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EFFECTIVENESS OF SURVEILLANCE MEASURES ON URBAN CRIME PREVENTION AND CONTROL IN MAKURDI TOWN, NIGERIA

Patience Adzande¹ and Timothy TerverGyuse²

¹Department of Urban and Regional Planning, Benue State University, Makurdi-Nigeria
padzande@bsum.edu.ng

²Department of Urban and Regional Planning, Nasarawa State University, Keffi-Nigeria
tguse62@gmail.com

Corresponding Author

E-mail: padzande@bsum.edu.ng

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ABSTRACT

Research on cities in the global north suggests that surveillance measures like street lighting and Closed Circuit Television Cameras have the potential to reduce the occurrence of crime. However, little or no empirical studies exist on cities of the global south. Thus, this study assessed the effectiveness of the surveillance measures used by individuals to control the occurrence of crime in Makurdi town. A semi-structured questionnaire was used to elicit information on the surveillance measures in place. Multiple regression analysis was applied to determine the effectiveness of the measures. The study found that dogs, security guards and avoiding late nights are the surveillance measures adopted by residents to prevent crime within the homes and on the streets. These measures had differential effects on the incidences of armed robbery and assault. The findings reiterate the importance of crime analysis as requisite knowledge in the design and application of crime prevention measures.

Keywords:

Surveillance, security guards, crime control, crime prevention, urban crime

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Introduction

The adoption of crime prevention interventions by city authorities or individuals is usually based on limited knowledge of what works to reduce crime and in which specific locations or cities. However, Willemsse and de Waard (1993) argued that crime prevention strategies will be more effective if they were based on a rigorous analysis of empirical evidence of their successes elsewhere. Three broad types of interventions that could be applied in crime prevention and control are law enforcement, social prevention and situational prevention. Situational prevention targets prevailing conditions or physical characteristics of a place/location that increase the opportunities for crime. There are a wide range of options that could be used to make certain locations unattractive to potential offenders. Amongst these are formal and informal surveillance measures like street lighting, closed circuit television (CCTV) cameras and security guards or neighbourhood watch groups.

These measures have been applied in cities across the world and their benefits or otherwise have been reported by quite a number of researchers. These evaluation studies are mostly found in cities in the global north; with little or no empirical studies on the types of measures used in cities of the global south and their capacity to reduce crime. Meanwhile, crime is endemic in cities of the global south and most efforts aimed at curbing the menace have yielded little or no results. Thus, studies that evaluate the effectiveness of crime measures in deterring crime are imperative. This study is one of such efforts to assess the value of surveillance measures in reducing incidences of crime in a rapidly growing city in Nigeria.

Different measures play one or more of five roles namely deterrence, detection, surveillance, liability reduction and fear

reduction. Out of these roles, deterrence is the most crucial. The capacity of the measures to play a specific role is dependent upon the location. For instance, lighting could be provided in public spaces like parks to reduce the fear of crime, to facilitate surveillance by passers-by and to increase the utilization of the park (The Grizzly Gazette, 2016). A summary of studies that have evaluated crime prevention measures or conducted reviews of the available evidence is presented here to provide an understanding of their contributions to crime deterrence in cities. Closed Circuit Television cameras and improved lighting are the most well developed surveillance measures currently in use in developed countries. Others are security guards and place managers (Welch, Mudge and Farrington, 2010). Farrington and Welsh (2002) conducted a systematic review of the effects of improved street lighting on crime from studies on American and British cities. They found mixed results in the available literature analysed in the review. The results showed that in four American studies, street lighting was effective in reducing crime while four others reported otherwise. From the British studies, five reported a decrease in crime with improved street lighting. The conclusion from the review was that even though street lighting had an effect in reducing crime, it apparently increased community pride more than it increased surveillance.

A study of lighting improvements in two cities, Dudley and Stoke-on-Trent in England showed that it reduced crime by forty-one percent in Dudley and forty-three percent in Stoke-on-Trent (Painter and Farrington, 1999). In this case, improved lighting also heightened perceived public safety. It has been observed that street lighting is particularly effective at night as it improves night time visibility within urban areas; thereby resulting in reduced

opportunities for crime (Jacobs, 1961; Welsh and Farrington, 2008). The assumption is that lighting will attract more users to a particular space; specifically, public and open spaces like streets and parks. This is capable of enhancing surveillance and increasing the risks for potential offenders who intend to prey on available targets.

Ratcliffe, Taniguchi and Taylor (2009) carried out a review of studies that had evaluated the effectiveness of CCTV cameras in reducing crime. Their findings show that the introduction of CCTV cameras in Philadelphia, USA was associated with a thirteen percent reduction in crime. One notable observation from the evaluations was that CCTV cameras were more effective in some areas as compared to other locations. Welch and Farrington (2009) also interrogated the relevance of CCTV cameras as measures of crime prevention based on existing studies on the US and other western countries. The results suggest that CCTV contributed to a sixteen percent decrease in crime in experimental areas as compared to control areas. These reductions in crime were higher in car parks (fifty-one percent) while they were significantly lower (seven percent) in city centres and public housing. Overall, CCTV cameras were more effective in public transport schemes (twenty-three percent); even though this was considered non-significant. This led to the conclusion that public transport schemes in the UK recorded higher levels of effectiveness than those in the US and other countries.

Piza (2018) also investigated the effect of CCTV cameras on three crime categories - auto theft, theft from automobile and violent crime in Newark, New Jersey. The results indicate that CCTV cameras were effective in deterring auto theft but ineffective on other crime types. This lends support to the report by Welsh and Farrington (2009) that CCTV cameras were

more effective in car parks. Thus, Piza (2018) concludes that CCTV cameras could be a viable option in areas where the target is auto theft. A survey of twelve former burglars showed that the most effective deterrents for home burglaries were CCTV cameras and a barking dog while for car theft, CCTV cameras and car alarms were the most effective (Smithers, 2017). A divergent view suggests that CCTV cameras are more effective in detection rather than deterrence which could actually prevent the occurrence of crime. Another survey of burglars by the University of North Carolina suggested that a barking dog can be an effective deterrent for burglars as it is capable of alerting home owners, neighbours and passers-by of impending danger.

Palmer and Button (2011) traced the exponential growth of civilian private security services across the world and obtained some fascinating results. The report shows that civilian private security services in France grew from 100,000 personnel in 1982 to 160,000 in 2010; in South Africa, the numbers increased from 115,000 personnel in 1997 to 390,000 in 2010 while India had about 7 million private security personnel by 2010. The authors observed that the private security personnel fill in gaps left by the overstretched Police and contribute to crime prevention and community safety. The personnel offer services like patrolling the streets, conducting surveillance and protecting individual properties or gated communities.

In South Africa, increasing reliance on private security companies has led to a surge in their numbers. Available records suggest that South Africa has the largest number of private security companies and employees in Africa. Private security employees outnumbered the Police by 2015/2016. Berg and Howell's (2017) analysis of the situation in South Africa

shows that by 2015/2016, there were two hundred and seventy-six Police Officers for one hundred thousand people while there were eight hundred and eighty-nine private security guards for the same population. From the literature, it is not clear if these private security personnel have contributed to crime reduction in South Africa. On the basis of a summary of evaluations of previous research findings from the US, UK, The Netherlands and Canada, Welsh and Farrington (2009) reported that it was difficult to draw conclusions on the effectiveness of security guards and place managers. However, the evidence from the UK suggested that a combination of measures including security guards were highly effective in reducing crime at a car park in Basingstoke. In this case, it was not possible to isolate the effects of specific measures on the reduction of crime in the area.

The findings presented from previous evaluations of the effectiveness of crime control measures imply that location matters as it is a potential contributor to the functionality and effectiveness of a particular intervention designed to reduce crime. Again, these findings suggest that the type of crime targeted should determine the intervention(s) that will be applied. Drawing from the studies reviewed, it can be seen that in western countries, closed circuit television cameras are more effective in reducing auto theft particularly in parking areas as compared to other street or outdoor crimes. As can be seen from the summary of the literature, there is a dearth of knowledge on the effectiveness of crime prevention measures used by urban residents in Africa and Nigeria in particular. This study was therefore designed to address this knowledge gap by examining the level of criminal victimization and the prevalent types of crime in Makurdi town; identifying the surveillance measures used by

individuals to ensure safety from crime and determining the effect of these individual measures in reducing specific types of crime in Makurdi town.

The Study Area

The contiguous built up area Makurdi town covers an area of about 13,000 hectares and is home to about 450,000 people. The town is dissected into North and South Bank by River Benue and is strategically located as a bridge and transit town linking the northern and eastern parts of Nigeria. It is both the capital of Benue State as well as the headquarters of Makurdi Local Government Area, and is the most urbanised settlement in the state with the highest concentration of people, public institutions and private businesses. Because of the large public service population, there are relatively low density areas like Old and New GRAs and Judges Quarters; and medium density areas such as High level, Nyiman, Welfare Quarters and Owner Occupier Quarters. Makurdi has a mixed population in terms of ethnicity, religion and social class. These mixed groups of people can be found living together in the different residential areas of the town.

In recent times, Makurdi has been witnessing rapid population increase accompanied by physical growth and expansion. The increase has been largely due to insecurity in neighbouring communities which resulted in the massive displacement of people and diminishing economic opportunities in adjoining areas. Most recent migrants locate on the periphery of the town in makeshift accommodations; others go to high density areas like Angwan-Jukun, Wadata and parts of North Bank. The rapid rise in population could potentially give rise to increased anonymity of especially new migrants; therefore, generating greater opportunities for offending and victimization. It is therefore

pertinent to evaluate the effectiveness of crime prevention and control measures applied by residents so as to generate empirical knowledge that could guide the design and implementation of interventions in Makurdi town.

Methodology

This study adopted a survey design which entailed the use of a semi-structured questionnaire to elicit information from household heads in Makurdi on the types of crime and the formal and informal surveillance measures used in crime prevention and control. The prevalent measures used by residents were identified from the responses obtained. A total of eight hundred and sixty respondents were systematically sampled for the study. The sampling method entailed the demarcation of Makurdi town into fifty-seven residential areas to ensure adequate representation of the population (Figure 1).

To determine the effectiveness of the crime control measures adopted by residents of Makurdi town, the multiple regression analysis was used. The percentages recorded against each of the dominant measures were regressed against the level of victimization and the five types of crime. In interpreting the results of the regression analysis, if the p-value is less than 0.05, then the correlation is considered to be statistically significant. This implies that at 95% confidence interval, the relationship between the variables is not due to chance but that the predictor variables have a significant effect on the dependent variable. The coefficients of determination (R^2) were also useful in understanding the percentage of the variance or fluctuations in crime that can be accounted for by the crime control measures. In interpreting the results, coefficients of determination values that were between seventy to one hundred percent meant that the particular crime measure had a strong effect on the occurrence of crime; forty to sixty-nine percent connoted a moderate effect on crime while one to thirty-nine percent indicated a

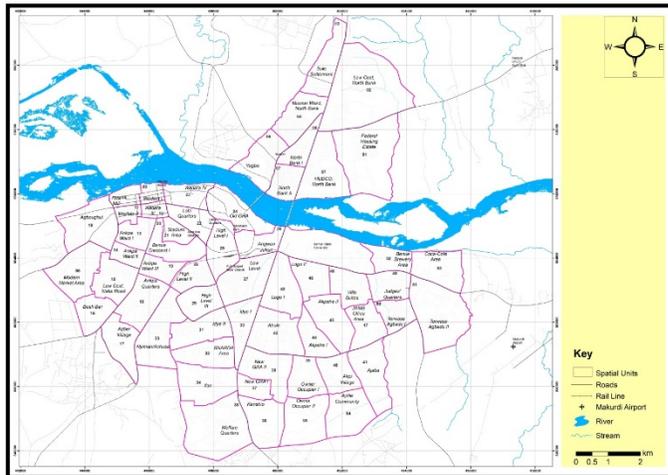


Figure 1: Makurdi Town showing the Fifty-seven Residential Areas.
Source: Author’s Fieldwork, 2015.

weak effect on crime. A positive relationship indicates that crime will increase when certain measures are deployed while a negative (inverse) relationship suggests that crime will decrease with the application of particular interventions. The unstandardized

coefficients (B) provided clarification on the direction of the relationship between the dependent and independent variables.

Results and Discussion

On average, about forty-two percent of residents in Makurdi town had experienced crime. The breakdown of the residents' experiences of crime shows that an average of fourteen percent had experienced assault; four percent had experienced rape while twenty-seven percent had been victims of burglary. Both armed robbery and theft had been experienced by an average of thirty-two percent of Makurdi residents. The analysis suggests that theft and armed robbery were the dominant crime types experienced by residents of Makurdi town. This implies that residents of Makurdi town have a higher risk of experiencing property crime as compared to crimes against persons.

The distribution of crime within Makurdi town shows that levels of victimization were reportedly higher in Lobi Quarters, Old G.R.A, Judges' Quarters, Low Cost North Bank, New G.R.A and Idye. In residential areas like Lobi Quarters, HUDCO Quarters North Bank, Kanshio and Judges' Quarters, more than fifty percent of the residents had been victims of armed robbery. Theft was significantly higher in areas like Federal Housing Estate North Bank, Ankpa Ward III, Owner Occupier I, Low Level and Idye. More than fifty percent of residents in Old G.R.A, High Level I, Akpehe I, Welfare Quarters and Low Cost Estate Naka Road had experienced burglary. Assault was prevalent in Ifan, North Bank

II, Modern Market Area and Akpehe II. Incidences of rape were higher in Angwan-Jukun, Kanshio, Owner Occupier II, Wadata I and Welfare Quarters.

Surveillance Measures Adopted in Crime Control in Makurdi

The surveillance measures used by residents of Makurdi town include dogs, security guards and avoiding late nights. Avoiding late nights was the preferred surveillance measure. The capacity of these measures to reduce the opportunities for victimization is discussed in the following subsections.

The Effectiveness of Dogs in Crime Control

Dogs were used by residents to keep watch over their homes and scare away intruders or potential offenders. For this reason, dogs can be classified as surveillance measures. The use of dogs in crime prevention and control was the least adopted measure in the residential areas of Makurdi town. Residential areas such as Sule Settlement, Low Cost Naka Road, Lobi Quarters and Terwase Agbadu II had the highest percentages of houses with dogs. Only armed robbery had a statistically significant relationship with the presence of dogs. The relationship was weak (7%) and positive (Table 1). This implies that dogs are not an effective measure in the control of incidences of armed robbery. The residential areas which had the highest percentage of residences with dogs also experienced high incidences of armed robbery except for Sule Settlement North Bank which had no reported case of armed robbery.

Table 1: Regression Results on the Effectiveness of Crime Control Measures

Measures/Type of Crime	Level of Victimization	Theft	Armed Robbery	Burglary	Assault	Rape
Dogs	0.24	0.18	0.043 (1.20)	0.35	0.11	0.25
Guards	0.14	0.07	0.001 (1.40)	0.47	0.07	0.57
Avoid Late Nights	0.82	0.09	0.014 (-0.46)	0.58	0.01 (0.35)	0.32

Source: Author's Analysis (2015)

Bold figures indicate significant relationship between the measure and the type of crime
Direction of relationship in parenthesis

As noted earlier, most of the incidences of armed robbery occurred on the streets. This probably explains why dogs were not very useful crime inhibitors in these residential areas since their sphere of surveillance is restricted within the compounds and its immediate surroundings and does not extend to the streets. On the contrary, Krainz (1988) found that dogs could effectively protect one family houses and villas against burglary. This conclusion was arrived at after a study in which more than half of the one hundred and eleven burglars interviewed stated that dogs, regardless of the type were effective deterrents. Aantjes (2012) also reported that the chances of burglary were lower in houses with a barking dog which were close to a busy street. The finding by Aantjes (2012) could imply that barking dogs are not necessarily effective deterrents of burglary on their own except when combined with the presence of human guardians. The results for Makurdi however showed that the presence of dogs was not an effective deterrent for any of the five types of crime studied.

The Effectiveness of Security Guards in Makurdi Town.

Security guards also fell into the category of surveillance measures. They provided formal policing of the residential

areas. Security guards were found in areas such as Low Cost Naka Road, Lobi Quarters, Old G.R.A, Judges' Quarters, TerwaseAgbadu II and HUDCO North Bank. In Lobi Quarters and Judges' Quarters for instance, some of the security guards were from the police or military while others were from private security firms.

Security guards had a statistically significant relationship with incidences of armed robbery. The relationship was weak (21%) but positive (Table 1). This implies that security guards are not effective in curbing the incidences of armed robbery within the study area. This is further established by the observation that armed robbery was prevalent in the residential areas where there were more security guards. In Lobi Quarters, twenty percent of the residences had security guards, yet seventy percent of the households reported incidences of armed robbery. Likewise, in Judges' Quarters, thirty percent of the residences had security guards; nevertheless, fifty-seven percent of the households had experienced armed robbery. Like dogs, the sphere of influence of security guards is limited. This possibly accounts for their inability to prevent the occurrence of armed robbery in residential areas in Makurdi town.

Cohen and Felson's (1981) routine activities theory postulates that opportunities for crime are created by the interaction between three variables: the availability of attractive targets, the absence of guardians and the presence of motivated offenders. Capable guardians could be neighbours, watchful parents, lighting, dogs, patrol officers, security guards or CCTV cameras. In the case of Makurdi, the presence of capable guardians in the form of security guards has proven to be ineffective in reducing crime.

The Effect of Avoiding Late Nights on Crime in Makurdi Town

Avoiding late nights was mainly a precautionary measure taken by residents against anticipated risks of exposure to crime. It appeared to be a measure adopted in response to the fear of crime and victimization. The residential areas with the largest percentage of residents that avoided late nights were Low Cost North Bank, Angwan-Jukun, parts of Wadata, North Bank, Idye and Ankpa-Ward and Akpehe. The analysis suggests that majority of the residents that avoid late nights are either pedestrians or those that depend on public commercial means of transportation. From the information obtained during the fieldwork, pedestrians and commuters on public transportation (particularly motorcycles) were more exposed to street crimes.

On average thirty percent of the residents of Makurdi town were concerned about their safety on the streets at night. This is probably because there were high incidences of night-time crime reported during the survey. This crime control measure had a statistically significant relationship with the incidences of armed robbery and assault (Table 1). The

relationship between avoiding late nights and armed robbery was negative while it had a positive relationship with assault. In both cases, avoiding late nights accounted for eleven percent of the variation in the incidences of armed robbery and assault respectively. This implies that avoiding late nights had very little positive and negative effect on the occurrence of armed robbery and assault in residential areas.

The negative association with armed robbery suggests that avoiding late nights could have a minimal (11%) effect in reducing the incidences of armed robbery. This finding is supported by the distribution of incidences of armed robbery within Makurdi town. The areas with the highest percentage of residents who avoided late nights coincided with the areas with either none or lower incidences of armed robbery. Such residential areas were Low Cost Estate North Bank, Idye, Akpehe II and Sule settlement. Ankpa-Ward II was the exception in this case; as it recorded high incidences of armed robbery even with a significant percentage of the residents avoiding late nights. Avoiding late nights appears to have the potential to reduce armed robbery because armed robbery was identified as a night-time street crime. Thus, avoiding late nights reduced the presence of attractive targets (people and valuable objects) on the streets at night and increased the chances of a minimal decrease in the incidences of armed robbery.

The implication of the positive relationship is that avoiding late nights can possibly increase the opportunities for assault to occur within residential areas of the town. A probable explanation is that less activity on the streets leaves the streets deserted and unguarded. Therefore, potential victims are exposed to greater risks of assault. Some of the residential areas with the highest percentage of respondents who avoided late nights also recorded relatively

higher incidences of assault. These residential areas include North Bank II, Akpehe II and Idye II. Low Cost Estate North Bank, Ankpa-Ward II, Wadata IV and Sule settlement had high percentages of residents that avoided late nights as a safety measure but had no reported incidences of assault. This is possibly an indicator that other triggers of assault such as the presence of young adults (motivated offenders) are absent in these residential areas. From another perspective, one would think that avoiding late nights might contribute to a reduction of crimes that take place within the homes like theft and burglary. But, there was no evidence from the analysis to support this assumption. This could mean that thefts and burglaries within residential areas were day time crimes and so the presence of capable guardians in homes at night had no significant effect in preventing their occurrence.

Conclusion

The study found that dogs, security guards and avoiding late nights are the surveillance measures adopted by residents to prevent crime and avoid personal victimization within the homes and on the streets. The analysis of the level of effectiveness of these measures revealed they all had significant but weak relationships with incidences of armed robbery and assault. Dogs and security guards were not capable of reducing incidences of armed robbery. However, avoiding late nights had the potential to minimally decrease incidences of armed robbery; since these mostly occurred at night and on the streets. On the other hand, avoiding late nights was not effective in curbing incidences of assault. This finding was conflicting because within the residential areas in Makurdi, some areas with high percentages of residents who avoided late nights had significantly higher

incidences of assault while others did not record any incidence of assault at all. This suggests that the factors that could facilitate the occurrence of assault or any other type of crime within residential areas in a city may vary; thus, requiring different interventions for the same type of crime in different locations.

Though, Cohen and Felson's (1981) routine activities theory seems to suggest that the presence of capable guardians could serve as a deterrent for crime, the results of the current study reveal the contrary. This goes to show that certain measures could be effective only when applied to specific crimes; thus, generalisations on what works to prevent crime should be avoided. These findings reiterate the importance of crime analysis to understand the types of crime, the location or context and the temporal dimension as requisite knowledge in the design and application of crime prevention measures. Equally important are evidence-based evaluations of what works to reduce specific types of crime in residential environments in cities of the global south.

REFERENCES

- Aantjes, F. (2012) "Residential Burglaries: A Comparison between Self-report Studies of Burglars and Observational Data from Enschede" University of Twente Student Thesis
https://essay.utwente.nl/MSc_F_Aantjes
- Berg, J and Howell, S. (2017) The Private Security Complex and its Regulation in Africa: Select Examples from the Continent International Journal of Comparative and Applied Criminal Justice pp. 1-14
<https://doi.org/10.1080/01924036.2017.1364280>

- Cohen, L.E. and Felson, M. (1981) Modelling Crime Trends: A Criminal Opportunity Perspective. *Journal of Residential Crime and Delinquency*, 18, pp. 138-164
- Farrington, D. P. and Welsh, B. C. (2002) Improved Street Lighting and Crime Prevention *Justice Quarterly* Volume 19, Issue 2, pp. 313-342
<https://doi.org/10.1080/07418820200095261>
- Jacobs, J. (1961) *The Death and Life of Great American Cities* Random House, New York
- Krainz, K. W. (1988) “Prevention von Hauseinbrüchen: Ergebnisse einer Täterbefragung” *Universität Graz*
- Painter, K. and Farrington, D. P. (1999) Improved Street Lighting: Crime Reducing Effects and Cost-Benefit Analysis *Security Journal* Volume 12, Issue 4, pp. 17-32 (Abstract)
- Palmer, R. W. and Button, M. (2011) “Civilian Private Security Services: Their Role, Oversight and Contribution to Crime Prevention and Community Safety” *UNODC Expert Group on Civilian Private Security Services*; Vienna: 12-14 October
- Piza, E. L. (2018) The Crime Prevention Effect of CCTV in Public Places: A Propensity Score Analysis *Journal of Crime and Justice* Volume 41, Issue 1, pp. 14-30
<https://doi.org/10.1080/0735648x.2016.1226931> First published online 31 August 2016
- Ratcliffe, J. H., Taniguchi, T. and Taylor, R. B. (2009) The Crime Reduction Effects of Public CCTV Cameras: A Multi-Method Spatial Approach *Justice Quarterly* Volume 26, Issue 4, pp. 746-770
<https://doi.org/10.1080.07418820902873852>
- Smithers, R. (2017) “Former Burglars Say Barking Dogs and CCTV are Best Deterrent” *The Guardian* Friday, 18 August
<https://www.theguardian.com/business/2017/aug/18>
- The Grizzly Gazette (2016) “Light your Way to Safety and Crime Prevention”
<https://www.prudentalsecurity.com/grizzly-gazette>
- Welsh, B. C. and Farrington, D. P. (2008) Effects of Improved Street Lighting on Crime. *The Campbell Collaboration*
- Welsh, B. C. and Farrington, D. P. (2009) Public Area CCTV and Crime Prevention: An Updated Systematic Review and Meta-Analysis *Justice Quarterly* Volume 26, Issue 4, pp. 716-745
<https://doi.org/10.1080/07418820802506206>
- Welsh, B. C. and Farrington, D. P. (2009) *Making Public Spaces Safer Oxford*: Oxford University Press
- Welsh, B. C., Mudge, M. E. and Farrington, D. (2010) Reconceptualizing Public Area Surveillance and Crime Prevention: Security Guards, Place Managers and Defensible Space *Security Journal* Vol. 23, 4; pp. 299-319
- Willemse, H. M. and de Waard, J. (1993) Crime Analysis and Prevention: Perspectives from Experiences in The Netherlands *Security Journal* Vol. 4, No. 4; pp. 193-204