Effectiveness of Crime Prevention through Environmental Design Strategies towards Feeling of Safety Sustainability in Osogbo, Nigeria

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Abstract

This study examined crime prevention strategies vis-a-vis perceived residents' feeling of safety in Osogbo Nigeria. The survey was conducted using systematic sampling. Four (4) crime prevention approaches were identified in the study area. Residents' perception of effectiveness of these safety strategies measured through an index of 5 and tagged Effectiveness Perception Index (EPI) revealed that Crime Prevention through Environmental Design (CPTED) was the most effective in the area (EPI=4.45) while the least effective was safety and security measures (EPI=3.99). Safety Perception Index (SPI) at home was 4.57 during the day and 4.45 in the night. The SPI at work place during the day was 4.41 while that of public place was 4.08 in the night. Highest correlation were recorded between CPTED and residents' feeling of safety as the coefficients (r) at home, work and public places were 0.935, 0.878 and 0.868 respectively. This study concluded that CPTED strategies are very significant in enhancing residents' feeling of safety in towns and cities. Recommendations were provided for adapting sustainable CPTED approaches for enhancing citizen's safety and well-being in the study area.

Keywords: Crime, victimization, prevention, safety, effectiveness, design, Osogbo

Introduction

Crime is a major source of social concern in the world today. A good number of countries in the world are faced with unacceptable levels of delinquency and crime. Findings in the last decade revealed that more than half of the urban residents are reported being victimized at least once regardless of what part of the world they inhabit (Ackerman and Murray 2004; Alemika and Chukwuma, 2005; Fajemirokun et al. 2006; Jayamala 2009). Among the conclusions drawn from the International Crime and Victim Survey (ICVS, 2010) is that high crime rates are not unique features of a few nations, rather a statistically normal feature of life all over the world. Specifically, ''no matter what part of the world, over a five year period, two out of three inhabitants of big cities are victimized by crime at least once'', and ''the chances globally to be victimized by serious contact crimes are one in five'. Thus, studies such as those of Agbola (1997), Agbola (2004), Alemika and Chukwuma (2005), Fajemirokun et al. (2006) and Sanni et al (2010) argued that a community with a high rate of criminal and delinquency activities is unattractive or less attractive to both local and foreign investment.

This situation prevails in many parts of Nigeria today. All daily newspapers devote a significant proportion of column inches to report incidences of murder and theft and accounts of sensational trials. The announcements concerning murder, rape, burglary, house and store breaking and stolen vehicles among others are daily features on the news and national dailies. The nation is being crippled by insecurity posed by criminals and not only is the incidence of violence becoming more frequent, the nature of the crime especially armed robbery, burglary and murder, have become more heinous, bolder and sophisticated (Agbola 2004; Alemika and Chukwuma, 2005; Fajemirokun et al 2006; Ekoja and Odole 2008). Lives and property no longer seem safe anywhere in the country.

In response to these global and national concerns, the government and the general public had long developed a number of crime prevention strategies to curb the epidemic of fear and feeling of insecurity posed by criminal activities. In fact, in the last decade, it is observed that some of these approaches had been intensified at different levels of government in order to abate these societal vices in the State of Osun. Governments and other authorities are trying to overcome this phenomenon by investing a lot of money in prevention measures. One of these measures which have

received greater attention is Crime Prevention through Environmental Design (CPTED).

The CPTED approach is on the basis of reducing opportunity, which aims to manipulate the built environment in order to affect users' behaviour that will reduce crime and the fear of crime (Cozens, 2007b). Therefore, CPTED principles are based on achieving objectives of sustainable community which Cozens, Saville and Hillier (2005) defined as "safe, perceives itself to be safe and is considered by others to be safe". The term sustainability should not only be interpreted as environmentally friendly, but it should also focus on creating a safe, attractive and ecologically rich environment (Edwards, 2000). Accordingly, Srinivasan, O'Fallon and Dearry (2003) commended that there is a sparse research concerning sustainable communities by considering diligent planning as an essential factor to create natural, mental and physical well-being.

Sampson and Raudenbush (1999) argued that crime and feeling of safety is considered a mirror of the quality of life and a component of public well-being. Urban planning professionals play a pivotal role in the promotion of sustainable development by affecting the built environment (Glasson & Cozens, 2010). They must focus on balancing and unifying the cultural, economic, physical and social contentment of people and, thus, confidently understand the social malaise of crime and take into consideration the safety of the surrounding environment and other social aspects of the environment in their design. It is proposed that urban sustainability is seriously undermined by crime and feelings of insecurity (Cozens, 2007a).

Since safety and security have always been major human needs throughout history (Cozens, 2007a, 2008), safety of the physical environment is therefore an integral part for the creation of sustainable community (Black, 2004). Both sustainability and security are however two important factors to be considered in an urban environment. In light of these considerations, mitigating crime and fear of crime may improve the quality of human life (Crowe 2000 and Schneider and Kitchen, 2002). To this end, a number of crime prevention strategies to curb criminal activities and create sustainable feelings of security in an environment have been developed.

This study therefore examines the effectiveness of these crime prevention approaches towards sustainability objectives with particular emphasis on CPTED approaches. It reviews crime prevention strategies associated with safety and sustainability. Consequently, the study examines three different aspects of sustainable development namely physical, social and environmental in relation to CPTED using Osogbo the capital city of Osun-State, Nigeria as the case study.

Crime Management and Prevention Strategies

In the literature, three approaches to crime management and prevention are identified. These include Crime Justice System, Crime Prevention through Social Development and Crime Prevention through Environmental Design.

Criminal Justice System is as old as man himself. It is the first crime prevention strategy that was introduced by man. Criminal justice system is the conventional and most pervasive approach to crime prevention (Yongcho, 1974; Bowker, 1980; Alemika 2001 and Badiora 2012). This approach represents the entire array of governmental institutions that function as the instrument of a society, to enforce its standards of conduct necessary for the protection of the safety and freedom of individual citizens, and for the maintenance of order (Yongcho, 1974 and Badiora 2012). This task is performed by means of detecting, apprehending, prosecuting, adjudicating and sanctioning those members of the society who violate the established rules and laws of society.

In order to control the criminal activities, there are three institutions that play a role in the enforcement of criminal justice system in Nigeria – the Police, the Courts, and the Prisons. Law enforcement and management of law and order, security, crime prevention and crime detection are essentially enforced and performed by the police authorities. In Nigeria, government had devised and employed several crime justice measures (Okorodudu, 2010). For instance, establishment and administration of juvenile justice; promulgation of juvenile laws and courts, establishment of remand homes, establishment of security and law enforcement agency such as the police, courts and prisons are all the pillars of the Nigerian criminal justice system. There are many other quasi-police and judicial institutions in the country which complement the roles and functions of the main

Judicial Justice System. The juvenile justice system can be said to be an integral part of the nation's criminal justice system (Alemika, 2001).

Yongcho (1974) and Bowker (1980) concluded that the main thrust of the criminal justice system is directed towards the control of crime, delinquency and criminal offenders after the crime is being committed; a palliative role, rather than crime prevention; a preventive role. The performance of this role makes crime become a symptom rather than a cause of violence and other deviant behaviour. It is on these grounds that the criminal justice system is faulted.

Crime prevention through social development is a relatively new approach to crime prevention. It is pioneered by sociologists and victimologists. Abodunrin, (1981); Aguda (1994); Obateru (1994) and Audy (1995) all agreed that there is a group of people in the society who bear the brunt of social injustice. They are the downtrodden and poverty-vulnerable groups and having come to the end of their wits; these people resort to crime in order to correct societal imbalances. This approach relies on the premise that there is a well-established body of research that can identify factors contributory to crime. It is the effects of these contributing factors that crime prevention through social development strives to alleviate. The efforts of this approach include initiatives to reduce poverty and to increase the availability of proper housing, employment, education and adequate recreational facilities (Agbola, 1997).

In order to bridge the gap between the rich and the poor, and discourage criminal tendencies among the poor, Abodunrin recommended what he called social harmonization. Abodunrin (1981) wrote that there is a dichotomy between the mode of life of the robber and of his victim. The robber is often half literate and unsuccessful, while his victim is often successful, either by virtue of his education or profession. For the criminal, his daily social contacts reinforce his feelings of impotence and erode his self-confidence and having been locked out of the game of success both materially and psychologically, he resorts to criminal behavior with the intent of changing the rules. Aguda   (1994)   recommended   social restructuring and his contention for this is that most societal crimes are committed out of frustration and desperation by the poor; and, therefore, to prevent crime, the national economy should be totally restructured so that everybody, especially the low and middle income classes can have access to

good food, employment, shelter, clothing, and transportation, and be able to take good care of their children.

Obateru (1994) agreed with this opinion when he wrote that planned urban growth promotes urban efficiency and consequently urban productivity, which in turn reduces urban crime and violence through raising the standard of living of urban residents. Abodunrin, Aguda and Obateru were writing from the point of view of African urban violence and crime, where the high rate of urbanization and the increasing rate of modernization and its attendant problems have contributed immensely to the increasing wave of urban violence.

Audy (1995) wrote to support the view of the social developers when he observed that certain factors make people more involved in a whole range of antisocial behavior and criminal acts. He concluded that when these factors are addressed through social planning, crime can be reduced and other beneficial results may be realized. In his view, such social planning benefits or advantages may include: less truancy in schools, fewer health-related problems, increased and better employability, independent living, effective parenting, and the productivity of citizens. He further said that all these are long-term programmes for crime prevention with the resultant positive impact and cost effectiveness may take a long time to materialize.

The approach (CPTED) was originally coined and formulated by criminologist C. Ray Jeffery. Crime prevention through environmental design (CPTED) is a multi-disciplinary approach to deterring criminal behaviour through environmental design. CPTED strategies rely on the ability to influence offender decisions that precede criminal acts. CPTED is basically concerned with the manipulation of the physical environment in order to deter crime; it is not intended to create an impregnable fortress, but merely to make penetration more difficult and time consuming (Agbola, 1997). CPTED is assumed on the hypothesis that "the proper design and effective use of the built environment can lead to a reduction in the fear of crime and the incidence of crime, and to an improvement in the quality of life" (Crowe, 1991, p.1). Furthermore, CPTED is the design or re-design of an environment to reduce crime opportunity and fear of crime through natural, mechanical, and procedural means (Sorensen, 2007).

At the forefront of this approach is Jacobs (1961), who put forward the notion that the physical environment and criminal behaviour were related in an architectural context. Jacobs noted that streets with higher accessibility to the public could attract more eyes from the buildings to the street and this mechanism of natural surveillance can work effectively against crime (Jacobs 1961). Jacobs believes that the development of activity areas within the city, such as commercial, industrial, financial, educational among others have led to the reduction of surveillance of streets and other public areas and consequently, the reduction of community cohesion and the feeling of territoriality. This brought about the classic statement "Streets with eyes are safe streets". Thus, the various strategies used in the study area were categorized into these approaches as identified from the literature.

The strategies employed in this approach are: natural surveillance, natural access control, territorial reinforcement and maintenance (Cozens, 2002 and Parnaby, 2007). The first two strategies, natural surveillance and natural access control are mainly geared towards promoting the offenders' risk perception by keeping users and outsiders under observation and denying access to potential targets. On the other hand, territorial reinforcement and maintenance are based on the assumption that the design and management of the environment can help the user of a property to feel a sense of ownership over a territory.

These four key elements provide the means to engender particular activities and decrease more deviant forms of activity (Haigh, 2006). The Natural Surveillance concept refers to the arrangement of physical design features involved with the activities and the people in order to maximize opportunities for surveillance at the right moment in time and space, consequently leading to crime discouragement (Cozens, 2002). Activity support refers to kinds of design that can be encouraged using public areas. This concept refers to the fact that offenders prefer those places with less observational control. It suggests that landscaping features can be designed to foster natural surveillance from within the home premises by residents and at the same time from the exterior by passers-by and neighbours. Natural access control involves the managing of a design to control the ingress and egress of persons to and from a specific space (Parnaby, 2007). This approach focuses on the management and design strategies in order to direct pedestrians and vehicular traffic to an easy flow while simultaneously discouraging criminal activities (Cozens, 2002).

Territoriality focuses on creating residents recognizable and identifiable zones within communities, so that people would feel connected and, thus, would attempt to defend their own community (Geason & Wilson 1989). It involves the use of physical design to encourage a sense of propriety among citizens while, at the same time, creating environments where the perceived probability of resident intervention is high (Crowe, 2000; Newman, 1972; Parnaby, 2007). In terms of housing design, the concept of 'territoriality' can be enhanced to discourage criminality through using real and symbolic barriers to define space and property as being private or public zones (Cozens, Hillier & Prescott, 1999). The image of development can encourage or discourage crime, which means that it can offer increased perceptions of vulnerability or isolation by way of design and maintenance (Cozens et al., 1999).

Osogbo: The Contextual Profile

Osogbo assumed the capital of Osun-State following the creation of a new state out of the old Oyo State in 1991. It is located at about 95km North East of Ibadan precisely on latitude 7^047^0 North of the equator and longitude 4^033^0 of the Greenwich Meridian. It covers an area of about 140 square km and lies at a height of 366 meters above sea level. The city has been experiencing dramatic development since the creation of the state. The population of the city has increased tremendously over the last decades because of the rapid rise in population and economic development. Osogbo occupies a central position with respect to towns around it. The town has been an important economic centre dating back to the colonial days. The railway line linking the northern and southern parts of the country went through Osogbo. This had seriously geared up the town and added to its social and economic growth. These dual advantages of being a former provincial headquarters and a railway transportation route made Osogbo a distribution centre for both finished and agricultural products.

The Nigeria Population Commission in 2006 put Osogbo's population at about 800,000 with an annual growth rate of 3.5%. Therefore, as the capital city of Osun State, Osogbo can be described as Osun's center of urbanization with financial, commercial and industrial capital concentration. As a capital city with a growing and diversifying population, Osogbo faces many management and insecurity challenges. These stems from the concentration of commercial activities and uncontrolled population growth through immigration from rural areas because of

economic presence and there are unplanned settlements with diverse social and economic challenges. In relation to public order, the security agencies face issues of violent crime. For indigenes, the Criminal Investigation Department (CID Osogbo) reported that house breaking, store breaking, stealing, burglaries, robberies, car-hijacking, car theft, false pretense and cheating, sexual harassment and victimizations as well as breach of public peace have all been concerns frequently reported at the various police stations in the town.

This survey discovered that in response to the concern of crime and safety, the government decided to implement a number of crime management and prevention strategies. These include the strategies to improve safety and security, increasing social development, community-government interaction and environmental development (CPTED). Approaches under CPTED include strategies such as environmental Development and Design through territoriality, surveillance strategies, security barriers, street lighting, active support, maintenance as well as green area and landscaping.

Social Development includes Job creation and Youth empowerment, Small and Medium Scale Business Support through Grants, Loans and Designing Policies to stem rural-urban migration (Agricultural and Rural Development Policies). Other approaches include community mobilizations and sensitization of the residents on security issues.

Government-Community Dialogue approaches are consistent engagements between government and indigenes as well as various community associations such as landlord associations, women associations, market women and religion bodies. Included in Safety and Security measures approach were closer cooperation between the police command and other security agencies (such as vigilante groups and private security agencies), equipping and empowering law enforcement agencies to tackle crime (e.g. enactment of laws, patrol vehicles and so on), developing physical and urban planning policies that take into account policing and security concerns. Others approaches were the establishment of effective communication and emergency response system and creation of conflict management resolution and community integration bodies in smaller communities.

Methodology

Primary data were obtained through interviews of 202 systematically selected residents of the town. Systematic sampling procedures were used to reduce any bias that might affect the findings. From the reconnaissance survey, a total of 372 formally named streets in Osogbo were identified from the local authorities. Considering the homogeneity of the population in the different areas under survey, one out of every five road/street (20%) was selected without replacement. In order to administer questionnaire, one out of every fifty buildings (2%) along the selected streets was interviewed. Questionnaire was administered on residents on each flow of the selected building who has attained age 22years and above and has been residing in the town for at least 3 years. The interviews were conducted for a period of one week and responses were analyzed using descriptive and inferential statistics.

The effectiveness of four basic approaches was investigated from residents' perception. This was summarised to effectiveness Perception Index (EPI). To arrive at the EPI, residents were provided with a list of identified crime prevention strategies and their approaches. They were further instructed to indicate the effectiveness of each of the identified strategies. Residents were to express their perception of effectiveness of these safety approaches using one of five Likert scales of 'very effective' (VE), 'Effective' (E), 'Just Effective' (JE), 'Not effective' (NE) and 'not effective at all' (NEA). The analyses of the ratings indicated by the residents from the Likert's scales adopted evolved into an index called "Effectiveness Perception Index" (EPI). To arrive at EPI, weight value of 5,4,3,2 and 1 were respectively attached to 'very effective' (VE), 'Effective' (E), 'Just Effective' (JE), 'Not effective' (NE) and 'not effective at all' (NEA). The index for each type of strategies was arrived by dividing the Summation of Weight Value (SWV) by the total number of responses. The SWV for each type was obtained through the addition of the product of the number of responses to each strategy and the respective weight value attached to each rating.

This is mathematically expressed as:

$$\mathbf{SWV} = \sum_{i=1}^{5} x_i y_i \quad \text{.. (1)}$$

Where:

SWV= Summation of Weight value; x_i= number of respondents to rating i; y_i=the weight assigned to a value (i=1, 2, 3, 4, 5). The index for each identified strategy thus takes a value of between 5 and 1. The nearer the value to 5, the higher is the feeling of safety.

$$EPI = \frac{SWV}{\sum_{1}^{5} x_i} \qquad \text{……………………………. (2)}$$

The mean index for the town was computed. This was obtained by summing the indices of all the prevention strategies and dividing by the number of the identified strategies (n=4). This was denoted by EPI_n

Using percentages and safety perception index (SPI), residents' safety survey was documented. To arrive at the *PSI*, the process adopted for effectiveness perception index (*EPI*) was also adopted. However, in this case, residents were to express their feeling of safety at home, work and in public places using one of five Likert scales of 'very safe' (VS), 'Safe' (S), 'just safe' (JS), 'not safe' (NS) and 'not at all safe' (NAS). The mean index for the town both in the day and night time were computed also. This was denoted by SPI_{day} and SPI_{night} Correlation between residents' feeling of safety and crime prevention strategies were examined. The correlation was investigated using Pearson Product Momentum Correlation coefficient.

Results and Discussion

The result of the analysis of the available data is discussed under various sub-headings as follows. Except where otherwise stated, all the tables emanated from the survey conducted by the researcher in 2011.

Effectiveness of Crime Prevention Strategies from Residents' Perception

Summary of the findings in this section is presented in Table 1. The EPI_n computed was *4.29.* It was therefore evident that crime prevention strategies such as social development and crime prevention through environmental design (CPTED) had their EPI above EPI_n. They were by this indication considered as important and more effective strategies from residents' perception. In addition, government-community dialogues as well as security measures had their EPI below EPI_n. These were by this indication considered as less important strategies relative to residents' perception.

Table 1:   Effectiveness of Crime Prevention Strategies from Residents Perception

S/n	Strategy	Crime Management and Prevention Approaches	(EPI)
1	Safety and Security	Closer cooperation between the police command and other security agencies and Osun-State government. Equipping and empowering law enforcement agencies to tackle crime (e.g. enactment of laws, patrol vehicles among others). Developing physical and urban planning policies that take account of policing and security concerns. Establishing an effective communication and emergency response system. Creation of conflict management resolution and community integration bodies in smaller communities	3.99
2	Social Development	Job creation and Youth empowerment. Small and Medium Scale Business Support through Grants, Loans. Designing Policies to stem rural-urban migration (Agricultural and Rural Development Policies). Community Mobilizations and sensitization on security issues	4.36
3	Government-Community dialogue	Through consistent engagement between government and indigenes as well as government and various community associations (Landlord Associations, Women Associations, Market Women, Religion Bodies.	4.12
4	Crime Prevention through Environmental Design (CPTED)	Environmental Development and Design through territoriality, surveillances strategy, security barriers, street lighting, active support, maintenance and green area and landscaping.	4.45
5	Total	Effectiveness Perception Index (EPI)	**17.16**

Explicitly, CPTED were considered as the most effective crime prevention approach in Osogbo relative to residents' perception. The effectiveness perception index (*EPI*) was 4.45. Next in effectiveness to this was Social Development with *EPI* of 4.36. Effectiveness of Government-community dialogue approach from residents' perception was 4.12. The least effective from residents' perception was safety and security measures (*EPI*=3.99).

$$EPI_n = \sum EPI = 17.16, \; EPI_n = \frac{\sum EPI}{(N=4)} = \frac{17.16}{4} = 4.29$$

(b Residents Feeling of Safety

With these findings above, residents' safety survey was documented. The summary is presented in table 2. The analysis of safety perception index (PSI) revealed that the overall safety index for Osogbo during the day (SPI_{day}) was put at 4.43 while that of night time (SPI_{night}) *was* 4.25. It was established that the *PSI* at home during the day and in the night were higher than SPI_{day} and SPI_{night}. Therefore, it was evidently seen that residents felt most secured at home during the day and in the night time when compared with work and public places. This was confirmed as the *PSI* at home was put at 4.57 during the day with a standard deviation (SD) of 0.14 and 4.45 (SD= 0.20) in the night. Furthermore, residents felt more secured at workplace when compare with their feeling of safety in public places. The *SPI* for work place during the day and in the night was respectively put at 4.41 and 4.23 while that of public places were 4.30 and 4.08 respectively. It was also noted that the *PSI* computed for workplaces and public places were lower than SPI_{day} and SPI_{night}. This is an indication that residents feel secure at work places and in public places. However, residents'' felt least secured in public places.

It was evident that 65.3% of the residents felt 'very safe' at home during the day as 59.4% and 54.5% have the same level of feeling in their respective work place and public place respectively. The study further revealed that the proportion of residents who felt 'safe' during the day at public places, work place and home were 30.7%, 26.2% and 24.8% respectively. While 4% were 'not safe' at home during the day, corresponding 2.5% and 7.9% had the same feeling at workplaces and public places respectively in Osogbo. The proportion of those who were 'not safe at all' during the day were 0.5%, 1.0% and 2.0% respectively at home, work places and public places. In the night time, 60.4% of the residents of Osogbo felt 'very safe' at home while 55.9% and 50% had the same feeling in the night at work place and public places respectively. The proportion of those who felt they were 'safe' during the night time at home, work places and public places were 25.7%, 21.3% and 22% respectively. Furthermore, it was revealed from the summary in Table 3 that those residents who felt 'not safe' at their homes accounted for just 3%. While, 10% of the residents reported they were not safe at work place, it was also revealed that 7.4% had the same feeling in the night at public places. The

proportion of residents who were 'not safe at all' at home, work places and in public place were 0.5%, 0.9% and 5% respectively.

It is therefore noted generally that the proportion of residents who felt "safe" both in the day and during night time was higher at home. These differences in the proportion of feeling of safety from home, work and public places is an indication that as people move away from most familiar places (such as Home or place of resident) to less familiar places (such as place of work and public places), feeling of being unsaved or being victimized is on the increase. This corroborates the assertion of (Brantingham and Brantingham 1991; 2003) that there is a heightened level of fear and risk of victimization for those away from home.

Table 2: Residents' Feeling of Safety in Osogbo

Place	Day					Night					Day			Night		
	V S	S	J S	NS	NSA	V S	S	J S	NS	N S A	SWV	SPI	M D	SWV	SPI	MD
Home	132 (65.3%)	50 (24.8%)	10 (5%)	8 (4%)	2 (0.5%)	122 (60.4%)	52 (25.7%)	21 (10.4%)	6 (3%)	01 (0.5%)	918	4.57	0.14	894	4.45	0.20
Work place	120 (59.4%)	53 (26.2%)	20 (10%)	05 (2.5%)	04 (1%)	113 (55.9%)	43 (21.3%)	24 (11.9%)	20 (10%)	02 (0.9%)	886	4.41	-0.02	851	4.23	-0.02
Public place	110 (54.5%)	62 (30.7%)	10 (5%)	`16 (7.9%)	04 (2%)	101 (50%)	46 (22%)	30 (14.9%)	15 (7.4%)	10 (5%)	864	4.30	-0.13	819	4.07	-0.18

$$SPI_{day} = \sum PSI = 13.29, \quad SPI_{day} = \frac{\sum PSI}{(N=3)} = \frac{13.29}{3} = 4.43$$

Thus, SPI$_{day}$ = 4.43

$$SPI_{night} = \sum PSI = 12.75, \quad SPI_{night} = \frac{\sum PSI}{(N=3)} = \frac{13.29}{3} = 4.25$$

Thus, SPI$_{night}$ = 4.25

(c)   Correlations of Safety Strategies and Residents' Feeling of Safety

Summary in Table 3 revealed that high and middle up positive correlation existed between residents' feeling of safety and crime management and prevention strategies observed. This indicated generally that the more effective these prevention strategies were, the higher the feeling of safety of the residents. However, the effects of each of the approach on residents' feeling of safety vary as this was evident from the

correlation coefficients (r) computed. Safety and Security measures had a strong positive correlation with safety at home (r= 0.743) and safety in public places (r=0.709). However, in the case of work place, it was middle-up positive correlation (r = 0.627). In the case of social development, a very strong positive correlation existed in all the three areas observed. It was evidence from the summary in Table 4 that the correlation between social development and residents feeling of safety at home was 0.833 while that of public places was 0.821. The correlation coefficient (r) of safety at workplace in respect of social development was 0.789.

Table 3: Pearson Product Moment Correlations of Safety Strategies and Feeling of Safety

Variables	Safety and Security	Social Development	Community-Government Dialogue	Environmental. Design (CPTED)	Safety at home	Safety at Work Place	Safety at Public Places
Safety and Security	1						
Social Development	0.424	1					
Government-Community dialogue	0.421	0.435	1				
Environmental. Design (CPTED)	0.486	0.597	0.507	1			
Safety at Home	0.743	0.833	0.721	0.935	1		
Safety at Workplace	0.627	0.789	0.698	0.868	0.543	1	
Safety in Public Places	0.709	0.821	0.705	0.878	0.671	0.456	1

N=201, p<.01(Correlation is significant at the 0.01 level)

Community-Government dialogue had a strong positive correlation with safety at home (r= 0.721) and safety in public places (r=0.702). It was middle-up positive correlation (r= 0.698) in the case of safety at the workplace. A very strong positive correlation existed in all the three areas observed in the case of crime prevention through environmental design. The correlation between crime prevention through environmental design (CPTED) and residents feeling of safety at home was 0.935 while that of public places was 0.878. The correlation coefficient (r) of safety at workplace in respect of this measure was 0.868. It was revealed that among all crime strategies listed in Osogbo, highest correlation were recorded between CPTED and residents' feeling of safety at home, work place and public

places. The study therefore established that while CPTED strategies in the study area were effective, significant relationship also existed between residents' feeling of safety and CPTED strategies observed in the study area. Hence, features of environments where people live are very significant in feelings of (in) security of the residents.

Findings of this study is similar to that of Sampson and Raudenbush (1999) that crime and feeling of safety is associated with the quality of life and a component of built environment and that physical features of environments are very significant in feeling of (in) security of the residents. Similarly, Glasson & Cozens (2010) concluded that a significant relationship existed between residents' feeling of safety and CPTED strategies. Srinivasan *et al.*, (2003) in their study about creating healthy communities in the US have consistently revealed that a significant relationship between a deteriorated physical environment and high crime rate exists, leading to neighbourhood walkability decline and, as a consequence, resulting in higher social isolation and fear. CPTED, it is argued, can provide potential benefits of public health by means of risk assessments and delivering safer communities which tends to support active citizens, walkable communities and bring public health (Cozens, 2007b).

Conclusion and Recommendations

This study has been able to reveal CPTED as the most effective crime prevention strategy in Osogbo (EPI=4.45) while the least effective was safety and security measures (EPI=3.99). It also revealed that Safety Perception Index (SPI) at home was 4.57 during the day and 4.45 in the night. The SPI at the work place during the day was 4.41 while that of public place was 4.08 in the night. Furthermore, highest correlation coefficients were recorded between Crime Prevention through Environmental Design (CPTED) and residents' feeling of safety as the coefficients (r) at home, work and places were 0.935, 0.878 and 0.868 respectively. Hence, features of the environments where people live is very significant in feeling of (in) security of the residents.

To this end, if planning is about making places better for people, then it has to address those elements that make places problematic for people in which fear of crime are prominent. Security and perception of safety are important factors for achieving sustainable development.

However, there has been little empirical evidence in the examination of crime and fear of crime as prerequisite for sustainability (Cozens, 2007a, 2008). Several studies have found different ways to solve the safety problems among urban areas. While planners, landscape architects and designers attempt to solve criminalities using their influence on the built environment.

CPTED approaches have made substantial strides in explaining the key characteristics of the environmental sustainability concept. Jacobs (1961) and Berke and Conroy (2000) among others show that spatial layout and type of land uses affect the vulnerability of residents against burglaries. Significantly, it is clear that crime prevention by design strategies may be able to cover all three components of sustainability and provide a balance among such components. CPTED prevention approaches thus help to enhance sustainability in developments as well as safety of society. Cozens (2007a) recommended that crime and fear of crime measures need to be considered as integral components of urban sustainability. Furthermore, designing out crime approaches are highly in line with environmental, social, as well as economic sustainability Cozens (2007a). Such environmental approaches can lead to better quality of human life and also public cohesion which are fundamental elements for a sustainable development. One possible explanation is that neighbourhood environmental design can possibly be manipulated on the basis of crime prevention strategies to achieve crime reduction and ultimately, better quality of life and sustainable communities.

This study suggests that the application of CPTED principles have positive effects in the built environment and possess low levels of crime and fear among societies. Consequently, it can be pointed out that safety and security strategies appear to be effective methods towards achieving sustainability. Along this line of investigation, it may be concluded that safety and security should be considered as a prerequisite towards achieving sustainable development. Crime and the fear of crime must be considered in the development process as effective indicators in achieving sustainability for communities. Crime prevention strategies if considered at the initial stage of each development may able to provide comprehensive sustainability outcomes such as environmental, social as well as economic benefits.

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