of crime in Nigeria can be reduced, however, if the federal government can create a comprehensive database containing the vital socio-demographic as well as biometric details of all adult individuals in the country. This will help reduce the problem of anonymity and assist forensic criminal investigation in the country. Other solutions to be considered include the keeping of records of permanent and semi-permanent internal movement within the country and the revitalization of the manufacturing sector to boost the country's economic absorptive capacity for the creation of jobs. If these measures are put in place, it is believed that the problem of high incidence and rates of crime in the country will be brought under control.

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